

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

**Spring Meeting, April 20-21, 2004**  
**Minneapolis, MN**

**Attendees**

Pat Hughes, Chairman—Minnesota DOT  
Lee Smithson, SICOP Coordinator—AASHTO  
Steve Brandau, Henry County--NACE  
Bret Hodne, City of West Des Moines—APWA  
John Burkhardt, City of Indianapolis—TRB Winter Maintenance Committee  
Wilf Nixon, University of Iowa—SICOP Web Master  
Rick Nelson, Nevada DOT—Lead States Program  
Dan Roosevelt, Virginia DOT—AASHTO Southeastern Region  
John Blacker, Montana DOT—AASHTO Northwestern Region  
Joe Doherty, New York State DOT—AASHTO Northeastern Region  
Jerry Horner, North Dakota DOT—AASHTO Highway Subcommittee on Maintenance  
Ken Kobetsky, AASHTO Staff

**Guests**

Mark Wikelius, Minnesota DOT  
Jim Wright, Minnesota DOT

Chairman Pat Hughes opened the meeting at 1:00 PM on April 20, 2004 with introductions and a brief history of WMTSP. He reviewed the previous three international winter maintenance scans and the focus of the WMTSP in implementing the scan findings into winter maintenance operations. He also reviewed how the program is funded via pooled fund efforts. He pointed out the diversity of the committee with representation from the AASHTO regions, TRB, NACE, APWA and the partnering relationship with FHWA.

**Outreach & Discussion of Other Projects That WMTSP Members Are Involved In**

WMTSP discussed their involvement in projects with other agencies and evaluated what actions WMTSP should be taking to assist others in implementing or communicating findings:

- NCHRP Project 6-13, *Guidelines for Snow & Ice Control Materials & Methods*. The 269 page final report is finished and NCHRP will publish a 56 page “Guidelines” and distribute to its normal distribution list. WMTSP will have the entire 269-page report posted to the SICOP web site. WMTSP discussed the findings of the report and felt that the entire report should be evaluated and appropriate sections should be incorporated in the AI/RWIS CBT. This will speed up the technology transfer process, ensure the CBT stays current, and help improve uniformity in snow and ice control. The final report illustrates the many variables that must be considered in arriving at an optimal solution for snow and ice control operations. While most of the 6-13 situations agree with the June 1996, FHWA “Manual of Practice for an Effective Anti-icing Program”, some high

dilution situations call for application rates well above those recommended in the Manual of Practice. This causes some concern so Rick Nelson, 6-13 panel member, will review the 6-13 material and decide what should be incorporated into new material for the CBT.

- NCHRP Project 6-15, *Testing and Calibration Methods for RWIS Sensors*. Dan Roosevelt, panel member, explained the objective of this research is to develop practical guidelines for testing and calibration methods for reliable operation of RWIS sensors in field deployments to ensure that the sensor is providing an accurate representation of actual conditions at the installed site. The contractor has developed a matrix of testing and calibration methods for various RWIS surface and subsurface sensors and installed sensors at a test site for evaluation during the past winter. Guidelines will be prepared after another winter of testing and be ready for WMTSP to review in May 2005. WMTSP discussed avoiding carrying the accuracy to unrealistic limits but felt that the contractor has many years of field maintenance experience and has in previous work shown a practical bent to his work. Many of the western states are performing their own RWIS maintenance and have a need for the stand-alone guidelines of best practices for sensor testing and calibration methods. It is also important that all agencies agree and use the same standards for calibration and accuracy.
- NCHRP Project 6-16, *Guidelines for the Selection of Snow and Ice Control Materials to Mitigate Environmental Impacts*. Lee Smithson, panel member, explained the overall objective of this project is to develop guidelines for selection of snow and ice control chemicals and abrasives, based on their composition, performance, potential environmental effects, and cost of the product together with common site-specific conditions near roadways on which these products would be used. All snow and ice control materials have some potential for affecting the receiving environment. The magnitude of the effect is dependent on a wide range of conditions that include types of materials, quantities being applied, transport pathways, exposure pathways, exposure duration, chemical specific impacts, and other site-specific characteristics. This project will integrate these considerations into a framework for material selection guidelines. The framework will take into account factors such as material properties and constituents, site-specific conditions such as climate and proximity to wetlands or other sensitive areas, the regulatory environment, and storage and application procedures. It will also include which test methods are most effective for measuring the properties and constituents that determine the environmental impacts of the current range of snow and ice control materials. These will include properties such as BOD, COD, pH level, toxicity, and corrosivity, and constituents such as heavy metals, nutrients, and additives. A matrix will be developed describing currently available materials and their significant properties. A purchase specification will be developed and quality assurance test protocol for the evaluation of existing and future materials. WMTSP discussed the quantity and complexity of the material that will be released in this report a felt it should be incorporated in a lesson or lessons in the AI/RWIS CBT with target audience being the supervisors and managers level.
- NCHRP 20-7, Task 147, *Design Guidelines for the Control of Blowing Snow and Drifting Snow*, has been revised with color photographs and new materials, methods and algorithms. It has been posted to the SICOP web site and has been announced on the Snow and Ice List Serve. Hits are being tracked. Ron Tabler, the author of the report is teaching these proactive techniques to DOT designers at on site training courses, so hopefully, the technology transfer is underway.

