Winter Weather Operations Plans

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Winter Weather Affects Most of Us

Over 70% of U.S. roads and 70% of population are in the region with 5” or more of annual snow and ice.

Source: FHWA Road Weather Management Program website
Note: Over 65% of roads are maintained by local jurisdictions.
The Cost of Winter Weather Operations

Winter road maintenance accounts for:
- 20 percent of state DOT maintenance budgets.
- State and local agencies spend over $2.3B annually on this.
- Millions of dollars spent annually to repair infrastructure damaged by snow and ice.

ref: FHWA Road Weather Management Program, Snow and Ice

Winter Weather

Effects
- 70% of goods move by truck; delays cost in billions annually.
- Crashes (injuries, fatalities, property damage).
- Hinders emergency services and utilities.
- Disruption of normal life for millions.
Influences on Winter Operations Planning

Factors that affect winter maintenance operations:
- Climate
- Regulatory Mandates
- Economic conditions
- Workforce
- Technology

Changes create a “New Normal” that agencies must anticipate, assess, adjust, adapt to and act upon.

Winter Weather…Scope of the Situation

Problems:
- reduction in workforce
- loss of experience with retirements
- aging equipment
- little or no increase in funding
- increasing severity of storms

Solutions:
- total review of operations needed
- Levels of Service, Priorities and Routes must change
- revise policies, procedures, processes
- new materials, equipment, technology
- Expanded training for agency staff and contractors
Time for Decisions

**So What To Do Now?**

- Are policies, plans, procedures, processes and practices reflective of current situations?
- Are resources sufficient to meet expectations?
- If there is a shortfall or gap what are the options?
  - Acquire more resources
  - Use existing resources more efficiently
  - Adjust expectations
  - Ignore and continue as always.

The Benefits of a Plan and Manual

- Single complete, current, accessible document
- Establishes authority and responsibility
- Outlines organizational structure
- Defines goals, service levels, priorities, etc.
- Describes strategies, tactics and resources
- Reduces liability exposure
- Contributes to consistency and continuity of operations
- Guide for other emergencies and planned events.
The Planning Process

• Identify core group and key stakeholders
• Define the goals and objectives
• Review prior season(s)
• Evaluate policies, procedures, practices
• Rank actions by priority, necessity and feasibility
• Develop action plan and assign tasks
• Submit final plan for approval by higher officials

Key Points…

“Don’t say what you can’t or won’t do.”
• YOUR plan tailored to YOUR agency’s situation
• Expectations vs. Reality
• Identify resources and restraints
• Determine true capability for typical situations
• Project 2-5 years ahead
• For worst-case scenarios, state likely options
Base on Your Typical Climate, Conditions

Legal and Statutory

What You Do and Why You Do It:

• Statutes, ordinances or regulations establishing responsibility and authority
• Official policy/ resolution enacting the plan
• Exceptions
• Disclaimers
• Prohibitions
• Emergency Powers
• Mutual Aid
Description of Jurisdiction

- Geographic and demographic characteristics (area size, winter climate, topography, population, etc.)
- Road System Classifications and Priorities (highway, arterial, collector, residential, rural)
- Major nodes (employment, commercial, government educational, institutional, transportation)
- Identify roads or streets through or adjacent to jurisdiction that are maintained by others

Levels of Service

Define Level Of Service:
“Desired, normally achievable condition of road surfaces at different times during and after typical winter events.”
- core of winter operations planning
- varies according to priority classifications
- dependent upon available resources
- contingent upon conditions
- be descriptive, use illustrations
Levels of Service

sample definitions:

- "The best level of service we strive for on major roads is bare or clear pavement from curb-to-curb."
- "The minimum level of service we strive for is clear wheel tracks on through lanes and left-turn lanes."
- "For residential streets and low-volume roads the acceptable level of service is to provide a navigable surface; the street may still have snow or packed ice."

"Our goal is to provide adequate mobility and safety for properly equipped and prudently operated vehicles within a reasonable time after the end of a storm."

General Strategies and Tactics

- State basis for the plan (ex: APWA, AASHTO, TRB)
- Describe strategy based on typical conditions (Plan A)
- Describe strategy for unusual conditions (Plan B, C…)
- Explain treating bridges; steep hills, sharp curves, etc.
- Explain anti-icing and de-icing; when plowing begins
Resource Allocation

Goal is to maximize efficient and effective use of all resources:

• includes personnel, vehicles, equipment, materials, etc.
• assess condition, capability and availability
• match with desired LOS
• based on objective, measurable factors
• adjust to fill gaps

Route Optimization

Existing routes may be outdated, inefficient due to changes:

• lane-miles
• maintenance responsibility for segments
  – classification and priority of streets
  – basis (time, length or criticality)
  – traffic volumes and/or patterns
  – traffic control system
  – chronic trouble spots
  – begin and end points
• gaps and overlaps
• material selection and application rates
• plowing and spreading methods
• fleet capability
Command and Control

Who’s In Charge?

- clear lines of responsibility and authority
- relationship with other agencies
- identify “Command Central” location
- use Incident Command System model
- avoid confusion, contradiction and conflict

NOTE: A winter operations plan is an emergency operations plan and should be NIMS-based.

Winter Operations Plan a model for other emergency plans.

