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Minutes
AASHTO Winter Maintenance Technical Service Program (WMTSP)
Committee Meeting

July 12-13, 2008
San Diego Room, Monterey Marriott
Monterey, CA

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Attendees

Rick Nelson, NV DOT, AASHTO Region 4, Chair of WMTSP
Ken Kobetsky, AASHTO Staff
John Burkhardt, IN DOT, TRB Winter Maintenance Committee Chair
Roemer Alfelor, FHWA
Bill Hoffman, NV DOT, AASHTO HSCOM Snow & Ice Task Force Leader
Wilfrid Nixon, U of Iowa, TRB Surface Transportation Weather Committee Chair
Greg Parker, County Engineer, Johnson County, IA, NACE representative
Mark DeVries, McHenry County, IL Engineer, APWA representative
Lee Smithson, AASHTO SICOP Coordinator

Chairman Rick Nelson opened the meeting with a review of the agenda. No additional items were added or none deleted or deferred.

Outreach & Discussion of Outside Projects That WMTSP Members Are Involved In

- NCHRP 6-15, *Testing & Calibration Methods for RWIS Sensors and Aurora Project 2006-02*. Currently, most transportation agencies using ESS sensors rely on vendor-developed testing methods, or they accept the sensor data without regular testing. NCHRP determined that practical guidelines were needed for testing ESS sensors to evaluate whether the sensor is accurately representing actual conditions at the installed site. The NCHRP 6-15 research project was undertaken to develop standard field test procedures for in-place pavement sensors. Stakeholders were surveyed to determine their accuracy requirements for pavement temperature and surface condition data. The survey also provided information about the types of sensors used. Laboratory tests were performed on six passive ESS sensors and one active ESS sensor. Field tests were conducted in Minnesota, Nevada and Pennsylvania. The research project developed test protocols, conducted tests and analyzed and documented the results of laboratory and field validation testing to measure various performance parameters of pavement sensors. The 331 page final report for this project is available at the TRB web site www.trb.org/TRBNet/ProjectDisplay.asp?ProjectID=882. Aurora has programmed \$70,000 for Project 2006-02 "Pilot Test of ESS Sensor Testing Guidelines". The strategy was to create and acquire six kits for field testing ESS surface and atmospheric sensors and pilot test the 6-15 guidelines in up to three Aurora member states and publish the results and findings. The project champion retired and the project is currently on hold. A conference call of the remaining project team will be held this summer to determine future directions for the project. Rick Nelson asked Bill Hoffman to be a liaison for WMTSP on this project. Rick advised

1 that one of the problems the project team had with this project was it required the
2 closing of a lane of traffic for about two days to run through all the protocols. Part of
3 that was getting familiar with the procedures, so it was estimated the testing will go
4 faster but it will still take about half a day even with an experienced crew. The project
5 status can be followed at the Aurora web site www.aurora-program.org.

- 6 • NCHRP 6-17, *Performance Measures for Snow & Ice Control Operations* has been
7 completed. The objective of the research was to recommend methods and measures
8 for assessing agency and contractor performance in snow and ice control operations.
9 The project is complete and the final report was mailed to state DOTs on May 1, 2008.
10 Bill Hoffman received a copy of the report and read it prior to the meeting. He felt
11 NCHRP 6-17 report did an excellent job of summarizing the survey information from
12 their international and national sources. The report also did a good job of
13 summarizing Bob Blackburn's work using the 7 pavement snow and ice conditions
14 (PSIC) found in NCHRP Report 526. The difficult part will be convincing States to
15 adopt a uniform set of condition or performance standards. WMTSP needs to follow
16 the progress on NCHRP 20-74A, "Development of Service Levels for the Interstate
17 Highway System" which is currently underway and scheduled for completion
18 September 30, 2010. The objectives of this research are to develop a standard way to
19 describe the service level of Interstate System assets and a process that agencies can
20 use to prepare a template for describing service levels. Service levels and their
21 indicators will be uniformly defined for the Interstate System as a whole, but service-
22 level measures (how indicators are consistently assessed), could vary from one state to
23 another. The results of the research would be utilized by agencies for assessing and
24 benchmarking the performance of their Interstate Highways. WMTSP discussed the
25 difficulties in getting the service levels and their indicators defined and approaching
26 the problem of uniformity. It will likely be more difficult than getting agreement
27 when developing the MUTCD. Each state already has their own standards, their
28 climate varies dramatically, and the different climate regions have a wide range of
29 equipment and preparedness. The type of winter storms will also affect inputs and
30 outcomes. Some winter storm indexes have been developed, but they need to be
31 tested. The Midwest has developed an index that is showing promise. Bill Hoffman
32 volunteered to take that index and see if it would work in the Nevada/Utah interstate
33 corridor. The level of funding available will also be another issue. There will be many
34 legal issues to be addressed in examining the uniform level of service concept.
35 WMTSP then discussed that level of service was ranked very high (#3) by the
36 National Winter Maintenance Peer Exchange attendees and what outcomes were they
37 looking for. Most felt the attendees were looking for a yardstick to measure their
38 performance in comparison to their neighbor and also that the public wants to be able
39 to go from state to state and have winter maintenance to be fairly consistent. The
40 SHRP 2 focus on reliability will likely add more knowledge and process to bringing
41 these issues together. WMTSP also discussed the lack of an experienced winter
42 maintenance person on the 20-74A panel. Contact will be made with the NCHRP
43 Project Manager to express our concern and see if an additional member can be added.
44 Ken Kobetsky will make this contact. WMTSP will continue to follow the progress
45 on NCHRP 20-74A and the follow work underway to develop winter severity indexes.

