



Snowplow Driver Training Programs: A Survey of State Practice

Prepared for
Bureau of Highway Operations

Prepared by
CTC & Associates LLC
WisDOT Research & Library Unit
July 7, 2011

Transportation Synthesis Reports are brief summaries of currently available information on topics of interest to WisDOT staff throughout the department. Online and print sources for TSRs include NCHRP and other TRB programs, AASHTO, the research and practices of other transportation agencies, and related academic and industry research. Internet hyperlinks in TSRs are active at the time of publication, but changes on the host server can make them obsolete. To request a TSR, e-mail research@dot.wi.gov or call (608) 267-6977.

Request for Report

WisDOT's Bureau of Highway Operations is interested in learning from the experience of agencies that offer training programs for snowplow drivers. Through identifying best practices and gathering training materials used in snowplow driver training programs across the country, WisDOT hopes to provide local Wisconsin agencies and others in the winter maintenance community with a resource for developing or enhancing their own snowplow driver training programs.

Summary

To gather this information, we distributed a brief survey to members of the Snow and Ice Listserv for completion by appropriate staff at their agencies. The survey consisted of the following questions:

1. How often do you offer snowplow driver training?
2. What formats are used for the training? For example, do you use the following?
 - Classroom training
 - Hands-on training
 - Simulator training
 - Computer-based training
3. Please describe any challenges you have encountered in delivering snowplow driver training.
4. What has worked particularly well in your snowplow driver training program?
5. Please provide us with the name, e-mail address and phone number of the appropriate contact person in your agency for follow-up questions.

We also asked survey respondents to provide electronic copies of their curriculum with course descriptions, training outlines, presentations, handbooks or other materials associated with their snowplow driver training programs.

We received 31 responses to the survey. Respondents included 21 states (one state submitted three responses), one Canadian province, three counties (one county submitted two responses), one city and two private companies.

- Alberta, Canada
- Colorado
- Illinois
- Indiana
- Iowa
- Kansas
- Kentucky
- Maine
- Maryland
- Massachusetts
- Michigan
- Michigan (Kent County Road Commission)
- Minnesota (3)
- Missouri
- Nebraska
- Nebraska (City of Omaha)
- New Brunswick, Canada (MRDC Operations Corporation)
- New Hampshire
- New York
- North Dakota
- Ohio
- Pennsylvania
- Utah (Redmond Minerals Inc.)
- Virginia
- Washington
- West Virginia
- Wisconsin (Iowa County) (2)
- Wisconsin (Kewaunee County)

See **Survey Results** beginning on page 4 of this report for the full text of survey responses. An inventory of documentation provided by survey respondents is included in Appendix A.

Below we summarize findings from the survey in four topic areas:

- Training frequency and duration
- Training format
- Challenges in delivering training
- Success stories

Training Frequency and Duration

- All of the agencies responding to the survey provide annual training for new operators.
- Half of the agencies also provide annual training for experienced operators, while others require less frequent training for veteran snowplow drivers.
 - Maryland State Highway Administration’s experienced operators must retake a two-day Roadway Winter Operations training class every five years.
 - Missouri DOT’s annual snow academy assesses the skills of operators with five years of experience or less.
 - New Hampshire DOT has instituted a three-year training cycle for veteran operators.
 - Pennsylvania DOT requires remedial training for its operators once every four years.
- Agencies report differing class lengths for new and experienced operators.
 - Class length ranges from the annual two-hour sessions provided for Kentucky Transportation Cabinet snowplow drivers to the weeklong programs conducted by Colorado, Iowa and Michigan DOTs.
 - For Indiana DOT, the amount of training varies by district and experience level of the trainees.
 - The two-week training programs offered by Minnesota and Ohio DOTs are the longest single-session training commitments made by respondents.

Training Format

- All but two respondents—Alberta, Canada, and Kewaunee County, Wisconsin—report the use of classroom training.
- Hands-on training is also commonly used by respondents. One of the two respondents not using hands-on training—Nebraska Department of Roads—uses a simulator to complement classroom instruction.
- Some agencies rely heavily on hands-on training.
 - For Iowa DOT, hands-on training is the most popular training format and constitutes 60 percent to 70 percent of operator training. Iowa DOT notes that statistics show the retention rate for classroom-only instruction is 25 percent; combining classroom instruction with hands-on training raises retention rates to 50 percent to 60 percent.
 - Most of Kansas DOT’s training is hands-on.
 - Equipment or snow rodeos, which use obstacle courses to test operator proficiency with snowfighting equipment, are used in Colorado and Kentucky.
- Five states—Iowa, Maryland, Minnesota, Nebraska and West Virginia—report regular use of a simulator.
 - Maryland and West Virginia use a simulator for training on material spreader controls.
 - Five percent to 10 percent of Iowa DOT’s training is done in a driving simulator.
 - Minnesota provides statewide simulator training with two mobile simulators that are used in combination with computer-based training. Nebraska couples simulator training with classroom instruction.
- Half of the respondents also use computer-based training.
 - The agencies noting a specific program report use of AASHTO’s Anti-Icing/RWIS Computer-Based Training Program.
 - Some agencies making limited use of CBT cite the lack of computer access and problems with connectivity.
 - CBT sets a standard level of skill and knowledge in a format that is readily understandable to new operators in Alberta, Canada.
 - Iowa DOT notes that CBT programs work well to deliver training to supervisors.

Challenges in Delivering Training

- Respondents most often cite the demands on time, staff and equipment when asked about challenges in delivering training.
- Other common concerns include:
 - Keeping the training sessions fresh and continuing to engage veteran operators.
 - Timing the training to meet the needs of new hires and seasonal drivers.
 - Ensuring training is completed before the winter season begins.
 - Making sure operators get enough hands-on training and time spent on ride-alongs with an experienced driver.
 - Managing the logistics of bringing together the necessary equipment, materials and staff.

Success Stories

Successful snowplow driver training programs come in all shapes and sizes. The following highlights a few of the successful practices reported by respondents:

- For Illinois, Iowa, Missouri and West Virginia DOTs, employing credible trainers is important, particularly those with field experience.

- Consistency is established by Indiana DOT with teams providing districtwide training; the uniformity of Ohio DOT’s training materials ensures a consistent message.
- The benefits of mixing experienced operators with new hires are noted by Maine, Pennsylvania and West Virginia DOTs, and Iowa and Kewaunee counties in Wisconsin.
- Training at field locations is offered as a just-in-time solution for preparing new Iowa DOT operators.
- Some agencies cite cost savings or accident reduction.
 - Massachusetts DOT has reduced salt use by more than 30 percent and equipment costs by 15 percent while not changing its levels of service.
 - Pennsylvania DOT notes that providing front-line operators with an understanding of the benefits of smart salting and the effectiveness of proper treatment has translated to cost savings.
 - New York State DOT’s training has improved preventive maintenance and reduced preventable vehicle accidents.
- Mn/DOT offers training to cities and counties at a per-seat cost, which helps fund the trainer positions.

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.

Alberta, Canada

Contact: Steve Otto, Director, Highway Operations Section, Technical Standards Branch, Alberta Transportation, steve.otto@gov.ab.ca.

1. **Frequency of training:** Full course done for new hires; annual refresher as part of preparation for winter.

2. **Training formats:**

| | |
|-------------------------|------|
| Classroom training | No. |
| Hands-on training | Yes. |
| Simulator training | No. |
| Computer-based training | Yes. |

Computer-based training initially followed by hands-on training in the shop.

3. **Describe challenges:** Our main challenge is to confirm the practical skills. We ask that new operators have a ride-along supervisor for the first few days of work, then more days when the foreman or lead hand follows in a separate vehicle. But while everyone agrees that this sounds like a good idea, it often doesn’t happen for as long as it should, just because no one has a large enough staff to keep two employees (the new and experienced operators) in training for very long.

4. **Describe successes:** The computer-based training has set a standard level of skill and knowledge in a format that new operators can understand and remember.

5. **Staff contact information:** Steve Otto, Director, Highway Operations Section, Technical Standards Branch, Alberta Transportation, steve.otto@gov.ab.ca.

Additional information: In Alberta, all of our maintenance services on the provincial highway network are provided by contractors working for the government, so we aren’t actually involved directly with training operators. However, we do have a good partnership with the maintenance industry and have jointly developed a snowplow operator training program. To get information from the people who actually deliver the training, you may want to contact Mr. Art Riendeau at the Alberta Construction Safety Association (1-800-661-2272 or ariendeau@acsa-safety.org); see <http://www.acsa-safety.org/default.aspx>.

Documentation: [None provided.]

Colorado

Contact: Phillip Anderle, Highway Maintenance Supervisor—Region 4, Colorado Department of Transportation, (970) 350-2100, phillip.anderle@dot.state.co.us.

1. **Frequency of training:** All new employees go through 40 hours of snow removal operators’ training that consists of eight hours of classroom, a minimum of 16 hours of hands-on with an instructor showing the student, and then a minimum of 16 hours where the student demonstrates the learned skills to the instructor. We do the eight-hour classroom portion of this training every month from September through April. Each new employee also has 2.5 hours of classroom at the two weeks of training at our Maintenance Training Academy. Our SOG [standard operating guideline] requires each operator receive eight hours of refresher training annually.
2. **Training formats:**

| | |
|-------------------------|--|
| Classroom training | Yes, in the classroom portion of our 40-hour program we do eight hours and at the MTA we do 2.5 hours of classroom. Annual refresher training may or may not include classroom but generally does include at least some. |
| Hands-on training | Yes, our 40-hour program has at least 16 hours of hands-on, and often we have some hands-on for our annual refresher training. |
| Simulator training | We have used a simulator in the past, but it is not part of our standard training yet. |
| Computer-based training | The AASHTO CBT is available for all employees. |

We also do an annual Snow Roadeo and training session that last the better part of a day that includes some classroom, a written test, vehicle inspection, a driving obstacle course and some training videos.
3. **Describe challenges:** Our 40-hour program and the training at the MTA have worked very well.
4. **Describe successes:** Our 40-hour program has shown excellent results.
5. **Staff contact information:** Phillip Anderle, Highway Maintenance Supervisor—Region 4, Colorado Department of Transportation, (970) 350-2100, phillip.anderle@dot.state.co.us.

Additional information: [None provided.]

Documentation: See Appendix A.

Illinois

Contact: Tim Peters, Winter Operations Engineer, Illinois Department of Transportation, (217) 836-5600, tim.peters@illinois.gov.

1. **Frequency of training:** We provide annual training for our snowplow drivers and staff, typically in the fall of each year, as well as ongoing training related to changes throughout the season.
2. **Training formats:**

| | |
|-------------------------|---|
| Classroom training | We primarily use classroom training. |
| Hands-on training | New hires usually drive the route they will be assigned to at least once with an experienced operator. |
| Simulator training | We tried simulator training two years ago. We do not own a simulator and we do not have [the] budget to obtain one. |
| Computer-based training | We are investigating, but our network resources (connection speed) are limited in many field locations. |
3. **Describe challenges:** The wide range of skills and interest levels of drivers in our workforce is a challenge. Some are up-to-date and interested in new technology, others are not.
4. **Describe successes:** Having people the drivers see as credible involved in the training is important. If the people involved in training have field experience, they seem to be more easily accepted.

