



## **Training Supervisors in Winter Maintenance Operations: A Survey of State DOT Practices, Training Tools and Programs**

*Prepared for*  
**Clear Roads Pooled Fund Study**

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### **Request for Report**

Supervisors in winter maintenance operations are often promoted from within the ranks of operators. As they prepare to take on management responsibilities, new supervisors may require additional training. The Clear Roads winter maintenance pooled fund is interested in identifying key elements of a curriculum to train winter maintenance operations supervisors and has asked us to gather information about supervisor training programs used by state DOTs. Information about training tools and programs available through national associations and commercial organizations would also be useful.

### **Summary**

We asked Clear Roads technical advisory committee representatives and attendees of the 2007 National Winter Maintenance Peer Exchange to complete an online survey about their supervisor training programs consisting of the following questions:

1. Do you offer some type of training (informal or a structured program) for the front-line supervisors and managers in your winter maintenance operations?
2. Who provides the training?
- 2a. If a consultant participates in your supervisor training program, please provide the consultant's contact information below.
3. How often do you offer training?
4. Is the training required?
5. What training materials or documentation do you use in your training program? (Check all that apply.)
6. Are participants asked to evaluate the training program?
- 6a. Please describe the type of feedback you have received from participants.
7. Have you encountered any problems or challenges in training your front-line supervisors? Please describe.
8. Have you identified gaps in your current training program? Please describe.
9. Have you made use of computer-based training programs to train your supervisors?
- 9a. Which computer-based training programs have you used?

10. Please indicate the importance of each of the following training topics in a supervisor training program.

- Budgeting
- Planning
- Employee issues (discipline, contract issues, split shifts)
- Liability issues
- Security issues
- Selecting and purchasing materials
- Selecting and maintaining equipment
- Establishing service levels and performance measurement
- Stockpile management
- Weather and weather forecasting
- Road Weather Information Systems
- Post-storm meetings
- Sharing facilities with other state agencies
- Working with the public

10a. Are there other topics that you consider to be important to include in a supervisor training program?

11. Please use this space to provide details on any of your answers above, or to provide additional comments.

Eighteen state DOTs and the District of Columbia responded to the survey; we also received one anonymous survey response. (See **Survey Results** on page 7 of this report.) An outline used by Illinois DOT in its supervisor training program is included in [Appendix A](#).

Key findings from the survey include:

- Almost all of the agencies (**95 percent**) **offer some form of supervisor training program**.
- Almost three-quarters of the agencies (**74 percent**) **use internal staff to provide the training**. The remaining agencies collaborate with a consultant. No agencies completely outsource their supervisor training program.
- More than half of the agencies (**56 percent**) **offer annual training**, with one agency specifying that the annual training is offered to those who have not received it previously. Respondents were evenly split on requiring their supervisors to participate in the training program.
- Agencies make use of a variety of training materials in their programs. More than three-quarters of the agencies (**78 percent**) **use PowerPoint presentations**. Training manuals and hands-on training exercises are also popular training tools.
- Almost two-thirds of the agencies (**61 percent**) **ask participants to evaluate the training program**. Agencies note mostly positive feedback from participants. Several agencies report that feedback is used to improve training materials for the next session or to make adjustments to operating procedures.
- Almost three-quarters of the agencies (**74 percent**) **report challenges encountered in training front-line supervisors**. Almost half of these agencies (**43 percent**) **cited resistance to training in general or resistance to adopting new technologies or tools**. Only two respondents specifically stated that they have encountered no challenges in their training programs.
- More than half of the agencies (**63 percent**) **have identified gaps in their current training program**. Agencies report that their programs could be improved by developing a more comprehensive program with a plan for consistent delivery, offering the opportunity for individualized training, reinforcing decision-making concepts, and returning to basics—making sure the agency’s policies and procedures are well understood and implemented. Two respondents reported no gaps in their training programs.
- More than half of the agencies (**58 percent**) **use computer-based training programs to train their supervisors**. Nine agencies are using the Anti-Icing/RWIS Computer-Based Training Program; five agencies use the Clear Roads CBT Training Series.

- Respondents reflected a diversity of opinion with regard to the **importance of training topics**. Below is an ordered list of training topics included in the survey that reflects the rating average for each topic (5 = extremely important; 1 = not at all important). The higher the rating, the more important the topic was to respondents.

<b>Training Topic</b>	<b>Rating Avg.</b>
Planning	4.63
Weather and weather forecasting	4.58
Working with the public	4.53
Employee issues (discipline, contract issues, split shifts)	4.32
Post-storm meetings	4.32
Road Weather Information Systems	4.26
Stockpile management	4.11
Budgeting	4.06
Selecting and maintaining equipment	3.95
Establishing service levels and performance measurement	3.95
Liability issues	3.84
Selecting and purchasing materials	3.68
Security issues	2.95
Sharing facilities with other state agencies	2.71

- Respondents offered many suggestions for **other training topics to include in a supervisor training program**, including safety, equipment management (calibration, wing plow operation), data management, leadership skills, materials management, application techniques (deicing, anti-icing, general application rates), and discussion of new technologies.

To augment the information provided by state agencies offering supervisor training programs, we sought additional information about **Computer-Based Training**, a relatively new tool in the training arsenal used by more than half of the survey respondents. We also provide examples of other **Training Tools**, such as manuals, books and learning guides, videos, and online courses, which can supplement an instructor-led supervisor training program. Finally, we present **Commercial Training Programs** that offer standard and customized training in winter maintenance operations.

### **Computer-Based Training**

More than half of the survey respondents use computer-based training in their supervisor training programs. CBT offers a cost-effective alternative or supplement to instructor-led sessions. Often-cited benefits of CBT include:

- Interactivity that encourages better retention of material
- Easy customization
- Individualized pacing
- Consistency
- Easy updating
- Lower costs than most classroom sessions
- Testing and monitoring built into the program

#### **Anti-Icing/RWIS Computer-Based Training Program**

AASHTO, 2004.

<http://www.apwa.net/bookstore/detail.asp?PC=PB.X407>

This two-CD computer-based training is a self-paced, interactive multimedia training program that includes practice and review exercises, fun facts, and links to key definitions, a glossary, a Knowledge Base and related Internet sites. After completing lessons on core anti-icing and RWIS topics, students learn how to put their new knowledge into practice. In the Scenario Room, students battle winter events using tools in a simulated winter maintenance facility to hone their winter maintenance decision-making skills. A suite of administrative tools enables training managers to monitor student progress and performance, and customize the course content to reflect unique needs and practices.