- 1 • FHWA MDSS Deployment and Technical Assistance—Roemer provided an update
2 of the MDSS program. Version 5.0 of the MDSS Functional Prototype was released
3 in November 2007. Several MDSS Product Demonstration Showcases have been
4 conducted to date. The last one was held in Omaha, Nebraska in May with upcoming
5 showcases to be held in August in Pennsylvania just preceding the Eastern Snow Expo
6 and another one in Idaho in September. AASHTO TIG has developed a MDSS video
7 and brochure as part of the marketing effort. An MDSS Deployment Guide has been
8 written and should be posted on the ITS Electronic Document Library (EDL) by the
9 end of July. The “Lessons Learned” evaluation of MDSS deployment in Maine was
10 completed by Battelle and is available on the EDL at www.its.dot.gov/library.htm.
11 FHWA wants to continue with some quantitative analysis so two additional MDSS
12 Benefit/Cost studies are underway: one in South Dakota being conducted by Western
13 Transportation Institute and the other in Denver, Colorado being conducted by
14 Battelle. The next MDSS Stakeholder meeting will be August 6 and 7 in Reno,
15 Nevada. John Burkhardt reported that their director would like to go statewide with
16 MDSS. Wilf cautions that MDSS has to be kept simple and likes the Iowa DOT
17 approach with a laminated guidance card in each truck for operator reference.
- 18 • FHWA Clarus Initiative—Roemer says 18 states, 3 provinces and McHenry County,
19 Illinois are up and running providing data to the system. McHenry County is web
20 based through SSI. Phase 1 of the Multi-State Regional Demonstrations to develop
21 Concepts of Operations of Clarus-base applications was completed in February and
22 posted on the Clarus Initiative website at www.clarusinitiative.org. Phase 2 of the
23 Regional Demonstration, providing grants to state DOTs to connect to Clarus, will be
24 available on the web through September 2008. The RFP for Phase 3 of the Regional
25 Demonstration, to build, deploy and evaluate Clarus-based services is on the street
26 now. The RFP closes on August 1, 2008. The Clarus Stakeholder meeting will be
27 August 4 and 5 in Reno, Nevada.
- 28 • Other FHWA Initiatives—Roemer discussed the following other initiatives:
 - 29 ○ VII Weather Data Translator development is underway, but delayed due to
30 lack of probe data. Two VII and Weather reports have been published;
31 *Weather Applications and Products Enabled Through Vehicle Infrastructure*
32 *Integration (VII): Feasibility and Concept Development Study* and *Vehicles as*
33 *Mobile Sensing Platforms for Meteorological Observations: Volume 2*
34 *Research During a Summer Season* (report compliments Volume 1 which
35 focused on Winter Season characteristics.
 - 36 ○ RWIS ESS Siting Guidelines—implementation and evaluation of guidelines
37 are scheduled to be completed this summer. FHWA completed an evaluation
38 in Idaho and New Hampshire DOTs. Michigan DOT is implementing the
39 guidelines in the Upper Peninsula Region. Revised Siting Guidelines will be
40 published later this year.
 - 41 ○ NHI Course—*Principles and Tools for Road Weather Management* classroom
42 version is still available from NHI. A web-based version was developed and a
43 blended version (web-based with teleconference discussions) was held in April
44 2008 with 26 participants. The course will be refined/updated and held again
45 this Fall.

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- New course—*Introduction to RWIS Equipment and Operations* has been developed by ITS American and ITS Rocky Mountain. They are currently exploring delivery options.
- Upcoming Computer-based Training Courses to train transportation professionals about National Weather Service (NWS) products and services has been developed and will soon be available from the Cooperative Program for Operational Meteorology (COMET) at www.meted.ucar/dot. Also a computer-based course to educate NWS forecasters about surface transportation is under development by the NWS, Warning Decision Training Branch. This CBT should be available in late summer.
- Road Weather Resource Identification Tool, Version 2 is downloadable from the RWM website www.fhwa.dot.gov/weather. More resources will be added (from 600+ to 900+) and links to the documents will be improved.
- Road Weather Management Performance Measures—a Performance Measures project was completed earlier this year. More than 160 potential performance measures that related to SAFETEA-LU objectives were identified and narrowed down to 11. Work is underway to quantify the 11 measures and relate them to the RWMP products and activities. Another on-going study, Baseline Road Weather Information, will characterize the quality and availability of current road weather information to serve as baseline for enhanced weather information due to advanced weather products and technologies. A survey and analysis of existing weather data sources has been completed.
- Weather-Responsive Transportation Management—the TMC Weather Integration Self-Evaluation and Implementation Planning Guidelines was developed and evaluated in the Sacramento and Milwaukee TMC’s. Follow on work is planned to promote the guide and deploy it in at least 4 TMC’s and to help Sacramento TMC in implementing its weather integration plan that resulted from self-evaluation. Considerable research is underway. The final report entitled *Empirical Studies on Traffic Flow in Inclement Weather* is available and can be downloaded from the RWMP website. An ongoing research study, *Microscopic Analysis of Traffic in Inclement Weather* is looking at how weather affects car following, lane changing and gap acceptance behavior and will incorporate microscopic models in existing traffic simulation models. Another research study, *Incorporating Weather Impacts in Traffic Estimation and Prediction Systems* is looking at how weather and weather information affects pre-trip and en-route driving decisions. The goal is to incorporate this knowledge in dynamic traffic assignment models like DynaSmart and DynaMIT. Another research project anticipated to be awarded shortly is *Human Factors Analysis of Road Weather Advisory and Control Information*. This project will identify the requirements of travelers and drivers for road weather information, develop and implement procedures for evaluating the effectiveness of road weather information and dissemination methods, and recommend the best strategies for communicating road weather information. A TMC Pooled Fund meeting was held July 15-16, 2008 in Nashville, Tennessee. WMTSP discussion centered around the fast

1 pace that is underway and believe the technology and applications that are
2 coming will be amazing!!

