

Winter Maintenance (Snow and Ice Control) Training Resources

As of September 14, 2012

Name	Resource Type	Duration	Audience	Difficulty Level	Description	Cost	Contact
Snow and Ice Refresher Manual	Participant manual	56 pages	Experienced operators and operations managers	Intermediate	Participant manual for equipment course taught through Ohio DOT/LTAP.	No cost	NLTAPA Resource Database, http://www.ltap.org/
Graphics Collection	Photographs	Thousands of photos	All audiences	Basic	Gallery of photos from LTAP contributors relevant to snow and ice removal as well as many other transportation topics.	No cost	NLTAPA Graphics Collection, http://www.ltap.org/
City of Morgantown Snow Plow Painting Program	Newsletter article	3 pages	LTAP staff, public works directors, elected officials, community members, etc.	Basic	Article that details the City of Morgantown, West Virginia's painted snow plow outreach program aimed at area school students. Guidelines are also provided listing suggested steps for public works agencies wanting to start a similar program.	No cost	NLTAPA Resource Database, http://www.ltap.org/
Small Highway Department Management	Workbook	92 pages	Recently elected or appointed town/village highway/public works officials.	Basic	This workbook is a guide for those managing small highway departments and covers teamwork, budget management, scheduling projects, setting up snow and ice control operations and handling complaints. Cornell Local Roads Program.	No cost	NLTAPA Resource Database, http://www.ltap.org/
A Snow Plow - Cool!	Video	9 minutes	Second/Third grade children	Basic	Provides an understanding of the dangers of building snow forts next to the streets, building forts or tunnels with roofs, sliding into the streets and other safety issues around snowplows. Minnesota LTAP.	No cost	NLTAPA Resource Database, http://www.ltap.org/
Winter Maintenance - Snow and Ice Control	Presentation materials (PPT)	8 hours	Local (municipal and county, primarily) snow/ice fighters and managers, as well as elected officials.	Intermediate	Six module workshop covers the full range of snow and ice removal and control, including program development, planning, pre-season activities, in-season operations, post storm activities, and post season activities. Delaware T ² Center.	No cost	NLTAPA Resource Database, http://www.ltap.org/
Snow and Ice Control Workbook	Workbook, Handouts, Training Outline, Checklists	176 pages (total)	Highway and public works officials, foremen and crew supervisors.	Basic	The workbook provides an overview of snow and ice control operations including administrative and legal issues, equipment and materials, strategies for snow and ice control and resources. The handouts are a collection of materials suitable for use in a training workshop or as a source of information. The training outline can be used to develop tailgate safety briefings, agency training	No cost	NLTAPA Resource Database, http://www.ltap.org/

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					workshops, and agency plans and policies. Cornell Local Roads Program.		
Salt Mixing to Achieve Optimum Results	Build a Better Mousetrap	N/A	State, regional, and county personnel who manage snow and ice materiel.	Intermediate	Home-made solution for stretching salt dollars. They developed a means to mix the salt with a fine limestone at a 50/50 ratio, and then add a deicing liquid to it.	No cost	NLTAPA Resource Database, http://www.ltap.org/
Modified Salt Chute	Build a Better Mousetrap	N/A	State, regional, and county personnel who manage snow and ice materiel.	Intermediate	Home-made solution for better road application of material. By bypassing the truck’s salt spinner, this chute allows for maximum flow of a material onto the middle of the roadway, increasing the effectiveness of the material and allowing the brine solution to work more efficiently. Tests show greatly reduced scatter and experience has shown a reduction in the amount of material used.	No cost	NLTAPA Resource Database, http://www.ltap.org/
Curb Cleaner	Build a Better Mousetrap	N/A	State, regional, and county personnel who manage snow and ice materiel.	Intermediate	Home-made solution for removing accumulated snow in urban parking lanes.	No cost	NLTAPA Resource Database, http://www.ltap.org/
Complete Salt Conveyor System	Build a Better Mousetrap	N/A	State, regional, and county personnel who manage snow and ice materiel.	Intermediate	Innovative use of existing equipment to stack salt into a dome quickly to avoid delaying the drivers delivering the salt. Drivers are paid by the load delivered and will haul to agencies that are most efficient at offloading.	No cost	NLTAPA Resource Database, http://www.ltap.org/
Winter Roadway Maintenance Computer-Based Training (CBT)	DVDs	43 hours	State, regional, and county personnel who manage or execute snow and ice response.	Basic	Nine DVDs, as follows: <ul style="list-style-type: none">• Anti-icing / RWIS (24 hours)• Selecting Snow & Ice Control Materials to Mitigate Environmental Impacts (2 hours)• Equipment Maintenance (2 hours)• Proper Plow Techniques (2 hours)• Deicing (4 hours)• Blowing Snow Mitigation (3 hours)• Winter Maintenance Management (2 hours)• Performance Measures for Snow and Ice Control Operations (4 hours)	No cost (NLTAPA Clearinghouse)	NLTAPA Resource Database, http://www.ltap.org/ AASHTO, http://www.transportation.org/sites/sicop/docs/CBT_Flyer_v2b%5B1%5D.pdf
Maintenance Training Series: Weather-related Operations	Web based	60 minutes	State, regional, and county personnel who manage operations programs	Basic	While the majority of the Weather-related Operations course concentrates on snow and ice storms, many of the elements apply to other weather events as well, such as tornadoes,	No cost	National Highway Institute: available on

