

# 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.

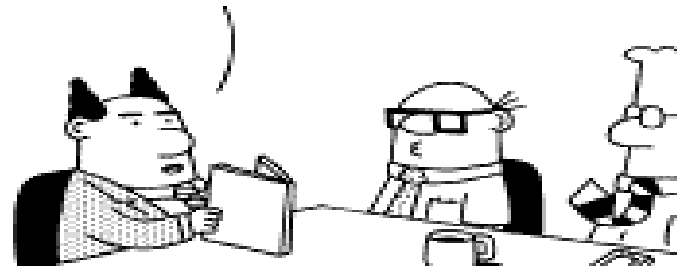


# Key Points

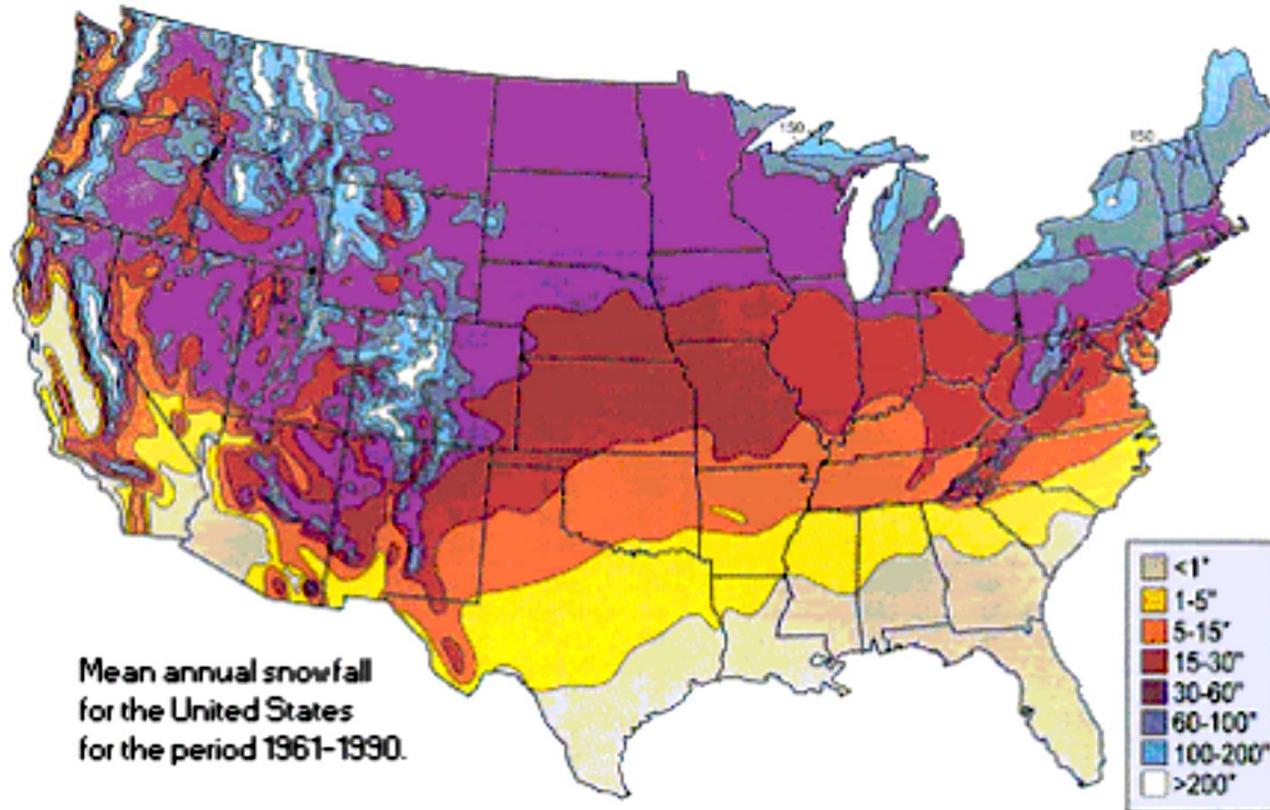
**“Don’t say what you can’t or won’t do.”**

- 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

I FOUND OUR  
FIVE-YEAR PLAN  
FROM FIVE YEARS  
AGO.

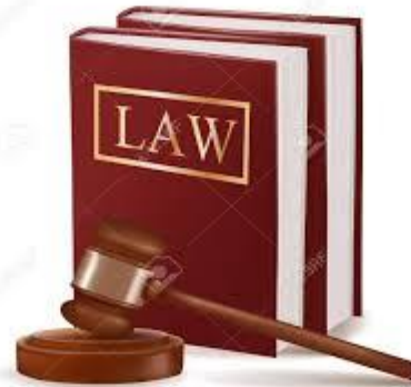


# Base on Your Typical Winter Climate and Conditions



# 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

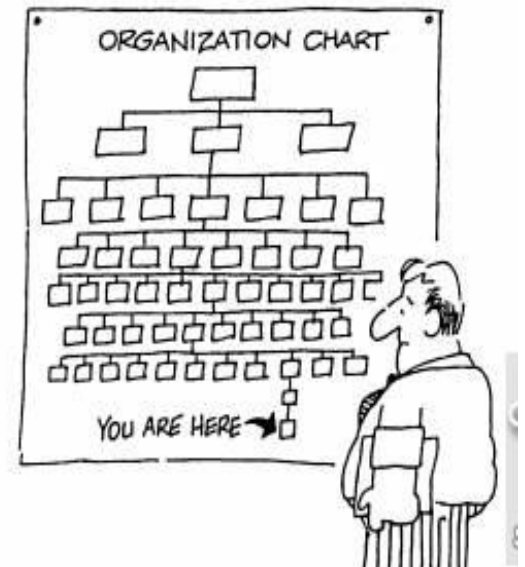


NOTE: A winter operations plan *is* an emergency operations plan and should be NIMS-based.

*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

**Normal Operations**  
**No Snow Predicted**



**Roads Clear**

# 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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