- NCHRP Synthesis of Highway Practice 34-10, *Winter Highway Operations* is progressing. Dan Roosevelt, panel member, discussed the project with WMTSP and his concern that the questionnaire had a low response rate. WMTSP encouraged Dan to try some additional responses to add to the update. The report is scheduled for completion in late summer 2004.
- American Meteorological Society's report *Weather and Highways* released April 2004 was discussed. Several WMTSP members participated in the AMS Policy Forum held in Washington DC in November 2003 which focused on identifying ways to improve the safety and operations of the nation's highway system through better application of weather information. WMTSP supported the overarching recommendations listed in the report. WMTSP also discussed the National Oceanic and Atmospheric Administration/National Weather Service Proposed Policy on Partnerships in the Provision of Weather, Water, Climate and Related Environmental Information. WMTSP members were encouraged to comment on the proposed policy to encourage NOAA/NWS to include 'road weather' in the scope of the services addressed in the proposed policy.
- The Board on Atmospheric Sciences and Climate (BASC) report, *Where the Weather Meets the Road: A Research Agenda for Improving Road Weather Services* was handed out at the meeting and discussed. Lee Smithson served on the BASC committee that compiled the material and wrote the report. He discussed its content and how the findings relate to WMTSP. The reports overarching recommendations to establish a focused, coordinated national weather research program that would concentrate on improving weather and transportation modeling capabilities, improve road weather instrumentation, development of a national road weather observation system with data quality assurance, and the development of a new means to effectively communicate road weather information to a wide range of users will interface well with several WMTSP projects and will assist in their implementation success and optimization. AASHTO is working with AMS to conduct congressional briefings to insure they understand the need for this national research agenda to be established. WMTSP discussion indicated support for reports recommendations and felt that although progress has been made in education, the universities need to be encouraged to get involved with the research and educational opportunities outlined in the report.
- TRB, 6<sup>th</sup> International Symposium on Snow Removal and Ice Control Technology was discussed by Wilf Nixon. Wilf was the chair of the TRB Winter Maintenance during the planning of this symposium. The symposium will be held in June in Spokane. There will be a total of 18 sessions with 55 papers being presented. Attendance is anticipated to be about 150, with considerable numbers from outside the United States.
- Maintenance Decision Support System (MDSS)—The MDSS Stakeholder 2004 meeting will be held in Boulder in July. Lee and Wilf have been asked to be speakers. The main focus of the meeting will be reporting the results of the 2003-2004 winter and discussions of future plans. WMTSP expressed their support for the program and believe DOTs will use MDSS if the private sector will offer it. Liability will probably be a major problem for the private sector.
- APWA—Bret discussed the APWA North American Snow Conference being held next week. APWA is looking for a contractor to do the update of their Snow Manual. Money and the possibility of it only being used by the large cities seem to be barriers in getting the project to move ahead. Pat presented the possibility of having AASHTO partner with

APWA and add a municipal section to the AASHTO Snow and Ice Manual. Bret will look into that.