#### **Clear Roads CBT Training Series**

Clear Roads Pooled Fund Project and Snow and Ice Pooled Fund Cooperative Program, 2008.

<http://apwa.net/bookstore/detail.asp?PC=SPR.CLROADSCBT>

This training series contains five two-hour modules that can be completed in any order. Centralized records allow training managers to monitor students' progress through individual courses and through the suite of modules.

Program modules include:

- Equipment maintenance
- Proper plowing techniques
- Deicing
- Blowing snow mitigation
- Policy management

The policy management module is particularly applicable to supervisor training programs, and includes the following units:

- Selecting, purchasing and managing materials
- Operational methods
- Establishing service levels and performance measurements
- Winter maintenance planning and budgeting
- Employee issues
- Liability issues
- Working with other agencies and the public

### **Fundamentals of Road Weather Management: Professional Development Module**

FHWA and Institute of Transportation Engineers, January 2005.

<http://www.ite.org/emodules/scriptcontent/Orders/ProductDetail.cfm?pc=CD-033>

This training module provides transportation practitioners with a quick, concise and easy way to learn about the basics of road weather management. The training CD provides general information about the magnitude of the road weather problem, the types of management strategies that can be used, the technologies available to support road weather management, and actions that can be taken to address road weather incidents. It also describes some of the best practices in road weather management. The module includes a PowerPoint presentation that takes about an hour to complete, as well as instructor's notes, supplementary materials, a sign-in sheet, an evaluation form and Instruction Guidelines.

### **Training Tools**

Agency-specific materials in a supervisor training program can be augmented by **Manuals, Books and Learning Guides, Audio-Visual CDs, and Online Courses** developed by regional and national organizations.

#### **Manuals, Books and Learning Guides**

##### **Winter Maintenance Manual**

Utah LTAP Center, August 2008.

<http://www.utahltap.org/Services/winter2008.pdf>

This guide to anti-icing and snow control strategies includes information about product selection, material usage, quality control and application rates.

##### **The Snowfighter's Handbook: A Practical Guide for Snow and Ice Control**

Salt Institute, 2007.

<http://www.saltinstitute.org/content/download/484/2996>

Originally published in 1967, The Snowfighter's Handbook provides the latest procedures and techniques for combating winter storms.

##### **Urban Snow and Ice Control**

Bruce Florquist, American Public Works Association, 2005.

<http://www.apwa.net/bookstore/detail.asp?PC=PB.A507>

This book focuses on successful operations and techniques in urban snowfighting. Topics include planning, public relations, relative merits of snow melting and traction techniques, and comparison of selection procedures for chemicals.

##### **Salt SMART Learning Guide**

Transportation Association of Canada, 2005.

<http://www.tac-atc.ca/english/seminars/pdf/completegguide.pdf>

This guide offers best practices for the Spreading, Maintenance, Application Rates & Timing (SMART) of road salt. Best practices are discussed in detail and summarized in a checklist that can be pulled out. These pullouts can be

used as refresher or quick reference material, either by posting on a wall or combining them into a best practices manual. The guide is divided into five modules:

- Getting Started
- Pre-Season: Getting Ready
- In-Season: Battling the Storm
- Post-Season
- Appendix

### **NLTAPA Winter Maintenance Training Resources**

Salt Institute, 2009.

<http://www.saltinstitute.org/Education-Center/Snowfighters-training/Snowfighting-training/WINOPS>

At the request of the National LTAP Association, the Salt Institute created this Web page of resources designed for those responsible for training winter maintenance personnel. Winter maintenance professionals across the country contributed materials, which were shared and distributed in conjunction with the National LTAP Association's WINOPS listserv.

### **Audio-Visual CDs**

#### **Developing an Effective Snow and Ice Program**

American Public Works Association, 2004.

<http://apwa.net/bookstore/detail.asp?PC=PB.E404>

This two-hour audio-visual CD presents key aspects of running an effective snow and ice control program from two of the industry's top municipal experts. Topics addressed in the program include media and public relations, equipment procurement and maintenance, chemical product selection, planning, policies and training.

#### **Winter Roads: Effective Use of Chemicals and Abrasives for Winter Road Maintenance**

American Public Works Association, 2001.

<http://www.apwa.net/bookstore/detail.asp?PC=PB.E300>

This two-hour audio-visual CD covers the basics of chemical and abrasive usage for snow and ice control, reviews new chemicals, and discusses how prewetting and anti-icing can be effective for improved safety of local and state roads. Topics include snow and ice impacts on road safety, the basic use of salt and sand, prewetting and anti-icing, and alternative chemicals including magnesium chloride, calcium chloride and more.

Other audio-visual CDs and videos available through the APWA bookstore that address the basics of snowfighting may also be appropriate for use in some supervisor training programs (see

<http://www.apwa.net/bookstore/category.asp?Category=Snow+and+Ice+Control>).

### **Online Courses**

#### **Principles and Tools for Road Weather Management**

FHWA, 2009.

This course provides transportation professionals with training to develop tools and strategies for addressing road weather problems. The course begins with an overview of the types of road weather problems and their associated costs, as well as basic meteorology for nonmeteorologists. Participants are exposed to various strategies for addressing road weather problems, including Road Weather Information Systems and the development of cross-cutting decision support systems to respond effectively to weather situations.

The course is available in two formats:

- Online  
<http://www.citeconsortium.org/courses/RoadWeatherMgmt.html>
- Instructor-led, Web-based  
[http://www.citeconsortium.org/courses/RoadWeatherMgmt\\_Blended.html](http://www.citeconsortium.org/courses/RoadWeatherMgmt_Blended.html)

## **Commercial Training Programs**

Agency-led training sessions can be supplemented or replaced by commercially available training programs.

### **Asset Insight Technologies LLC**

<http://www.ait-llc.com/>

Asset Insight Technologies offers standard and customized training programs. Standard training programs include:

**Managing Winter Maintenance.** Training for supervisors, managers and engineers is presented in a two- or three-day format. This course teaches the fundamentals of winter maintenance and advanced practices. Featured topics include managing winter maintenance operations, including financial analysis of resource decisions and balancing resources; using chemicals; anti-icing principles; managing information for effective decision making; winter maintenance equipment; and snow fence design. Group activities allow participants to develop improved maintenance strategies for their five most typical storms.