5. **Staff contact information:** Tim Peters, Winter Operations Engineer, Illinois Department of Transportation, (217) 836-5600, tim.peters@illinois.gov.

Additional information: [None provided.]

Documentation: [None provided.]

Indiana

Contact: Dennis Belter, Maintenance Administration Manager, Indiana Department of Transportation, (317) 232-5424, dbelter@indot.in.gov.

1. **Frequency of training:** Each district plans and conducts training for drivers prior to the winter season or delegates training to subdistricts. The amount of training will vary by district and experience of the driver.
2. **Training formats:**

| | |
|-------------------------|-------|
| Classroom training | Yes. |
| Hands-on training | Yes. |
| Simulator training | No. |
| Computer-based training | Some. |
3. **Describe challenges:** Keeping veteran drivers interested is difficult. Most areas try to address with separate training for new drivers. Secondly, with declining manpower, time is a major factor.
4. **Describe successes:** Some districts have established a team to provide consistency districtwide. One district brought all drivers in to one location and drivers rotated to each “station” for more detailed training.
5. **Staff contact information:** Snow and ice position is currently advertised. You can contact me in the interim.

Additional information: [None provided.]

Documentation: See Appendix A.

Iowa

Contact: Jim Dowd, Winter Operations Research Analyst, Iowa Department of Transportation, (515) 239-1724, jim.dowd@dot.iowa.gov.

1. **Frequency of training:** We offer snowplow driver training on a yearly basis. We have a six-part video series we have used for several years. We have a training academy series that incorporates video, instructor-led and hands-on training. The hands-on training has been the most popular, and we try to provide as much hands-on as possible.

If you want to waste time and money, put a bunch of snowplow operators in a room and show them PowerPoints all day!!! Statistics show that they only retain 25 percent of what they are told. Combine classroom and hands-on training and the retention rate goes up to 50 percent to 60 percent. We have noticed a big difference in our surveys from our training academies that if you get them involved they really like it and learn a lot more.

2. **Training formats:**

| | |
|--------------------|--|
| Classroom training | About 25 percent of our training is classroom. There is just some information they cannot get any other way. |
| Hands-on training | About 60 percent to 70 percent of our training is hands-on, led by experienced operators; they make the best instructors because they are credible and the students know they have been through this stuff before!!! Instructors in suits and ties will kill a training program. |
| Simulator training | Five percent to 10 percent of our training is done in a driving simulator. We have had one for five years and find it a good addition to our training academy. |

Computer-based training

Five percent to 10 percent of our training is computer-based. This type of training works well for supervisors and some operators, but most of our operators do not have direct computer access. This is better than PowerPoint but still not as good as hands-on, real-world driving with an experienced instructor.

- 3. **Describe challenges:** We have done a weeklong training here in Ames for the past several years for our new operators and other training at the field locations throughout the year. Our operators do not like to be away from home for long periods, and living out of a motel room for a week are not ideal conditions because they have to pay for their expenses and then wait to get reimbursed two weeks later. We have also struggled with our hiring process in that we don't get the OK to hire until mid-August. With our hiring process taking so long we are lucky to get people hired by the October/November time frame, too late to train them before they get into winter plowing activities. Timing of new hires has always been a problem.
- 4. **Describe successes:** We have recently developed a new operator training that can be given at the field locations and that seems to be a better way of providing "just-in-time" training to our new employees. We have hired approximately 50 to 75 new operators since an early retirement was offered last June, and the training has gone well for them.
- 5. **Staff contact information:** Jim Dowd, Winter Operations Research Analyst, Iowa Department of Transportation, (515) 239-1724, jim.dowd@dot.iowa.gov.

Additional information: [None provided.]

Documentation: See Appendix A.

Kansas

Contact: Troy Whitworth, Bureau of Construction and Maintenance, Kansas Department of Transportation, (785) 296-7140, troy@ksdot.org.

- 1. **Frequency of training:** Each district, area or sub area is supposed to do some sort of snowplow driver training at least once for an employee.
- 2. **Training formats:**

Classroom training

Some locations do classroom training. They will discuss techniques of snow and ice operations: plowing, spreading, chemical applications, loader operations and other winter weather-specific tasks.

Hands-on training

The typical training involves mostly hands-on training. They will go over the equipment that will be used by the operator and the routes they will service. Typically, the operator will drive the route they will be on prior to winter weather with an experienced operator. That person will discuss route hazards and give tips on what to watch for.

Simulator training

One of our districts had a simulator training vehicle come out a couple of years ago. It was a mobile vehicle that allowed a realistic plowing experience for the operators. Since that time I don't believe anyone in Kansas has bought time for a simulator to come out.

Computer-based training

We use the AI RWIS CBT [Anti-Icing/Road Weather Information System Computer-Based Training; see **Documentation** below] in our training. We have an employee progression program that mandates anyone going through this program to take and pass this course.

- 3. **Describe challenges:** When passing snowplow training down to the lowest levels it sometimes becomes less of a priority. I also believe that our supervisors are somewhat unsure of how to approach the training. They may or may not buy in to the new techniques and processes that don't follow the old school ways.
- 4. **Describe successes:** The new people are very eager to listen and learn. In the places where we use the classroom training we are able to give a consistent message.

5. **Staff contact information:** Troy Whitworth, Bureau of Construction and Maintenance, Kansas Department of Transportation, (785) 296-7140, troy@ksdot.org.

Additional information: This exact topic is something we are exploring ourselves. We are wanting to see what can be done to improve the way we train plow operators.

Documentation: [None provided.]

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.

Kentucky

Contact: Michael Williams, Department of Highways, Kentucky Transportation Cabinet, (502) 564-4556, michael.williams@ky.gov.

1. **Frequency of training:** Every operator, [including] state forces and contracted drivers, is required to attend a training session each year around late October/early November. Each session lasts for about two hours.

2. **Training formats:**

| | |
|-------------------------|--|
| Classroom training | Yes, all sessions involve a classroom-type setting. In addition to the classes that we provide, the Kentucky Transportation Center, through the University of Kentucky, offers a voluntary daylong snow and ice class for operators as part of a career advancement course. |
| Hands-on training | Yes, in conjunction with our trainings for state operators, we conduct an Equipment Roadeo where obstacle courses are set up for snowplows as an operator refresher course. |
| Simulator training | Yes, one district has provided simulator trainings on two occasions through MPRI [http://www.mpri.com/driver/]. The simulator was made available to about 40 operators each time, and we tried to focus on first-time drivers and drivers who had been involved in accidents. This option was beneficial to our insurance company. |
| Computer-based training | None yet. |

3. **Describe challenges:** As always, the most aggravating part of an annual training is trying to come up with a little variety of format. The veteran operators get a little discontented having to sit through the same ol' training course every season.
4. **Describe successes:** The simulator sessions were (surprisingly) pretty popular with the drivers, and the Equipment Roadeo is always a success. In addition, on a few occasions we have invited a meteorologist with our local National Weather Service as a guest speaker on the training program. He or she discusses difficulties involved in forecasting winter weather, historical weather events for our areas and provides an informal winter outlook. This could also work with local news station meteorologists.
5. **Staff contact information:** Michael Williams, Department of Highways, Kentucky Transportation Cabinet, (502) 564-4556, michael.williams@ky.gov.

Additional information: [None provided.]

Documentation: See Appendix A.

Maine

Contact: Brian T. Burne, Highway Maintenance Engineer, Maine Department of Transportation, (207) 624-3571, brian.burne@maine.gov.

1. **Frequency of training:** Three times annually; 60 people per session.
2. **Training formats:**

| | |
|-------------------------|------|
| Classroom training | Yes. |
| Hands-on training | Yes. |
| Simulator training | No. |
| Computer-based training | No. |
3. **Describe challenges:** Requires a lot of instructors, two days of training and thousands of dollars in travel, overnight and meals, but we feel it's worth it.
4. **Describe successes:** The variety of the sessions and mixing experienced with new employees.
5. **Staff contact information:** Brian T. Burne, Highway Maintenance Engineer, Maine Department of Transportation, (207) 624-3571, brian.burne@maine.gov.

Additional information: [None provided.]

Documentation: See Appendix A.

Maryland

Contact: Richard Shelton, Office of Maintenance, Maryland State Highway Administration, (410) 582-5555, rshelton@sha.state.md.us.

1. **Frequency of training:** Formal plow operator training is made available to our highway maintenance employees through:
 - Initial dump truck training and certification testing. Employees must take this training and pass the certification test within their probation period. Plowing operations training is included in this certification.
 - Roadway Winter Operations two-day training class (one-day classroom/one-day field operations). Required for all new hires and must retake every five years. Typically, seven classes are conducted each year.
 - AASHTO Winter Roadway Maintenance computer-based training modules are utilized online through our agency's shared drive.
 - New hires ride "shotgun" with seasoned operators and receive on-the-job plowing training.
 - An abbreviated Roadway Winter Operations presentation is given to our contractor/hired equipment operators annually as part of each of our 28 maintenance facilities' prewinter contractor meetings.
2. **Training formats:**

| | |
|-------------------------|-------------------------------|
| Classroom training | Yes. |
| Hands-on training | Yes. |
| Simulator training | Yes (salt spreader controls). |
| Computer-based training | Yes. |
3. **Describe challenges:**
 - Not having the time/equipment/human resources to conduct more classes.
 - Some classes are large, causing hands-on equipment operation to be limited.
 - Logistics; having to take time to move and set up training materials at various districts.

4. **Describe successes:**
 - Our in-house training materials along with the AASHTO Winter Roadway Maintenance computer-based training modules.
 - Dickey John simulators for simulated hands-on granular and liquid application.
5. **Staff contact information:** Richard Shelton, Office of Maintenance, Maryland State Highway Administration, (410) 582-5555, rshelton@sha.state.md.us.

Additional information: [None provided.]

Documentation: See Appendix A.

Massachusetts

Contact: Paul G. Brown, Director of Snow and Ice Operations, Massachusetts Department of Transportation, (617) 973-7792, paul.brown@state.ma.us.

1. **Frequency of training:** We train all of our personnel every year. We are privatized so we have to do a little bit different focus.
2. **Training formats:**

| | |
|-------------------------|---|
| Classroom training | Yes. We currently do more classroom training. |
| Hands-on training | Yes. We do a few sessions of hands-on (calibration, correct equipment inspections, etc.). |
| Simulator training | Massachusetts does not have a simulator but may take advantage of a nearby state's. |
| Computer-based training | Yes. I incorporate the CBT by Clear Roads and AASHTO. |
3. **Describe challenges:** The biggest challenge is to keep our personnel on the same page; they are underappreciated and sometimes they tune out. I constantly need to challenge them to get better at operations, material application and overall snow and ice procedures.
4. **Describe successes:** Being transparent, letting them know the direction, the purpose of the training. Stressing the need to strive to better themselves as well as making our operations more effective. It has worked well. We have reduced salt use by more than 30 percent, reduced equipment by 15 percent, and overall haven't changed levels of service.
5. **Staff contact information:** Paul G. Brown, Director of Snow and Ice Operations, Massachusetts Department of Transportation, (617) 973-7792, paul.brown@state.ma.us.

Additional information: [None provided.]