- NACE—Steve reported on the NACE Annual meeting. Bruce Drewes had a vendor booth at the meeting to demonstrate the AI/RWIS CBT.
- SICOP web site—Wilf reported on updating the SICOP web site. He has revised the Resources page and thanked all who posted their specifications. The University of Iowa will be invoicing AASHTO for another \$10,000 maintenance fee.
- Other WMTSP member input—Pat is the AASHTO representative to PIARC and is on the planning committee for the Turin, Italy PIARC Conference in 2006. The request for abstracts for that conference has been published. WMTSP needs to determine if we need to make application for a winter scanning tour. The 2004 and 2005 scans have been approved and 2006 proposals need to be written. Wilf discussed the SIRWEC conferences and thought WMTSP should be thinking about hosting a SIRWEC conference in the United States. SIRWEC meetings are self-supporting so we would need to have some financial backing. This would be an item to discuss at the June HSCOM meeting in Bismarck.

### **Project Review**

- Develop and Deploy AI/RWIS CBT—the CBT has been completed in generic form and the states that purchased customized versions are in the process of submitting their customization recommendations to the contractor. Contractor will be able to customize a states CBT in about six weeks after all the customization materials have been received. So far Indiana and Wisconsin DOTs have been completed. Alaska and Kansas are almost finished gathering their material. Other states are still working at pulling their material together. The current version of the CBT has seven scenarios, which seems to be adequate for the state DOT use now, but we should be adding about 10 new scenarios each year to update the CBT and include any new materials. Also need to regionalize the scenarios since storm development isn't uniform across the United States. Need to update the CBT as new material becomes available, such as NCHRP 6-13 and 6-16. WMTSP needs to make a recommendation on how to update the CBT, add lessons such as those for 6-13 and 6-16 and submit those recommendations and funding requirements to AASHTO for approval. Ken reported that APWA would be selling the generic CBT to its members for \$400 and to non-members for \$500. License agreements do not include future updates. Canadian Provinces and Cities have expressed an interest in obtaining the CBT in metric. A metric version of the CBT complete with Canada maps and radar has been developed for the Ontario Good Roads Association.
- Winter Maintenance Chemical Specification—the goal was to mirror the PNS process to assist others in developing specifications and forming working groups. John Blacker will have a member of his staff who is a PNS member develop a white paper on the PNS process that can be posted on the SICOP web site for this project. That should finish the work needed on this project and it can be listed on the completed project section of the web. As soon as NCHRP 6-16 is finished WMTSP needs to review the final report and decide if a new winter chemical project statement needs to be written. There is value in having a group of states agreeing on chemical specifications, testing and quality assurance and WMTSP should assist the process.