**Scenario-Based Training.** Training for all winter maintenance personnel presented in a one-and-a-half or two-day format. This course teaches advanced winter maintenance practices and features scenario exercises.

AIT also offers a Winter Maintenance Knowledge Assessment that allows training coordinators to evaluate the effectiveness of training on individual and organizational levels.

**Contact:** Wilfrid Nixon, (319) 594-4447, [wilfrid-nixon@uiowa.edu](mailto:wilfrid-nixon@uiowa.edu); Bob Stowe, (541) 938-0184, [bob-stowe@ait-llc.com](mailto:bob-stowe@ait-llc.com).

### **Ice & Snow Technologies Inc.**

<http://www.iceandsnowtechnologies.com>

Ice & Snow Technologies offers custom training packages and out-of-the-box training that can be presented by a certified trainer or an employee trained to be certified. Employees must successfully complete a four-day Instructional Techniques Course before they will be permitted to train others.

IST's standard training program includes five modules that contain 29 lessons. The modules include:

- Introduction to ice and snow control
- Environmental impact of winter operations
- Weather information, data sources (RWIS) and its use
- Work methods and equipment
- Program design and support

The final module, program design and support, addresses topics likely to appear in winter maintenance supervisor training programs. Individual lessons include:

- Legal aspects of winter maintenance operations
- Operations planning
- Evaluation and implementation of FAST technologies
- Operations support
- Planning
- Budgeting
- Contracting and purchasing
- Specification writing—chemicals
- Specification writing—equipment
- Laboratory procedures for testing/certifying and quality control of chemicals

**Contact:** Dale Keep, (509) 525-3197, [dalekeep@innw.net](mailto:dalekeep@innw.net).

## Survey Results

The full text of each survey response is provided below. For reference, we have included an abbreviated version of each question before the response; for the full question text, please see the Summary on page 1 of this report.

### Arizona

1. **Do you offer training?** Yes.
2. **Who provides the training?** Internal staff
- 2a. **Consultant contact information:** [No response.]
3. **How often do you offer training?** Less frequently than annually.
4. **Is the training required?** No.
5. **Training materials used:** PowerPoint presentation.
6. **Do participants evaluate the training?** No.
- 6a. **Type of feedback received:** [No response.]
7. **Have you encountered any problems or challenges?** [No response.]
8. **Have you identified gaps in your training program?** [No response.]
9. **Do you use computer-based training?** No.
- 9a. **Which CBT programs?** [No response.]
10. 

<u>Training Topic</u>	<u>Rating</u>
Budgeting	5 - Extremely important
Planning	5 - Extremely important
Employee issues (discipline, contract issues, split shifts)	4
Liability issues	4
Security issues	4
Selecting and purchasing materials	5 - Extremely important
Selecting and maintaining equipment	5 - Extremely important
Establishing service levels and performance measurement	4
Stockpile management	4
Weather and weather forecasting	5 - Extremely important
Road Weather Information Systems	3 - Somewhat important
Post-storm meetings	3 - Somewhat important
Sharing facilities with other state agencies	4
Working with the public	4
- 10a. **Are there other topics that are important to include in training?** [No response.]
11. **Details or comments:** [No response.]

### Connecticut

1. **Do you offer training?** Yes.
2. **Who provides the training?** Internal staff.
- 2a. **Consultant contact information:** [No response.]
3. **How often do you offer training?** Less frequently than annually.
4. **Is the training required?** Yes.
5. **Training materials used:** PowerPoint presentation.
6. **Do participants evaluate the training?** Yes.
- 6a. **Type of feedback received:** Good feedback.
7. **Have you encountered any problems or challenges?** No.
8. **Have you identified gaps in your training program?** We keep the material up to date.
9. **Do you use computer-based training?** No.
- 9a. **Which CBT programs?** [No response.]
10. 

<u>Training Topic</u>	<u>Rating</u>
Budgeting	5 - Extremely important
Planning	5 - Extremely important
Employee issues (discipline, contract issues, split shifts)	4
Liability issues	4
Security issues	3 - Somewhat important
Selecting and purchasing materials	5 - Extremely important
Selecting and maintaining equipment	4
Establishing service levels and performance measurement	5 - Extremely important

Stockpile management	5 - Extremely important
Weather and weather forecasting	4
Road Weather Information Systems	4
Post-storm meetings	5 - Extremely important
Sharing facilities with other state agencies	3 - Somewhat important
Working with the public	4

- 10a. **Are there other topics that are important to include in training?** [No response.]
11. **Details or comments:** Every year our supervisors and trainers give a class on snow and ice guidelines to our winter operations [staff]. This is done prior to our snow and ice season, which occurs the first week of November.

**District of Columbia**

1. **Do you offer training?** Yes.
2. **Who provides the training?** Internal staff.
- 2a. **Consultant contact information:** [No response.]
3. **How often do you offer training?** Several times each snow season to ensure all drivers and supervisors receive training.
4. **Is the training required?** Yes.
5. **Training materials used:** Training agenda; training manual; PowerPoint presentation; hands-on training exercises
6. **Do participants evaluate the training?** No.
- 6a. **Type of feedback received:** Since they're required to attend, they enjoy that we change it around a little each year.
7. **Have you encountered any problems or challenges?** Consistency.
8. **Have you identified gaps in your training program?** We filled a previous gap with simulation training.
9. **Do you use computer-based training?** Yes.
- 9a. **Which CBT programs?** Real-time simulator training.

<b><u>Training Topic</u></b>	<b><u>Rating</u></b>
Budgeting	1 - Not at all important
Planning	1 - Not at all important
Employee issues (discipline, contract issues, split shifts)	5 - Extremely important
Liability issues	2
Security issues	1 - Not at all important
Selecting and purchasing materials	2
Selecting and maintaining equipment	2
Establishing service levels and performance measurement	2
Stockpile management	2
Weather and weather forecasting	5 - Extremely important
Road Weather Information Systems	5 - Extremely important
Post-storm meetings	5 - Extremely important
Sharing facilities with other state agencies	4
Working with the public	4

- 10a. **Are there other topics that are important to include in training?** What to do in accident (or incident) can never be taught too many times.
11. **Details or comments:** We issue color flip-books with quick information, phone numbers, etc. that supervisors (and drivers) are to keep on hand. This has proved to be very useful.