Documentation: [None provided.]

Michigan

Contact: Tim Croze, Pavement Maintenance Engineer, Michigan Department of Transportation, (517) 322-3394, crozet@michigan.gov.

1. **Frequency of training:** We have snowplow driver training annually in fall for new maintenance workers. We also offer training to all garage staff as well as our contract agencies in fall on topics that we feel need to be addressed.
2. **Training formats:**

| | |
|-------------------------|------|
| Classroom training | Yes. |
| Hands-on training | Yes. |
| Simulator training | No. |
| Computer-based training | No. |

3. **Describe challenges:** Finding the resources (trucks and trainers) for our weeklong hands-on training for new employees.
4. **Describe successes:** We have an old maintenance garage that we use for a training facility. We have a classroom set up in the garage and plenty of space outside for our hands-on training program.
5. **Staff contact information:** Tim Croze, Pavement Maintenance Engineer, Michigan Department of Transportation, (517) 322-3394, crozet@michigan.gov.

Additional information: [None provided.]

Documentation: See Appendix A.

Michigan (Kent County Road Commission)

Contact: Tom Byle, Assistant Director of Engineering, Kent County Road Commission (616) 242-6901, ext. 6981, tbyle@kentcountyroads.net.

1. **Frequency of training:** We haven't had a class in some time; no new hires for at least five years.
2. **Training formats:**

| | |
|-------------------------|-------------------|
| Classroom training | Yes. |
| Hands-on training | Yes (supervised). |
| Simulator training | No. |
| Computer-based training | No. |
3. **Describe challenges:** [No response.]
4. **Describe successes:** We feel it's been very successful.
5. **Staff contact information:** Tom Byle, Assistant Director of Engineering, Kent County Road Commission, (616) 242-6901, ext. 6981, tbyle@kentcountyroads.net.

Additional information: We developed our own in-house training program back in 1990 because I was uncomfortable putting new drivers on the road with only a couple hours of supervised driving. We modeled it after MDOT's in-house training program. We started with a week but condensed it to three days.

Documentation: [None provided.]

Minnesota

Contact: Rick Shomion, Maintenance Operations Training Coordinator, Minnesota Department of Transportation, (651) 366-3576, rick.shomion@state.mn.us.

1. **Frequency of training:** We offer annual training, Snow Plow Operator Training (SPOT), for our new snowplow operators each fall. Trainees from around the state attend two weeks of training at a central facility (Camp Ripley). In addition, we have identified eight different areas that necessitate annual refresher training. This training takes place in each of the districts.
2. **Training formats:**

| | |
|-------------------------|------|
| Classroom training | Yes. |
| Hands-on training | Yes. |
| Simulator training | Yes. |
| Computer-based training | Yes. |

The format we use for SPOT is a combination of classroom and hands-on. We also have two mobile simulators that are used in combination with computer-based training. This training takes place around the state.
3. **Describe challenges:** Some of the challenges we have encountered include the following:
 - Buy-in from all the districts regarding SPOT and the simulator training.

- Funding for the simulator trainers. We are training cities and counties and charging them a fee to help fund the trainer positions, but we do not have any dedicated funding for the positions.
4. **Describe successes:** Our training format for SPOT seems to work extremely well. We have been conducting this training for seven years now. Annually, we get trainees from cities, counties and other state DOTs.
 5. **Staff contact information:** Rick Shomion, Maintenance Operations Training Coordinator, Minnesota Department of Transportation, (651) 366-3576, rick.shomion@state.mn.us.

Additional information: [None provided.]

Documentation: See Appendix A.

Minnesota

Contact: Andrew Kubista, Simulator Training Program Manager, Office of Maintenance, Minnesota Department of Transportation, (651) 366-3560, andrew.kubista@state.mn.us.

1. **Frequency of training:**

- Initial vehicle and handling training is given once a year to new employees and consists of a two-week training period at Camp Ripley National Guard training area. Training involves instructor-led classroom with written testing, instructor ride-along and evaluation, vehicle inspection training and evaluation.
- Additional annual training is provided in-house as needed, along with statewide simulator training.
- All training is available for Mn/DOT operators along with numerous city and county employees at a per-seat cost.

2. **Training formats:**

| | |
|-------------------------|------|
| Classroom training | Yes. |
| Hands-on training | Yes. |
| Simulator training | Yes. |
| Computer-based training | Yes. |

3. **Describe challenges:**

- Snow and ice events during winter season.
- Extreme weather and emergency events during any season.
- Vacation and holidays.
- SAS (Simulator Adaptive Syndrome, or cybersickness) for a minute number of operators.
- Confrontational individuals.

4. **Describe successes:** See 1 and 2 above.

5. **Staff contact information:** Rick Shomion, (651) 366-3576; rick.shomion@state.mn.us; Brian Barott, (651) 366-5247, brian.barott@state.mn.us; Andrew Kubista, (651) 366-3560, andrew.kubista@state.mn.us.

Additional information: [None provided.]

Documentation: [None provided.]

Minnesota

Contact: Tina M. Warwick, Human Resources, Minnesota Department of Transportation, (320) 223-6509, tina.warwick@state.mn.us.

1. **Frequency of training:** We hold prewinter refresher training as well as new snowplow operator training.
2. **Training formats:** We use a variety of resources when planning and preparing training.

| | |
|-------------------------|---|
| Classroom training | We have a PowerPoint, snow and ice plan, and various other handouts we use and modify each year. |
| Hands-on training | We have all our new drivers practice plowing and winging at a local driving safety center. |
| Simulator training | Our department has a simulator and we have a training plan and requirements with regard to simulator training. We assess backing, speed management and other maneuvers through this prescribed curriculum. This is a statewide training effort. |
| Computer-based training | We have access to this but use it as a filler. |
3. **Describe challenges:** The biggest challenge is the time involved and scheduling when everyone is able to drive and participate in class. Also the time it takes to get it all done prior to snow and ice season. It's a staffing strategy that involves many people to be on board with the program. Another challenge is to ensure that the training continues on an informal basis and supervisors drive along with the new snowplow driver to ensure they are following the methods learned in class and other decision-making tools in the truck.
4. **Describe successes:** The fact that we do not allow the new drivers to do any on-the-job training until they have satisfied all formal training requirements. We also require new drivers to ride along in a snowplow and get acquainted with the routes in the area. Once they have accomplished that, they begin driving with a senior driver mentoring and coaching.
5. **Staff contact information:** Tina M. Warwick, Human Resources, Minnesota Department of Transportation, (320) 223-6509, tina.warwick@state.mn.us.

Additional information: [None provided.]

Documentation: [None provided.]

Missouri

Contact: Aaron Cox, Employee Development Specialist, Human Resources—Employee Development, Missouri Department of Transportation, (573) 526-5633, james.cox@modot.mo.gov.

1. **Frequency of training:** Training is provided on an as-needed basis typically starting in the fall. Participants range from full-time employees to seasonal or emergency employees that may only plow snow for the department. In 2010 we held 97 classes statewide with 942 participants completing the training. (Most of the participants are emergency employees.)
2. **Training formats:**

| | |
|-------------------------|--|
| Classroom training | <ul style="list-style-type: none">• Five hours basic snow and ice removal.• Two hours ground-speed spreader systems (GL400 and ACS systems).• One hour tire chains. |
| Hands-on training | <ul style="list-style-type: none">• Four hours basic snow and ice removal.• Two hours ground-speed spreader systems (GL400 and ACS systems).• Two hours tire chain installation. |
| Simulator training | [No response.] |
| Computer-based training | [No response.] |

| | |
|--|--|
| On-the-job-training | <ul style="list-style-type: none"> • Four hours new employee rides with the trainer and observes proper operating techniques. • Four hours trainer rides with new employee and evaluates the operator's performance. |
| Additional training covering tow plows | <p>Mandatory for tow plow operators.</p> <ul style="list-style-type: none"> • Four hours classroom. • Four hours closed obstacle driving course. • Four hours check ride with experienced operator. |

Training includes an annual (snow academy) assessment of employees with five years or less experience plowing snow and nonmaintenance employees who plow snow. The following activities are required and districts may include additional activities based on areas of concern:

- Snow academy assessment.
- Pretrip inspection—truck.
- Pretrip inspection—loader.
- ACS ground-speed spreader system operation and calibration.
- Snowplow truck obstacle course.
- Loader obstacle course.
- Twenty-five question exam.

One additional elective activity may be chosen by the district based on their particular needs or concerns:

- Tire chain installation.
- Wing plow operation.
- Tow plow operation.
- Snowplow and cinder bed installation.
- Snow route plans and priorities.
- Other activity.

3. **Describe challenges:** The biggest challenge is providing the hands-on portion of the training with the equipment. Having equipment available is a big portion of this problem. One way we have improved this is to complete the hands-on training session at the maintenance facility the new employee is assigned to. This allows the trainer or supervisor time to bring the new employee up to speed with their facility, record keeping, materials used and storage facilities, type of equipment and storm preparedness that is utilized in their particular area.
4. **Describe successes:** Utilize experienced operators to deliver our training. We will have operators that enjoy training snow and ice removal throughout different areas of the state, and they can provide a lot of insight about our winter operations to the new employees.
5. **Staff contact information:** Aaron Cox, Employee Development Specialist, Human Resources—Employee Development, Missouri Department of Transportation, (573) 526-5633, james.cox@modot.mo.gov.

Additional information: [None provided.]

Documentation: See Appendix A.

Nebraska

Contact: Tom Renninger, Assistant Operations Division Manager, Nebraska Department of Roads, (402) 479-4787, tom.renninger@nebraska.gov.

1. **Frequency of training:** In an ideal situation we offer the training early in the fall to new employees first.

2. **Training formats:**

| | |
|-------------------------|----------------|
| Classroom training | Yes. |
| Hands-on training | [No response.] |
| Simulator training | Yes. |
| Computer-based training | [No response.] |

The NDOR has an eight-hour training course that involves classroom time and simulator time. The simulator is owned by Central Community College out of Hastings, Neb. The following are some of the items that are covered in the training but certainly not all of them.

- Accurate road condition reporting.
- Equipment operation.
- Equipment upkeep.
- Tandem plowing.
- How management reacts to weather warnings (preparations).
- Plowing around and near obstructions.
- Safety (stranded, carbon monoxide poisoning, etc.).
- Decision making.

3. **Describe challenges:** Timing of the class seems to be the biggest challenge we have had. Doing the class too far in advance of winter weather isn't as effective, and waiting until winter sets in is difficult as well. We also have to coordinate the simulator with the college to travel to various parts of the state.

4. **Describe successes:** The ability to have a simulator along with the classroom. The employees who have taken the class really feel they will see a benefit from it. I would be more than happy to visit with your group and share more of our experience regarding this training.

5. **Staff contact information:** Tom Renninger, Assistant Operations Division Manager, Nebraska Department of Roads, (402) 479-4787, tom.renninger@nebraska.gov.

Additional information: [None provided.]

Documentation: [None provided.]

Nebraska (City of Omaha)

Contact: John Brown, City of Omaha Street Maintenance, (402) 690-7629, jbrown@ci.omaha.ne.us.

1. **Frequency of training:** We do a snowfighter training class every year with the employees that have five years or less at a minimum. The other employees do get mixed in depending on what the workload is at that time. We also do this every time that we hire a group of full-time or part-time employees.