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COURSE NUMBER: FHWA-NHI-134109H			and deal with oversight and quality assurance across broad geographic areas; also those involved with handling materials, scheduling, budgeting, and planning.		hurricanes, and flooding. In any weather event, agencies need to restore roadways and bridges and to ensure they are safe for motorists. Participants learn about the planning requirements for an effective storm response, including scheduling and training personnel, identifying equipment needs, executing dry runs, and the additional requirements posed by a multi-day storm event. This training assists participants with planning and responding effectively to all weather-related operations.		internet at: www.nhi.fhwa.dot.gov/
Principles and Tools for Road Weather Management COURSE NUMBER: FHWA-NHI-137030	Instructor Led Training	1 day	Transportation professionals in highway maintenance and/or highway operations	Basic	Provides training to develop tools and strategies for addressing road weather problems. Includes overview of the types of road weather problems and their associated costs, as well as basic meteorology for non-meteorologists. Participants are exposed to various strategies for addressing road weather problems, including Road Weather Information Systems (RWIS) and the development of crosscutting decision support systems to respond effectively to weather situations. In addition, road weather solutions unique to maintenance management, traffic management, traveler information, and emergency management are discussed.	\$300 per participant – 20 participants minimum, 30 participants maximum	Available on internet at: www.nhi.fhwa.dot.gov/
Manual of Practice for an Effective Anti-icing Program: A Guide For Highway Winter Maintenance Personnel Publication No. FHWA-RD-95-202	Document	72 pages	Snow/ice fighters and managers	Intermediate	Provides information for successful implementation of an effective highway anti-icing program. It is written to guide the maintenance manager in developing a systematic and efficient practice for maintaining roads in the best conditions possible during a winter storm. The manual includes recommendations for anti-icing practices and guidance for conducting anti-icing operations during specific precipitation and weather events.	No cost	Federal Highway Administration, http://www.fhwa.dot.gov/reports/mopeap/eapcov.htm
Tort Liability of Highway Agencies	CD Download	13 articles	Snow/ice managers, as well as elected officials and representing attorneys.	Advanced	Covers basic theories of tort liability of public transportation agencies, activities that give rise to transportation tort liability, immunities and defenses, trial preparation, procedural consideration, and shifting or sharing tort liability.	No cost	Transportation Research Board, http://www.trb.org/Publications/Blurbs/152200.aspx
Guide for Snow and Ice	Document	256 pages	Developers of winter	Intermediate	A comprehensive overview of a snow and ice	\$25 (member)	AASHTO