- 3 • Aurora—Bill discussed some of Aurora’s 26 on-going projects. Surface weather
4 training was a top priority issue. Bill had evaluated FHWA’s web-based version of
5 *Principles and Tools for Road Weather Management* and thought it was very good.
6 The problem with much of this training is that training programs are available, but
7 very few are utilizing what is there. He had asked at a recent WASHTO
8 Subcommittee on Maintenance meeting if people were using the AASHTO AI/RWIS
9 CBT and no one was using it. It seems that if a state has a champion, the CBT gets
10 used, if not it lays dormant. Salinity sensing is the next priority and use of friction
11 was the third. Incorporation of MDSS into Winter Weather Forecasting, a 2007
12 project is underway with 15% completion. Also the Development of a National Road
13 Weather Testing Facility, a 2008 project is underway with 15% completion. Aurora is
14 working on a white paper to define the Winter Maintenance Testing Program (scope,
15 mission, processes, etc). Nevada is teaming up with Utah on an FHWA project to use
16 data and forecast sharing for winter maintenance operations on an Interstate corridor.
17 Project is in the forming an agreement stage.
- 18 • Clear Roads—Bill reported he had received a letter from Clear Roads to work with the
19 AASHTO Snow and Ice Task Force to develop a nationwide snow and ice condition
20 reporting system. This support fits well with a similar WMTSP project (see page 13
21 of these minutes) and the emphasis that the Task Force will be stressing in the
22 National 511 Coalition Presentation in the General Session of the Highway
23 Subcommittee meeting on Tuesday. Bill also reported on current projects for Clear
24 Roads. See the Clear Roads attachment at the end of the minutes for more details
25 about each project.
- 26 • PNS—Bill had an e-mail from Monty Mills, Washington DOT about Pacific
27 Northwest Snowfighters program. One PNS project of high interest to the snow and
28 ice community is a pooled fund research entitled, “Inhibitor Longevity/Field
29 Performance”. Contributors to the pooled fund include, Washington, Idaho, Montana,
30 Oregon, Colorado, Utah, North Dakota, Minnesota, Iowa, Indianan, and Virginia
31 DOTs, Ontario Ministry of Transportation plus several private companies. The project
32 will use the recently established Lewistown Cold Regions Test Bed, officially known
33 as Transcend, and WTI will do the testing. They plan to test Geomelt C, Ice Slicer
34 Elite, Freezgard Zero C1 Plus, Salt Brine w/GLT, and sand-salt mix. Progress on this
35 project and other information can be found on their website
36 www.wsdot.wa.gov/partners/pns/default.htm and click on “Research”.
- 37 • TRB Winter Maintenance Committee—John reviewed the #2 priority Research Needs
38 Statement (RNS) from the National Winter Maintenance Peer Exchange entitled
39 “Staffing” that had been assigned to Transportation Research Board (TRB). Since the
40 scope of the RNS was better suited to the TRB Maintenance Personnel Committee,
41 John met with that Committee at their January 2008 meeting in Washington DC. The
42 Personnel Committee thought the project was very worthwhile and fit closely with a
43 NCHRP Project 20-81, entitled “Challenges and Successes in Attracting and Retaining
44 a Skilled Transportation Workforce”. This project is funded for NCHRP’s FY 2009
45 program, progress can be followed on www.trb.org/news/blurb_detail.asp?id=9026 .
46 The Personnel Committee Chair will contact the NCHRP project manager to insure

1 maintenance is represented on the NCHRP 20-81 Project Panel. John also discussed
2 RNS #4 entitled “Funding” which had been assigned to TRB. John met with the TRB
3 Maintenance Operations and Management Committee in January 2008 in Washington
4 DC to discuss the RNS. The Committee agreed the RNS fit their scope and prepared a
5 TRB Research Problem Statement entitled, “Relationship Between Maintenance Cost
6 and Level of Service” which addresses most of the elements in the RNS. Also a
7 NCHRP 14-18 entitled “Determining Highway Maintenance Costs”
8 www.trb.org/TRBNet/ProjectDisplay.asp?ProjectID=1638 will address some of the
9 needs in this RNS. WMTSP will continue to monitor progress on the NCHRP 14-18
10 and 20-81 to insure the needs expressed in the RNS are being met. Also John
11 discussed the research needs statements that were generated at the TRB 4th National
12 Conference on Surface Transportation Weather and the 7th International Symposium
13 on Snow Removal and Ice Technology that were held in Indianapolis in June 2008. A
14 total of 23 research needs statements were written and submitted to the TRB Winter
15 Maintenance Committee which John chairs and the TRB Committee on Surface
16 Transportation Weather which Wilf Nixon chairs. These RNS are currently being
17 reviewed for inclusion into future research programs.

- 18 • TRB New Committee on Surface Transportation Weather. Wilf reported that this
19 committee was just approved by the TRB Technical Activities Council and is in the
20 process of selecting committee membership. The Committee will have a very diverse
21 membership from all modes of transportation and the meteorological community. The
22 Committee will be co-sponsoring a Spotlight Session at the TRB Annual Meeting in
23 January 2009 dealing with looking at weather events and their impacts on
24 transportation. The TRB Committee and WMTSP will have high interest in the
25 contract that FHWA will be award soon on “Human Factors Analysis of Road
26 Weather Advisory and Control Information” and the performance measures FHWA is
27 quantifying to meet the objectives of SAFETEA-LU.
- 28 • American Public Works Association—Mark DeVries, new chair of Winter
29 Maintenance Committee passed out the APWA update. He noted that the Louisville
30 Conference was well attended, but not as high as the Saint Paul conference last year.
31 Full registration was up, but the day attendance from local field maintenance people
32 was down. Had the best talk shows ever with news media talk-show host. The 2009
33 Call for Speakers flyer is available at their website
34 www.apwa.net/meetings/snow/2009/CallforPresentations/speaker.asp. Snow plow
35 operators and supervisor certification program is still under discussion by the APWA
36 Winter Maintenance Subcommittee. Agencies have expressed an interest in the
37 certification program however, the fleet managers program cost was considerable and
38 not many people have used it. The Subcommittee will look at what the private sector
39 is using. Mark is pleased with the outreach to local and regional conferences and
40 seminars that the APWA Winter Maintenance Subcommittee members are making.
41 The APWA Bookstore reports they sold nine Equipment Maintenance CBTs, one
42 Deicing CBT (only been available about two weeks) and twenty AI/RWIS CBTs.
43 Mark prepared an article for the APWA Reporter that will likely spur sales. APWA
44 gets articles on aviation, but doesn't have a mechanism to use them and share the
45 knowledge, so Mark is looking for ideas on how to get aviation involved in a
46 meaningful way. This fall APWA will be offering a webinar on best practice for salt

1 storage. Regional salt storage is becoming a high interest subject. Clear Roads
2 offered APWA Winter Maintenance Subcommittee a seat at the table. APWA is
3 looking for funding to make this happen for APWA and LTAP. Kathy Schafer, MN
4 LTAP, and member at APWA Winter Maintenance would bring experience from both
5 APWA and LTAP to the table.

