

# Evaluation of Winter Service Provider Certification Programs



Prepared to support development of a  
Northern Virginia Salt Management Strategy

Prepared for  
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**Cover Picture**

Program or organizational logos for evaluated programs.

**Disclaimer**

The opinions expressed in this report are those of the authors and should not be construed as representing the opinions or policies of the United States government or the signatories or Commissioners to ICPRB.

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## Introduction

During the initial meeting of the Salt Management Strategy (SaMS) Non-Traditional Best Management Practices Workgroup in October 2018, members requested additional information on existing winter service provider certification programs. In response to this request, ten winter service provider certification programs are identified and summarized in alphabetical order in Section 1 of this document. The ten program names are listed below. Table 1 provides summary information about the programs for easy comparison.

At the second meeting of the Non-Traditional Best Practices Workgroup in March 2019, further evaluation of five programs that can be administered in Virginia was requested. That evaluation is provided in Section 2 of this document. Program names selected for further evaluation are bolded in the list below and in Table 1.

- AORS: Association of Ontario Road Supervisors Certified Road Supervisor, Winter Operation Training Series
- **APWA: American Public Works Association Winter Maintenance Supervisor Certificate**
- **ASCA: Accredited Snow Contractors Association Certification**
- City of Madison, Wisconsin Winter Salt Certification
- McHenry County, Illinois Sensible Salting Workshop and Certification
- MPCA: Minnesota Pollution Control Agency's Smart Salting Certification
- NHDES: New Hampshire Department of Environmental Services' Green SnowPro Training – NHDES Salt Applicator Certification
- **SASC: Smart About Salt Council Certification**
- **SIMA: Snow and Ice Management Association Certified Snow Professional and Advanced Snow Manager Certification**
- **SWIM: Sustainable Winter Management Certification**

Table 1. Summary information for winter service provider certification programs. All programs (except SWiM, SIMA, ASCA, and APWA that did not have readily available information on the topic) address multiple surface types like roads, sidewalks, and driveways. The five programs selected for further evaluation in Section 2 of this document are labeled in **bold** in the table.

Program Name	Training				Level			Liability Protection
	In Person	Online	Exam	Reporting	Organization	Individual	Cost <sup>†</sup>	
AORS Certified Road Supervisor, Winter Operation Training Series	X					X		
<b>APWA Winter Maintenance Supervisor Certificate</b>	X		X			X	\$\$	
<b>ASCA Certification</b>		X	X			X	\$\$\$	X
City of Madison, Wisconsin Winter Salt Certification	X		X	X*	X*	X	\$	
McHenry County, Illinois Sensible Salting Workshop and Certification	X		X			X	\$	
MPCA's Smart Salting Certification	X*			X*	X*	X*		
NHDES Salt Applicator Certification	X		X	X		X	\$\$	X
<b>SASC Certification</b>	X	X	X	X	X*	X*	\$\$\$	
<b>SIMA Certified Snow Professional and Advanced Snow Manager Certification</b>		X	X			X	\$\$\$	
<b>SWiM Certification</b>	x			x	x		Variable	

\*Required for specific levels/types of certification

†Cost breakdown:

\$=<\$100

\$\$=\$100-\$250

\$\$\$=>\$250

Information not readily available

## Section 1. General Program Information

Each program is described in more detail below. Please note that much of the language describing programs is taken directly from online source materials. The accuracy of the information has not been verified. In some cases, edits were made to original language to make this document concise and pertinent for the intended purpose.