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Control			maintenance training materials and operational control plans		control program, it describes the purpose of snow and ice control and how to achieve an appropriate level of service, including the importance of involving other jurisdictions, the media, emergency management services, and the public in developing policies and practices to provide the level of service. It encourages an organizational culture that promotes innovative practices and procedures to improve operations, reduce costs, and provide a safe environment for road users. Chapters include personnel practices, equipment types and capabilities, weather information, and the materials and chemicals for snow and ice removal. 1999.		Bookstore, www.transportation.org
Snowfighters	Video	21 minutes	Snow/ice fighters and managers, as well as elected officials.	Basic	A comprehensive training video for use by snowfighters whose job it is to keep traffic safely moving when snow and ice make it very difficult. The booklet explains basics of snow removal, equipment preparation and maintenance, salt application rates, salt vs. abrasives, fuel consumption, history and uses of salt, etc. in an informative, interesting manner.	\$20	Salt Institute, http://www.saltinstitute.org/Publications-A-V/Snowfighters-video
Winter Maintenance Training CD set	Presentation materials (five modules)	8 hours	Local government public works technical personnel from the Public Works Director and Engineer, to the Road/Street Superintendent and public works technicians.	Basic	This two CD set contains five snowfighter training programs in MS PowerPoint, four PDF and MS Word format handout documents. Plus e-copies of Salt Institute's winter maintenance training materials. Developed in cooperation with LTAP Centers.	\$20	Salt Institute, http://www.saltinstitute.org/Publications-A-V/Winter-Maintenance-Training-CD-set
The Snowfighter's Handbook	Document	27 pages	Snow/ice fighters and managers, as well as elected officials.	Basic	Manual for winter maintenance. Includes pre-winter planning, equipment scheduling and maintenance, instruction in regard to special plowing and spreading problems, and environmental considerations are addressed.	No cost	Salt Institute, http://www.safewinterroads.org/wp-content/uploads/2011/08/The-Snowfighters-Handbook.pdf
Guidelines for the Selection of Snow and Ice	Document	211 pages	Developers of winter maintenance training	Advanced	In-depth operational and performance discussion of chemicals and abrasives, juxtapositioned with	No cost	Transportation Research Board,

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Control Materials to Mitigate Environmental Impacts NCHRP Report 577			materials		environment and infrastructure effects. Includes considerations of sodium chloride, calcium chloride, magnesium chloride, blended chlorides, calcium magnesium acetate, potassium acetate, agricultural by-products, manufactured organic materials, urea, and abrasives. 2007.		http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_577.pdf
Snow and Ice Control: Guidelines for Materials and Methods NCHRP Report 526	Document	50 pages	Developers of winter maintenance training materials	Intermediate	Cover an array of winter maintenance topics, including level of service, operational consideration, performance measures, methods and materials relating to level of service choices, influencing factors, application rates, and weather information systems. 2004.	No cost	Transportation Research Board, http://onlinepubs.trb.org/Onlinepubs/nchrp/nchrp_rpt_526.pdf
Winter Maintenance Technical Peer Exchange, A Final Report FHWA 2304P63420031000 Harrisburg, PA; March 2005	Document	70 pages	Developers of winter maintenance training materials	Intermediate	Results of a 2½ day technical peer exchange involving FHWA, two DOTs, twelve LTAPs, the Salt Institute, and Penn State University. Topics included polices, strategies, training options, technical clearinghouses, LTAP roles, technical issues such as abrasives and chemical use, introducing new technologies, legal issues, and risk management.	No cost	Mark Sandifer, mark.sandifer@hwa.dot.gov Matt Carter, matheu@udel.edu
APWA's North American Snow Conference	Conference and training	4 days	Snow/ice fighters and managers, as well as elected officials.	Varies	The 2013 Snow Conference will bring together more than 1,500 snowfighters from cities and townships, county and rural street divisions, and state and provincial departments of transportation. It's four days of education and networking, featuring an exhibit floor with the newest equipment and products available, quality education programs and technical tours, and opportunities to exchange ideas with manufacturers, distributors, consultants and other public works professionals. The Snow Conference website with full program, travel and registration information will be available in December 2012. April 7 - 10, 2013; Charlotte Convention Center, Charlotte, North Carolina	\$425 (2012 Conference, members)	American Public Works Association, http://www.apwa.net/snow/
Effective Use of Chemicals and Abrasives for Winter Road Maintenance	Streaming video	2 hours	Managers of winter maintenance operations, as well as elected officials.	Basic	Learn the basics of chemical and abrasive usage for snow and ice control, review new chemicals, and gain an understanding of how pre-wetting and anti-icing can be effective for improved safety of local and state roads. This course will cover: Snow and ice impacts on road safety; Basic use of	No cost (members)	American Public Works Association, http://www2.apwa.net/