**Idaho**

1. **Do you offer training?** Yes.
2. **Who provides the training?** Internal staff.
- 2a. **Consultant contact information:** [No response.]
3. **How often do you offer training?** Annually.
4. **Is the training required?** No.
5. **Training materials used:** Training agenda; PowerPoint presentation; hands-on training exercises.
6. **Do participants evaluate the training?** No.
- 6a. **Type of feedback received:** [No response.]

7. **Have you encountered any problems or challenges?** Just the general lack of a formalized training program geared specifically towards winter maintenance. The training program offered is for all aspects of front-line supervisor training, not just winter maintenance. Therefore, training specifically regarding winter maintenance is only a small portion of the training program. A specialized program would be beneficial.
8. **Have you identified gaps in your training program?** It is not comprehensive enough.
9. **Do you use computer-based training?** No.
- 9a. **Which CBT programs?** [No response.]
10. 

<u>Training Topic</u>	<u>Rating</u>
Budgeting	5 - Extremely important
Planning	5 - Extremely important
Employee issues (discipline, contract issues, split shifts)	5 - Extremely important
Liability issues	4
Security issues	3 - Somewhat important
Selecting and purchasing materials	3 - Somewhat important
Selecting and maintaining equipment	5 - Extremely important
Establishing service levels and performance measurement	3 - Somewhat important
Stockpile management	3 - Somewhat important
Weather and weather forecasting	5 - Extremely important
Road Weather Information Systems	5 - Extremely important
Post-storm meetings	3 - Somewhat important
Sharing facilities with other state agencies	1 - Not at all important
Working with the public	5 - Extremely important
- 10a. **Are there other topics that are important to include in training?** [No response.]
11. **Details or comments:** [No response.]

### Illinois

See [Appendix A](#) for an outline used by Illinois DOT in their supervisor training program.

1. **Do you offer training?** Yes.
2. **Who provides the training?** Internal staff.
- 2a. **Consultant contact information:** [No response.]
3. **How often do you offer training?** Annually.
4. **Is the training required?** No.
5. **Training materials used:** Training agenda; course objectives; PowerPoint presentation; hands-on training exercises.
6. **Do participants evaluate the training?** Yes.
- 6a. **Type of feedback received:** 99 percent of the attendees feel that the training is valuable in becoming more efficient in their snow and ice operations.
7. **Have you encountered any problems or challenges?** Most of the problems revolve around securing enough budget to conduct the training.
8. **Have you identified gaps in your training program?** Yes. We need to continue to work on salt application rates. We have too many supervisors not using the weather forecast to dictate their application rates.
9. **Do you use computer-based training?** Yes.
- 9a. **Which CBT programs?** Anti-Icing/RWIS Computer-Based Training Program.
10. 

<u>Training Topic</u>	<u>Rating</u>
Budgeting	2
Planning	5 - Extremely important
Employee issues (discipline, contract issues, split shifts)	2
Liability issues	3 - Somewhat important
Security issues	2
Selecting and purchasing materials	4
Selecting and maintaining equipment	3 - Somewhat important
Establishing service levels and performance measurement	2
Stockpile management	3 - Somewhat important
Weather and weather forecasting	5 - Extremely important
Road Weather Information Systems	5 - Extremely important

Post-storm meetings	5 - Extremely important
Sharing facilities with other state agencies	2
Working with the public	3 - Somewhat important

10a. **Are there other topics that are important to include in training?** Spreader control systems (programming, calibration, etc.); analyzing weather forecasts to determine chemical selection and application rates; discussion of new technologies.

11. **Details or comments:** [No response.]

### Indiana

(Questions 2 through 9a. were skipped because Indiana DOT does not offer a supervisor training program.)

1. **Do you offer training?** No.

<u>Training Topic</u>	<u>Rating</u>
Budgeting	5 - Extremely important
Planning	5 - Extremely important
Employee issues (discipline, contract issues, split shifts)	5 - Extremely important
Liability issues	4
Security issues	3 - Somewhat important
Selecting and purchasing materials	4
Selecting and maintaining equipment	4
Establishing service levels and performance measurement	5 - Extremely important
Stockpile management	4
Weather and weather forecasting	5 - Extremely important
Road Weather Information Systems	5 - Extremely important
Post-storm meetings	5 - Extremely important
Sharing facilities with other state agencies	3 - Somewhat important
Working with the public	5 - Extremely important

10a. **Are there other topics that are important to include in training?** MDSS training.

11. **Details or comments:** Supervisor training has been on-the-job primarily. We have presented an annual Snow Conference (1 day) that addresses supervisors. Supervisors are responsible for annual driver training. An outline for driver training has been provided that allows flexibility from year to year. The anti-icing CBT was a requirement a few years ago.

### Iowa

1. **Do you offer training?** Yes.

2. **Who provides the training?** Collaboration of staff and consultant. We use both consultant and internal staff for training.

2a. **Consultant contact information:** We have used several different consultants in the past to provide supervisor training in deicing chemicals, weather, RWIS and other areas.

3. **How often do you offer training?** Several times each year.

4. **Is the training required?** No. No roll is taken, but supervisors are strongly encouraged to attend.

5. **Training materials used:** Training agenda; training manual; PowerPoint presentation. The materials used for training vary depending on the trainer and topic. We also use the Internet and computer-based training.

6. **Do participants evaluate the training?** No.

6a. **Type of feedback received:** [No response.]

7. **Have you encountered any problems or challenges?** There are many areas in winter maintenance where there are several right answers because of the variability in weather and operations. It's difficult to train on the "right" methods. Finding time to provide the training and the distance many have to travel for training adds major costs to training.

8. **Have you identified gaps in your training program?** Yes. I think decision-making concepts are not well covered in training. Helping supervisors identify the important information they need to make decisions and then how to act based on the information is difficult.

9. **Do you use computer-based training?** Yes.

9a. **Which CBT programs?** Anti-Icing/RWIS Computer-Based Training Program; Clear Roads CBT Training Series.