2. **Training formats:**

| | |
|-------------------------|------|
| Classroom training | Yes. |
| Hands-on training | Yes. |
| Simulator training | No. |
| Computer-based training | No. |

3. **Describe challenges:** Our biggest challenge is getting the class (trainers, trainees and equipment) to where we don't try to slow down our production on other areas that we have to maintain in our division. The past few years we have been doing a lot more street work because of the very harsh winters and streets needing more attention because of chuckholes.

4. **Describe successes:** The biggest benefit I think is the proper way of plowing the many different types of cul-de-sacs and the way that the many different pieces of equipment that we have work. The other benefit would be is that the employees understand better the orders that are given.
5. **Staff contact information:** John Brown, City of Omaha Street Maintenance, (402) 690-7629, jbrown@ci.omaha.ne.us.

Additional information: We use a classroom and hands-on application for the class. We have laid out a format for the classroom that includes proper procedures for plowing and spreading of major and secondary roads and the residential. This also includes the documentation part with pictures on an overhead and films. We also have had them take the different types of vehicles to different types of cul-de-sacs to practice the proper place to put the snow and the easiest way to plow each different kind of scenario. We also go through the different types of trucks and their capacity for spreading granule and liquid materials.

Documentation: See Appendix A.

New Brunswick, Canada (MRDC Operations Corporation)

Contact: Ross Mathers, MRDC Operations Corporation, rmathers@mrdc.ca.

Note: MRDC Operations Corporation is responsible for the operation and maintenance of the Fredericton-Moncton Highway in New Brunswick, Canada.

1. **Frequency of training:** Every fall, depending on the number of new drivers.
2. **Training formats:**

| | |
|-------------------------|-------|
| Classroom training | Yes. |
| Hands-on training | Yes. |
| Simulator training | No. |
| Computer-based training | Some. |
3. **Describe challenges:** Finding an area big enough to operate the hands-on course with the big trucks. Also, finding the time to train everyone is a challenge.
4. **Describe successes:** The hands-on portion and the interaction among the drivers from the various agencies.
5. **Staff contact information:** Todd Carr, MRDC Operations Corporation, (506) 357-1240, ext. 350, tcarr@mrdc.ca.

Additional information: MRDC Operations Corporation [<http://www.mrdc.ca>], in consultation with Brun-Way Highway Operations Inc. [<http://www.brunway.com>], New Brunswick DOT and New Brunswick Community College, has prepared a complete Snow Fighters Training Course that is offered at least annually.

Documentation: Training materials are the property of New Brunswick Community College [<http://www.nbcc.ca/en/home/aboutnbcc/default.aspx>]; they may be able to provide you with some of the info.

New Hampshire

Contact: Caleb B. Dobbins, State Maintenance Engineer, Bureau of Highway Maintenance, New Hampshire Department of Transportation, (603) 271-2693, cdobbins@dot.state.nh.us.

1. **Frequency of training:** New employees yearly; for all other employees we have instituted a three-year cycle.
2. **Training formats:**

| | |
|-------------------------|----------------|
| Classroom training | Primarily. |
| Hands-on training | [No response.] |
| Simulator training | [No response.] |
| Computer-based training | Available. |
3. **Describe challenges:** Overall the training is well-received. New technology is at times seen as questionable by the old school.
4. **Describe successes:** Training DOT and hired drivers together.
5. **Staff contact information:** Caleb B. Dobbins, State Maintenance Engineer, Bureau of Highway Maintenance, New Hampshire Department of Transportation, (603) 271-2693, cdobbins@dot.state.nh.us.

Additional information: My response is to the snow and ice training we give our operators. Our Mechanical Services Bureau works with employees on the actual operation of the truck.

Documentation: [None provided.]

New York

Contact: Mike Lashmet, Snow and Ice Program Manager, New York State Department of Transportation, mlashmet@dot.state.ny.us.

1. **Frequency of training:** Training is provided as new employees are hired. Annual certification/refresher training is provided prior to the winter season.
2. **Training formats:**

| | |
|-------------------------|--|
| Classroom training | Classroom and shop. |
| Hands-on training | Shop and OJT. |
| Simulator training | No. |
| Computer-based training | No; classroom and hands-on are sufficient. |
3. **Describe challenges:** Keeping up with operational changes that may occur (new directives like hopper access, new technologies like anti-icing, etc.). Finding ways to “spice up” the classroom sessions; ensuring that delivery of training is consistent statewide; training temporary employees with high turnover rates year to year. More temporary employees are being hired due to permanent personnel cuts; all are not hired on the same date so new employee training must occur throughout the winter season, while facing limited training staff availability.
4. **Describe successes:** Initial and refresher training has helped improve preventive maintenance of our equipment and has helped reduce preventable vehicle accidents.
5. **Staff contact information:** Matt Leveroni, (518) 469-4784, mleveroni@dot.state.ny.us.

Additional information: [None provided.]

Documentation: See Appendix A.

North Dakota

Contact: Shane Freitag, Equipment Fleet Manager, Maintenance Division, North Dakota Department of Roads, (701) 328-2565, shfreita@nd.gov.

1. **Frequency of training:** We have snowplow driver training once a year, usually in the first part of October.
2. **Training formats:**

| | |
|-------------------------|------|
| Classroom training | Yes. |
| Hands-on training | Yes. |
| Simulator training | No. |
| Computer-based training | Yes. |
3. **Describe challenges:** The biggest challenge is providing the same atmosphere as what the driver will encounter in the field.
4. **Describe successes:** Setting up courses with dirt windrows and cones that the drivers have to work with. Also one-on-one training has helped a lot.
5. **Staff contact information:** Shane Freitag, Equipment Fleet Manager, Maintenance Division, North Dakota Department of Roads, (701) 328-2565, shfreita@nd.gov.

Additional information: [None provided.]

Documentation: See Appendix A.

Ohio

Contact: Diana Clonch, Assistant Administrator, Office of Maintenance, Ohio Department of Transportation, (614) 644-7159, diana.clonch@dot.state.oh.us.

1. **Frequency of training:** ODOT trains all new employees with a two-week truck and loader course that includes a section on snow and ice; a copy of the PowerPoint and instruction manual will be sent to you (this is copyrighted material). We also require new hires to attend the Highway Technician Academy's Snow and Ice Course; this is a one-day course and a copy of the PowerPoint and manual for this will also be forwarded to you (it is copyrighted too). Minimum requirement for new employees also includes the following:

903.2 Training

1. Each County will conduct annual Snow and Ice Operator training sessions for all regular and auxiliary drivers. Successful completion of this or equivalent training will be a prerequisite for participation in snow and ice removal activities. This training should include, **at a minimum:**
 - a. Safety issues
 - b. Labor issues
 - c. Anti-icing/deicing practices
 - d. Plowing practices and hazards
 - e. Equipment function and operation
 - f. Environmental concerns
 - g. Economic concerns
 - h. Radio operations
 - i. Truck routing
2. The training objective is to provide an informational refresher for experienced drivers and a fundamental review for inexperienced drivers.
3. Each County will maintain a list of training session participants.

4. It is recommended that first-time drivers have a minimum of eight hours of *actual driving* time in a *dump truck* during a *snow storm* with an *experienced driver*, before operating the truck alone. This recommendation also applies to any returning drivers who have not driven within the past 3 years.

2. **Training formats:**

| | |
|-------------------------|------------------------------|
| Classroom training | Yes. |
| Hands-on training | Yes. |
| Simulator training | No. |
| Computer-based training | Yes, though not widely used. |

ODOT uses primarily classroom and hands-on. We do not have a simulator. We do have the CBT programs; however, as of yet they have not been widely used.

3. **Describe challenges:** Timely training, especially of seasonal and auxiliary drivers.
4. **Describe successes:** Providing outreach to the various counties and districts in their locations and addressing issues specific to their operations. Uniformity in training materials.
5. **Staff contact information:** Diana Clonch, Assistant Administrator, Office of Maintenance, Ohio Department of Transportation, (614) 644-7159, diana.clonch@dot.state.oh.us.

Additional information: [None provided.]

Documentation: See Appendix A.

Pennsylvania

Contact: Jim Smith, Chief, Equipment Division, Bureau of Maintenance and Operations, Pennsylvania Department of Transportation, (717) 787-4299, walsmith@state.pa.us.

1. **Frequency of training:** New hire permanent operators and temporary winter operators are trained before their first winter season. All other operators are required to receive remedial training once every four years. Managers and highway foremen are also required to attend. There are various modules of the training. We cover a “year-round” approach to winter services.
2. **Training formats:**

| | |
|-------------------------|------|
| Classroom training | Yes. |
| Hands-on training | Yes. |
| Simulator training | No. |
| Computer-based training | No. |
3. **Describe challenges:** We have developed a standardized program for this training. The Bureau of Maintenance and Operations personnel provide the managers/foremen training, as well as a “Train the Trainer” program for the individuals who will ultimately provide the instruction to the operators in the various engineering districts. We annually review and evaluate the feedback from the individuals trained and make changes as necessary to improve the program. These changes include the incorporation of instruction for any policy, equipment, material, material application techniques and technology changes that will be or have been introduced throughout the previous year.
4. **Describe successes:** The ability to allow the veterans to share their experiences with the younger operators and the conveyance and reception of information related to the proper application/treatment and the potential impacts on the environment. Providing the front-line operator with an understanding of the benefit of smart salting and the effectiveness of proper treatment has realized savings.
5. **Staff contact information:** Jason Norville, (717) 787-7004, janorville@state.pa.us; Jim Smith, (717) 787-4299, walsmith@state.pa.us.

Additional information: [None provided.]

Documentation: See Appendix A.

Utah (Redmond Minerals Inc.)

Contact: Doug Anderson, Redmond Minerals Inc., doug@redmondminerals.com.

Mr. Anderson provided the following in response to the survey:

Many of the Utah counties and municipalities utilize the Utah LTAP for training. Dee Hadfield does a terrific job. Their contact information is as follows:

Utah LTAP Center

Phone: (435) 797-2931

Toll Free: (800) 822-8878

Fax: (435) 797-1582

E-mail: utahltap@usu.edu

4111 Old Main Hill

Logan, UT 84322-4111

<http://www.utahltap.org/>

Note: Training resources available on the Utah LTAP Center website include the following manual:

Winter Maintenance Manual, Utah LTAP Center, August 2008.

http://utahltap.org/files/uploads/Training_Pamphlets/wintermaintmanual2008.pdf

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

Virginia

Contact: Allen Williams, Salem District Maintenance Engineer, Virginia Department of Transportation, (540) 387-5346, allen.williams@vdot.virginia.gov.

1. **Frequency of training:** We have a Basic Operators course for new hires. Part of this training is basic snowplow training. Each year we have operator training at the local area headquarters/shops. We also provide training to our contractor personnel.

2. **Training formats:**

| | |
|-------------------------|------|
| Classroom training | Yes. |
| Hands-on training | Yes. |
| Simulator training | No. |
| Computer-based training | Yes. |

3. **Describe challenges:** The big issue is having adequate time to train drivers on their specific routes. Many of our operators come out of areas other than field maintenance and many are hired from outside the organization so they are not always accessible for training.