- Vehicle Based Equipment Integration—this project has several parts. 1) a matrix of AVL users has been posted to the SICOP web. This matrix will be the basis for a synthesis investigation. A request for synthesis investigation has been submitted to determine how integrated data might best support operations and determine how AVL might support MDSS, 2) the on-board freeze point detection equipment (Frensor unit) tests are reported in the Phase IV report on the Highway Maintenance Concept Vehicle (HMCV) <http://www.ctre.iastate.edu/conceptv/>. Only limited field-testing was performed, but conclusions were that the Frensor was a reasonable sensor for freezing point measurement. The Frensor's cleaning system needs to be improved before wide spread field use is recommended. The Swedish National Road Administration installed six Frensor units for testing during the winter of 2003-2004. WMTSP will liaison with the Swedish National Road Administration and monitor their progress. 3) A problem statement will be submitted to continue the recommendations of NCHRP 6-14 and validate Scenario 1 through a pilot study. The technology used in automobile traction control systems (TCS) will be explored in this pilot study. Friction measuring equipment using a contact method has been reported in HMCV Phase IV report listed above. Also Ohio DOT is using Haliday Technologies Road Friction Units, six units were evaluated use last winter and Ohio has ordered 26 more units for evaluation in 2004-2005 winter. All will be GPS coordinated. WMTSP will monitor Ohio's progress. Friction is in the evaluation stage and not a operational tool. The Finnish National Road Administration is using friction as a performance measure for its contract snow and ice control operations. 4) Surface temperature measurement synthesis of practice will be requested. The synthesis will report on the operational capabilities and limitations of mobile temperature sensing devices. The synthesis should also determine how this integrated data supports operations.
- Fixed automated spray technology (FAST)—matrix has been posted on the SICOP web listing FAST units in operation. The matrix lists the unit make, year, number and type of system installed, contact person, chemical application, and notes on operation etc. A request for synthesis has been submitted to determine best management practices for FAST systems.
- Development of ESS Guidelines—a draft copy of the Annotated Guidelines Outline dated April 8, 2004 was available for review at the meeting. WMTSP will assist FHWA in this project through a review of the project documents, developing a follow-on project to validate site selection guidelines, and technology transfer, promotion and deployment of guidelines. The guideline report will be completed about March 2005. This might be a candidate for another lesson in the AI/RWIS CBT. The advantage of developing another lesson in the CBT or developing a separate CBT or publishing a document for sale is it will receive AASHTOs approval and endorsement that it has been developed and peer reviewed by technically qualified people.
- Synthesis of Winter Maintenance Practices and Their Impacts to Infrastructure has been submitted for funding consideration. If it is not selected, WMTSP could reevaluate it and if it is still high priority, submit for 20-7 funding.
- Base Line Winter Maintenance Performance Standards—has been selected by NCHRP for funding. This project will be posted on the SICOP web site as a project being done by others. Pat will send a letter to Bob Reilly nominating Wilf, John Blacker and Rick for panel members.

- Promoting Anti-drifting Measures and SNOWMAN—as noted earlier in the minutes, the Design Guidelines for the Control of Blowing Snow and Drifting Snow has been updated and posted to SICOP web site. The second part of this project, SNOWMAN is a project that the Hurricane System Labs developed new algorithms and worked with Ron Tabler to determine if their approaches agreed with Tabler's work. The conclusion was they agreed. The NYSDOT office at Buffalo integrated SNOWMAN into their design system and has submitted a proposal for designing a stretch of road for snow considerations. The contract for this design should be signed in May 2004. SNOWMAN is less labor intensive than Ron Tabler's work, which will have an appeal to the designers. WMTSP and AASHTO should endorse Tabler's report as a good piece of work.
- Use of Road Condition Data for Traveler Information has three scopes of work underway. The first is for WMTSP to pursue funding to validate Phases I and II projects recommended by NCHRP 6-14, *Feasibility of Using Friction Indicators to Improve Winter Maintenance Operations and Mobility*. Initially, this will be through the NCHRP funding process, but if this is not successful, a pooled fund project will be considered. The second project was for WMTSP to work with the ITS and 511 committees to document the state-of-the-practice of winter road condition information for travelers and follow with an evaluation of the most promising techniques. This part of the project will be put on hold until an Aurora/Enterprise project to develop web site display icons is complete. A sample of the icons will be available in late summer 2004. Once the Aurora/Enterprise project is complete, WMTSP will review the results and decide what next steps WMTSP should take. The third project is for WMTSP to monitor progress in the Vehicle Infrastructure Integration Use Case committee. This project is led by the ITS Joint Program Office at FHWA in coordination with the vehicle manufacturers, to explore using dedicated short-range communications to send data between vehicles and roadside. This might have application in the first project listed above in that it might be possible to monitor the traction control systems (TCS) and down link that information to traffic management centers to be used in determining real time surface traction.
- Outreach to Local Government—Steve distributed a white paper entitled “BUSINESS PLAN: Winter Maintenance Deployment and Outreach to Local Governments”. After a brief review it was decided that Steve and Bret should take the lead in refining the proposals in the paper and recommending a project team. Wilf offered to be a resource person to put a list serve together. Ken offered to provide a contact person from a committee on communications that could help with communication ideas.
- Communications Standards and Winter Maintenance—as RWIS expands beyond use primarily by maintenance garage personnel and are incorporated into other information systems such as advanced traffic management and traveler information systems, a need exists for uniformity in data formatting in support of information exchange, dissemination, and presentation. The ITS & Winter Operations Scan to Japan in 2002 found work underway in Japan on Road Web Markup Language (RWML), which is based on eXtensible Markup Language (XML). RWML use in Japan has enabled road weather information to be distributed easily on the Internet to PCs in road administration offices, maintenance garages, and traffic control centers. There is some question as to the practicality of adapting RWML for use in the U.S. that needs further study. WMTSP discussed the purpose of this project is to work with the appropriate Standards Development Organizations to develop standards that are practical and useable by the U.S. winter maintenance and operations community. To understand how to accomplish