<b>10. <u>Training Topic</u></b>	<b><u>Rating</u></b>
Budgeting	4
Planning	4
Employee issues (discipline, contract issues, split shifts)	4
Liability issues	2
Security issues	2
Selecting and purchasing materials	1 - Not at all important
Selecting and maintaining equipment	1 - Not at all important
Establishing service levels and performance measurement	1 - Not at all important
Stockpile management	4
Weather and weather forecasting	4
Road Weather Information Systems	4
Post-storm meetings	5 - Extremely important
Sharing facilities with other state agencies	1 - Not at all important
Working with the public	5 - Extremely important

10a. **Are there other topics that are important to include in training?** Safety issues, deicing chemical use, environmental impact of winter operations.

11. **Details or comments:** [No response.]

**Maryland**

1. **Do you offer training?** Yes.
2. **Who provides the training?** Internal staff.
- 2a. **Consultant contact information:** [No response.]
3. **How often do you offer training?** Annually.
4. **Is the training required?** Yes.
5. **Training materials used:** Training agenda; course objectives; training manual; PowerPoint presentation; hands-on training exercises.
6. **Do participants evaluate the training?** Yes.
- 6a. **Type of feedback received:** Most feedback is positive.
7. **Have you encountered any problems or challenges?** The training is for front-line supervisors as well as equipment operators and mechanics. The equipment operators and mechanics tend to be more receptive to the training. There is more resistance to the training on the part of some front-line supervisors and managers.
8. **Have you identified gaps in your training program?** Gaps are identified and addressed through an annual review of the course. Gaps usually reflect changes to the agency's policies and procedures, materials or equipment.
9. **Do you use computer-based training?** Yes.
- 9a. **Which CBT programs?** Clear Roads CBT Training Series.

<b>10. <u>Training Topic</u></b>	<b><u>Rating</u></b>
Budgeting	4
Planning	5 - Extremely important
Employee issues (discipline, contract issues, split shifts)	4
Liability issues	5 - Extremely important
Security issues	3 - Somewhat important
Selecting and purchasing materials	5 - Extremely important
Selecting and maintaining equipment	5 - Extremely important
Establishing service levels and performance measurement	5 - Extremely important
Stockpile management	5 - Extremely important
Weather and weather forecasting	4
Road Weather Information Systems	5 - Extremely important
Post-storm meetings	5 - Extremely important
Sharing facilities with other state agencies	Not applicable
Working with the public	5 - Extremely important

10a. **Are there other topics that are important to include in training?** [No response.]

11. **Details or comments:** SHA's primary snow and ice control training program is called Snow College, Roadway Winter Operations. It is for all maintenance shop equipment operators, mechanics, team leaders and managers. SHA puts all new shop personnel through Snow College along with approximately 20 percent of its existing force. The goal is for all maintenance personnel to have the training every five years.

**Massachusetts**

1. **Do you offer training?** Yes.
2. **Who provides the training?** Collaboration of staff and consultant.
- 2a. **Consultant contact information:** MTAP, Chris Amajhian, Director, (413) 545-2604.
3. **How often do you offer training?** Annually.
4. **Is the training required?** Yes.
5. **Training materials used:** Course objectives; PowerPoint presentation; hands-on training exercises.
6. **Do participants evaluate the training?** Yes.
- 6a. **Type of feedback received:** Improvements are being made each year.
7. **Have you encountered any problems or challenges?** Hard to teach an old dog new tricks, resistance to new technology.
8. **Have you identified gaps in your training program?** Absolutely, middle managers are not prepared significantly to handle new technology.
9. **Do you use computer-based training?** No.
- 9a. **Which CBT programs?** Clear Roads CBT Training Series.

<b><u>Training Topic</u></b>	<b><u>Rating</u></b>
Budgeting	2
Planning	5 - Extremely important
Employee issues (discipline, contract issues, split shifts)	4
Liability issues	3 - Somewhat important
Security issues	2
Selecting and purchasing materials	2
Selecting and maintaining equipment	3 - Somewhat important
Establishing service levels and performance measurement	5 - Extremely important
Stockpile management	5 - Extremely important
Weather and weather forecasting	5 - Extremely important
Road Weather Information Systems	5 - Extremely important
Post-storm meetings	4
Sharing facilities with other state agencies	3 - Somewhat important
Working with the public	5 - Extremely important

- 10a. **Are there other topics that are important to include in training?** Communication skills, negotiation skills.
11. **Details or comments:** We are in a different situation because we have almost 90 percent of our snow and ice operations contracted out. Our training has another aspect of working together with vendors and still getting the work done that is required.

**Minnesota**

1. **Do you offer training?** Yes.
2. **Who provides the training?** Internal staff.
- 2a. **Consultant contact information:** [No response.]
3. **How often do you offer training?** Annually.
4. **Is the training required?** No.
5. **Training materials used:** Training agenda; course objectives; training manual; PowerPoint presentation.
6. **Do participants evaluate the training?** Yes.
- 6a. **Type of feedback received:** [No response.]
7. **Have you encountered any problems or challenges?** We have had some problems getting the supervisors to attend the training. There is also an accountability issue associated with the training and putting it into practice.
8. **Have you identified gaps in your training program?** [No response.]
9. **Do you use computer-based training?** Yes.
- 9a. **Which CBT programs?** Anti-Icing/RWIS Computer-Based Training Program; Clear Roads CBT Training Series.

<b><u>Training Topic</u></b>	<b><u>Rating</u></b>
Budgeting	4
Planning	4
Employee issues (discipline, contract issues, split shifts)	3 - Somewhat important
Liability issues	3 - Somewhat important
Security issues	2
Selecting and purchasing materials	4
Selecting and maintaining equipment	3 - Somewhat important

Establishing service levels and performance measurement	4
Stockpile management	4
Weather and weather forecasting	4
Road Weather Information Systems	4
Post-storm meetings	4
Sharing facilities with other state agencies	3 - Somewhat important
Working with the public	4

10a. **Are there other topics that are important to include in training?** Proper use of anti-icing; material application rates; use of AVL and GPS; MDSS.

11. **Details or comments:** [No response.]