### Section 1.1. Association of Ontario Road Supervisors (AORS) Certified Road Supervisor, Winter Operation Training Series

<http://aors.on.ca/education/winter-operation-series/>

Ontario has a certification program designed for various kinds of snow operators and public works employees. The trainings are developed and delivered by Ground Force Training, Inc. [Ground Force Training](#) is a Canadian heavy equipment and driver training company, providing heavy equipment training to townships, counties, districts and rural municipalities as well as private industries including farms, construction and utility companies

Many of the trainings for different types of plow operators (listed below) cover topics related to smart salting:

- Front end loader plow
- Motor grader-snowplow
- Pick-up truck with plow
- Sidewalk plow
- Snow plow defensive driving course
- Snow plow operator 1.2
- Snowplow – classroom only
- Snowplow – one person plowing
- Tractor loader backhoe snowplow
- Winter patroller

### Section 1.2. American Public Works Association (APWA) Winter Maintenance Supervisor Certificate

<http://www3.apwa.net/learn/Certificates/Winter-Maintenance-Supervisor-Certificate>

This certification program is designed to be held annually at The North American Snow Conference. Participants include supervisors with winter maintenance responsibilities, operators who aspire to be supervisors, and operators who want a greater understanding of winter maintenance processes.

Training topics include:

- Expand knowledge of planning and preparation in winter maintenance operations
- Increase understanding of winter weather and how it affects operations
- Identify how to better use traditional and alternative chemicals
- Consider what equipment is available and how to maintain it
- Expand understanding of snow and ice control techniques
- Gain understanding about the environmental impacts of winter maintenance policies

The winter maintenance supervisor certificate workshop costs \$25 in addition to conference registration. The most recent conference registration cost \$225.

### Section 1.3. Accredited Snow Contractors Association (ASCA) Certification

<https://www.ascaonline.org/>

This certification program was designed to help address the rising cost of comprehensive insurance coverage. The ASCA worked with Mills Insurance Group to develop the ASCA certification. Certified members are provided with access to insurance programs that offer exclusive discounts to ASCA members.

Snow and ice professionals who complete 10 hours of ASCA-approved educational programming and are ASCA members in good standing earn the designation “ASCA Certified.” Topics are listed on the ASCA [website](#). Each course includes a presentation followed by a short quiz. Once the quiz is passed, the course is completed and a certificate-of-completion document is issued. ASCA provides an all-encompassing certificate for achieving initial certification and for renewal. Certification is renewed on an annual basis and requires the completion of 10 hours of ASCA-approved education to meet the renewal requirements.

Each hour course is \$15. ASCA membership costs are based on annual snow revenue, ranging from \$200-\$400 for a one-year membership.

### Section 1.4. City of Madison, Wisconsin Winter Salt Certification

<https://wisaltwise.com/Winter-Salt-Certification>

This is a voluntary certification program open to all Dane County contractors that discusses parking lots, roads, sidewalks, and driveways. Certification is available for both individuals and organizations.

The individual certification includes a six-hour training and a written exam. To become certified, the individual must also agree to use practices that reduce impacts on the environment. Two types of individual trainings offered are the roads class for high/low speed snowplow drivers and the parking lot/sidewalk class for those who maintain private/public walkways and/or parking lots and service roads. Individual certification lasts 5 years. The class includes the chemistry or salt use, recommended salt application rates, how to calculate the amount of salt needed based on weather conditions, and technological advancements like brining, new spreading equipment, and alternative products.

The organizational certification requires 30% of the salt related staff to be certified and submission of an annual report. The organizational certification is valid for 1 year. Organizational certification includes 1) submission and acceptance of the application that describes current de-icing practices, 2) hands on equipment calibration training, 3) tracking use of salt per storm, and 4) submission of an annual salt savings report.

### Section 1.5. McHenry County, Illinois Sensible Salting Workshop and Certification

<https://www.mchenrycountyil.gov/county-government/departments-j-z/planning-development/water-resources/sensible-salting>

This certification is for public and private sector employees responsible for maintenance of roads, sidewalks, and parking lots in McHenry County, Illinois. Trainings and certification workshops are hosted through the University of Wisconsin, McHenry County, or the American Public Works Association. The training topics include application rates, liquids, weather conditions, materials storage, levels of service,

truck washing, new maintenance methods, environmental effects, state/local law, and NPDES compliance. It also includes demonstration/hands-on discussion of calibrating equipment. Operators are required to be recertified every three years. Refresher courses are offered annually. The training costs \$25.

There is a \$12 registration fee for the certification training for parking lots, sidewalks, and trail maintenance professionals currently listed on the website.