4. **Describe successes:** Training contractor employees in proper techniques has been very beneficial. The Basic Operators course has been successful for getting new hires up to speed quickly. On-the-job training has always been a good means of helping new operators to learn how techniques learned in the classroom or in formal training are applied in day-to-day operations.

5. **Staff contact information:** Allen Williams, Salem District Maintenance Engineer, Virginia Department of Transportation, (540) 387-5346, allen.williams@vdot.virginia.gov.

Additional information: [None provided.]

Documentation: [None provided.]

Washington

Contact: Monty Mills, Maintenance and Operations Branch Manager, Washington State Department of Transportation, (360) 705-7803, millsm@wsdot.wa.gov.

1. **Frequency of training:** As often as necessary to accommodate the needs of new and/or inexperienced operators. Typically each year in each region.
2. **Training formats:**

| | |
|-------------------------|--|
| Classroom training | [No response.] |
| Hands-on training | Yes. Primarily hands-on training with an instructor. |
| Simulator training | [No response.] |
| Computer-based training | [No response.] |
3. **Describe challenges:** Late-season hires (fall and winter) need to be brought up to speed very quickly if they are allowed to even operate a plow. Most areas require them to perform ride-alongs for the first season or to operate in the company of an instructor. Staffing challenges make this problematic.
4. **Describe successes:** The inclusion of various technologies such as intelligent controllers, AVL [Automatic Vehicle Location]/GPS [Global Positioning System], laser-guided wing plows, and displays which assist operators in the performance of winter operations.
5. **Staff contact information:** Monty Mills, Maintenance and Operations Branch Manager, Washington State Department of Transportation, (360) 705-7803, millsm@wsdot.wa.gov.

Additional information: [None provided.]

Documentation: [None provided.]

West Virginia

Contact: Travis L. Ray, Regional Maintenance Engineer, SRIC [Snow and Ice Removal] Operations, West Virginia Department of Transportation, (304) 637-0220, travis.l.ray@wv.gov.

1. **Frequency of training:** WVDOT goes through operator training yearly. It's not a snowplow driving course. Our training is geared more toward operation of the computerized spreader systems. We discuss past application rates, cost, snow removal materials, and weather conditions and material usage. Before winter, operators participate in a dry run where all plow trucks are suited up and the operator drives their designated route assignment.
2. **Training formats:**

| | |
|-------------------------|--------------------------|
| Classroom training | Yes. |
| Hands-on training | Yes. |
| Simulator training | Yes (spreader controls). |
| Computer-based training | No. |
3. **Describe challenges:** Providing adequate training to prepare new operators.
4. **Describe successes:** The most valuable training is when you can get experienced operators to explain situations and conditions, and new operators hear this valuable information.
5. **Staff contact information:** Travis L. Ray, Regional Maintenance Engineer, SRIC Operations, West Virginia Department of Transportation, (304) 637-0220, travis.l.ray@wv.gov.

Additional information: [None provided.]

Documentation: [None provided.]

Wisconsin (Iowa County)

Contact: Randy Sudmeier, State Patrol Superintendent, Iowa County, (608) 574-2936, randy.sudmeier@iowacounty.org.

1. **Frequency of training:** We offer training whenever we hire a new employee. Also we offer periodic training to all plow operators.
2. **Training formats:**

| | |
|-------------------------|--|
| Classroom training | Our insurance provider has given presentations to all plow drivers regarding liability concerns. This included whiteouts from plowing, centerline plowing and traffic safety issues. |
| Hands-on training | All new hires are mentored by an experienced plow operator, including riding along on plow routes and then operating the plow truck with the experienced operator riding along to give guidance and assure safety. |
| Simulator training | We used simulator training for the first time in 2009. We felt this was a good training tool. |
| Computer-based training | We have training discs that we can access for operator training. |
3. **Describe challenges:** The biggest challenge is getting new hires enough time in a truck with a mentor before they are required to plow alone due to our limited personnel resources.
4. **Describe successes:** Our program of mentoring with an experienced operator has worked well for us. This gives the new hire the opportunity to experience the entire plowing operation before they are sent out to plow a route alone.
5. **Staff contact information:** Randy Sudmeier, State Patrol Superintendent, Iowa County, (608) 574-2936, randy.sudmeier@iowacounty.org.

Additional information: [None provided.]

Documentation: [None provided.]

Wisconsin (Iowa County)

Contact: Mark James, County Patrol Superintendent, Iowa County, mark.james@iowacounty.org.

1. **Frequency of training:** Whenever a new employee is hired. This past fall we offered a simulator training unit for the first time. It was well-received by all and we felt it was beneficial.
2. **Training formats:**

| | |
|-------------------------|-----------------------|
| Classroom training | [No response.] |
| Hands-on training | Yes. |
| Simulator training | Once, this past fall. |
| Computer-based training | [No response.] |
3. **Describe challenges:** Getting the new hires familiar with the different types of controls we have on various different units.
4. **Describe successes:** On-the-job training.
5. **Staff contact information:** Mark James, County Patrol Superintendent, Iowa County, mark.james@iowacounty.org.

Additional information: [None provided.]

Documentation: [None provided.]

Wisconsin (Kewaunee County)

Contact: Dale R. Jandrain, Kewaunee County Highway Commissioner, (920) 388-3707, jandraid@kewauneeeco.org.

1. **Frequency of training:** Whenever we have a new driver, we have him trained by an experienced driver.
2. **Training formats:**

| | |
|-------------------------|------|
| Classroom training | No. |
| Hands-on training | Yes. |
| Simulator training | No. |
| Computer-based training | No. |
3. **Describe challenges:** Finding the time.
4. **Describe successes:** Have the new driver ride with an experienced driver.
5. **Staff contact information:** Dale R. Jandrain, Kewaunee County Highway Commissioner, (920) 388-3707, jandraid@kewauneeeco.org.

Additional information: [None provided.]

Documentation: [None provided.]