- 6 • National Association of County Engineers—Gregg discussed the impact that travel
7 restrictions is having on their liaison and networking. NACE is still providing
8 distribution of the CBTs to LTAP.
- 9 • 13th Annual Eastern Snow Expo is being held August 27-28, 2008 at the Valley Forge
10 Convention Center, King of Prussia, Pennsylvania. The FHWA MDSS Showcase is
11 being held in an adjoining hotel on Wednesday, August 26, 2008. It was felt that by
12 holding the Showcase the day before the Expo a larger crowd would be attracted to the
13 Showcase and that those people would also remain one more day to participate in the
14 Expo. Lee distributed copies of the Eastern Snow Expo website
15 www.transportation.org/meetings/178.asp to show the linkage AASHTO had
16 provided to get visitors to register for both programs. The website also has the
17 program agendas for both the Showcase and the Expo. The Expo will feature three
18 concurrent technical tracks, Track 1, Environmental & Safety, Track 2 Management &
19 Operations and Track 3 Technology and Research. Exhibit Hall booth sales have been
20 excellent. So far 55 companies have purchased 149 booths. 80% of the companies are
21 returning exhibitors from previous Expos. Feedback from the exhibitors is they are
22 impressed with the quality of attendees that are attracted to the Expo.
- 23 • 4th National Surface Transportation Weather Conference—Need to follow through
24 with exploring the partnership possibilities with NOAA’s Office of the Federal
25 Coordinator for Meteorology (OFCM). The National Surface Weather Conferences
26 have been held annually. However, with the extreme cutbacks in budgets every
27 agency is facing, setting up web conferences will likely be a necessity. The joint
28 conference with the TRB Winter Maintenance Committee on a 3 or 4 year cycle may
29 provide the necessary communication and technology transfer to the wider audience.
30 Regular web conferences using Committee members as the subject matter experts
31 need to be explored. The TRB Committee on Surface Transportation Weather had one
32 “practice-ready paper” that they will be considering how to make implementation and
33 technology transfer happen.
- 34 • 7th International Symposium on Snow Removal and Ice Control Technology—the
35 TRB Winter Maintenance had six “practice-ready papers” which they will be
36 considering how to make implementation and technology transfer happen.
- 37 • 2010 PIARC Update—Rick passed out Permanent International Association of Road
38 Congresses (PIARC) Technical Committee (TC) B.5 Winter Service Issues paper.
39 Issue B.5.1 “Improve winter maintenance and operation information” has two
40 activities underway: 5.1.1 to investigate information systems, including two-way
41 communications with road users, (Desired outputs are case studies of best practice in
42 design and implementation of information/management systems); 5.1.2 to study
43 winter service management systems (Desired outputs are case studies of best practice
44 in design and implementation of information/management systems). Issue B.5.2
45 “Provide sustainable winter maintenance” also has two activities: 5.2.1 to study the
46 full slate of social (safety), environmental and economic (cost-benefit) aspects

1 required to achieve ‘sustainability’ in winter maintenance, (Desired outputs are
2 identification of what optimum sustainability means in terms of winter maintenance,
3 and strategies to achieve it); 5.2.2 to identify impacts of climate change (changes in
4 winter severity) on winter services and on road infrastructure, (Desired output is report
5 on the impact of climate change on winter service and propose actions as preventive
6 measures). Issue B.5.3 “Share knowledge via the Winter Road Congress” has one
7 activity: 5.3 to identify which priority issues and knowledge World Road Association
8 members would find it useful to share, and in what format they would like to receive it
9 (Desired output is to produce a knowledge-sharing tool to suit the needs of the winter
10 operation community). Issue B.5.4 “Communication with road users” has one
11 activity; 5.4 to identify innovative approaches to inform and influence road users
12 about winter operations and safe winter driving (Desired outputs are case studies
13 illustrating best communication practice). Rick reported he introduced PIARC to the
14 SICOP Listserve. Topics for the 2010 conference in Quebec City have been approved
15 and the call for papers will be posted soon on their website. AASHTO will post a link
16 on their website and Lee will put an e-mail on the SICOP Listserve to alert the snow
17 and ice community.

- 18 • Other WMTSP Input—Rick and Wilf hosted a group from Argentina. These were
19 upper level managers and knew what they wanted to explore. They drove by bus from
20 Iowa to California on two lane routes during winter stopping at points that would
21 show maintenance facilities and equipment. Discussions were continuous as they
22 drove the routes. Topics included operations, stripping, roadside, and legal
23 discussions. Argentina has set up working groups and has similar function as the
24 AASHTO HSCOM Snow and Ice Task Force.

25 26 **Project Review of SICOP Program**

- 27 • CBT Revisions & Development—Lee provided a short history of the project. The
28 original AI/RWIS CBT, Version 1, was completed and distributed on May 1, 2003.
29 As the CBT was utilized many suggestions were submitted to make improvements.
30 Also as new snow and ice control research was completed and a method to achieve
31 technology transfer and implementation was needed, the AI/RWIS CBT seemed a
32 good mechanism to achieve those goals. Version 2 of the AI/RWIS CBT therefore
33 was prepared and distributed on July 9, 2007. Version 2 contained inputs from the
34 field received during the four years Version 1 was used and also the research results
35 from NCHRP 6-13, *Snow and Ice Control: Guidelines for Materials and Methods* and
36 NCHRP6-16, *Guidelines for the Selection of Snow and Ice Control Materials to*
37 *Mitigate Environmental Impacts*. Then in June 2006, AASHTO and Clear Roads
38 joined forces to develop five Computer-base Training Programs titled: *Equipment*
39 *Maintenance; Proper Plowing Techniques; Blowing Snow Mitigation; Deicing;* and
40 *Winter Maintenance Management*. The first four CBTs are finished and have been
41 distributed. The last CBT will be finished and distributed about September 1, 2008.
42 The AI/RWIS CBT has received awards in both National and International training
43 methods competitions. The distribution has been accomplished to the 34 Snow Belt
44 state DOTs who joined the pooled fund effort and distribution to local governments is
45 taking place through APWA bookstore sales. NACE made the CBTs available to the

1 LTAP centers for their use. Mark wants to explore if additional training is needed on
2 spreader calibration and performance measures.

