

**MINUTES  
WINTER MAINTENANCE TECHNICAL SERVICE PROGRAM (WMTSP)**

**Summer Meeting August 27-28, 2003  
Albany, New York**

**Attendees**

Pat Hughes, Chairman—Minnesota DOT  
Lee Smithson—AASHTO SICOP Coordinator  
Paul Pisano—FHWA  
Diana Evans—APWA (Ohio DOT)  
Mjueeb Basha—AASHTO  
Dan Roosevelt—AASHTO Southeastern Region (Virginia DOT)  
Joe Doherty—AASHTO Northeastern Region (New York DOT)  
Ed Fink—AASHTO Highway Subcommittee on Maintenance (Colorado DOT)  
Wilf Nixon—TRB Committee A3C09 Winter Maintenance (University of Iowa)  
Rick Nelson—Lead States Program (Nevada DOT)

**Guests**

Dennis Belter—Indiana DOT  
Curt Pape—Minnesota DOT  
Max Perchanok—Ontario Ministry of Transportation

Chairman Pat Hughes opened the meeting with a round of introductions and a brief history of WMPCC/SICOP from 1994 forward to today. He reviewed the focus of the three international winter scans and the purpose of WMTSP in implementing the scan findings into winter maintenance operations. He also reviewed how the committee and projects were funded via pooled fund efforts. He pointed out the diversity of the committee with representation from the AASHTO regions, TRB, NACE and APWA and the valuable partnering relationship WMTSP has with FHWA.

**Discussion of the Aurora/COMET/WMTSP Programs Interrelationship**

Lee discussed the purpose of holding this back to back meeting in Albany with Aurora, COMET (Cooperative Program for Operational Meteorology, Education and Training) and WMTSP. Paul discussed the value of on site meetings with the three organizations and getting a briefing on each organization's projects, anticipated schedules and expected outcomes and products. Each organization is working in areas that supplement each other's efforts, but care is taken to prevent overlap or duplication of effort. Dan felt the exposure to COMET was very helpful and was impressed with Pennsylvania State University's "Development of an Interactive Mesonet for PENNDOT". WMTSP members were very interested in and impressed with the storage and retrieval system for all RWIS data as well as the quality assurance program PENNDOT had implemented. WMTSP agreed that we should investigate a method to promote the results of the

Penn State effort and determine what it would cost to get this implemented in other states. All agreed that the states have millions invested in RWIS, but the quality of data is suspect. Also, some states are not retaining the data because of liability and reliability issues. Rick feels the liability issue will disappear if a good quality assurance program is implemented.

### **Outreach and Discussion of Other Projects that WMTSP Members are Involved In**

Lee discussed his involvement with the America Meteorological Society in the planning for an AMS “A Policy Forum: Weather and Highways” to be held November 4-5, 2003 in Washington DC. More information can be found on their web site at [www.ametsoc.org/atmospolicy/2003transportationforum.html](http://www.ametsoc.org/atmospolicy/2003transportationforum.html). The focus of this forum will be of particular interest to the SICOP program as it deals with what public policies are needed to foster effective application of weather services to the management of the nation’s highway system. Lee also discussed his involvement with The National Academies, Board Atmospheric Sciences and Climate (BASC) “Committee on Weather Research for Surface Transportation: The Roadway Environment”. The purpose of this committee is to examine the research opportunities and required services needed to support improved weather-related information on the nation’s roadways. More details can be found at [www.nationalacademies.org/basc](http://www.nationalacademies.org/basc) then click on projects and enter BASC-U-02-06-A in the search box. The outcomes from both of these efforts will have a positive affect on several SICOP projects.

Dennis Belter thanked the group for letting him sit in on the COMET and WMTSP meetings and learn what others are doing. He discussed the team process the Indiana DOT was using for reviewing, editing and customizing their AI/RWIS CBT. The team consisting of trainers and experienced field employees is going through the entire CBT page by page. Lee commented that the Indiana team had made significant improvements to the first three lessons of the generic version of the CBT and we are looking forward to their input to lessons 4-7. Their efforts will benefit all the states in the development of the final version of the CBT. Dennis said he got his start and developed an interest in the program from attending the APWA Snow Conferences. He felt it was good to involve all levels of government in these conferences. Pat reinforced Dennis’ observation and discussed how Minnesota involved the County, City and State in the planning and execution of the Minnesota Snow Expo. He could see the results of how that outreach effort seemed to penetrate through all levels of government.

