NYSDOT Snow & Ice Operations
WINTRE-MIX Workshop

WEATHER FORECASTING TRIGGERS AND OBSERVED WEATHER RESPONSE TACTICS

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May 2023
Snowbank Graffiti
Courtesy of Pompey in CNY
Operational Goals:
Control of snow and ice is mandated by the **NYS Highway Law Section 12**, which states “The maintenance of State Highways shall include the control of snow and ice…”, and the Snow & Ice control shall “provide reasonable passage and movement of vehicles over such highways.”
NYSDOT Weather Forecasting Triggers and Observed Weather Response Tactics:

- Introduction
- Timing, Coordination and Traffic
- Priority Network
- Snow and Ice 101 (NYSDOT Perspective)
- Science of Salt
- Lake Effect (BUF/BTV)
- Freezing Rain
- Snow + Wind
- Typical Forecasting DOT questions
Priority Highway Network by Region:
Snow & Ice 101

- Prevent the bond of ice to the Pavement.
Science of Salt

- The solution is in the dilution to a solution.
- Temperature & Precipitation
Science of Salt (cont.)

- Temperature is the most influential variable when it comes to the effectiveness of salt and brine.

<table>
<thead>
<tr>
<th>Temperature °F</th>
<th>Pounds of ice melted per pound of salt</th>
</tr>
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<tbody>
<tr>
<td>30°</td>
<td>46.3</td>
</tr>
<tr>
<td>25°</td>
<td>14.4</td>
</tr>
<tr>
<td>20°</td>
<td>08.6</td>
</tr>
<tr>
<td>15°</td>
<td>06.3</td>
</tr>
<tr>
<td>10°</td>
<td>04.9</td>
</tr>
<tr>
<td>5°</td>
<td>04.1</td>
</tr>
<tr>
<td>0°</td>
<td>03.7</td>
</tr>
<tr>
<td>-6°</td>
<td>03.2</td>
</tr>
</tbody>
</table>
Forecasting for NYSDOT

- Confidence (High/Medium/Low)
- Where (Specific Geographic and Elevation detail)
  - North/South of I-90
  - Adirondacks/Catskills
  - Lake Effect I-81 Between Exits (XX-XX)
  - Lake Effect I-90 Between Exits (XX-XX)
  - Precipitation changeover Location(s)
  - System Track & Axis predictions
Forecasting for NYSDOT (cont.)

- **Timing** *(Duration – 3hr cycle time)*
  - Morning commute (7-9 AM)
  - Evening commute (4-7 PM)
  - Weekend timing
  - Holiday Travel
  - Precipitation changeovers Time(s)
  - Daylight timing
Forecasting for NYSDOT (cont.)

- Precipitation type(s)
  - Snow/Sleet/Freezing Rain/Black Ice
    - Expected/Max/Min inches
    - Surface temperature(s) (Before, During, After)
  - Duration
  - Changeovers
  - Moisture content
  - Snow Load + Wind (>30MPH) + Downed tree risk potential (gusts/sustained) timing
Total Hours by Program Area - Statewide
Period Ending: Sunday, February 7, 2021

- Bridge Maint & Repair: 448 hours (0.33%)
- Drainage: 369.5 hours (0.27%)
- Pavement Maintenance & Preservation: 1,724.25 hours (1.28%)
- Rest Area: 459.5 hours (0.34%)
- Safety: 3,188.25 hours (2.37%)
- Snow and Ice Control: 128,353.5167 hours (95.31%)
- Vegetation Control: 0.09%
BEFORE (ANTI-ICING)

- PLANNING
- FORECASTING
  - RATE & TYPE
  - TEMPERATURE
- CYCLE TIME
  - RATE (2-3HR)
- LOCATION/RISK
DURING (ANTI-COMPACTION)

- PLOWING
- SPREADING
  - RATE VS TEMP
  - RATE VS TYPE
- CYCLE TIME
  - RATE (2-3HR)
Post-storm Cleanup
AFTER (DE-ICING)

- RETURNING THE SYSTEM
- TIMING DAY/NIGHT
- BLOWING & DRIFTING
- TEMPERATURE
- WIND
2022–2023 AWSSI: "NY – Buffalo"

Season: 2022–11–13 to 2023–01–13, 62 days
About ETO

Official program created in 2006

Mission Statement: Prepare for, respond to, and recover from all transportation and cyber related hazards.