- 3 • ESS Guidelines Implementation & Evaluation—FHWA in 2004 published the ESS
4 Siting Guidelines in partnership with Aurora and SICOP. FHWA did a survey to
5 determine if the siting guidelines were working and to determine if changes needed to
6 be made. Nine of the fifteen states responded to the survey. The overall impression of
7 the Guide was positive. Idaho used the guidelines for ESS deployment. New
8 Hampshire reported they didn't use the FHWA guidelines when they installed their
9 ESS because they weren't yet published. However, the guidelines they used were
10 consistent with what FHWA published. Michigan was in the process of deploying and
11 asked their contractor to use the FHWA Guidelines. Working with Michigan revealed
12 sensing technology has changed which needs to be changed in the revised guidelines.
13 The metadata requirements identified in the guide were also evaluated and made
14 consistent with Clarus metadata requirements. Ken asked if FHWA would like to ESS
15 Guidelines be an AASHTO guide since AASHTO currently has all the ITS standards.
16 Roemer will explore that with Paul.
- 17 • Promote Anti-drifting Measures With Proactive Road Design Consideration—Filling
18 in for the project champion Mike Lashmet, Lee gave a short history of this project that
19 New York State DOT (NYSDOT) worked with Ron Tabler and SUNY Buffalo to
20 develop a CADD Expert System for considering mitigation of blowing snow in the
21 design of a roadway. The NYSDOT project is titled "SNOWMAN". Prior Winter
22 Maintenance Scans to Japan discovered the Japanese were putting much effort into the
23 design of their roadways to mitigate the adverse affects of blowing snow, to improve
24 visibility and minimize snow removal from the roadway. The Japanese were using
25 some mathematical modeling and considerable wind tunnel testing of roadway cross-
26 section reduced-scale models. Tabler's work used models and full scale field
27 applications to build a variety of mathematical models. The SNOWMAN project
28 status is that the software was installed nearly a year ago on their MicroStation design
29 platform and does very useful snowdrift simulation modeling. Much of the success
30 for this work is likely due to the NYSDOT Program Manager who did his master's
31 degree work on blowing snow at SUNY Buffalo. SUNY Buffalo just this past week
32 submitted the 1) Developer's Manual, 2) Journal Paper and 3) Final Report. These
33 documents are now under review by NYSDOT. WMTSP will continue to monitor the
34 SNOWMAN roll out to NYSDOT in-house design and operation personnel. WMTSP
35 should also look for opportunities to work with NYSDOT in long term maintenance,
36 upgrading and technical support. WMTSP might also help with marketing by
37 supporting a webinar for showcasing SNOWMAN to interested winter maintenance
38 engineers and designers. Mike will continue to keep WMTSP current with progress
39 being made at NYSDOT.
- 40 • Road Condition Information—Lee provided some background information on this
41 project since the project champion, Dan Roosevelt has now retired from Virginia
42 DOT. The purpose of this project is to document the state-of-the-practice of winter
43 road condition reporting for travelers and promote the development of friction
44 measurement to the point where it can be shared in real time with road operations
45 decision makers (snow and ice control operations, traffic management centers, etc)
46 and travelers. Use of friction was discovered on prior winter maintenance scans to

1 Japan and Europe. Use of friction in these countries was state-of-the-practice. The
2 Ohio DOT and the Ontario Ministry of Transportation have on-going pilot projects
3 using a rolling wheel to measure contact friction. The Vehicle Infrastructure
4 Integration (VII) initiative is evaluating incorporating traction information from the
5 automobiles braking system to determine road condition. The Aurora project 2006-04,
6 “Evaluation of Vaisala Spectro Pavement Sensor” which is 85% complete and Aurora
7 project 2007-02, “Cold Weather Testing of the Halliday Road Grip Unit” which is
8 80% complete will add more knowledge to measuring road conditions. More
9 information on these two projects can be found at www.aurora-program.org. A
10 technical session entitled “Role of Surface Friction in Winter Maintenance” was held
11 on Wednesday, June 18, 2008 at the 4th National Conference on Surface
12 Transportation Weather and 7th International Symposium on Snow Removal and Ice
13 Control Technology. Technical papers can be found in TRB Circular E-C126 at web
14 site www.trb.org. WMTSP will continue to monitor the development of the state-of-
15 the-art as new technologies and applications are discovered and assist with technology
16 transfer and promote marketing efforts where appropriate. Wilf believes the state
17 DOTs will need to see a return on investment such as it reduces snow and ice control
18 cost or that it improves level of service before they will make the rather high initial
19 investment to equip the fleet.

- 20 • Outreach to Local Government—Mark pointed out that APWA has several
21 mechanisms for helping the local governments. The APWA has an array of snow and
22 ice control CBTs and books for sale to the local governments. Members of the Winter
23 Maintenance Subcommittee participate in local and regional seminars and conferences
24 and LTAP conferences and workshops. They also get questions from local
25 governments about groundwater issues and alternatives for chemicals. Mark did an
26 article for magazines on being proactive. Mark made an eleven day trip to Europe to
27 show them the proactive ways we do operations and chemical storage. He went to
28 yards and walked the ground with them. Bret just completed a similar trip to Austria.
29 APWA moves the Snow conference around to get different local audiences. The
30 LTAP conference begins next week and members of the APWA Winter Maintenance
31 Subcommittee will be there. The LTAP training program has many snow and ice
32 control power points which trainers can download and use for their training
33 presentations www.ltap2.org/resources. Mark is working with LTAP in Illinois to
34 develop web cast for snow and ice control. Duane Collet has developed a website,
35 www.wintermaintenance.com and current has 34 Podcasts on a variety of winter
36 maintenance subjects. Lee has reviewed the latest one entitled “Multi-Agency Salt
37 Storage Facilities with Bret Hodne and Larry Schneider” and found it very
38 informative. Duane is using the Snow and Ice Listserve to promote these free
39 Podcasts. Duane is donating his time to organize these Podcasts and would like to
40 have presentations from WMTSP
- 41 • Communications Standards and Winter Maintenance—Roemer reported that Version
42 3.0 of NTCIP 1204 – Object Definitions for Environmental Sensor Stations (ESS)—is
43 developed and currently being balloted, while Version 3 of the Joint ITE/AASHTO
44 TMDD 2.1 – Traffic Management Data Dictionary and Message Sets for External
45 TMC Communication – is still under development.