### Section 1.6. Minnesota Pollution Control Agency's (MPCA) Smart Salting Certification <https://www.pca.state.mn.us/water/smart-salting-training>

The Smart Salting Certification is conducted at two levels (Level 1 and Level 2).

Level 1 certification is for individuals like public road maintenance staff (state, city, and county), winter service providers, staff responsible for maintaining public and private walkways and/or parking lots, property managers, and other snowplow drivers. Level 1 certification includes attending an in-person training, held in Minnesota. Training manual and videos available [online](#).

Level 2 certification is for organizations and requires submission of data each year for the previous year. Level 2 reporting includes best management practices and salt savings assessments using the [Smart Salting Assessment Tool](#) for the most recent fully completed winter maintenance season. To maintain certification, reports have to be submitted each year for the previous year. Individuals at the organization do not need to be Level 1 certified for the organization to become Level 2 certified. Level 2 certification is valid for 2 years. Organizations remain certified as long as they update and resubmit their best management practices and salt savings reports each year.

### Section 1.7. New Hampshire Department of Environmental Services' (NHDES) Green SnowPro Training – NHDES Salt Applicator Certification <https://www.des.nh.gov/organization/divisions/water/wmb/was/salt-reduction-initiative/categories/faq.htm#two>

This certification program is for snow removing contractors, municipalities, and anyone running a plow. By completing the program, certified parties become eligible for liability protection for self and client from slips and falls per New Hampshire Code of Administrative Rules. To become a certified NHDES Salt Applicator, individuals must take a Green SnowPro workshop, pass the exam, and fill out the initial or renewal certification form. The initial course is five hours and covers proper salt use and efficiency issues related to winter maintenance. The training is held at various locations around New Hampshire. Annual [salt usage reporting](#) is also required for recertification. Additional information like storm-specific reporting can also be kept in the online system to ensure maximum liability protection.

For recertification, a new certification form must be submitted each year in June. A minimum of two hours of professional development courses are required every two years for recertification. This obligation can be met through a two-hour Green SnowPro refresher course, an Annual New Hampshire Salt Symposium, or a SIMA on-line refresher course.

There is no fee to apply for certification. The Green SnowPro trainings cost \$100 per person for municipalities and \$200 per person for private companies. The Green SnowPro refresher training is \$25 per person for municipalities and \$50 for private companies. Other professional development courses and the salt symposium have separate fees.

### Section 1.8. Smart About Salt Council (SASC) Certification

<http://www.smartaboutsalt.com/becomesascertified>

The Smart About Salt Council is a non-profit organization that offers training to improve salting practices and protect freshwater from negative impacts of salting. This is a certification program for both contracting companies and sites and is valid for five years. Certification includes completing the Essentials of Salt Management training. Individual training and accreditation are also available. Training is available online or as a one-day in-person class. An example training course agenda is available [online](#). To maintain certification, an annual report is required and random program verifications may be conducted. Online course registration including all modules, review, and exam is \$375. Businesses in certain locations may qualify for stormwater credits to save on monthly utility bill.

### Section 1.9. Snow and Ice Management Association (SIMA) Certified Snow Professional and Advanced Snow Manager Certification

<https://www.sima.org/education/certified-snow-professional/certified-snow-professional-faq>

SIMA is a non-profit trade association. The Certified Snow Professional certification program is designed for business owners and executives. It is focused on business elements like marketing, human resources, snow-specific operations, and legal aspects. The Advanced Snow Manager certification program is designed for operations managers and personnel. Four courses are included: core principles, sidewalk operations, plowing operations, and ice management. Annual continuing education is required to maintain good standing.

Certification is for individuals only, not for companies. The certification of an individual's competence is accomplished through a written exam. The 200-question exam is designed to measure the individual's knowledge in six areas: Business, Human Resource Management, Marketing, Sub-Contractors, Snow and Ice Science, and Snow and Ice Operations and Techniques. Exams are given online once per month through [SIMA's Training Center](#). A candidate will determine eligibility, complete an application and submit any necessary application materials, be approved by SIMA, and then take the exam.

