



NCHRP 06-18 Guide for Snow and Ice Control Operations

2021 AASHTO Committee on Maintenance
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Background

- 1999 AASHTO Guide for Snow and Ice Control needs updated
- Incorporate recent advancements in all aspects of snow and ice control
- Develop guide applicable to agencies of various levels in all climactic regions
- Provide best practices, example information, and cost-effective measures for snow and ice control
- Anticipated completion date end of 2021

Guide Outline

Chapter	Title
1	Introduction
2	Snow and Ice Control Operations and Strategies
3	Levels of Service
4	Personnel
5	Snow and Ice Control Equipment
6	Materials Handling, Storage, and Application
7	Technologies
8	Road Weather Information
9	Safety and Liability

Guide Development

- Use literature review and existing guide as starting point
- Significant outreach to practitioners
- Add additional information from reviews
- Writing and formatting style as guide
- All chapters will include introduction and references
- Anticipated completion at the end of 2021

Chapter 1: Introduction

- Need and purpose of guide
- Target audience
 - Agencies of all levels and all climatic regions
- Updates since original guide
- Topics covered in the following chapters

Chapter 2 Outline

- Impacts of Winter Weather
- Snow and Ice Control Policy
 - *Administration of Snow and Ice Control*
 - *Defining a Snow and Ice Control Policy*
 - *Levels of Service Definitions*
 - *Road Closures and Restrictions*
 - *Contracting*
 - *Environmental Issues*
- Prewinter Preparations
 - *Staffing*
 - *Equipment*
 - *Materials*
 - *Facilities*
 - *Personnel*
 - *Operations and Strategies*
 - *Communications, Coordination, Outreach*

Chapter 2 Outline

- Pre-Storm Preparation
- During-Event Operations
 - *Weather and System Monitoring*
 - *Personnel and Equipment*
 - *Plowing*
 - *Material Application*
 - *Complex Geometries and Non-Standard Features*
- Post-Storm Activities
- Special Considerations
 - *Avalanches*
 - *Snow and Ice Control as Part of the Project Development Process*
 - *Procurement*
 - *Benefit-Cost Analyses*

Chapter 2: Operations and Strategies

- Snow & Ice Control Policy and Administration
 - Examples of practices and policies
 - Incident command structure for major events
- Includes, pre-winter, pre-storm, during storm, and post-storm activities
- Fixed Automated Spray Systems (FAST)
 - Also allow for specialized chemicals to reduce chloride contamination
- Turn-around markers for operators
- Mechanical removal of snow instead of plowing

Chapter 2: Operations and Strategies

- Complex geometries and non-standard features
 - ADA requirements, sidewalk requirements
- Coordination between agencies
 - Turnarounds, road closures, agreements
- Need to balance information in this chapter with other chapters
 - Mention information for topics and reference to chapters for detailed information
- Added section for special considerations to include avalanches, Snow & Ice Control as part of project development process, procurement, and benefit-cost analyses

Chapter 3: Levels of Service

- Levels of Service Measures
 - *Speed Based*
 - *Road Condition Based*
 - *Operations Based*
 - *Public Input*
- Data and Systems Considerations/Requirements
 - Include traveler information, pathfinder, and public input
 - Grip/friction-based measures

Chapter 4: Personnel

- Recruitment, Development, and Advancement
 - Assist with obtaining CDL
- Training
 - *In-Vehicle and Simulator Training*
 - *Practice and Dry Runs*
 - *Certification Programs, Workshops, and Conferences*
- Contract personnel
 - *Full crews and supplemental staff*
 - *Training needs*
- Health and Safety Issues

Chapter 5: Equipment

- Trucks
- Loaders
- Graders
- Snow Blowers
- Tow Behind Plows
- Snow Melters
- Snow Brooms
 - Saddle tanks
- Plows
- Plow blades
 - Include advanced cutting edges
 - Safety, time, and material use benefits
- Spreaders
 - Slurry spreaders, Uni/municipal body
- Maintenance and Washing
 - Corrosion prevention

Chapter 6: Materials

- Acquisition
- Delivery
- Handling and Storage
- Application
 - Anti-icing
 - Deicing
 - Rates
- Environmental considerations for low/no salt areas
- Include liquid only routes used throughout storms
- Distinguish information for solids, prewetted solids, and liquids
- Material acquisition best practices
- Storage facilities in compliance with environmental regulations
- Use of drones to measure stockpiles

Chapter 6: Materials

- Mention qualified product list as a resource but not necessarily required to meet standards
- Tables showing price and temperature ranges for materials will not be included in guide
 - General guidance about application rates and pavement temperatures

Chapter 7: Technologies

- GPS/AVL
 - Other communication protocols (5G, DSRC, microwave)
 - Coverage area
- Sensors
- Plow Tracking and Reporting Systems
- Driver Assistance Systems
- Maintenance Decision Support Systems (MDSS)
- Automated vehicles
 - Future implications, used at airports

Chapter 8: Road Weather Information

- Road Weather Information Systems (RWIS)
 - Infrared road grip
 - Mobile RWIS
- Road Surface Condition Monitoring
- Fixed RWIS provides Ground Truth while Mobile is less expensive
 - Balance between both for optimal system
- Weather Forecasting versus Ground truth

Chapter 9: Safety and Liability

- Safety Training Programs for Snow and Ice Control Personnel
- Personnel Safety
 - PPE available to operators
- Public Safety
 - Messaging, Pathfinder
 - Integration of S&IC personnel, network operations units, and public
- Vehicle Visibility and Technologies
 - Some is dictated by law
- Emergency Preparedness
- Liability
 - Need to follow Snow & Ice Control Policy

Appendix

- A. Glossary of Terms
- B. Sample Snow and Ice Control Plans
- C. Sample Public Information Releases and Messages
- D. Sample Contract for Services
- E. Sample Specifications for Equipment
- F. Sample Specifications for Materials
- G. Training Resources