- 1 • Integrated ITS Corridor—following up from the minutes of the December 6, 2007
2 WMTSP meeting, the TMC Weather Integration Self-Evaluation and Implementation
3 Planning Guidelines were published and the progress was reported earlier in these
4 minutes on page 4, “Weather-Responsive Transportation Management”.
- 5 • Report on 2008 Domestic Scan—Rick reported the Scan is moving forward. They
6 now have a subject matter expert, Rod Pletan. The team is small in number but if
7 needed Rick will ask for more representation and provide for their justification. The
8 team will be scoping out the scan and developing a schedule in the next few months.
- 9 • Report on 2010 International Scan—Ken will follow up and see where this is for 2010.
10 Lee will contact Ken and get the information to WMTSP.
- 11 • Update 1999 AASHTO Guide for Snow and Ice Control—problem statement was
12 submitted last year at the AASHTO HSCOM Madison meeting and was funded by
13 NCHRP as Project 20-7, Task 250. Amir Hanna is the NCHRP project manager.
14 Completion date is scheduled for December 30, 2008.
- 15 • Update on 2007 National Snow & Ice Peer Exchange Research Needs Statements—
16 Western Transportation Institute has been hosting the website for the Peer Exchange.
17 They are contributing their efforts on maintaining the site, but do not have any funds
18 for web site upkeep. Lee has been preparing the electronic updates for WTI so all they
19 need to do is transfer post them to the web. The largest update has been the July 2008
20 progress update for the Research Needs Statements (RNS). Lee provided those
21 updates to WMTSP prior to the meeting. Those RNS that have been assigned to
22 WMTSP will be discussed later in the minutes.
- 23 • Develop best method practices, NCHRP 25-25(4), Task 29, Reduced Salt—Lee
24 reviewed the background for this project. The Compendium of Environmental
25 Stewardship Practices for Highway Construction and Maintenance was produced from
26 NCHRP 25-25(4) in September 2004. It was the initial step in expanding awareness
27 of environmental stewardship in terms of specific practices and procedures as well as
28 general policies and programs. The primary intent of the 2004 Compendium was to
29 enable transportation agencies to more fully benefit from one another’s experience and
30 to help them more fully integrate stewardship into all aspects of their work. The 2004
31 Compendium was well received as an encyclopedic compilation of current practice.
32 The NCHRP 25-25(4) Task 29 project was designed to “mine” the compilation of
33 current practices in the 2004 Compendium and develop a process for screening Best
34 Practice within the 2004 Compendium to develop a comprehensive library of Best
35 Practices. NCHRP 25-25(4) Task 29 is now complete and the final report is posted on
36 the NCHRP Project web site. The report details a process for screening Best Practices
37 for the Compendium and keeping it current. The suggested approach is to engage the
38 Center for Environmental Excellence to sponsor the efforts of a program leader and
39 chapter leaders knowledgeable in the subject area to oversee Working Groups
40 comprised of experienced practitioners, a facilitator and administrative support staff.
41 In addition to screening, continually updating the Compendium and managing the
42 efforts of chapter leaders, the program leader would manage the data, suggestions, and
43 volunteer resources that users offer through the Compendium newly created links.
44 These newly created links allow viewers to make comments on existing Best
45 Practices, suggest new Best Practices and volunteer to help work on a Best Practice.
46 The 2004 Compendium currently has eleven chapters. Chapter 8 is entitled “Winter

1 Operations and Salt, Sand and Chemical Management”. Chapter 8 has six sections:
2 Section 8.1 “Selecting Snow and Ice Control Materials to Mitigate Environmental
3 Impacts” is 7 pages; Section 8.2 “Reducing Sand Usage and Managing Traction
4 Materials” is 2 pages; Section 8.3 “Strategic Planning for Reducing Salt Usage” is 6
5 pages; Section 8.4 “Stewardship Practices for Reducing Salt and Other Chemical
6 Usage” is 31 pages; Section 8.5 “Winter Operations Facilities Management” is 4 pages
7 and 8.6 “Training for Salt Management and Winter Operations” is 9 pages. Section
8 8.4 underwent the intensive review as part of NCHRP 25-25(4) Task 29 which
9 accounts for the added length of this Section. The other Sections need to be evaluated
10 and rewritten. Although there has not been any guidance to the Snow and Ice Task
11 Force, to undertake these needed revisions, it is likely guidance will be forthcoming at
12 the AASHTO Joint Meeting, General Session, on Monday, July 14, 2008 when
13 Shannon Eggleston, Director, Center for Environmental Excellence, gives his update.
14 Lee circulated a copy of Chapter 8. WMTSP needs to monitor progress on this project
15 and determine how best to support the ongoing effort.

- 16 • Guidelines for A/I & Deicing RNS #1 (note RNS refers to Research Needs Statements
17 # from the National Winter Maintenance Peer Exchange website
18 www.wti.montana.edu/TechnologyTransfer/2007PeerExchange.aspx)—Short title,
19 “Guidelines for anti-icing and deicing” covers three research needs statements which
20 read: How to determine the proper timing and frequency of anti-icing and deicing;
21 Develop anti-icing deicing and pre-wetting implementation guidelines; and, Are the
22 FHWA TE-28 anti-icing guidelines accurate, appropriate and effective. Discussion at
23 the December 6, 2007 WMTSP meeting was that some details could be improved
24 upon there is generally sufficient research on the subject for an agency to implement
25 an anti-icing program. The current research covers most situations, but there are some
26 situations that aren’t covered in the storm scenarios and more research to increase the
27 number of weather events would be helpful as well as add value to the basic research.
28 A working group consisting of Wilf Nixon, Dennis Burkheimer and Rick Nelson was
29 appointed to form a work plan to address the: 1) research needs and 2) technology
30 transfer, work culture and institutional issues. The working group will identify
31 resources already available, identify any research gaps ie are more storm scenarios
32 needed?, summarize the resources and gaps and look for ways to better communicate
33 with the snow and ice community to improve technology transfer.
- 34 • National Winter Test Facility #13—Short title, “Field Testing” covers three research
35 needs statements: Build a test facility to provide objective data regarding the
36 effectiveness of various winter maintenance treatments; Pursue objective testing to
37 verify the effectiveness of innovative maintenance treatments; Standardized tests for
38 winter maintenance equipment. In an effort to locate winter maintenance testing
39 facilities, Lee put together a survey and sent it to all the National Peer Exchange
40 attendees on April 18, 2008. The survey asked the attendees to list winter
41 maintenance testing facilities they knew of, listing the name of the facility and
42 location and any contact information they might have. The survey also asked each
43 attendee to describe what they felt their organization needed tested or evaluated. The
44 survey form asked them to list each product, equipment or technology to be tested and
45 the desired testing they felt would be needed or outcome they desired. Nine state
46 DOTs responded, (Illinois, Iowa, Maine, Maryland, Minnesota, Nebraska, Ohio,