This certification program does not require records of salt use or BMP implementation.

The exam fee is \$350 for SIMA members and \$500 for non-members. The fee must be paid before taking the exam. Study materials cost: \$300 for the set of six, or \$400 for the set of six plus the recorded study presentations for members. Non-members pay \$400 for the set of six, or \$500 for the set of six plus the recorded study presentations.

Recertification requires an annual renewal fee of \$130 to SIMA. Fifteen continuing education credits are also required per year, starting the year after initial certification. Credits can be obtained through various activities such as educational seminars, SIMA's annual symposium, publishing industry related articles, and mentoring new SIMA members.

### Section 1.10. Sustainable Winter Management (SWiM) Certification

<http://witadvisers.com/swim/>

The SWiM Certification is administered through a private firm, WIT Advisers, that consults with property owners, municipalities and contractors. SWiM is a systematized approach to implementation of efficient practices that includes policy guidelines and standards of practice, the nuts and bolts. There are three types of certifications offered through the SWiM program: a) *SITE* certification, b) *ROAD* certification,

and c) *CF* Certification (Chloride Free). Trainings are provided for property owners, managers, contractors, highway departments, and public officials. The program includes a needs assessment, implementation training, program management, automated monitoring, and SWiM certification. Maintaining certification includes operations audits and monitoring of salt tracking and level of service.

SWiM certified SITES and ROADS require automated monitoring (ongoing tracking of salt use and level of service achieved through SITE / ROAD weather cameras). Periodic monitoring includes engagement with contractors, highway operators, property owners, and public officials to improve performance and reduce salt use by implementing more efficient practices. In addition to automated monitoring, random in-person/on-site audits are performed with contractors, highway operators, and property owners.

A future certification / accreditation for contractors (service companies) is being considered for contractors who follow SWiM guidelines and service a minimum number of SWiM sites.

## Section 2. Further Evaluation of Five Programs

This section provides a comparison of five [salt management certification training programs selected by the Non-Traditional BMPs workgroup](#). These programs were selected for further comparison as these five programs appear, based upon readily available information, to be transferable to Virginia and also covers recommended best management practices (BMPs) identified by the Traditional BMPs workgroup. The programs reviewed are:

1. American Public Works Association (APWA) Winter Maintenance Supervisor Certification
2. Accredited Snow Contractors Association (ASCA) Certification
3. Smart About Salt Council (SASC) Certification
4. Snow and Ice Management Association (SIMA) Certified Snow Professional and Advanced Snow Manager Certification
5. Sustainable Winter Management (SWiM) Certification

This comparison is on the extent to which each program covers environmental impacts (Section 2.1), economic benefits (Section 2.2), and the [set of BMPs](#)<sup>1</sup> identified by the Traditional BMPs workgroup (Section 2.3). Note that the intent of this document is to provide a broad overview of each program and is not an endorsement of any program reviewed. Additionally, the information provided in this review may not identify the full extent of a program's offering, due to limited details on the programs' websites on the content of information covered by the trainings as the material is often proprietary and there is a fee for participating in trainings and receiving materials. For the SASC, ASCA, APWA, and SIMA programs the information presented below was gathered from the organizations' websites. The SWiM information is based upon a phone interview with the program's founder Phill Sexton.

### Section 2.1. Environmental Impacts

#### APWA Winter Maintenance Supervisor Certification Programs

Environmental issues associated with chemicals and abrasives are both discussed during the certification programs. This covers corrosion, damage to vegetation, soil, waterbodies (including sources of drinking water), aquatic life, and air quality.

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<sup>1</sup> In the final version, this text will hyperlink to the applicable appendix.

### ASCA Certification

Environmental impacts are covered in a variety of the ASCA courses but are not the focus of this program.

### SASC Certification

SASC's training begins with a section titled, "The Environmental Effects of Salt." It covers the effects of excessive salt on soil, vegetation, surface water and its biota, wildlife, and groundwater. It also covers [Environment Canada's](#) perspective on salt management.