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|---------------------------------------|---------------------|---------|--------------------------------|---------|------------|------------|---|-----------------|--|
| Colorado Department of Transportation | Presentation | General | Snow Removal Operator Training | Undated | PowerPoint | 236 slides | Training materials are provided by CDOT's Region 4 based in Greeley, Colo. This presentation is used in an eight-hour training session that is mandatory for all new hires. presentation includes references to training videos developed by vendors that are not included in this inventory. | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |
| Colorado Department of Transportation | Supporting Document | Safety | Safety Values | Undated | PowerPoint | 1 slide | Safety is among the values highlighted in this review of CDOT's mission. | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |
| Colorado Department of Transportation | Video | Plowing | Snowstorm | Undated | Media File | 14 seconds | Included as a link in the PowerPoint presentation, this excerpt from a television report shows a passing snowplow inundating a reporter with snow. An example of how not to plow. | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |
| Colorado Department of Transportation | Video | Plowing | Bridge Plowing | Undated | Media File | 11 seconds | Also included as a link in the training PowerPoint, this video shows a snowplow driving too fast over a bridge, cascading snow onto the roadway below. Another example of how not to plow. | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |
| Colorado Department of Transportation | Video | Plowing | Bus Stop 3 | Undated | Media File | 23 seconds | Another example showing improper snowplowing techniques, with a rapidly moving snowplow creating banks of snow at a bus stop. | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |
| Colorado Department of Transportation | Video | Plowing | Bus Stop 4 | Undated | Media File | 25 seconds | This time a fast-moving snowplow floods a bus shelter with snow, providing an opportunity to discuss how to operate the plow when encountering fixed structures. | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|---------------------------------------|---------------|---------|---------------------|---------|------------|------------|--|-----------------|--|
| Colorado Department of Transportation | Video | Plowing | Guardrail 2 | Undated | Media File | 7 seconds | This video of a snowplow burying a guardrail in snow provides the opportunity to advise students to square the angle of the plow and carry snow to the end of obstacles such as this. | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |
| Colorado Department of Transportation | Video | Plowing | Passing Plow 3 | Undated | Media File | 6 seconds | A passing snowplow blinds another vehicle with snow. Students are advised to slow down, pick up the blade, or change the angle. | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |
| Colorado Department of Transportation | Video | Plowing | Pulling Dowd Canyon | Undated | Media File | 1 minute | Plowing in tandem in Dowd Canyon. | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |
| Colorado Department of Transportation | Video | Plowing | Pushing Snow Vail 1 | Undated | Media File | 10 seconds | Pointing out hazards of the activity illustrated in this video--no lights, no TC, working around guardrail. And what about support under where the operator is pushing the snow? | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |
| Colorado Department of Transportation | Video | Plowing | Water Vail Pass | Undated | Media File | 41 seconds | This video demonstrates that water on the road makes for more work. Water pumping washes the asphalt from the aggregate and allows the aggregate to pop loose. Students are advised to keep water off the road. This video gives an idea of the damage that can be done. | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |
| Colorado Department of Transportation | Video | Plowing | Water Vail Pass Cut | Undated | Media File | 20 seconds | An excerpt from the Water Vail Pass video. | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|---------------------------------------|-------------------|--------------------|--|---------|--------|----------|--|-----------------|--|
| Colorado Department of Transportation | Training Overview | General | Snow Removal Training Overview | Undated | Print | 11 pages | Agenda items for this eight-hour classroom training include: storm preparation; radio use; pre-trip/post-trip inspections; attachments (plow, wing, sander, liquid unit); accidents; documentation; avalanche guidelines; materials; loading and unloading materials; liquid program; cleaning of equipment; and communication between employees during snow shift. The outline also includes an overview of the 16 hours the employee rides with an instructor that addresses the same topics covered during classroom instruction. | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |
| Colorado Department of Transportation | Checklist | Student Evaluation | Job Training Standard | Undated | Print | 2 pages | This form, initialed by the instructor and student, covers the major topics addressed in the classroom and on-the-job practice with an instructor. | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |
| Colorado Department of Transportation | Training Manual | General | Standard Operating Guide for Winter Maintenance and Operations | 2010 | Print | 21 pages | From the manual: The purpose if this guide is to assist the maintenance professional to use the proper product at the correct time and in the proper amount to achieve the targeted Level of Service (LOS) as programmed for the current fiscal year (FY)...The guide recommends procedures for the application of anti-icers/de-icers, and abrasives, calibration of sprayers, logs to be used for recording information about the specific applications and information/testing on the products themselves. | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|---------------------------------------|-------------------------|--------------------|---|---------|--------|----------|--|-----------------|--|
| Colorado Department of Transportation | Supporting Document | Anti-Icing | TAPER Log | Undated | Print | 3 pages | A template and sample TAPER log with a field-by-field description of the data to be entered. The TAPER log is a form developed by Washington State DOT and used by maintenance employees to record weather, road surface and maintenance operation information. TAPER is an acronym for the data elements collected: temperature, application rate, product used, event and results. | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |
| Colorado Department of Transportation | Training Manual | Material Spreaders | Calibration & Maintenance of Liquid Applicators and Sanders | Undated | Print | 4 pages | This document provides guidelines for computer calibration of liquid units and sanders; operator guidelines; and recommendations for applicator and sander maintenance. | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |
| Colorado Department of Transportation | Training Manual | Materials | Winter Maintenance Products | Undated | Print | 3 pages | This brief materials selection guide also describes material testing procedures and materials storage. | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |
| Colorado Department of Transportation | Supporting Document | Deicing | CDOT De-Icer Sampling Program | Undated | Print | 15 pages | This procedure describes the methodology for obtaining liquid deicer samples for quality assurance testing | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |
| Colorado Department of Transportation | Policies and Procedures | General | Snow Removal Policies | Varies | Print | 6 pages | This series of documents include a July 5, 2004, memo that outlines snow removal policies during extended hours of operation; a June 1996 procedural directive on priorities and levels of service; and an August 23, 2005, on the notification process for accidents. | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|---------------------------------------|-------------------------|--------------------|---------------------------------------|---------|------------|-----------------------|--|-----------------|--|
| Colorado Department of Transportation | Policies and Procedures | Accident Reporting | Accident Reporting and Claim Handling | Varies | Print | 15 pages | This packet of materials includes a May 1, 2004, memo on accident reporting and claim handling and report forms (employee incident statement, on-scene accident report, vehicle accident report, and property loss). | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |
| Colorado Department of Transportation | Policies and Procedures | Avalanche | Avalanche Management Plan | 2004 | Print | 4 pages | The avalanche plan for Region 4. | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |
| Colorado Department of Transportation | Supporting Document | Winter Driving | Winter Driving | Varies | Print | 7 pages | A collection of documents that includes a Colorado winter driving handbook, a guide to Colorado's chain law for commercial vehicles, and Federal Motor Carrier Safety Administration regulations. | Phillip Anderle | Phillip.Anderle@DOT.STATE.CO.US |
| Indiana DOT | Training Manual | General | Snow and Ice Training Manual | Undated | PDF | 42 pages | From the introduction: The purpose of this manual is to provide a reference to the Maintenance Work Force during the snow and ice season. It will also be used as an aid for training purposes and provide all necessary forms and documents available for INDOT employees involved in snow and ice removal. The contents will include policies, definitions and snow and ice control protocol. It will also provide route documentation, fuel vendor stops and valuable advice to plow truck drivers. | Dennis Belter | DBELTER@indot.IN.gov |
| Iowa Department of Transportation | Video | General | Intro to Winter Operations | Undated | Media File | 10 minutes | Part of Iowa DOT's Winter Operations Training Series. | Jim Dowd | jim.dowd@dot.iowa.gov |
| Iowa Department of Transportation | Video | General | Pre-Season Preparation | Undated | Media File | 29 minutes 55 seconds | Part of Iowa DOT's Winter Operations Training Series. | Jim Dowd | jim.dowd@dot.iowa.gov |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|-----------------------------------|---------------|------------|-------------------------------------|---------|------------|-----------------------|--|-------------|--|
| Iowa Department of Transportation | Video | Equipment | Equipment Operation | Undated | Media File | 10 minutes 29 seconds | Part of Iowa DOT's Winter Operations Training Series. | Jim Dowd | jim.dowd@dot.iowa.gov |
| Iowa Department of Transportation | Video | Plowing | Plowing Techniques | Undated | Media File | 29 minutes 46 seconds | Part of Iowa DOT's Winter Operations Training Series. | Jim Dowd | jim.dowd@dot.iowa.gov |
| Iowa Department of Transportation | Video | Anti-Icing | Anti-Icing & Deicing | Undated | Media File | 30 minutes 19 seconds | Part of Iowa DOT's Winter Operations Training Series. | Jim Dowd | jim.dowd@dot.iowa.gov |
| Iowa Department of Transportation | Video | General | Winter Weather Resources | Undated | Media File | 35 minutes | Part of Iowa DOT's Winter Operations Training Series. | Jim Dowd | jim.dowd@dot.iowa.gov |
| Iowa Department of Transportation | Video | Equipment | Dump Truck Operation and Inspection | Undated | Media File | 55 minutes 29 seconds | Topics covered include: daily inspection and start-up; transmissions; Eaton-Fuller auto-shift; basic dump truck maneuvers; operating the dump body; and shut-down procedure. | Jim Dowd | jim.dowd@dot.iowa.gov |
| Iowa Department of Transportation | Video | Equipment | Loader Maintenance and Operation | Undated | Media File | 33 minutes | Topics covered include: daily checks; basic maneuvering; shut down; stockpiling; and loading dump trucks. | Jim Dowd | jim.dowd@dot.iowa.gov |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|-----------------------------------|---------------------|-------------------------|--|-------------|------------|-----------|--|-------------|--|
| Iowa Department of Transportation | Presentation | Plowing | Training Academy: Snowplow Simulation Training | May 2010 | PowerPoint | 54 slides | <p>Course objectives:</p> <ul style="list-style-type: none"> • Demonstrate an understanding and application of SIPDE (hazard perception: Scan and Search, Identify, Predict, Decide and Execute). • Demonstrate space and speed management skills in tandem snow plowing. • Demonstrate skills required to effectively communicate while plowing. • Use simulator to apply what you learn. | Jim Dowd | jim.dowd@dot.iowa.gov |
| Iowa Department of Transportation | Examination | Student Evaluation | Operator Observation Sheet: Dump Truck Operation | Undated | Word | 2 pages | Evaluates operator skills using a scale of 0 to 5. | Jim Dowd | jim.dowd@dot.iowa.gov |
| Iowa Department of Transportation | Presentation | Equipment | 2004 Cargo Securement Rules | August 2006 | PowerPoint | 89 slides | Instructions on securing cargo. | Jim Dowd | jim.dowd@dot.iowa.gov |
| Iowa Department of Transportation | Presentation | Policies and Procedures | Commercial Drivers License Disqualification | July 2007 | PowerPoint | 31 slides | Explains the conditions under which a commercial driver may be disqualified. | Jim Dowd | jim.dowd@dot.iowa.gov |
| Iowa Department of Transportation | Presentation | Equipment | Pre-Trip Inspection | 2010 | PowerPoint | 68 slides | This richly illustrated presentation was not used in a classroom setting but can be used as a reference for pre-trip inspections. | Jim Dowd | jim.dowd@dot.iowa.gov |
| Iowa Department of Transportation | Supporting Document | Training Schedule | Iowa DOT Training Academy: Maintenance Weeks Spring 2010 | Spring 2010 | Word | 1 page | A sample agenda for the week-long session developed for the Iowa DOT Training Academy. | Jim Dowd | jim.dowd@dot.iowa.gov |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|-----------------------------------|---------------|-------------|------------------------------------|----------|------------|------------|--|-------------|--|
| Iowa Department of Transportation | Presentation | General | New Operator Snow and Ice Training | May 2010 | PowerPoint | 115 slides | <p>The complete presentation for new operators. Training objectives include:</p> <ul style="list-style-type: none"> • Greater understanding of the elements involved in winter operations. • Basic introduction to the technical aspects of winter operations. • Introduction to some of the tools used in winter operations. | Jim Dowd | jim.dowd@dot.iowa.gov |
