Effective Winter Weather Operations
Plans for Snow and Ice Control

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The Situation

Challenges:
• reduction in workforce; increased turnover
• loss of experience and institutional knowledge
• aging equipment
• little or no increase in funding
• increasing severity of storms
• demographic shifts

Changes:
• technology and information
• Levels of Service and Priorities must change
• total review of operations needed
The Benefits of a Plan and Manual

- Single complete, current, accessible document
- Establishes authority and responsibility
- 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.
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 capability for typical situations
• For worst-case scenarios, state likely options
• Project 2-5 years ahead
Base on Your Typical Winter Climate and Conditions

Legal

- 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
Level 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
Operations

Processes
• Plowing procedures and techniques
• Spreading patterns and techniques
• Snow melting and/or hauling

Activities
• Pre-storm
• During Storm
• Post–storm
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
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)
Training and Certification

- No national standards
- Annual refresher for all staff *including contractors*
- Intensive training for new operators
- Remedial training
- Skill competitions (“Road-eo”)
- MnDOT model
- APWA Snow Supervisor course
- Clear Roads course in development
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
• base on objective, measurable factors
• adjust to fill gaps
Vehicles, Equipment and Machinery

- Annually inspect for maintenance needs
- Pre-season maintenance, repair
- Assess potential capability enhancement of each unit
- Explore retrofitting other non-typical vehicles
- Borrow, rent, purchase to augment fleet
- 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”
- Calibration essential
- Document reasons for selection and use

*Science and Invention*, Jan. 1925
Contracting

- Determine how used; as “regulars” or “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
Other Resources

- Weather Information Sources

- Facilities

- Communications Systems

- Supply and Support
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
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
Sustainability In Winter Operations

Environmental benefits

- reduce adverse impacts on air, soil, plants, water, pavement, bridges, vehicles
- wise use of resources by:
  - conservation
  - recycling
  - proper storage

Fiscal benefits

- smart practices reduce direct annual costs
- Better methods and materials for longer equipment life
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
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
A Snow Plow We All Like….

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