### SIMA Certification

The target audience for the Certified Snow Professional certification is business owners and executives and, as such, the primary focus of training materials is key business elements; however, environmental considerations are an underpinning of the program. The Advanced Snow Manager certification, which is designed for operations managers and personnel, directly addresses environmental considerations. Both certifications rely on the recommended best practices for sustainable salt use and training modules are available that focus on environmental impacts such as "Salt Application Oversight and Environmental Responsibility".

### SWiM Certification

SWiM certification is different from the other programs discussed in this document. This program focuses on property owners and managers, and to a more limited extent, municipalities, and how to practically implement training so that salt use and reductions can be quantified. To this end, recognition of the environmental impacts of salt use are embedded in an organization's decision to have their facility or roads SWiM certified.

## Section 2.2. Economic Benefits of Practices

### APWA Winter Maintenance Supervisor Certification Programs

This program only briefly discussed this topic in the context of that economic losses due to closed roads exceeds the cost of snow removal.

### ASCA Certification

This topic is not covered during training.

### SASC Certification

This topic does not appear to be covered during training.

### SIMA Certification

This topic is not covered directly during training, but is briefly discussed in some SIMA library articles such as "Is anti-icing worth the ROI". Other economic components such as finance, building a bid, and job costing are included in SIMA training materials.

### SWiM Certification

Cost reduction is a goal of the program. It specializes in GPS tracking of salt use so the rate of application is always known allowing for changing costs to be tracked. The program's website promotes its ability to prevent delayed business openings, thus protecting revenue.

### Section 2.3. Best Management Practices

The list of BMP categories in this section are those organized by the Traditional BMPs workgroup. The complete list and discussion can be found in their paper, [SaMS: Operational Best Management Practices – Pros & Cons](#). Table 2 provides a summary of BMP coverage in the five training courses.

Table 2. Summary of BMP coverage.

BMP	APWA	ASCA	SASC	SIMA	SWiM
Plowing Practices	X	X	X	X	X
Calibration	X	X	X	X	X
Measurement	X	X	X	X	X
Level of Service	X	Unknown	No	X	X
Training	X	X	X	X	X
Anti-Icing	X	Unknown	X	X	X
Liquids	X	X	X	X	X
Application Practices, Varying Application Rates, Use of Deicers at Cold Temperatures	X	X	X	X	X
Pre- and Post-Storm Meetings to Review Plans and Performance	X	X	X	X	X
Weather Forecasting/Surface Temperature Information	X	Unknown	X	X	X
Enhanced Equipment/Technology	X	X	X	X	X
Salt Storage and Handling	X	No	X	X	X
Winter Maintenance Planning	X	X	X	X	X
Accountability/Tracking and Reporting	X	X	X	X	X
Additional Practices	Contracting guidelines, liability and risk management, safety, management skills and tips, interacting with the public and media, driver's licenses and training.	Training courses are tailored to private contractors and, specifically, how to reduce their liability. There are many courses dedicated to meeting industry standards.	None identified	Business-focused topics related to human resources, subcontractors, sales, and management.	None identified

### APWA Winter Maintenance Supervisor Certification Programs

APWA's training is coordinated through the organization's chapters. For Virginia, any training would be hosted by the Mid-Atlantic Chapter. There is a fee to hold a standalone training, as well as any meeting facility and speaker costs. Trainings are also often conducted in association with APWA conferences. In addition to the eight-hour supervisor training reviewed here, a four-hour operator training is also available.

Information on this training program comes from a handout provided to training attendees (APWA 2019). As stated, the goal of the programs is "more effective, efficient, equitable & environmentally-friendly snow & ice control." Topics covered include:

- Policy and planning
- Weather
- Materials
- Equipment and fleet
- Snow and ice control

The information below summarizes what is covered during the training and sometimes includes details of what is presented. In all cases, this is not a comprehensive representation of the training.