Paul reminded everyone that the Eastern States Winter Conference was being held next week. He also discussed that the reorganization of the Resource Centers has caused a shift in focus areas and that the Winter Conference will now be the responsibility of the Midwest Resource Center. This means that we will loose Deb Vocke’s experience so we should be keep our eyes open for opportunities to assist in the planning of these future conferences. WMTSP discussed the importance of the Winter Conferences that bring all levels of government snow and ice control personnel in this technology transfer effort. Paul has discussed the possibility of needing help from AASHTO with Ken Kobetsky. Paul discussed the AMS Policy Forum being planned for November 4 and 5<sup>th</sup> in Washington DC. WMTS felt that invitations should be extended to State DOT maintenance engineers, Chambers of Commerce, State Economic Development

Commissions, and State Emergency Managers. Paul distributed flyers that described the Foretell and COMET programs.

Rick discussed the opportunity he had to take attendees of the Low Volume Roads Conference to Mount Rose to view the RWIS station and discuss how NVDOT uses RWIS in snow and ice control operations. WMTSP discussed the knowledge gap we have in understanding the status of the 511 project. It was suggested that it might be appropriate to invite Jim Wright to the December Aurora meeting and also invite Rick to that meeting to help understand how Aurora and WMTSP might interface with 511. Lee will coordinate this with Rick, Mike Adams, Joe Holt and Jim Wright.

Max discussed the salt management issue in Canada. He has a project underway to develop a winter index that might be useful in determining how much salt is appropriate for a winter season. Might be able to set some guidelines based on winter index and 5 year salt usage averages. Max also discussed an Aurora project he has underway to predict snow fall amounts based on friction measurements. He discussed the usefulness of local roundtable discussion workshops they have been using. They also have a one-day annual winter maintenance-training program to demonstrate RWIS and other snow removal equipment. Wilf suggested a member of WMTSP be invited to observe these workshops since there may be some techniques we might use to improve our technology transfer.

Curt reviewed the project he has underway on the hot plate precipitation sensor. He also reviewed the progress using cameras on RWIS stations and the required increase in bandwidth. He congratulated WMTSP on being able to reach upper management and influencing change. He felt there was a need to get upper management to see the benefits of training and not get lost in how much the training is costing. He felt that sometimes upper management set goals that conflict with optimizing winter operations. An example is putting an emphasis on reducing overtime encourages applying anti-icing at 3:00 PM if there is a chance that it will be needed the next morning rather than waiting and taking the benefit of higher accuracy in later forecasts. This could save the cost of equipment, material and labor if the application turned out to not be needed.

Ed reported that the AASHTO Snow and Ice Focus Group had approved the WMTSP proposed four-year program at their July meeting. A resolution will be present to the AASHTO Standing Committee on Highways for action at the September AASHTO Annual meeting. He discussed how Colorado DOT had switched from sand/salt mix to anti-icing because of air and water quality problems, but then experienced a problem with the evergreens turning brown. They now have a vegetation study underway. Ed said the browning occurred during a drought period and now that they have had some precipitation the trees are beginning to turn green again. The lack of moisture may have been the problem. . Ed also discussed the water quality problem Colorado is having with BOD. Organic based chemicals are now a concern. He said that they are going to just in time application of chemicals to avoid getting the product on cars and boats. Colorado DOT has hired six people with meteorology backgrounds to assist in avalanche control and are leasing some artillery to provide the firepower.

Joe had two salt domes collapse this past winter and had to condemn 100 other salt domes. They may be able to salvage some with canvas coverings. The company that built the domes is now out of business.

Wilf reported the response from the Call for Papers for the 6<sup>th</sup> International Symposium on Snow Removal and Ice Control Technology was very good. The Symposium will be held in Spokane, Washington on June 7-9, 2004. Papers are currently being peer reviewed. Wilf found some agencies are using the new AI techniques, but many others are not. Therefore he is writing a series of articles "Why Aren't You Using AI?" to be published in various magazines. He is also using the same theme at presentations at winter conferences and workshops. He is also doing a study to determine the practical cutoff temperatures and conditions for switching from NaCl to CaCl. He is also tackling the complexities of corrosion in studies in Iowa. Ed Fink commented that Colorado is demolishing a number of old and obsolete bridges, inspecting the concrete and, to their surprise, discovered the concrete doesn't show any signs of corrosion on the reinforcing steel. The surface concrete, however, exhibited much surface deterioration. Wilf is also looking at the possibilities of establishing a Center for Winter Maintenance Research and Application for the Midwest. Wilf reported that he had conducted three one-week training sessions this summer. The session in Washington State had Canadians in attendance.