Core Functions:

- Traffic Incident Management (Regions only)
- Disaster Response & Recovery
- Emergency Planning/Management
- Cyber Security-Related Operations
Overview

• Coordinate Department’s preparedness and response to planned and unplanned events.
  • Statewide Transportation Information and Coordination Center (STICC)
  • Emergency Plans/Procedures
  • Training
  • Reporting protocols
• Coordinate with other state agency partners and the Office of Emergency Management (OEM).
• Ensure DOT assets are secure from cyber and physical threats.
• Ensure staffing and equipment are available and ready to respond to all hazards.
Pre-Event Operations

Prior to an event, several steps occur:

- Weather Calls with NWS/NYS Mesonet
- Coordination Calls (DOT and multi-agency)
- Official Event Creation
- Event PIN / MMS Event ID Created
- Event created in SharePoint, SEERT, AMS, and RSDA
- Statement of Readiness
- Communication with affected Regions
DOT Event Planning Timeline

72 Hours
- Conference Calls
  - National Weather Service (NWS)/Mesonet
  - Multi Agency Call (MAC)
  - Statewide Coordination Call
- Resource Needs Identified
  - Equipment/Personnel
- STICC Pre-Activation Activities
  - PIN/MMS Event ID
  - Create Event in Event Reporting System (ERS)
- Reporting
  - Fleet Readiness Report
  - Asset Management System
  - Operational Plan
  - WTA
  - MMS

48 Hours
- Conference Calls
  - NWS/Mesonet
  - MAC
  - Statewide Coordination Call
- Resource Needs Identified
  - Resources entered in SEERT
  - Equipment Staging Areas
- Reporting
  - Statement of Readiness
  - Fleet Readiness Report
  - Asset Management System
  - Operational Plan Updates
  - WTA
  - MMS
  - SEERT

24 Hours
- Conference Calls
  - NWS/Mesonet
  - MAC
  - Statewide Coordination Call
- Resource Needs Deployed
  - SEERT updated
- Reporting
  - Statement of Readiness
  - Fleet Readiness Report
  - Asset Management System
  - Operational Plan Updates
  - WTA
  - MMS
  - SEERT

12 Hours
- Conference Calls
  - NWS/Mesonet
  - MAC
  - Statewide Coordination Call
- Reporting
  - Statement of Readiness
  - Fleet Readiness Report
  - Asset Management System
  - Operational Plan Updates
  - WTA
  - MMS
  - SEERT

Event Begins
- Conference Calls
  - NWS/Mesonet
  - MAC
  - Statewide Coordination Call
- Reporting
  - Statement of Readiness
  - Fleet Readiness Report
  - Asset Management System
  - Operational Plan Updates
  - WTA
  - MMS
  - SEERT

PIN = Project Identification Number
WTA = Winter Traveler Advisory
MMS = Maintenance Management System
SEERT = Statewide Emergency Event Resource Tracking
Main Office ICS Response

- STICC - Statewide Transportation Information & Coordination Center
  - DOT’s information clearing house for all incidents on the State’s Transportation System.
  - Operates 24 hours a day / 365 days a year
  - Coordinates response activities and communications within DOT as well as with other state agencies.
  - Maintains schedules for ICS staffing.
  - Distributes consolidated status reports every 2 hours.
    - Information on road status, weather conditions, response actions, areas of concern, road closures, and traffic signal outages.
    - Refines and performs QA on regional reports.
    - Emails to predefined distribution lists.
Regional ICS Response

• Each Region activates their Regional Operations Center (ROC) for overall management of the event.
  • Regional focus is on operations and tactical response.
  • ROCs:
    • Coordinate sending/receiving of personnel and equipment.
    • Monitor and gather information for situational awareness.
    • Coordinate with other State agencies, County Reps, Utility Companies, etc.
    • Submit status reports to STICC.
    • Deploy field assessment teams/damage inspectors as needed.
Large Scale Event Operations

During larger events, additional assistance may be requested by locals (Counties).

- New York Responds (NYR) Requests
  - Office of Emergency Management (OEM) may activate Emergency Support Function #1, 3, or 7
- Shared Service Agreements (SSA) for local work
  - Debris / Snow Removal
Post-Event

• After Action Surveys distributed
• After Action Review (AAR)
  • Identify gaps/weakness, strengths, etc.
• Work with local programs for reimbursement, as necessary
  • RSDA II

Photo Source: EmergingRNLeader, 2020
Wish List:

- NYS Storm Severity Index based on Mesonet Observations
- Material Application Effectiveness - performance measurement (AI based on road conditions from forward-facing camera images from plow trucks and subsequent passes)
- Events forecasted for DLA treatments by geographic zone
- Prime DLA locations geographically based on historical events
Questions?

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