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Click, Listen & Learn					salt and sand; Pre-wetting and anti-icing; Alternative chemicals including magnesium chloride, calcium chloride, and more.		
Performance Measures for Winter Maintenance	Streaming video	2 hours	Managers of winter maintenance operations, as well as elected officials.	Basic	Presents how performance measures can be developed and applied in the field of winter maintenance. Four critical factors to be considered in developing performance measures in winter maintenance include: (1) the severity of the storm that the agency faces must be determined; (2) the effectiveness of the chosen tactics used to combat the storm; (3) the effort expended in fighting a given storm must be fully and accurately measured; and (4) the results or outcomes of the agency efforts must be measured in a reliable, objective, and repeatable way to assess strategic effectiveness. October 2009.	No cost (members)	American Public Works Association, http://www2.apwa.net/
Click, Listen & Learn							
Lessons Learned From Extreme Winter Events	Streaming video	2 hours	Local (municipal and county, primarily) snow/ice fighters and managers, as well as elected officials.	Basic	This program details how agencies in Washington, D.C. and Denver, CO have dealt with major winter events and what they changed because of it. They discuss actions taken such as implementing new programs (anti-icing, pre-wetting, contracting etc.) and looking for best practices (new routes, using liquids, new equipment). Consideration will be given to such items as: how did the budget change, who implemented the change, how did staff react and how the public perceived the changes. October 2011.	No cost (members)	American Public Works Association, http://www2.apwa.net/
Click, Listen & Learn							
Liquid Use in Winter Maintenance	Streaming video	2 hours	Managers of winter maintenance operations	Basic	This session provides insights from both seasoned and new liquid users and answers several basic questions such as: How are liquids used? What are the benefits? When is it appropriate to use liquids? When is it not? What infrastructure is required? What are all these additives and should I use them? Will liquids save money, provide safer roads, or both? What climatic conditions affect the use of liquids and how to get started. March 2012.	No cost (members)	American Public Works Association, http://www2.apwa.net/
Click, Listen & Learn							
A Better Understanding of Chemical Deicing	Streaming video	46 minutes	Managers of winter maintenance operations	Intermediate	Let’s take the mystery out of the science behind chemical deicing. End-users need to know not only how environmentally-friendly and cost effective different products are, but also how deicer performance relates to factors such as	No cost (members)	American Public Works Association, http://www2.apwa.net/

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					eutectic temperature, eutectic concentration, deicer freezing point, heat-releasing properties.		
Innovative Winter Maintenance Practices of High-performing Agencies	Streaming video	58 minutes	Managers of winter maintenance operations	Intermediate	Learn how technologies are being deployed in cutting-edge communities. Don't miss this exploration of best management practices across the nation.	No cost (members)	American Public Works Association, http://www2.apwa.net/
Using the Sperry - Piltz Ice Accumulation Index to Prepare for the Storm	Streaming video	50 minutes	Managers of winter maintenance operations	Advanced	In response to eight major ice storms since 2000, an ice algorithm was developed to predict (3-4 days in advance) not only the footprint of the approaching storm but also the total ice accumulation to expect. This index can be used to predict data that will allow sand/salt crews to be pre-staged days in advance but also alert utilities and emergency preparedness teams.	No cost (members)	American Public Works Association, http://www2.apwa.net/
The Fundamentals of Deicing Past and Present in the United Kingdom and North America	Streaming video	48 minutes	Managers of winter maintenance operations	Intermediate	Examines alternative approaches for deicing depending on climate and geography, how deicers work, how various deicers work in different situations, when and where deicers should be applied. Special focus will be given to use of additives in rock salt to enhance deicing performance. Storage practices, spread rates and patterns, melting capacities, and anti-corrosion properties will also be discussed.	No cost (members)	American Public Works Association, http://www2.apwa.net/
Write it Right: Developing an Effective Winter Operations Snow and Ice Control Manual	Streaming video	45 minutes	Managers of winter maintenance operations	Intermediate	Winter maintenance activities are so much easier when roles, policies, and procedures are clearly delineated. Plus – no manual today is complete without a component addressing the National Incident Management System (NIMS) requirements.	No cost (members)	American Public Works Association, http://www2.apwa.net/

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