Diana says she is finding that the supervisors in rural Ohio need more training in RWIS. They did a study and found 81 of 88 surveyed like AI. Research with the University of Ohio showed that chemical applications are removed from the roadway by traffic within a few hours after application. Pat agreed with Diana noting that maintenance personnel in the Minnesota metro areas find early application of chemicals on high volume roadways are not effective. Diana said the public relations people in Ohio are encouraging them to do just in time applications. She feels more education is needed on when to apply and what chemical is best to use. Ohio will be doing more friction testing this winter using an additional six Haliday units. Diana will be giving up the chair of the APWA Winter Maintenance Subcommittee. Bret Hodne of West Des Moines, Iowa, will be the new chair of the Subcommittee.

Dan reviewed the Aurora projects of interest to WMTSP. The Aurora Board voted to help fund further work in MDSS. Aurora would like to partner with SICOP and Ohio DOT on further evaluation use of friction in winter operations and reporting road condition to motorists. The Synthesis of Highway Practice 34-10, "Winter Highway Operations" has been awarded to Consultant Steven Conger, Meger, and Mohaddes Associates of Boise Idaho. Consultant has started a survey to determine the state of the practice and ongoing research. The previous NCHRP Synthesis 207 "Managing Roadway Snow and Ice Control Operations" was published in 1994. Winter operations have changed substantially since then, thus creating the need for this updated synthesis. NCHRP Project 6-16 "Guidelines for the Selection of Snow and Ice Control Materials to Mitigate Environmental Impacts" was let to Levelton Engineering, Ltd in June 2003. Completion date is December 2004. Ed and Lee are on the project panel. Another project of interest to WMTSP is NCHRP 6-15, "Testing and Calibration Methods for RWIS Sensors". Contractor for the project is SRF Consulting Group, Inc, and principal investigator is Ed Fleege.

The objective of the research is to develop practical guidelines and standardized testing and calibration methods for the reliable operation of RWIS pavement surface and subsurface sensors in field deployments. The research includes bench-scale and full field tests. This research will build on the Aurora report, *Standardized Testing Methods for Pavement Sensors*. Project completion is May 2005. Paul, Dan and Curt Pape are on the project panel. Dan also reported that the unedited NCHRP Project 6-13 *Guidelines for Snow and Ice Control Materials and Methods* was released in July 2003 to the AASHTO Highway Subcommittee on Maintenance and TRB State Representatives. The report contains guidelines to assist maintenance managers select appropriate snow and ice control strategies and tactics for specific ranges of climate, site, and traffic conditions.

Pat is working with PIARC on planning for the next Winter Congress to be held in Italy. Topic areas will include: User Service; Standards and Specifications; Finance; Safety and Mobility in Winter; Snow and Ice Control Technology; and Winter Social Aspects. Finland requested customer feedback be included. Pat will advise WMTSP as more information becomes available. Pat met with the AASHTO Highway Subcommittee on Maintenance, Task Force on Snow and Ice in July. They approved the proposed four-year program WMTSP laid out at our May 2003 meeting. Pat felt WMTSP could have probably ten or twelve projects posted on the web, but could likely only be able to have three or four of them active at any one time. WMTSP discussed possibilities to obtain wider community involvement in bringing projects to our attention. Various outreach ideas were discussed, such as: holding another research workshop; e-mailing WMTSP minutes to the Snow and Ice Task Force; posting an executive summary of the minutes on the web; and, insuring WMTSP gets on the agenda of regional AASHTO meetings, winter workshops, and conferences and the TRB A3C09 Winter Committee meeting.

### **Project Review and Work Assignments**

- ▶ **Develop and Deploy RWIS/AI Computer Based Training Program** (Nelson, Smithson)
- The purpose of this project is to develop and deploy a comprehensive, interactive, computer-based training program on RWIS and Anti-icing strategies, snow and ice control materials, equipment and procedures for operators, supervisors, and mid-level managers who are responsible for providing snow and ice control on state and local roadways.
- Contractor distributed all seven lessons of the generic version of the CBT to states for their customization recommendations. Most states have formed teams to determine their customization requirements. Three states and the Ontario Good Roads Association will have their requirements to the contractor in about three months. The remaining states want to use the generic version for training this winter and provide their customization recommendations in Spring 2004.
- Customization goal is to complete each state within 60 days of receipt of customization materials. Lee will continue bimonthly telephone contact with each State's CBT manager to insure progress is being made.
- The Technical Working Group (TWG) is reviewing scenarios. Target date for completing eight scenarios for the generic version is November 1, 2003. The other 42 scenarios will be developed and reviewed by the TWG and be ready for implementation by February 1, 2004.