#### *Plowing Practices*

The various types of plows (one-way, two-way/reversible, V, underbody, wing), plow blades, controllers, and hydraulic systems are discussed as well as how to select the one best-suited for local needs. Operational speed for plowing, special snow operations (multi-modal areas, gravel roads), optimizing routes, and using automatic vehicle locations systems are also covered during training.

#### *Calibration*

APWA's main message regarding calibration is that it is important to know what and how much is being applied.

#### *Measurement*

This is taught as part of the discussion about how to calibrate equipment.

#### *Level of Service*

The level of service determined is the "desired, usually achievable, condition of pavement surface."

#### *Training*

Training at all staff levels is encouraged.

#### *Anti-Icing*

The difference between anti-icing and de-icing is explained, as well as the benefits of anti-icing: Reduced material usage and effort. Details on how anti-icing works, how to account for pavement temperature, when it should be used, and how to calculate how much material is needed are provided.

#### *Liquids*

It is recommended that the material selected should meet the level of service needed and account for "societal, economic, and environmental concerns." The training course presentation includes general information on liquids and selecting the appropriate material. In addition to what is covered in this

training, APWA offers four additional courses on liquids. These are offered as in-person trainings and as recordings for APWA members.

#### *Application Practices, Varying Application Rates, Use of Deicers at Cold Temperatures*

The APWA training covers application practices, including variable application rates, in breadth and depth. Highlights are conditions for using direct liquid application, the benefits of pre-treating salt, recommendation to plow first, and encouragement to check pavement temperature before applying salt.

#### *Pre- and Post-Storm Meetings to Review Plans and Performance*

Both how to prepare for a storm and review actions taken during one are explained. Additionally, adjusting operations during a storm as needed is also recommended.

#### *Weather Forecasting/Surface Temperature Information*

The basics of weather and forecasting are taught as well as how this interacts with road conditions. The benefits of using advanced forecasts for winter road maintenance is also explained.

#### *Enhanced Equipment/Technology*

A number of enhanced equipment and technologies are discussed including:

- Mobile sensors,
- Road Weather Information System (RWIS),
- Maintenance Decision Support System (MDSS) forecasts, and
- New types of equipment: dual blade, tow plows, expandable plows, ice breakers, satellite assisted GPS controller, alternative fuel fleets.

#### *Salt Storage and Handling*

The reasons for proper storage and handling and best practices for doing so are covered in detail.

#### *Winter Maintenance Planning*

APWA training covers the planning cycle by activities that need to occur during each season. The use of a written plan is encouraged.

#### *Accountability/Tracking and Reporting*

Setting performance measures and how to track them are taught. This is discussed in large part in relation to the use of automatic vehicle location systems.

#### *ASCA Certification*

Specific information on the content covered in the many course offerings is not available. The list of courses can be found on the [ASCA website, and are offered in a series of 5 levels \(100 through 500\)](#). Initial certification requires that all ten 100-level courses are completed. The information below summarizes readily available information from the program's website. In all cases, this is not a comprehensive representation of the training.

#### *Plowing Practices*

Based upon course titles, this topic may be addressed under "Snow Management Basics" and/or "Ice Management Basics."

*Calibration*

Based upon course titles, this topic may be addressed under “Snow Management Basics” and/or “Ice Management Basics.”

*Measurement*

Course offered that covers this topic, but specifics of the course are unknown.

*Level of Service*

Based upon course titles, unknown if this program addresses this topic.

*Training*

Course offered that covers this topic, but specifics of the course are unknown.

*Anti-Icing*

Course offered that covers this topic, but specifics of the course are unknown.

*Liquids*

Course offered that covers this topic, but specifics of the course are unknown.

*Application Practices, Varying Application Rates, Use of Deicers at Cold Temperatures*

Course offered that covers this topic, but specifics of the course are unknown.

*Pre- and Post-Storm Meetings to Review Plans and Performance*

Course offered that covers this topic, but specifics of the course are unknown.

*Weather Forecasting/Surface Temperature Information*

Based upon course titles, unknown if this program addresses this topic.