this, a white paper was been prepared as the first deliverable in this project. The paper entitled “ITS Standards Impacting the Maintenance Community” is intended to be a primer for the maintenance community, introducing them to the ITS Standards and familiarizing them with the resources available to aid in their implementation. WMTSP discussed the white paper and agreed it should be posted to the SICOP web site and was of sufficient importance to the maintenance community that Jerry should have someone give an overview of the paper at the June meeting of the AASHTO HSCOM. Since not all states will be attending the June meeting, AASHTO should distribute the white paper to all the states for their background understanding. The white paper will provide the maintenance community with a better understanding of the process and illustrate why it takes so long to develop and test the necessary communication standards. WMTSP needs to monitor another project that Aurora and Enterprise have jointly underway to avoid any overlap or duplication. This project entitled “Weather Information Dissemination Guidelines Surface Transportation Weather Service (STWS) Interface Specification” is developing guidelines for presenting surface transportation weather information on web sites. One of the tasks in this project will identify user needs and requirements related to data exchanges between STWS and external centers and define guidelines for XML communication of weather and surface information. Dan serves on that project committee and the NTCIP ESS Working Group.

- Integrated ITS Corridor—there are several projects that WMTSP needs to examine to determine how integrated ITS impacts maintenance operations and responsibilities. Demonstration ITS corridors are underway in Salt Lake City, St. Louis, and Florida. The E-18 corridor in Finland and Sweden has had integrated ITS for several years and should be a valuable source for understanding maintenance opportunities and obligations. Lee is to discuss this with John Conrad, chair of the AASHTO Highway Subcommittee on Systems Operations and Management. Need to develop a white paper to pull the details together.
- Equipment and Facilities for RWIS & AI—this project is complete and is serving its intended use to provide a variety of user specifications on the SICOP web. The project will be moved to the completed list, but does require periodic updating. This updating needs to be accomplished annually by the web master contacting the people who posted specifications and asking them to review and update the specifications they have posted. Web master needs to maintain a history of visits to this section to monitor its usefulness.
- Develop Driver Education Program for Snow-covered and Icy Roads and Market Plan—Montana DOT has been successful in developing and implementing an educational program about driver behavior around snow plows, but has not had any success in getting other DOTs interested in doing likewise in their state. Next step for the current project will be to write a closure paper addressing the successes in Montana and acknowledging the recommendations in the BASC report calling for support for human factors research to obtain desired responses to road weather and incorporating training on the use of road weather information and technology into driver education nationwide. It appears that safety will be a major initiative in the next transportation bill and WMTSP will need to look for opportunities to assist after the bill has been rolled out. GE has developed a driver-training simulator for medium and heavy-duty highway maintenance trucks. The simulator has been demonstrated in several states and the conclusion is that it seems to hold promise for improving operator training.