### Missouri

1. **Do you offer training?** Yes.
2. **Who provides the training?** Internal staff.
- 2a. **Consultant contact information:** [No response.]
3. **How often do you offer training?** [No response.]
4. **Is the training required?** [No response.]
5. **Training materials used:** [No response.]
6. **Do participants evaluate the training?** [No response.]
- 6a. **Type of feedback received:** [No response.]
7. **Have you encountered any problems or challenges?** [No response.]
8. **Have you identified gaps in your training program?** [No response.]
9. **Do you use computer-based training?** No.
- 9a. **Which CBT programs?** [No response.]
10. **Rate the importance of training topics:** [No response.]
- 10a. **Are there other topics that are important to include in training?** [No response.]
11. **Details or comments:** [No response.]

### Montana

1. **Do you offer training?** Yes.
2. **Who provides the training?** Collaboration of staff and consultant.
- 2a. **Consultant contact information:** Wilf Nixon with AIT (Asset Insight Technologies, LLC); [wilf-nixon@ait-llc.com](mailto:wilf-nixon@ait-llc.com).
3. **How often do you offer training?** Less frequently than annually.
4. **Is the training required?** Yes.
5. **Training materials used:** Training agenda; course objectives; training manual; PowerPoint presentation; hands-on training exercises.
6. **Do participants evaluate the training?** Yes.
- 6a. **Type of feedback received:** Very positive feedback and worth the time.
7. **Have you encountered any problems or challenges?** No.
8. **Have you identified gaps in your training program?** No.
9. **Do you use computer-based training?** No.
- 9a. **Which CBT programs?** [No response.]

<u>Training Topic</u>	<u>Rating</u>
Budgeting	5 - Extremely important
Planning	5 - Extremely important
Employee issues (discipline, contract issues, split shifts)	5 - Extremely important
Liability issues	5 - Extremely important
Security issues	4
Selecting and purchasing materials	5 - Extremely important
Selecting and maintaining equipment	5 - Extremely important
Establishing service levels and performance measurement	5 - Extremely important
Stockpile management	5 - Extremely important
Weather and weather forecasting	5 - Extremely important
Road Weather Information Systems	5 - Extremely important

- Post-storm meetings 4
- Sharing facilities with other state agencies 2
- Working with the public 5 - Extremely important

10a. **Are there other topics that are important to include in training?** [No response.]

11. **Details or comments:** [No response.]

**Nebraska**

1. **Do you offer training?** Yes.
2. **Who provides the training?** Internal staff.
- 2a. **Consultant contact information:** [No response.]
3. **How often do you offer training?** Annually.
4. **Is the training required?** Yes.
5. **Training materials used:** Training manual; hands-on training exercises.
6. **Do participants evaluate the training?** Yes.
- 6a. **Type of feedback received:** Revisions every year for a clearer understanding.
7. **Have you encountered any problems or challenges?** Difference in opinion between the operators and the supervisors.
8. **Have you identified gaps in your training program?** Yes.
9. **Do you use computer-based training?** Yes.
- 9a. **Which CBT programs?** Anti-Icing/RWIS Computer-Based Training Program; Nebraska Department of Roads shared training DVDs.

<b><u>Training Topic</u></b>	<b><u>Rating</u></b>
Budgeting	[No response]
Planning	5 - Extremely important
Employee issues (discipline, contract issues, split shifts)	4
Liability issues	3 - Somewhat important
Security issues	3 - Somewhat important
Selecting and purchasing materials	3 - Somewhat important
Selecting and maintaining equipment	4
Establishing service levels and performance measurement	4
Stockpile management	4
Weather and weather forecasting	5 - Extremely important
Road Weather Information Systems	4
Post-storm meetings	5 - Extremely important
Sharing facilities with other state agencies	3 - Somewhat important
Working with the public	4

10a. **Are there other topics that are important to include in training?** Problem resolution; material selection and use; efficiency using equipment, materials and manpower; conflict resolution; emergency management; unified command.

11. **Details or comments:** [No response.]

**New Hampshire**

1. **Do you offer training?** Yes.
2. **Who provides the training?** Internal staff.
- 2a. **Consultant contact information:** [No response.]
3. **How often do you offer training?** Annually. Training is offered annually to those who have not had it previously.
4. **Is the training required?** Yes.
5. **Training materials used:** Training agenda; course objectives; training manual; PowerPoint presentation.
6. **Do participants evaluate the training?** No.
- 6a. **Type of feedback received:** [No response.]
7. **Have you encountered any problems or challenges?** [No response.]
8. **Have you identified gaps in your training program?** [No response.]
9. **Do you use computer-based training?** Yes.
- 9a. **Which CBT programs?** Anti-Icing/RWIS Computer-Based Training Program.

<u>10. Training Topic</u>	<u>Rating</u>
Budgeting	4
Planning	5 - Extremely important
Employee issues (discipline, contract issues, split shifts)	5 - Extremely important
Liability issues	5 - Extremely important
Security issues	4
Selecting and purchasing materials	5 - Extremely important
Selecting and maintaining equipment	5 - Extremely important
Establishing service levels and performance measurement	5 - Extremely important
Stockpile management	5 - Extremely important
Weather and weather forecasting	5 - Extremely important
Road Weather Information Systems	4
Post-storm meetings	3 - Somewhat important
Sharing facilities with other state agencies	3 - Somewhat important
Working with the public	5 - Extremely important

10a. **Are there other topics that are important to include in training?** [No response.]

11. **Details or comments:** In addition to anti-icing/RWIS, we also have a generic winter maintenance operations training that is required of all personnel, including hired equipment operators. We also include the media and state and local police departments.

**New Jersey**

1. **Do you offer training?** Yes.
2. **Who provides the training?** Internal staff.
- 2a. **Consultant contact information:** [No response.]
3. **How often do you offer training?** Annually.
4. **Is the training required?** No; it is asked that everyone involved attend, but those who did not are not denied to work.
5. **Training materials used:** Training manual; one season we did a full course but not every year.
6. **Do participants evaluate the training?** Yes.
- 6a. **Type of feedback received:** We encourage and receive feedback on operational procedures and methods in our manual and make the adjustments as needed.
7. **Have you encountered any problems or challenges?** Changing old methods.
8. **Have you identified gaps in your training program?** Yes, we need more individualized training in some areas.
9. **Do you use computer-based training?** No.
- 9a. **Which CBT programs?** [No response.]