*Enhanced Equipment/Technology*

Course offered that covers this topic, but specifics of the course are unknown.

*Salt Storage and Handling*

Based upon course titles, unknown if this program addresses this topic.

*Winter Maintenance Planning*

Course offered that covers this topic, but specifics of the course are unknown.

*Accountability/Tracking and Reporting*

Course offered that covers this topic, but specifics of the course are unknown.

SASC Certification

The [SASC Training Workbook](#) for operators and winter maintenance contractors covers most of the BMPs endorsed by the Traditional BMPs workgroup. The information below summarizes readily available information from the program’s website. In all cases, this is not a comprehensive representation of the training.

*Plowing Practices*

Suggests that mechanical removal should be the first approach to snow removal. The training covers the benefits of doing so and how to best do it.

### *Calibration*

Topics covered in this section are “the importance of calibration, how to calibrate equipment, how often to calibrate, and the importance of documentation.”

### *Measurement – Measuring Deicer Use*

This is covered during training. No additional details are available.

### *Level of Service*

Based upon readily available information, it does not appear this topic is covered.

### *Training*

In addition to the training described in this section for operators and winter maintenance contractors, SASC provides a similar training for facility owners and operators.

### *Anti-Icing*

This program covers this topic and the various materials for winter road maintenance.

### *Liquids*

The workbook provides guidelines for when it is and is not appropriate to use anti-icing/Direct Liquid Application (DLA). Training covers how one can make his or her own liquid, document procedure, and concentration made. Emphasis is placed on the best temperatures to use each liquid and the advantages and disadvantages of each. The liquids discussed during training are:

- Salt Brine (Sodium Chloride) (23.3%)
- Magnesium Chloride (various concentrations)
- Calcium Chloride (36.0%)
- Agricultural blends mixed with above liquids
- Sugar beets (exclusively mixed with salt brine)
- Corn (mixed with Magnesium Chloride)

### *Application Practices, Varying Application Rates, Use of Deicers at Cold Temperatures*

Application practices are in terms of the “5 Rs of Salt Management.” The “5 Rs” are “Right material,” “Right time,” “Right amount,” “Right place,” “Retain it.” The benefits of having the option for low, medium, and high application rates are discussed. Also covered are how to calculate the amount of salt needed for a given area and the corresponding application rate.

### *Pre- and Post-Storm Meetings to Review Plans and Performance*

Participants are encouraged to have these meetings to review performance and to proactively address known issues.

### *Weather Forecasting/Surface Temperature Information*

SASC training covers the essential weather conditions to monitor and the different types and sources of forecasts.

### *Enhanced Equipment/Technology*

The need to invest in new equipment is discussed in order to implement advanced winter maintenance techniques.

### *Salt Storage and Handling*

General procedures for storage and handling are discussed, as well as how to treat solids and liquids differently.

### *Winter Maintenance Planning*

How to conduct a site assessment is covered. The goal of this assessment is to identify high-risk areas and estimate salt requirements.

### *Accountability/Tracking and Reporting*

This topic is covered under the training's section on Risk Management and Record-Keeping. An example of a daily log sheets is provided and discussed.

### *SIMA Certification*

All of the BMPs are covered as part of the SIMA program. The summary below provides available information from the SIMA member's website. In all cases, this is not a comprehensive representation of the training.

### *Plowing Practices*

"Instruction on best practices for snow plowing techniques" is a key focus of the Advanced Snow Management Plowing Operations course.

### *Calibration*

Calibration is considered a key best practice area by SIMA and is covered in several training courses. "Understanding principles of calibration" is discussed in the Advanced Snow Management Ice Management course; calibration of liquid spray systems is covered in the "Fundamentals of Anti-Icing and Liquids" course; and field operations trainings include a calibration component.

### *Measurement*

Measurement is considered a key best practice area by SIMA.

### *Level of Service*

Defining level of service is included, especially as it relates to designing, communicating, and executing contracts.

### *Training*

The importance of training is highlighted in several SIMA modules including "Assessing Operations and Creating a Hands-On Snow Safety Program" and "Pre-Season Snow Operations Training".