- An evaluation program is being drafted and will be ready to be reviewed by Technical Working Group in six weeks.

► **Winter Maintenance Chemical Specification** (Fink, Nixon)

- The purpose of this project is to make winter maintenance chemical specifications easily accessible and maintain contact with regional winter maintenance groups. (Ed and Wilf will review this scope of work, revise as necessary and prepare a work plan)
- Post Pacific Northwest Snowfighters (PNS) power point to SICOP Web
- Prepare new project statement including NCHRP 6-16
- Develop QA/QC component

► **Vehicle Based Equipment Integration** (Roosevelt, Evans, Smithson)

- The purpose of this project is to track and support the implementation of vehicle-based winter maintenance equipment and its integration into a system. Technologies to be covered will include:
  - AVL
  - On-board freezing point detection (include Frensor[Sweden] and salinity measurement using refractive light[Japan] technologies)
  - Surface friction measurement using physical contact with surface
  - Surface temperature measurement
  - Millimeter wavelength radar sensor for detecting obstacles ahead of a plow
  - Ground view a visual vehicle mounted sensor that determines the road condition (icy, snow-covered, etc.) in real time

As appropriate, the project will determine the state-of-the-practice, the integration of the technology into operations and support evaluation of the technology.

- Synthesis on the state of development and practice of vehicle-mounted winter maintenance technologies will be made and include their state of system integration. Synthesis scope to include all above technologies except friction measurement. Friction measurement is addressed in the “Road Condition Information” project below. Only the integration of the measurement data is part of this project.

► **Fixed Automated Spray Technology (FAST)** (Pisano, Roosevelt)

- Develop synthesis on state of the practice after winter 2003-2004. Synthesis to include when, where, why, etc and benefit/cost analysis and best management practices.

► **Development of Environmental Sensor Station (ESS) Guidelines** (Pisano, Roosevelt)

- Produce comprehensive guidelines for the siting of ESS specifically for the roadway environment. The principal audience for these guidelines is state and local government personnel responsible for procuring, siting, operating, and maintaining ESS along the public roadways. FHWA will produce literature search, synthesis and final approved ESS Siting Guidelines document.
- WMTSP will support the FHWA project with the following tasks:
  - Cooperating with the FHWA project steering committee through review of documents

- Developing a follow-on project to validate and verify the siting guidelines.
- Technology transfer, which will include promotion and deployment of the guidelines among state and local transportation agencies

► **Synthesis of Winter Maintenance Practices and Their Impacts to Roadway Infrastructure** (Fink, Blacker)

- Prepare a synthesis assessing the effects of winter maintenance deicers on the infrastructure. Elements to be considered include:
  - Identification of the various methods of sanding, anti-icing and deicing
  - Impacts to bridge elements
  - Impacts to tunnels
  - Impacts to concrete reinforcing bars
  - Impacts to rigid and flexible pavements
  - Impacts to road bases
  - Develop long range projections of infrastructure impacts
  - Provide a gap analysis of research relevant to the subject and recommend areas of needed study and research to address gaps noted

► **Baselining Winter Performance Standards** (Hughes)

- The purpose of this project is to monitor those government agencies, both nationally and internationally, that are actively involved in establishing winter performance standards, including the development, implementation, and measurement of them.
- Develop problem statement to obtain NCHRP funding for doing a synthesis of the state of the art of winter maintenance performance standard practices.
- The University of Wisconsin and the Wisconsin DOT presented a paper, “So We’re a 7.0, But What Does That Tell Me?” at the AASHTO TRB Maintenance Management Workshop. This paper, which addresses collecting and analyzing managerially relevant customer data, will be of interest to WMTSP in administering this project. Lee will contact the authors and invite them to the next WMTSP meeting.

► **Promote Anti-drifting Measures with Pro-Active Road Design Considerations** (Doherty, Smithson)

- Monitor NCHRP 20-7, Task 147, “Design Guidelines for the Control of Blowing and Drifting Snow”. Post electronic version to SICOP web when finished and actively promote its use to the design community.
- Assess the SNOWMAN project sponsored by NYSDOT and if appropriate take it to completion. This project is developing advanced algorithms for projecting snowdrift profiles, deliver user-friendly MicroStation compatible software, and provide initial training on its use.