Organization

- List personnel by position, facility, and shift**
- List by name and contact information
- Shift hours/ schedule
- Brief position duties**
- O-chart **
- Relationship- connection with other departments, agencies**

** (may be attachment)
Personnel

- Notification Process to Employees/ Contractors
- Responsibility to report for duty in adverse situations
- Fitness for duty
- Requesting absence/ leave
- Required clothing, PPE and other items
- CDL/ driver license; DOT card (if required)
- where/when rest, relief and meal breaks
- Maximum continuous work hours
- Time-keeping (reference agency policies and rules)
- Personal cell-phones restrictions
- Emergency lodging and transportation

Training and certification

- Annual refresher for all staff including contractors
- Intensive training for new operators (MnDOT model)
- Remedial training for those having difficulty
- Mid-season briefing on changes
- Skill competitions (“Road-eo”)
- No national standards
Vehicles, Equipment and Machinery

- Inventory; type, number, condition, age
- Annually inspect for maintenance needs
- Determine capability of each unit
- Pre-season maintenance, repair
- Explore retrofitting other vehicles
- Borrow, rent, purchase
- Reserve or “mothball fleet”

Materials

- More reliance on anti-icing
- Less use of abrasives
- Different chemicals for different situations
- Improvements in equipment technology
- Advances in application methods
- “more is not better”
- Document reasons for selection and use
Contracting

- Determine how used; as regular element or as "reserves"
- Contracts need to be very specific
- Pre-qualification recommended
- Bonding, insurance, indemnification
- Quality control; objective standards
- Dispute resolution
- Payment process
- Emergency contracting for special assistance such as hauling

Weather Information

Sources used for deciding when and what to do:

- NOAA/ NWS
- The Weather Channel
- private weather services
- RWIS
- local TV and radio
- MDSS
- upstream agencies
Liability and Risk Management

- Reduce liability exposure by proactive measures.
- Actions/decisions defensible if *reasonable* and in plan.
- Keep good records.
- Pre-season inspection of streets and roads to note hazards and existing damage/deficiencies
- Policies and Procedures for claims

Communications

- Radios
- Phone systems, land line and cellular
- Pagers
- AVL
- E-mail, web-based intakes, texting, social media
- Reverse 9-1-1
Public Relations

- Media and Public Relations
  - designated spokesperson
  - press releases
  - interviews, briefings
  - web sites
  - advance info
  - community outreach events
- Customer Service
  - Handling complaints and requests

Sustainability In Winter Operations

Environmental benefits
- reduce adverse impacts on air, soil, plants, water, pavement, bridges, vehicles
- Conservation of resources by:
  - precise applications
  - recycling
  - proper storage

Fiscal benefits
- smart practices reduce direct annual costs
- Better methods and materials for longer equipment life
Facilities

Activities during winter operations busier than other times

- identify all facilities, including auxiliary or temporary
- regularly inspect
- check exterior and interior lighting; power outlets
- adequate space for dispatchers and call-takers
- stock prepared food
- emergency power back-up
- signage
- clear vehicle and pedestrian paths

Seasonal Activities

- **Pre-season**
  - Equipment inspection and preparation; calibration
  - Stockpile materials
  - Inspect routes
  - Training
- **Mid-Season**
  - Monitor material usage and storage
  - Clean and repair equipment promptly
  - quality control; identify chronic problems
- **Post-season**
  - Equipment changeover and inspection
  - Cleanup and properly secure excess materials
  - repair roadside damage caused by plowing
Operations

- Plowing procedures and techniques
  - Intersections, interchanges
  - Gravel roads
- Spreading patterns and techniques
- Snow melting and/or hauling
- Benching

Actions

- Alerts and Activations
- Pre-storm
- During Storm
- Post –storm
**Winter Storm Status**

- **GREEN** no adverse weather expected next 96 hours
- **YELLOW** potential for adverse weather next 72 hours
- **BLUE** adverse weather expected within 12 -24 hours
- **WHITE** begin operations within next 4 hours
- **RED** situations critical; curtailed operations
- **BLACK** situation extreme; operations halted
- **GREY** wind-down and clean-up; post-storm work

**Contingencies**

- Ice storm debris clearance
- Intense/ excessive snow rate
- Increased accumulations from successive storms
- Shortage of material
- Shortage of usable vehicles
- Shortage of personnel
- Communications failures
- Loss of facilities
- Flooding caused by ice-jams
- Emergencies
Ready To Write…?

- Prepare an outline
- Decide on format
- Consider the “audience”
- Set aside adequate time
- Avoid overly technical, legal or bureaucratese” language
- Have others review

Objectives

- Comprehensive
- Cohesive
- Clear
- Concise
- Correct
- Current
- Continuous
Change is Constant

Anticipate--- envision next 5 years; identify challenges.
Assess--- determine impacts based on current capabilities.
Adjust --- revise plans, policies, procedures, processes, practices.
Adapt--- be flexible as situations dictate.
Act--- implement changes in operations.

Summary

• Review your winter operation plan
• Consider budgets, resources, climate, laws
• Establish and define realistic Levels of Service
• Emphasize annual training for all
• Sustainability an important element
• Improve communication with public and officials
• Remember that this is a public document
Reference Sources

- **Snow Fighters Handbook**, Salt Institute
- **Guide For Snow and Ice Control**, ASHTTO
- **Winter Highway Operations**, NCHRP Synthesis 344
- **The Basics of Snow and Ice Control**, APWA
- **Manual for an Effective Anti-Icing Program**, FHWA
- CDs:
  - “Crafting a Written Snow Plan”
  - “Developing an Effective Snow and Ice Program”
  - “Performance Measurements for Winter Maintenance”
  - “Ready, Set, Plow”
- CBT series by AASHTO and APWA

For More Information…

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