### *Anti-Icing*

Anti-icing is considered a key best practice area by SIMA. "Applying anti-icing and deicing techniques" is a key focus of the Advanced Snow Management Ice Management course.

### *Liquids*

The training materials include a "Fundamentals of Anti-Icing and Liquids" course.

### *Application Practices, Varying Application Rates, Use of Deicers at Cold Temperatures*

"The effects of moisture and temperature on snow plowing strategy" is a key focus of the Advanced Snow Management Plowing Operations course. "Understanding principles of various application rates" is a key focus of the Advanced Snow Management Ice Management course.

*Pre- and Post-Storm Meetings to Review Plans and Performance*

This topic is covered through SIMA training modules like “Post-Snow Season Review”.

*Weather Forecasting/Surface Temperature Information*

This topic is covered through SIMA training modules like “Making Weather Work for You”.

*Enhanced Equipment/Technology*

This topic is covered in publications such as “Tech innovations clear paths to a better way” and training modules like “Upfitting Vehicles for Snow Management”.

*Salt Storage and Handling*

Salt storage and transport is considered a key best practice area by SIMA. Storage of liquids is discussed in the “Fundamentals of Anti-Icing and Liquids” course.

*Winter Maintenance Planning*

The importance of pre- and post- season planning are underscored in multiple courses and modules offered through SIMA.

*Accountability/Tracking and Reporting*

Tracking and reporting is considered a key best practice area by SIMA. “The importance of onsite documentation of operations” is highlighted in the Advanced Snow Management Core Principles course. Field operations trainings include discussion of the importance of verification and documentation.

*SWiM Certification*

All of the BMPs are covered as part of the SWiM program. A 100-point matrix of policy guidelines is used to ensure that winter maintenance materials use is optimized (Sexton 8/27/19). The program is focused around a target application rate, working to reduce it, and verifying material use via technology. The information below summarizes information obtained from a phone interview with the program’s founder. In all cases, this is not a comprehensive representation of the training.

*Plowing Practices*

Topic covered by this program, but specifics are unknown.

*Calibration*

Topic covered by this program, but specifics are unknown.

*Measurement*

Topic covered by this program, but specifics are unknown.

*Level of Service*

Topic covered by this program, but specifics are unknown.

*Training*

Topic covered by this program, but specifics are unknown.

*Anti-Icing*

Topic covered by this program, but specifics are unknown.

*Liquids*

Topic covered by this program, but specifics are unknown.

*Application Practices, Varying Application Rates, Use of Deicers at Cold Temperatures*

Topic covered by this program, but specifics are unknown.

*Pre- and Post-Storm Meetings to Review Plans and Performance*

Topic covered by this program, but specifics are unknown.

*Weather Forecasting/Surface Temperature Information*

Topic covered by this program, but specifics are unknown.

*Enhanced Equipment/Technology*

Topic covered by this program, but specifics are unknown.

*Salt Storage and Handling*

Topic covered by this program, but specifics are unknown.

*Winter Maintenance Planning*

Topic covered by this program, but specifics are unknown.

*Accountability/Tracking and Reporting*

Topic covered by this program, but specifics are unknown.

## References

The information in this document was compiled using readily available web-based information and existing materials in the sources listed below.

1. Accredited Snow Contractors Association. 2016. Course Selection. <http://learning.ascaonline.org>. Accessed 8/21/2019.
2. American Public Works Association. 2019. APWA's Winter Maintenance Supervisor Certificate Workshop (workshop handout).
3. Sexton, Phill. WIT Advisors. Personal Communication. 8/27/2019.
4. Smart About Salt Council. 2018. Training Workbook. [www.smartaboutsalt.com/resources/Documents/Training%20Workbook%2020180222v3.pdf](http://www.smartaboutsalt.com/resources/Documents/Training%20Workbook%2020180222v3.pdf). Accessed 8/21/2019.
5. Snow and Ice Management Association. Members access at [www.sima.org](http://www.sima.org). Accessed 11/6/2019.