<u>10. Training Topic</u>	<u>Rating</u>
Budgeting	5 - Extremely important
Planning	5 - Extremely important
Employee issues (discipline, contract issues, split shifts)	5 - Extremely important
Liability issues	5 - Extremely important
Security issues	3 - Somewhat important
Selecting and purchasing materials	4
Selecting and maintaining equipment	5 - Extremely important
Establishing service levels and performance measurement	5 - Extremely important
Stockpile management	5 - Extremely important
Weather and weather forecasting	5 - Extremely important
Road Weather Information Systems	5 - Extremely important
Post-storm meetings	5 - Extremely important
Sharing facilities with other state agencies	Not applicable
Working with the public	5 - Extremely important

10a. **Are there other topics that are important to include in training?** Resource sharing and consistency.

11. **Details or comments:** We are moving towards more computer-based training at the crew level.

**New York**

NYSDOT highway maintenance training materials are available online at <https://www.nysdot.gov/programs/trns-maint-train>.

1. **Do you offer training?** Yes.
2. **Who provides the training?** Internal staff.
- 2a. **Consultant contact information:** [No response.]
3. **How often do you offer training?** As needed – regionally.
4. **Is the training required?** The program is offered at management discretion. Generally, all operational supervisors attend.
5. **Training materials used:** Training agenda; course objectives; training manual; critical incident case studies.
6. **Do participants evaluate the training?** Yes.
- 6a. **Type of feedback received:** Positive.
7. **Have you encountered any problems or challenges?** The normal challenges of operational supervision.
8. **Have you identified gaps in your training program?** Timely delivery for a dispersed workforce is an ongoing difficulty.
9. **Do you use computer-based training?** Yes.
- 9a. **Which CBT programs?** Those offered by the NYS-CSEA Labor Management Partnership.
10. **Training Topic** **Rating**

Budgeting	3 - Somewhat important
Planning	4
Employee issues (discipline, contract issues, split shifts)	5 - Extremely important
Liability issues	4
Security issues	4
Selecting and purchasing materials	3 - Somewhat important
Selecting and maintaining equipment	5 - Extremely important
Establishing service levels and performance measurement	5 - Extremely important
Stockpile management	3 - Somewhat important
Weather and weather forecasting	2
Road Weather Information Systems	2
Post-storm meetings	4
Sharing facilities with other state agencies	2
Working with the public	5 - Extremely important
- 10a. **Are there other topics that are important to include in training?** Leadership, coaching.
11. **Details or comments:** [No response.]

**North Dakota**

1. **Do you offer training?** Yes.
2. **Who provides the training?** Collaboration of staff and consultant.
- 2a. **Consultant contact information:** [No response.]
3. **How often do you offer training?** Annually.
4. **Is the training required?** Yes.
5. **Training materials used:** Training agenda; course objectives; online training.
6. **Do participants evaluate the training?** No.
- 6a. **Type of feedback received:** Good, but most would like more training.
7. **Have you encountered any problems or challenges?** Yes, some don't want training. They feel their experience is all that is needed.
8. **Have you identified gaps in your training program?** No.
9. **Do you use computer-based training?** Yes.
- 9a. **Which CBT programs?** Anti-Icing/RWIS Computer-Based Training Program.
10. **Training Topic** **Rating**

Budgeting	4
Planning	5 - Extremely important
Employee issues (discipline, contract issues, split shifts)	4
Liability issues	3 - Somewhat important
Security issues	2
Selecting and purchasing materials	3 - Somewhat important
Selecting and maintaining equipment	4

Establishing service levels and performance measurement	4
Stockpile management	4
Weather and weather forecasting	5 - Extremely important
Road Weather Information Systems	5 - Extremely important
Post-storm meetings	4
Sharing facilities with other state agencies	3 - Somewhat important
Working with the public	4

10a. **Are there other topics that are important to include in training?** General computer training, inventory and records keeping/management.

11. **Details or comments:** [No response.]

### Washington

1. **Do you offer training?** Yes.
2. **Who provides the training?** Collaboration of staff and consultant.
- 2a. **Consultant contact information:** AIT - Wilf & Bob.
3. **How often do you offer training?** Less frequently than annually.
4. **Is the training required?** While not required, we try to ensure that all front-line supervisors are exposed to this training.
5. **Training materials used:** Training agenda; course objectives; training manual; PowerPoint presentation; hands-on training exercises; CBTs in some cases.
6. **Do participants evaluate the training?** Yes.
- 6a. **Type of feedback received:** Feedback on consultant training is mostly positive. Attendees rate the presentation and materials highly. There are occasional remarks that the content is more technical than absolutely necessary.
7. **Have you encountered any problems or challenges?** Rotating all front-line supervisors through the training can be challenging, since leave, turnover and/or transfers sometimes remove them from scheduled events.
8. **Have you identified gaps in your training program?** Training remains inconsistent from one year to the next in terms of attendance and content. Also, there appears to be a need to return to basics in many areas since there are disparities in treatment techniques and application rates.
9. **Do you use computer-based training?** Yes.
- 9a. **Which CBT programs?** Anti-Icing/RWIS Computer-Based Training Program.

<u>Training Topic</u>	<u>Rating</u>
Budgeting	5 - Extremely important
Planning	5 - Extremely important
Employee issues (discipline, contract issues, split shifts)	4
Liability issues	5 - Extremely important
Security issues	4
Selecting and purchasing materials	5 - Extremely important
Selecting and maintaining equipment	4
Establishing service levels and performance measurement	4
Stockpile management	4
Weather and weather forecasting	5 - Extremely important
Road Weather Information Systems	4
Post-storm meetings	5 - Extremely important
Sharing facilities with other state agencies	3 - Somewhat important
Working with the public	4

10a. **Are there other topics that are important to include in training?** Safety (was this a test?); calibration of equipment; material storage and testing; communications - radio, cell phone, email; data collection and reporting; internal resource sharing and resource management; accident reporting and documentation; wing plow operation.

11. **Details or comments:** We have had limited success distributing the CBTs for training purposes due to time constraints and incomplete buy-in from Maintenance Trainers.

### Wyoming

1. **Do you offer training?** Yes.
2. **Who provides the training?** Internal staff.
- 2a. **Consultant contact information:** [No response.]