► **Road Condition Information** (Roosevelt, Nelson, Nixon)

- Develop NCHRP problem statement for a pilot study to validate scenario 1 of NCHRP 6-14 for friction measurement using variable slip and traction control systems. Monitor other

technologies (piezo sensors embedded in tire tread and Forensic Dynamics fixed roadway sensor). Explore partnering opportunities with Ohio DOT on evaluation of Haliday Technologies Road Friction Tester.

- Work with the ITS and 511 committees and Aurora to document the state-of-the-practice of winter road condition information and uniform reporting to the traveler. A synthesis of best practices and most promising techniques needs to be prepared.

► **Project to Look at Deployment/Outreach to Local Governments** (Basha, Brandau, Hodne)

- Develop a business plan to deploy the AI/RWIS CBT to LTAP, APWA, and NACE

► **Communications Standards and Winter Maintenance** (Pisano, Nelson, Smithson)

- The purpose of this project is to work with the appropriate Standards Development Organizations (SDO) to develop standards that are practical and useable by the winter maintenance and operations community. Once developed, this project will promote appropriate testing and evaluation of the standards, and promote their use across the winter maintenance community. The term standard refers to a broad scope including those standards being officially developed in the ITS program, as well as related standards/guidance activities such as 511 deployment assistance, and Road Web Markup Language (RWML) being developed in Japan.
- Deliverables included in this project:
  1. A white paper that describes the standards developed or under development by others that are of interest to the winter maintenance community.
  2. Test and evaluation results of standards that have already been adopted.
  3. Promotion material to assist others with deployment.
- The expectation is that those responsible for standards development will produce better standards based on the input and participation from the winter maintenance community.

► **Integrated ITS Corridor** (Hughes, Basha)

- There are ITS projects in Missouri and Florida which should be explored to see if maintenance has been involved in their planning and design efforts. Mujeeb will contact Ken Kobetsky and find out if this subject has been explored with the AASHTO Committee on Freeway Operations. Papers written on the E-18 project in Finland and Sweden should provide some insight to incorporating maintenance into the planning and design stages.
- Like the previous project the expectation is that those responsible for planning and design will produce better end products if there is input from those who will eventually maintain the facilities.

► **Equipment and Facilities for RWIS and Anti-icing** (Nixon, Nelson)

- Need to post more links on the SICOP web site for equipment and facility design and specifications. Wilf will get links to WMTSP member states. Iowa and Nevada are posted, but need links to Colorado, Ohio, Virginia, and Minnesota. Posting the link with a contact person is a big help and speeds the communication process.



### **WMTSP/SICOP Budget**

- The letter to the States, APWA and NACE requesting funds to administer the WMTSP resulted in 32 states responding. This put \$132,000 in the administrative account (Note Texas put in a double amount, \$8,000, instead of the \$4,000 requested amount). Neither APWA nor NACE have responded to the request.
- Project champions are to develop during the next two months their problem statements with budget amounts and timelines for submittal to NCHRP, 20-7 funding or possible pooled funding.

### **Other Business**

- Next meeting will be next spring and probably be held in Minneapolis
- Need to determine how to get the results of NCHRP 6-13 implemented. Wilf would like to post a PDF of the 45 page summary guide and its two attachments to the SICOP web. Lee will talk with Ken Kobetsky and Amir Hanna to determine what the appropriate marketing plan should be. Since Larry Frevert was on the NCHRP 6-13 panel, Lee will call Larry and get his recommendation on how to best introduce the new guidelines into the APWA community. Rick served on the 6-13 panel, so he volunteered to compare the results of 6-13 with the TEA 28 guidelines used in the AI/RWIS CBT and determine if changes need to be made to the CBT.
- Wilf has some ideas for redesigning the SICOP web.
- Dan would like to see WMTSP partner with Aurora and the Ohio DOT in the test and evaluation of Haliday friction measuring devices this coming winter. Aurora has approved \$25,000 and he would like to see WMTSP approve \$50,000 to assist with the data collection and camera installation effort. Lee suggested that there may be some funds remaining in the Concept Vehicle Pooled fund that could serve as a logical extension of that project. Also CTRE has experienced staff and Diana should make contact with them to see if they could assist her in setting up the data collection and evaluation effort.