- Develop Model Media Package—Wilf put out a request on the SICOP List-Serve for public agencies to send him samples of their media contacts and other materials. He received a considerable amount of written material and videos that he will post to the SICOP web site. This will be useful to both state and local agencies for next winter since cutbacks have forced some agencies to reuse old materials. The material on the SICOP web should provide them with material probably not yet used in their area. If WMTSP would desire to put the material together in a media package, a TWG should be assembled to select and organize the material. Wilf estimates it would cost about \$25,000 to develop a media package for local agencies.

### **Budget**

- AI/RWIS budget has a balance of about \$315,000 which should be sufficient to pay for the remaining customizations
- Administrative budget has a balance of about \$60,000 which is to the point of needed a replenishment. WMTSP needs to present to AASHTO HSCOM a request to replenish the administrative budget with a solicitation for funds request of \$4,000 per state. This is in accordance with AASHTO AR-3-94. After HSCOM approves the request at their June meeting, Ken will prepare the required resolution to SCOH for their Fall 2004 meeting so the CEOs of each DOT know the solicitation has been approved and is coming.

### **511 Interface Opportunities**

- Jim Wright of Minnesota DOT provided WMTSP an overview and update on 511 progress. His power point was handed out at the meeting and is attached to the minutes. He provided background for the project, deployment progress, performance measures, outcomes, and discussed weather and road conditions presented on 511. WMTSP discussed the lack of consistency in reporting between states and the need for data quality assurance. The BASC report discussed at the beginning of the WMTSP meeting has both of these subjects on their priority list. National uniformity is the goal.

### **Develop Project Priorities, Schedules and Work Assignments**

- Project statements were reviewed for consistency and given to the SICOP web master for posting. Project champions were to send any further revisions to Wilf by May 15, 2004. Goal is to update the SICOP web site by June 15, 2004.
- Lee will develop an update and maintenance plan for the AI/RWIS CBT. WMTSP felt about 10% of the total project cost should be allocated for an annual update and maintenance. Updates would include completed work such as NCHRP Projects 6-13 and 6-16 plus 10 new scenarios each year.
- Wilf will develop a scope of work and budget for the Media Package project.
- Dan will develop project statements for any of the projects he is champion for and submit them for 20-7 funding if they fail to be selected for NCHRP funding.
- Pat will submit the names of Wilf, Rick and John Blacker for NCHRP panel on Base Line Winter Performance Standards



- Lee will contact Paul Pisano to see if Mitretek could assist in preparing a handout summary of the white paper ( i.e., a trifold). AASHTO can do the reproduction.
- Steve and Bret will form a Deployment/Outreach to Local Government TWG. Steve will be team leader, John Burkhardt, Bret Hodne members. Other possibilities to contact include Jennifer Gaven (an AASHTO rep to canvas liaison for PR people), Mike Blankenship from West Virginia or Bruce Drewes, Deana Gray-Fisher from Iowa DOT. Develop strategies on how to guide field people to web site and training opportunities.
- John Blacker will work with Dan Williams to write a white paper on PNS specification writing and how to establish regional groups. John will also work with Mujeeb on finishing a white paper on Montana’s outreach in driver awareness and include the need for a national driver education similar to that proposed in the BASC report.
- Lee needs to look for an WMTSP meeting site where a visit can be made to an ITS demo project
- Lee needs to draft an international winter scan proposal to coincide with the PIARC meeting in Turin, Italy in 2006
- Bret will investigate the possibilities of putting a municipal section in the Snow and Ice Manual if APWA doesn’t revise their Snow and Ice Manual.
- Wilf will post the “ITS Standards Impacting the Maintenance Community” to the SICOP web
- Jerry will put the following items on the agenda to discuss at the HSCOM meeting
  - Hosting a SIRWEC meeting in the U.S.
  - Hand out the “ITS Standards Impacting the Maintenance Community” white paper and discuss as appropriate
  - Present a request to replenish the WMTSP administrative fund by \$4,000 state solicitation in accordance with AASHTO AR-3-94.

Draft dated May 18, 2004