3. **How often do you offer training?** Less frequently than annually.
4. **Is the training required?** No.
5. **Training materials used:** PowerPoint presentation; hands-on training exercises.
6. **Do participants evaluate the training?** No.
- 6a. **Type of feedback received:** [No response.]
7. **Have you encountered any problems or challenges?** Our training is actually very informal. Challenges are getting folks to believe in additional tools we are currently trying in our agency.
8. **Have you identified gaps in your training program?** We need to formalize it more.
9. **Do you use computer-based training?** Yes.
- 9a. **Which CBT programs?** Anti-Icing/RWIS Computer-Based Training Program; Clear Roads CBT Training Series.
10. 

<u>Training Topic</u>	<u>Rating</u>
Budgeting	5 - Extremely important
Planning	5 - Extremely important
Employee issues (discipline, contract issues, split shifts)	5 - Extremely important
Liability issues	5 - Extremely important
Security issues	4
Selecting and purchasing materials	4
Selecting and maintaining equipment	4
Establishing service levels and performance measurement	4
Stockpile management	5 - Extremely important
Weather and weather forecasting	4
Road Weather Information Systems	4
Post-storm meetings	3 - Somewhat important
Sharing facilities with other state agencies	3 - Somewhat important
Working with the public	5 - Extremely important
- 10a. **Are there other topics that are important to include in training?** Leadership and mentoring employees.
11. **Details or comments:** [No response.]

**Anonymous (no organization provided)**

1. **Do you offer training?** [No response.]
2. **Who provides the training?** Internal staff. We'll also use local NWS personnel to help train on winter storms.
- 2a. **Consultant contact information:** [No response.]
3. **How often do you offer training?** Annually.
4. **Is the training required?** No.
5. **Training materials used:** Training agenda; PowerPoint presentation; hands-on training exercises.
6. **Do participants evaluate the training?** Yes.
- 6a. **Type of feedback received:** Typically it is very well received.
7. **Have you encountered any problems or challenges?** Yes. The training we offer is actually more of a combination for supervisors and crew. We need something much more in-depth and consistent for all of the supervisors, much like the CBT.
8. **Have you identified gaps in your training program?** See comments in Q7.
9. **Do you use computer-based training?** No.
- 9a. **Which CBT programs?** Anti-Icing/RWIS Computer-Based Training Program. We have looked at this training and like it. We have even distributed copies for people to use, but it needs to be formalized and I would like to find a way to get it on our network.
10. 

<u>Training Topic</u>	<u>Rating</u>
Budgeting	5 - Extremely important
Planning	5 - Extremely important
Employee issues (discipline, contract issues, split shifts)	5 - Extremely important
Liability issues	4
Security issues	3 - Somewhat important
Selecting and purchasing materials	3 - Somewhat important
Selecting and maintaining equipment	4
Establishing service levels and performance measurement	3 - Somewhat important
Stockpile management	4
Weather and weather forecasting	5 - Extremely important
Road Weather Information Systems	3 - Somewhat important

Post-storm meetings	5 - Extremely important
Sharing facilities with other state agencies	3 - Somewhat important
Working with the public	5 - Extremely important

10a. **Are there other topics that are important to include in training?** General equipment operation and oversight (to assure safety and proper actions of those they supervise). Shared experiences (case studies) with other supervisors.

11. **Details or comments:** Supervisor training is an area we definitely need to improve.

**Appendix A:  
Illinois DOT Supervisor Training Agenda**

**WORKSHOP SCHEDULE**

**Monday**

**1:00 p.m.**

◆ **Introductions**

◆ **Team Building**

Objectives

1. To understand work team behavior.
2. To practice work team problem solving skills.
3. To identify and adopt ways to be more effective in team problem solving skills.

◆ **Coming Together**

Objectives

1. To identify common traits in team members.

**5:00 p.m.      Adjourn**

## WORKSHOP SCHEDULE

Tuesday

**8:00 a.m.**

◆ **Effective Personnel Practices**

Objectives

1. Understand IDOT winter operations policies and procedures.
2. Understand IDOT winter operations primary policies and procedures.
3. Understand winter operations roles of supervisors.

**12:00 p.m. Lunch**

**1:00 p.m.**

◆ **Diversity**

Objectives

◆ **Weather Forecasting**

Objectives

1. To understand the importance of weather forecasting for winter operations.
2. To identify the sources of weather data.
3. To practice using weather data to form winter storm strategies.

◆ **Communications**

Objectives

1. To identify methods to improve communications during winter storm operations.
2. To understand how communication relates to effective leadership.

**5:00 p.m. Adjourn**

## WORKSHOP SCHEDULE

Wednesday

8:00 a.m.

### ◆ Training Subordinates

#### Objectives

1. To identify proper methods of training subordinates.
2. To identify resources to assist in training subordinates.

### ◆ Safety

#### Objectives

11:30 a.m.    **Lunch**

12:30 p.m.

### ◆ Dickey-john

#### Objectives

1. To know and understand the following functions of Dickey-john Spreader Control Systems.
  - ✓    Operation
  - ✓    Programming
  - ✓    Calibration
  - ✓    Trouble-shooting

5:00 p.m.    **Adjourn**

## WORKSHOP SCHEDULE

Thursday

8:00 a.m.

### ◆ Storm Management

#### Objectives

1. To know and understand the different types of winter chemicals and how to use them.
2. To be more efficient in winter operations.
3. To learn proper methods of plowing and treating procedures.
4. To form a more active storm management plan.

12:00 p.m.    **Lunch**

1:00 p.m.

### ◆ Equipment

#### Objectives

1. To identify specific winter equipment needs.
2. To evaluate current winter operations equipment.

### ◆ Team Building Part II

#### Objectives

1. To understand work team behavior.
2. To practice work team problem solving skills.
3. To identify and adopt ways to be more effective in team problem solving skills.

5:00 p.m.    **Adjourn**

## WORKSHOP SCHEDULE

Friday

**8:00 a.m.**

◆ **New Concepts**

Objectives

1. To provide knowledge of new concepts in winter operations.

**10:00 a.m.**

◆ **Making Winter Operations More Effective**

Objectives

1. To discuss issues and concerns with the Engineer of Operations and statewide Operations Engineers/Managers.
2. To identify ways to be more effective in winter storm operations.

**12:00 p.m.    Adjourn and Lunch**