1 Pennsylvania, Tennessee). Responders listed the following: **WINTER**
 2 **MAINTENANCE TESTING FACILITIES** (Cold Regions Research and Engineering
 3 Laboratory (CRREL), Virginia Tech Smart Road, University of Iowa, Iowa State
 4 University, University of Northern Iowa, Honda Transportation Research Center
 5 (Marysville, Ohio) and then their own state DOT Materials and Testing Labs). They
 6 listed the following needs for testing: **EQUIPMENT** (RWIS chemical sensors and
 7 other surface sensors; snow plow cutting blades; and vehicle tracking devices.)
 8 **PRODUCTS** (Agricultural products blended with salt brine and other traditional anti-
 9 icing and deicing chemicals; all types of deicing chemicals performance at different
 10 temperatures using both laboratory tests and correlation with field tests; and test and
 11 evaluate different products that can be added to salt to reduce corrosion.)
 12 **TECHNOLOGY** (How to install and operate the FHWA MDSS application;
 13 determine if the TE-28 results and current MDSS treatment recommendations are
 14 sound guidance; what is the best way to reach drivers with safety messages about
 15 winter driving safety; develop a standard procedure and method to measure the
 16 accuracy of weather forecasts; can route optimization or other technology help move
 17 the fleet around to help combat winter storms?; and what is an effective fence that can
 18 be used along the right-of-way to control near snow and also serve as access control?.)
 19 A project that relates to this project is the Clear Roads project, “Development of
 20 Standardized Test Procedures for Evaluating Deicing Chemicals” which is scheduled
 21 for completion in 2009. WMTSP needs to monitor this project to avoid duplication of
 22 efforts and identify possible gaps in research that will exist even after the project is
 23 finished. Another effort related to this project and currently underway is an Aurora
 24 project that was approved in August 2007 to investigate the options for a national
 25 testing facility. In an effort to coordinate the various research consortiums Tina
 26 Greenfield past chair of Aurora took the lead for Aurora Project 2008-01
 27 “Development of a National Road Weather Testing Facility” and conducted a
 28 teleconference call with representatives from Aurora, Clear Roads, Pacific Northwest
 29 Snowfighters, WMTSP (Bill Hoffman, Dennis Burkheimer and Lee Smithson), and
 30 FHWA to discuss existing and emerging testing facilities, and the possibility of
 31 creating a coordinated national plan for meeting all of the various winter maintenance
 32 testing needs. A white paper is being prepared entitled, “Winter Maintenance Testing
 33 Program”. This is currently a work in progress. Wilf and Rick will review the white
 34 paper as soon as it is ready for circulation and determine what assistance WMTSP
 35 should providing.

- 36 • Consistent descriptions of road conditions#15—short title “Consistent descriptions of
 37 road conditions” covers two research needs statements: Develop standard rating and
 38 descriptions for road conditions; and Develop acceptable dynamic messages for snow
 39 and ice. The need for uniform road condition reporting was also reported as research
 40 needs statement #8 from the TRB 7th International Symposium on Snow Removal and
 41 Ice Control Technology in June 2008. Also research needs statement #9 from that
 42 symposium sited the problem motorists have with some states that are using the copy
 43 righted 511 to direct motorists to commercial sources in their state which charge
 44 subscription fees for road conditions. These states are linked to the 511 web pages in
 45 other states, but do not provide the motorists any help in getting to the free official
 46 government road condition sites they are accustomed to finding in other 511 states.

1 There will be problems with standard descriptions and requirements such as the chain
2 control in western states is not needed in the Midwest but once all the states sign on to
3 511, these problems can be resolved. Bill says he has been working with Utah for a
4 Nevada-Utah interstate corridor managing and reporting project that may help guide
5 the 511 project. Bill will bring the 511 issue to the Snow and Ice Task Force meeting
6 later this week for their consideration.

- 7 • Future National Peer Exchanges #18—short title “Peer Exchange” covers just one
8 research needs statement to support more meetings similar to the 2007 meeting for
9 further peer exchanges. This problem was discussed at the combined Aurora and
10 WMTSP meeting December 5, 2007 and recommended another exchange be
11 considered in 2009 or 2010. Clear Roads will be discussing this topic at their next
12 meeting July 30, 2008 and the possibility of providing funding. WMTSP discussed
13 developing a newsletter to report progress but decided to go with using the SICOP List
14 serve to alert the snow and ice community as progress is made and the WTI website is
15 updated.
- 16 • Boiler Plate Legal Language #26—short title “Boilerplate legal language” covers just
17 one research needs statement to develop standard language that could serve as a
18 starting point for states to address legal issues that may be involved with data sharing.
19 FHWA is working with the National Conference of State Legislatures (NCSL) on the
20 disclaimers the states are using as a first step in the project.

21 **WMTSP Program**

- 22 • Presentation of New Projects
 - 23 ○ LOS Determination #3—short title “LOS determination” covers seven
24 research needs statements: Road prioritization formula for winter
25 maintenance LOS; Case studies on ensuring consistency in winter
26 maintenance practice across state borders; Establish seamless boundaries for
27 winter information across states; Develop a national LOS to better transition
28 motorists across boundaries without sudden change in conditions; Is there a
29 defensive way to determine or establish LOS nationwide (corridor
30 management) and seamless LOS across state Boundaries?; FHWA develop
31 pilot/demonstration projects for seamless winter operations (NCHRP 20-74A
32 problem statement) This would include LOS, winter messages, RWIS, and
33 other technologies; and Determine an appropriate wintertime LOS for specific
34 areas. A concern of WMTSP was there were no maintenance members on the
35 NCHRP. Ken will contact the NCHRP Project manager and ask him to
36 consider this concern.
 - 37 ○ Communication/Public/Legislators#5—short title “Communication with
38 public and legislators” covers five research needs statements: Need effective
39 ways to communicate and explain level of service, expectations, and costs on
40 various road systems to motorists, management, and politicians; Best
41 practices for balancing politics and performance; Synthesis of how to
42 effectively relay and communicate winter maintenance budget needs to upper
43 management and legislature; How to most effectively communicate
44 performance measures and associated costs to internal staff, operators and
45 stakeholder; and the image of maintenance workers needs to be improved and
46

1 the critical activities they do needs to be communicated to the public so they
2 understand how maintenance impacts their daily lives. AASHTO’s Director
3 of Communications and Publications, Sunny Schust, has been contacted to
4 ensure the current marketing initiative that the AASHTO Public Affairs
5 Committee has undertaken to heighten the awareness in both the legislative
6 and the public sector about all that DOTs do includes the importance of
7 winter maintenance. Lee will follow through with this.

- 8 ○ Practice Ready Papers TRB E-C126. The following papers were selected as
9 practice-ready papers and need to be evaluated to determine how proceed
10 with implementation: SNOW 08-001 “Guidance for Creating and
11 Maintaining Written Snow and Ice Control Plan and Policy Documents”;
12 SNOW 08-008 Eutectic Depressants: Relationship of Eutectic, Freezing
13 Point, and Ice Melting Capacity in Liquid Deicers; SNOW 08-019 “Providing
14 Winter Road Maintenance Guidance: An Update of the Federal Highway
15 Administration Maintenance Decision Support System”; SNOW 08-021 “A
16 Study on the Expression of Winter Road Information and Its Effects on
17 Drivers’ Travel Decision Making”; SNOW 08-029 “Maintenance Decision
18 Support System is Not Just for State Departments of Transportation”; SNOW
19 08-038 “Overview of Implementation and Deployment of the Pooled Fund
20 Study Maintenance Decision Support System”; WEATHER 08-005
21 “Integrating Weather into Transportation Operations: A Utah Department of
22 Transportation Case Study”. WMTSP needs to work with TRB and
23 determine how we can help with the practice-ready process. MDSS is very
24 important and FHWA has stakeholder meetings scheduled for MDSS and
25 Clarus. The stakeholder guidance coupled with the proposed Regional
26 Demonstrations are probably moving the technology along as fast as can be
27 expected. When the two Benefit/Cost studies are completed, WMTSP can
28 probably help disseminate the results through the SICOP Listserve. WMTSP
29 should also explore how APWA and LTAP might help. TIG can also help
30 with marketing success stories.