| Iowa Department of Transportation | Presentation | Managers | New Operator Snow and Ice Training | May 2010 | PowerPoint | 39 slides | <p>This excerpt from the larger presentation for new operators is targeted to managers. Training objectives include:</p> <ul style="list-style-type: none"> • Greater understanding of the elements involved in winter operations. • Basic introduction to the technical aspects of winter operations. • Introduction to some of the tools used in winter operations. | Jim Dowd | jim.dowd@dot.iowa.gov |
| Iowa Department of Transportation | Presentation | Supervisors | New Operator Snow and Ice Training | May 2010 | PowerPoint | 39 slides | <p>This excerpt from the larger presentation for new operators is targeted to supervisors. Topics covered include equipment, sand and salt use, snow fences, weather, anti-icing and deicing, prewetting, and post-storm cleanup.</p> | Jim Dowd | jim.dowd@dot.iowa.gov |
| Iowa Department of Transportation | Presentation | Equipment | Radio Training | 2010 | PowerPoint | 20 slides | A well-illustrated presentation on radio use. | Jim Dowd | jim.dowd@dot.iowa.gov |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|-----------------------------------|---------------------|-------------------|--|------------------|------------|-----------|---|------------------|--|
| Iowa Department of Transportation | Supporting Document | Map | Maintenance Service Level Map | October 15, 2009 | PDF | 1 page | Color-coded map designates roadways as Service Levels A, B and C. | Jim Dowd | jim.dowd@dot.iowa.gov |
| Iowa Department of Transportation | Presentation | Equipment | Truck presentation | | | | Can't view the PPT on my computer | Jim Dowd | jim.dowd@dot.iowa.gov |
| Kentucky Department of Highways | Supporting Document | Route Designation | Route sheets | 2007 | PDF (2) | 1 page | Route sheets are developed for each route, with a diagram and description of the complete route. The route sheets are given to drivers as they leave for each shift. | Michael Williams | Michael.Williams@ky.gov |
| Kentucky Department of Highways | Training Outline | General | Contract driver training outline | 2007 | Excel | 1 page | This outline addresses topics such as truck routes, spread patterns, application rates and pavement conditions. | Michael Williams | Michael.Williams@ky.gov |
| Maine DOT | Presentation | Environment | The Effects of Road Salt in the Environment | 2010 | PowerPoint | 18 slides | Topics covered include: water cycle; fate of road salt (environmental receptors, pathways and mass balances); summary of research (water quality, ecosystems); trends; and things to avoid. | Brian Burne | Brian.Burne@maine.gov |
| Maine DOT | Presentation | General | Snow and Ice Materials Jeopardy! | Undated | PowerPoint | 58 slides | A question-and-answer presentation in the form of the game show Jeopardy! | Brian Burne | Brian.Burne@maine.gov |
| Maine DOT | Presentation | Weather | The National Weather Service and Winter Weather Safety | Undated | PowerPoint | 54 slides | Presentation by National Weather Service meteorologist that covers the following topics: agency and mission; winter weather challenges; weather safety; and winter weather criteria. | Brian Burne | Brian.Burne@maine.gov |
| Maine DOT | Supporting Document | Anti-Icing | Anti-Icing Application Decision Flowchart | Undated | PDF | 1 page | Questions and answers that help an operator determine when to apply anti-icing materials. | Brian Burne | Brian.Burne@maine.gov |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|-----------|---------------------|--------------------|---|---------|------------|----------|--|-------------|--|
| Maine DOT | Supporting Document | Material Spreaders | Cirus Controls: SpreadSmart RX Quick Start User's Guide | 2005 | PDF | 2 pages | Vendor publication describes use of electronic spreader control. | Brian Burne | Brian.Burne@maine.gov |
| Maine DOT | Supporting Document | Safety | Think*Act*Be Safe: Safe Winter Operations for Professional Snowfighters | 2000 | PDF | 5 pages | This Salt Institute publication covers a range of safety-related topics and includes a safety checklist. | Brian Burne | Brian.Burne@maine.gov |
| Maine DOT | Supporting Document | Anti-Icing | Ice Melting Capacity | Undated | Image file | 1 page | A graph showing the ice melting capacity of Ice B' Gone and salt. | Brian Burne | Brian.Burne@maine.gov |
| Maine DOT | Supporting Document | Environment | Highway Salt and Our Environment | 2004 | PDF | 28 pages | Chapters in this Salt Institute publication include: what we use highway salt; road, bridge and vehicle corrosion; roadside vegetation; wildlife and fish; human health; and sensible salting. | Brian Burne | Brian.Burne@maine.gov |
| Maine DOT | Supporting Document | Equipment | MaineDOT W.I.S.E. College: Wheels, Tires and Chains | Undated | PDF | 9 pages | This is a reproduction of the U.S. DOT publication, "Servicing Truck Tires & Wheels." | Brian Burne | Brian.Burne@maine.gov |
| Maine DOT | Supporting Document | Equipment | Torque Recommendations & Procedures | Undated | PDF | 2 pages | Torque specifications for a variety of equipment used by MaineDOT. | Brian Burne | Brian.Burne@maine.gov |
| Maine DOT | Supporting Document | General | Snow and Ice Control | Undated | PDF | 2 pages | A brochure designed for the public that describes deicing and anti-icing, materials used and how to use the 511 system. | Brian Burne | Brian.Burne@maine.gov |
| Maine DOT | Supporting Document | Salt | MaineDOT Salt Application Quick-Reference Chart | 2010 | PDF | 1 page | This chart shows application rates plotted with miles that can be treated. | Brian Burne | Brian.Burne@maine.gov |
| Maine DOT | Supporting Document | Salt | MaineDOT Salt Application Quick-Reference Chart | 2009 | {DF | 1 page | This chart shows application rates plotted with miles that can be treated. | Brian Burne | Brian.Burne@maine.gov |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|-----------|---------------------|------------------|---|----------------|--------|----------|---|-------------|--|
| Maine DOT | Supporting Document | Salt Brine | Getting the Facts About Salt Brine | undated | PDF | 1 page | Reprinted in part, with permission, from MoDOT "Quick Facts" sheet (D6PA, dated 11/01). This fact sheet discusses benefits of salt brine, when and how to use it, and the use of other liquid chlorides. | Brian Burne | Brian.Burne@maine.gov |
| Maine DOT | Supporting Document | Environment | What You Should Know About Safe Winter Roads and the Environment (EPA 901-F-05-020) | September 2005 | PDF | 2 pages | This EPA publication discusses the effects of salt on the environment and the safety concerns related to reduced salt use. Also provided are recommendations for reducing salt and sand use and proper storage of salt and sand. | Brian Burne | Brian.Burne@maine.gov |
| Maine DOT | Supporting Document | Staff Commentary | A Crew Supervisor's Recap of | Undated | Word | 1 page | An account of a day in the life of crew supervisor that emphasizes the importance of communication. | Brian Burne | Brian.Burne@maine.gov |
| Maine DOT | Training Manual | General | The Snowfighter's Handbook: A Practical Guide for Snow and Ice Control | 1999 | PDF | 27 pages | Topics addressed in this Salt Institute publication include: teamwork; equipment; pre-winter planning; snow types; calibration; salt application; spreading and plowing techniques; anti-icing; deicing and prewetting; post-storm activities; safety; and communicating with the public. | Brian Burne | Brian.Burne@maine.gov |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|-----------|-----------------|--------------------|------------------------------------|--------------------|--------|----------|--|-------------|--|
| Maine DOT | Training Manual | Material Spreaders | Snow Fighter's Compu-Spread Manual | Undated | PDF | 28 pages | <p>From the manual: The purpose of this guidebook is to aid the operator in the basic operation of the Basic Technologies Compuspread CS230 AC unit.</p> <p>The Compuspread unit is a devise that allows the operator to select a desired application and spread width. Then through the CS230, it makes the necessary adjustments to maintain a uniform application of materials, relative to the speed of the truck.</p> | Brian Burne | Brian.Burne@maine.gov |
| Maine DOT | Training Manual | Material Spreaders | Material Spreaders | September 13, 2010 | PDF | 45 pages | <p>This guide provides step-by-step instructions for using material spreaders.</p> <p>From the document: MaineDOT has over 400 vehicles equipped with some type of granular/liquid material spreading apparatus. Of these, just over 200 are hopper units, 200 are front dumping patrol trucks, and a couple dozen others are either Henderson bodies or specialty hoppers manufactured by Schmidt Stratos.</p> | Brian Burne | Brian.Burne@maine.gov |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|---------------------------------------|------------------|-----------------|--|------------------|------------|-----------|---|-----------------|--|
| Maine DOT | Training Outline | General | W.I.S.E. College - Classroom Agenda | 2010 | Excel | 1 page | This outline describes the classroom sessions for the two-day W.I.S.E. College. Day 1: Anti-icing/deicing; effects of road salt in the environment; materials; and be prepared. Day 2: Weather Sentry/Operations Center; weather and understanding storms; application of materials; plowing and winging; and MaineDOT policies. | Brian Burne | Brian.Burne@maine.gov |
| Maine DOT | Training Outline | General | W.I.S.E. College - Group A Schedule | undated | Word | 1 page | This schedule, which details the two days of MaineDOT's W.I.S.E. College, is representatives of the individual schedules are created for Groups A through H. | Brian Burne | Brian.Burne@maine.gov |
| Maine DOT | Training Outline | General | Snowfighter's Training Program | March 28, 2005 | PDF | 3 pages | This printout of a 2005 Salt Institute Web page provides a suggested program outline for fall training sessions. Also recommended is a review of the Transportation Association of Canada's synthesis of best practices in training, a Salt SMART training program and a train-the-trainer guide on how to best use the materials. All are available free on the TAC website. | Brian Burne | Brian.Burne@maine.gov |
| Maine DOT | Training Set-up | Training Set-up | WISE College Set-up Needs | Undated | Word | 2 pages | This document has been prepared in an attempt to capture the items that are needed in each location where W.I.S.E. College will be held and will be provided by the region. | Brian Burne | Brian.Burne@maine.gov |
| Maryland State Highway Administration | Presentation | Environment | Snow College (Part II): Winter Operations Environmental Considerations | October 18, 2005 | PowerPoint | 32 slides | See above. | Richard Shelton | RShelton@sha.state.md.us |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|---------------------------------------|-----------------|-----------|--|------------------|------------|-----------|--|-----------------|--|
| Maryland State Highway Administration | Presentation | General | Snow College: Roadway Winter Operations (Part I) | October 10, 2005 | PowerPoint | 74 slides | This two-day training class (one-day classroom / one-day field operations) is required for all new hires and must be retaken every five years. Typically, seven classes are conducted each year. | Richard Shelton | RShelton@sha.state.md.us |
| Maryland State Highway Administration | Training Manual | Equipment | Single & Tandem Axle Dump Truck (student guide) | May 6, 2010 | PDF | 99 pages | <p>Employees must take this training and pass the certification test within their probation period. Plowing operations training is included in this certification.</p> <p>From the introduction: The objective of this student guide is to provide the student with a basic knowledge and skill in operating the Dump Truck. This book will include the following areas: Safety, Terms & Definitions, Preventive Maintenance (Pre-start, Pre-operations, Shut-down) and basic dump truck operations including snow removal. The student should be aware that each District and/or shop may have different equipment. It will be up to the student to become familiar with the operator's manual for your equipment. After covering this student guide and hands on instruction, you will be tested on your knowledge by means of a written test and a field test.</p> | Richard Shelton | RShelton@sha.state.md.us |
| Michigan DOT | Presentation | Abrasives | Abrasives and Winter Maintenance | Undated | PowerPoint | 22 slides | Addresses best practices for using abrasives (sand useful only in certain situations and expensive to spread, pick up and dispose of; applying excessive amounts of sand causes additional maintenance issues). | Tim Croze | CrozeT@michigan.gov |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|--------------|---------------|-------------------------|------------------------------------|---------|------------|-----------|--|-------------|--|
| Michigan DOT | Presentation | Policies and Procedures | White Shoulder Policy | Undated | PowerPoint | 15 slides | Highlights MDOT's white shoulder policy: unnecessary to plow shoulders unless more than 2 inches of snow exists or circumstances warrant; when plowing shoulders apply only enough blade pressure to leave them lightly snow-covered; and do not plow shoulders with a fully loaded truck. | Tim Croze | CrozeT@michigan.gov |
| Michigan DOT | Presentation | Policies and Procedures | Winter Operations Guidelines | Undated | PowerPoint | 22 slides | Topics include assigning winter levels of service (Priority 1 Orange Routes and Priority 2 Blue Routes). Winter operations guidelines provide a definition of "generally bare of ice and snow" and discuss communication and coordination, effort during the storm, exceptions, and service uniformity. The presentation concludes with answers to frequently asked questions. | Tim Croze | CrozeT@michigan.gov |
| Michigan DOT | Presentation | Salt | Over Application of Salt | Undated | PowerPoint | 7 slides | Describes reasons for applying too much salt, including equipment and human factors. Includes things to remember and true cost of over salting. | Tim Croze | CrozeT@michigan.gov |
| Michigan DOT | Presentation | Supervisors | Supervisors and Winter Maintenance | Undated | PowerPoint | 11 slides | Topics include post-storm meetings; monitoring road conditions and operator efficiencies; encouraging operators to communicate via radio; and monitoring storm forecasts for informed decision making and communicating to crew. | Tim Croze | CrozeT@michigan.gov |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|---------------|------------------|-----------|--|------------------|--------|-----------|---|--------------|--|