- 31 • Evaluation of WMTSP program
 - 32 ○ SICOP 4 Year Program—the Draft Proposed Four Year Program 2009-2012
33 for the Winter Maintenance Technical Service Program was reviewed,
34 revised and a final Program was approved. That program is attached to these
35 minutes.
 - 36 ○ SICOP 4 Year Program Resolution was prepared and approved for
37 presentation at the July 17, 2008 Highway Subcommittee on Maintenance
38 business meeting.
- 39 • Budget Considerations—the annual voluntary contribution solicitation is working
40 well. About 30 states respond to the solicitation and that brings in sufficient funding
41 to support the program.

42
43 Next meeting—explore meeting in conjunction with Clear Roads. Legislatures begin meeting
44 after Martin Luther King day and TRB also meets in January. Decided to monitor activities
45 and other consortium meetings and identify need and opportunities.

46
47 *Minutes as of August 6, 2008*

1 **CLEAR ROADS ATTACHMENT**



11 **Clear Roads Status Report**

12 Clear Roads is a pooled fund research program (Wisconsin is the Lead State) aimed at
13 rigorous testing of winter maintenance materials, equipment and methods for use by highway
14 maintenance crews. It responds to a need for research based on practical experience.

15 Primary activities include:

- 16 • Evaluating winter maintenance materials, equipment and methods under
17 real-world conditions
18 • Developing specifications and recommendations
19 • Studying and promoting innovative techniques and technologies that will
20 save agencies money, improve safety and increase efficiency

21
22 **OUR PARTNERS**

Colorado Department of Transportation
Illinois Department of Transportation
Indiana Department of Transportation
Iowa Department of Transportation
Massachusetts Highway Department
Michigan Department of Transportation
Minnesota Department of Transportation

Missouri Department of Transportation
New York Department of Transportation
Ohio Department of Transportation
Utah Department of Transportation
Virginia Department of Transportation
Wisconsin Department of Transportation
Wyoming Department of Transportation

23 **COMPLETED PROJECTS**

24
25 **Synthesis of Best Practices for Eliminating Fogging and Icing on Winter Maintenance**
26 **Vehicles (September 2006)**

27 *Results:* The report compiles a range of solutions, both long-term and short-term, for keeping
28 snow plow glass and mirror surfaces clean of winter precipitation inside and out.

29
30 **Calibration Accuracy of Manual and Ground-Speed-Control Spreaders (January 2008)**

31 *Results:* Guidelines to help snow plow operators establish and maintain accurate calibration of
32 ground speed controllers, resulting in reduced salt usage and improved efficiency.

33
34 **RESEARCH IN PROGRESS**

1 **Determining Effectiveness of Deicing Materials and Procedures**

2 *Expected results:* A portable test method for determining the effectiveness of deicers that
3 could be used by any interested state in a variety of locations under a variety of winter
4 conditions.

5 *Expected completion date:* December 2008

6 **Development of Standardized Test Procedures for Carbide Insert Snowplow Blade**
7 **Wear**

8 *Expected results:* Testing procedures that could be used by an independent testing laboratory
9 to determine life expectancy of any carbide insert snowplow blade.

10 *Expected completion date:* July 2009

11
12 **Development of Standardized Test Procedures for Evaluating Deicing Chemicals**

13 *Expected results:* Standard tests that will help simplify the deicer evaluation process for state
14 DOTs.

15 *Expected completion date:* April 2009

16
17 **Development of Interface Specifications for Mobile Data Platforms on DOT Vehicles**

18 *Expected results:* Communication and data format specifications that would support a “plug
19 and play” approach to integrating sensors and other devices with mobile data platforms used
20 by State DOT’s.

21 *Expected completion date:* November 2009

22
23 **Development of a Toolkit for Cost-benefit Analysis of Specific Winter Maintenance Practices,**
24 **Equipment and Operations**

25 *Expected results:* A standard tool, manual and training for cost-benefit analysis of specific
26 winter maintenance practices, equipment and operations.

27 *Expected completion date:* February 2010

28
29 **PARTNERSHIP PROJECTS**

30
31 **National Winter Maintenance Peer Exchange**

32 In collaboration with Aurora, SICOP, FHWA, and PNS, Clear Roads helped plan a national
33 winter maintenance peer exchange conference dedicated to information sharing and research
34 coordination among winter maintenance professionals. The conference took place in
35 Columbus, Ohio on August 28 and 29, 2007. Thirty-five states plus Washington D.C.
36 attended. Work continues on the 70 research problem statements developed.

37
38 **National Winter Safety Campaign**

39 Clear Roads initiated a national multimedia campaign designed to educate drivers about the
40 importance of driving safely in winter conditions. **“Ice and Snow... Take it Slow”**

41
42 **Computer-Based Training**

43 Clear Roads supports the efforts of the Snow and Ice Pooled Fund Cooperative Program in
44 developing additional computer-based training modules related to winter maintenance. Proper
45 Plowing Techniques was released last Fall. Mitigating Blowing Snow, Deicing Chemicals,
46 and Snow and Ice Management should be available early in 2008.

1 **Snowplow Design**
2 Clear Roads is working with the Winter Concept Vehicle Pooled Fund to conduct research on
3 optimum snowplow design.
4

5 **TECHNOLOGY TRANSFER LEADERSHIP**

6
7 **Winter Maintenance E-Newsletter**
8 Clear Roads publishes a quarterly e-newsletter that highlights applications of winter
9 maintenance research and technology and the latest transportation research reports
10

11 **Product Evaluation Survey**
12 In an effort to encourage the informal evaluation of products related to winter maintenance,
13 Clear Roads created a Product Evaluation Survey for use by any interested organization. The
14 survey allows states to share experiences with new or existing products.
15

16 For more information on any Clear Roads project please visit the Web site at:

17 www.clearroads.org
18
19