| Michigan DOT | Training Manual | Equipment | Winter Operations Truck Driving School | Winter 2010-2011 | PDF | 192 pages | <p>Includes training outlines and hand-outs for the one-week course.</p> <p>Course objective: At the conclusion of this week-long course, the student will have an understanding of the responsibilities and basic skills required for winter maintenance. This will include preventive maintenance procedures of the winter maintenance truck and front end loader operations. Students can expect daily written quizzes from material covered along with a final written examination. An evaluation of the student's ability to safely and properly operate a large truck with winter attachments will be scheduled.</p> | Tim Croze | CrozeT@michigan.gov |
| Minnesota DOT | Training Outline | Equipment | SPOT Training Outline | October 29, 2004 | Word | 1 page | <p>The outline lists the classroom presentations (Class 33 dump truck components, driver responsibilities, truck preventative maintenance, snow and ice equipment, truck operation and operator safety) and the topics for the hands-on training that follows (pre- and post-trip inspections, engine operating procedures, backing proficiency, speed and space management, operating with plow, wing and sander, power take-off operations, plow/wing hook-ups, sanding and driving skills, and equipment care and maintenance).</p> | Rick Shomion | Rick.Shomion@state.mn.us |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|----------|-----------------|--------------------|---|---------|--------|---------|--|-------------|--|
| Missouri | Checklist | Student Evaluation | Snow and Ice Removal Training Checklist | Undated | PDF | 4 pages | This checklist documents the training required for each employee. Includes check boxes for concepts/topics covered in each training session to indicate employee understanding. Completed and signed by trainer and employee. | Aaron Cox | James.Cox@modot.mo.gov |
| Missouri | Checklist | Student Evaluation | Tow Plow Training Checklist | Undated | PDF | 3 pages | This checklist documents the training required for tow plow operators. Includes check boxes for concepts/topics covered in the classroom, hands-on and dry run portions of the training. Completed and signed by trainer and employee. | Aaron Cox | James.Cox@modot.mo.gov |
| Missouri | Inspection Form | Equipment | Two Plow Inspection | Undated | PDF | 1 page | Required; used by employees to perform an inspection of the Tow Plow prior to each shift. | Aaron Cox | James.Cox@modot.mo.gov |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|----------|-----------------|------------|---------------------------------|-----------|--------|----------|--|-------------|--|
| Missouri | Training Manual | Anti-Icing | Operator's Guide for Anti-Icing | July 2004 | PDF | 13 pages | <p>Referenced in the Snow and Ice Removal Training manual.</p> <p>Includes guidelines for anti-icing operations for six winter weather event: light snow storm; light snow storm with period(s) of moderate or heavy snow; moderate or heavy snow storm; frost or black ice; freezing rain storm; and sleet storm.</p> <p>From the foreword: The purpose of this booklet is to provide guidelines for the application of salt to the roadway for a variety of winter storm conditions. The timing and application rates were developed under the SHRP/FHWA Research Program, in which MoDOT participated.</p> | Aaron Cox | James.Cox@modot.mo.gov |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|----------|-----------------|-----------|----------|--------------------|--------|----------|--|-------------|--|
| Missouri | Training Manual | Equipment | Tow Plow | September 24, 2010 | PDF | 38 pages | <p>Used with tow plow operator training.</p> <p>Tow plow operator training includes an 8-hour instructor-led class, including hands-on and closed driving course, plus a 4-hour assessment, where the operator performs a ridealong dry-run (pre-winter storm) during good weather in the area that the operator will perform snow removal operations with the tow plow. Issues addressed during the dry run include roadside hazard identification, plowing techniques, and turnaround points.</p> <p>A check ride during active snow and ice removal operations is optional. The purpose of this check ride is to evaluate the new employee's safety and performance abilities of tow plow operation and is required only at the discretion of the supervisor.</p> | Aaron Cox | James.Cox@modot.mo.gov |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|----------|-----------------|---------|--|--------------|--------|----------|--|-------------|--|
| Missouri | Training Manual | General | Snow and Ice Removal Training (Basic) Participant's Book | October 2008 | PDF | 88 pages | <p>From the foreword: The purpose of this manual is to provide a training tool in snow and ice removal operations for new employees, emergency maintenance equipment operators and employees who have never received training or need additional training in snow and ice removal operations.</p> <p>This training will consist of both classroom studies and “hands on” training of the various pieces of equipment used in snow and ice removal. The class will be a minimum of three days. The first day will be spent reviewing the Snow and Ice Removal Basic manual in the classroom as well as time spent on assembling and operating the snow removal equipment. The second day of training will be spent reviewing the GL400 Basic Operation’s manual along with the Tire Chain manual in the classroom as well as time spent performing hands on operation of the GL400 spreader system and installation of tire chains and or cables. The third day of training will be conducted during a winter storm. The trainee will ride with an experienced employee during the first half of the shift observing proper operating techniques. During the last half of the shift, the trainee will operate the equipment with the experienced employee riding along as an observer.</p> | Aaron Cox | James.Cox@modot.mo.gov |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|--------------------------|-------------------------|--------------------|---|---------|--------|----------------|---|-------------|--|
| Missouri | Training Manual | Material Spreaders | Advanced Control System (Operator's Manual) | Undated | PDF | 45 pages | <p>In 2009, MoDOT replaced GL400 spreader systems with the Advanced Control System. Unlike the GL400 the ACS system controls/operates all hydraulic functions, including spreader control, hydraulic control and hydraulic system monitoring. Functions such as plow operation, bed up and down, along with accessory hydraulic functions are controlled by the ACS system.</p> <p>This manual addresses powering up the system, basic operations such as setting and application rates, different operating modes and materials available, and tracking and clearing storm totals.</p> | Aaron Cox | James.Cox@modot.mo.gov |
| Nebraska (City of Omaha) | Policies and Procedures | Material Spreaders | Operating Instructions (ForceAmerica SSC5100) | Undated | Print | 3 pages | Illustrations and instructions for operating the ForceAmerica's SSC5100 spreader control. | John Brown | John.Brown@ci.omaha.ne.us |
| Nebraska (City of Omaha) | Guidelines | Safety | Safety Bulletins | Undated | Print | 6 pages | These bulletins produced by Marcotte Insurance provide tips for driving safely in traffic and when school is in session, vehicle stopping distances, and defensive driving. | John Brown | John.Brown@ci.omaha.ne.us |
| Nebraska (City of Omaha) | Checklist | Inspection | Pre-Trip Inspection Checklist | Undated | Print | Card | This reference card for commercial drivers serves as a pre-trip inspection checklist. | John Brown | John.Brown@ci.omaha.ne.us |
| Nebraska (City of Omaha) | Policies and Procedures | Safety | Snow Operating Information/Truck Backing Safety | Undated | Print | Laminated card | Safety tips on safely backing a truck and precautions to take before and during snowplowing operations. | John Brown | John.Brown@ci.omaha.ne.us |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|----------------------------------|------------------|--------------------|---|----------------|--------|----------|---|---------------|--|
| Nebraska (City of Omaha) | Examination | Student Evaluation | Snow and Ice Post-Training Examination | Undated | Print | 5 pages | A 25-question multiple-choice exam administered after Omaha's training. | John Brown | John.Brown@ci.omaha.ne.us |
| Nebraska (City of Omaha) | Training Outline | General | Various training materials | Undated | Print | 11 pages | This packet of training materials includes: a study guide for snow and ice control training; rules of the road; truck inspection and operation; accident investigation and reporting; using the radio; and pre-trip inspections. | John Brown | John.Brown@ci.omaha.ne.us |
| New York State DOT | Training Manual | General | Equipment Operator Snow & Ice Manual | September 2007 | PDF | 59 pages | <p>From the foreword: This manual is intended to provide N.Y.S.D.O.T. SNOWFIGHTERS with basic information on Snow and Ice staffing policy, equipment, material spreading, snow plowing, safety, communications, and legal issues. More detailed information is available in the Highway Maintenance Guidelines, Highway Maintenance Safety Manual, Snow and Ice Training Manual, and other procedures/policies issued by N.Y.S.D.O.T.</p> <p>Every employee involved in snow and ice operations is responsible for becoming familiar with this manual and must adhere to the procedures, guidelines and policies as stated. Supervisors and Managers are responsible for enforcing the contents of this manual. As guidelines and policies change, all employees will be kept informed.</p> | Mike Lashmet | mlashmet@dot.state.ny.us |
| North Dakota Department of Roads | Training Outline | General | Program of Instruction: 2010 Transportation Technician Training Academy | September 2010 | Excel | 1 page | Training outline for week-long course that includes classroom and hands-on instruction. | Shane Freitag | shfreita@nd.gov |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|----------------------------------|------------------|--------------------|---|----------------|------------|------------|---|---------------|--|
| North Dakota Department of Roads | Examination | Student Evaluation | Pre-Test and Post-Test Questions: 2010 Transportation Technician Training Academy | September 2010 | Word | 2 pages | Test questions used during week-long training session. | Shane Freitag | shfreita@nd.gov |
| North Dakota Department of Roads | Training Set-up | Training Set-up | Registration Letter | September 2010 | Word | 1 page | Letter provided to registrants attending the September 2010 session of NDOR's Transportation Technician Training Academy. | Shane Freitag | shfreita@nd.gov |
| Ohio DOT | Presentation | Equipment | Truck and Loader (Course HT-104) | January 2010 | PowerPoint | 418 slides | Learning objectives: performing pre-trip inspections; maneuverability of dump truck and front end loader; techniques and principles of plowing and snow and ice control methods; other drivers' responsibilities while on the road; safely securing a front end loader to a trailer for transport; defensive and safe driving techniques; loading materials using a front end loader; proper entry and exit of both the dump truck and the front end loader; safety techniques for the dump truck and front end loader. | Diana Clonch | Diana.clonch@dot.state.oh.us |
| Ohio DOT | Presentation | General | Snow and Ice Control (Course HT-105) | January 2010 | PowerPoint | 224 slides | Learning objectives for this one-day course: sound winter maintenance practices; winter maintenance impacts; level of service; areas of responsibility; basic components; weather forecasting; materials; equipment retirement; preparedness; safety. | Diana Clonch | Diana.clonch@dot.state.oh.us |
| Ohio DOT | Training Outline | General | Course Outline: Snow and Ice Control (Course HT-105) | January 2010 | PDF | 140 pages | Course materials for HT-105, including exercises and appendices. | Diana Clonch | Diana.clonch@dot.state.oh.us |
| Pennsylvania DOT | Presentation | Communications | Snow Academy: Part 3, Communications | 2010-2011 | PowerPoint | 10 slides | A discussion of internal and external communications. | Jim Smith | walsmith@state.pa.us |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|------------------|---------------|----------------|---|-----------|------------|------------|--|-------------|--|
| Pennsylvania DOT | Presentation | Communications | Snow Academy: Part 5, Situational Awareness | 2010-2011 | PowerPoint | 11 slides | Situational Awareness is a statewide incident communication process primarily for use on Pennsylvania's Interstates and 511 routes or closure of any route. | Jim Smith | walsmith@state.pa.us |
| Pennsylvania DOT | Presentation | Finance | Snow Academy: Part 2, Planning and Budget | 2010-2011 | PowerPoint | 9 slides | Discusses winter operations comprehensive plan, operational budget, and includes specific winter costs. | Jim Smith | walsmith@state.pa.us |
| Pennsylvania DOT | Presentation | General | Snow Academy: Part 4, Fundamentals | 2010-2011 | PowerPoint | 112 slides | <p>Detailed discussion of anti-icing equipment, spreading operations, weather conditions, new technology and equipment, and safety. Addresses:</p> <ul style="list-style-type: none"> • People: Equipment Operators, Foremen, and Managers who possess the knowledge and skills needed to perform their jobs well • Equipment: The right types and pieces of equipment properly maintained, available when and where needed to perform winter operations • Materials: Sufficient quantities of the correct materials for conditions, in the right locations, ready for proper application • Schedules: Detailed operational assignments for people and equipment, and materials ready and available for deployment as needed to achieve Levels of Service goals for each route before, during, and after winter storm events | Jim Smith | walsmith@state.pa.us |

Appendix A: Snowplow Training Materials Inventory

| Agency | Document Type | Topic | Title | Date | Format | Length | Description | Provided By | Email |
|------------------|---------------|-------------------------|--|-----------|------------|-----------|---|-------------|--|
| Pennsylvania DOT | Presentation | Policies and Procedures | Snow Academy: Part 1, Publication 23 | 2010-2011 | PowerPoint | 19 slides | Publication 23 contains guidelines for winter services including: chronological list of winter related activities by season; levels of service by priority; material application and plowing techniques; and winter season productivity. | Jim Smith | walsmith@state.pa.us |
| Pennsylvania DOT | Presentation | Policies and Procedures | Snow Academy: Part 6, After Action Reviews | 2010-2011 | PowerPoint | 17 slides | From the presentation: The AAR is an after-event learning process that enables organizations to achieve continuous improvement by building on successes while correcting mistakes. The AAR is a tool that can be used to collect feedback to improve products and services to our customers. Includes personnel from all levels of the organization; operators, supervisors, garage and office staff and managers. | Jim Smith | walsmith@state.pa.us |