

**New Hampshire
Department of Transportation
Transportation Management Center
Road & Weather Program**

**Denise Markow, P.E.
TMC Program Manager
NHDOT**

TMC Functionality

- Lead Agency
- Support Agency
- ITS Program
- R & W Program

Where does the ITS and R&W Program Overlap?

RWIS Sites

VSL's

RWIS Inheritance

Communication Links < 50% active

Atmospheric & Pavement Sensors Off-line

No Monitoring Program

No In-house Maintenance Program

No longer any buy-in from Maintenance Personnel

10+ sites are programmed for construction in FY 2010

Step 1 - Restore Reliability

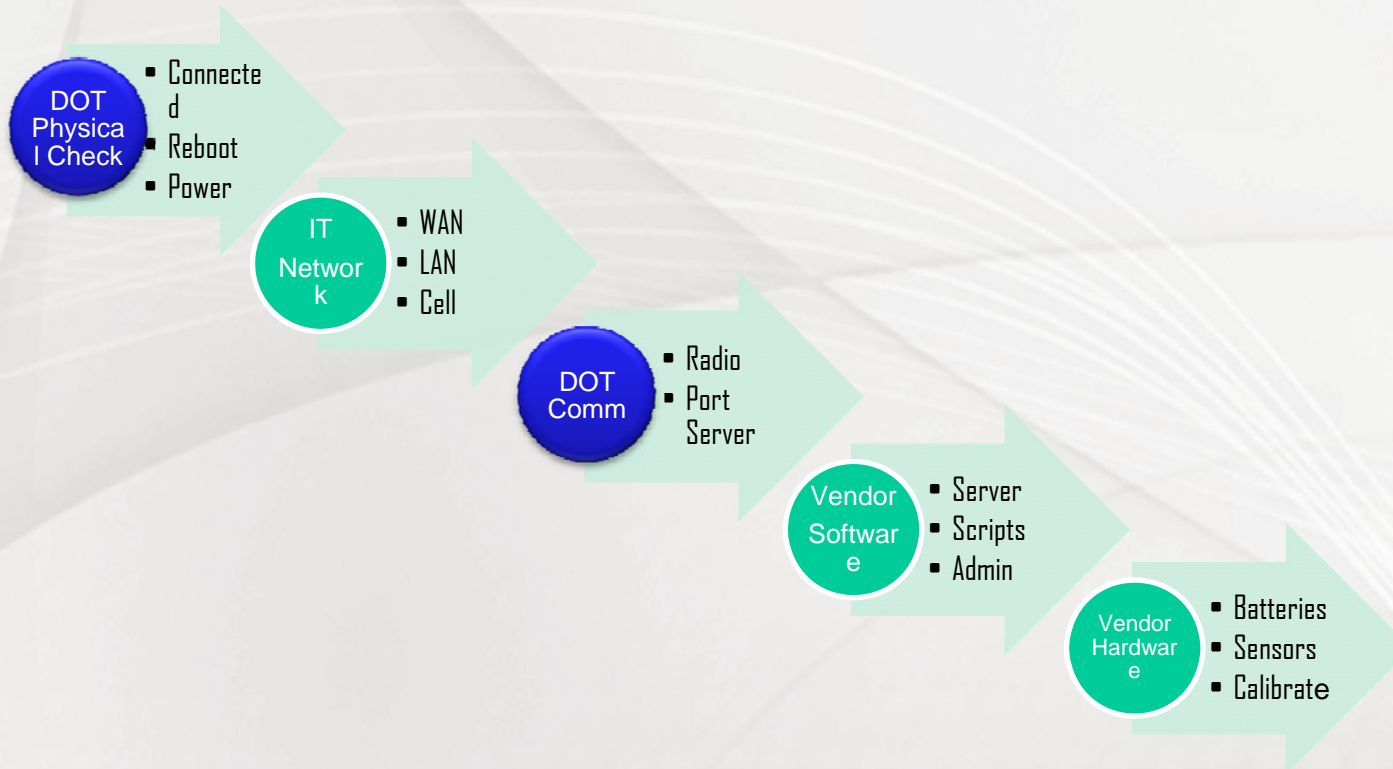
Communication Link System

Atmospheric Sensors

Pavement Sensors

- Started In-house Monitoring
- In-house Maintenance Response < 24 hours
- Today on-line 98%

Monitoring/Maintenance Flow Diagram



RWIS Daily Tracking Sample

4AM	Air Temperature	13 F	Visibility	1.11 miles
4AM	Dewpoint Temperature	9 F	Precipitation Type	None
4AM	Relative Humidity	83%	Precipitation Intensity	None
4AM	Wind Speed (avg)	1 mph	Wind Dir. (avg)	S
4AM	Surface Temperature	12 F	Surface Conditions	Ice Watch

Step 2 - Ground Truth Baseline Data

- RWIS Scan Web Data
- NWS
- MDSS
- DTN Weather Sentry
- Clarus

RWIS Storm Comparison Data

- Surface Temperature
- Atmospheric Temperature
- Dew Point
- Validated Alert System

Plymouth State University Validation Report

Results

- Atmospheric Sensors Reliable
- Pavement Sensors Problematic
- Forecasting experience at departmental level
- Maintenance personnel request:
 - Storm Activation Notifications
 - Storm Termination Notifications

PSU Task #1: Forecasting Experience

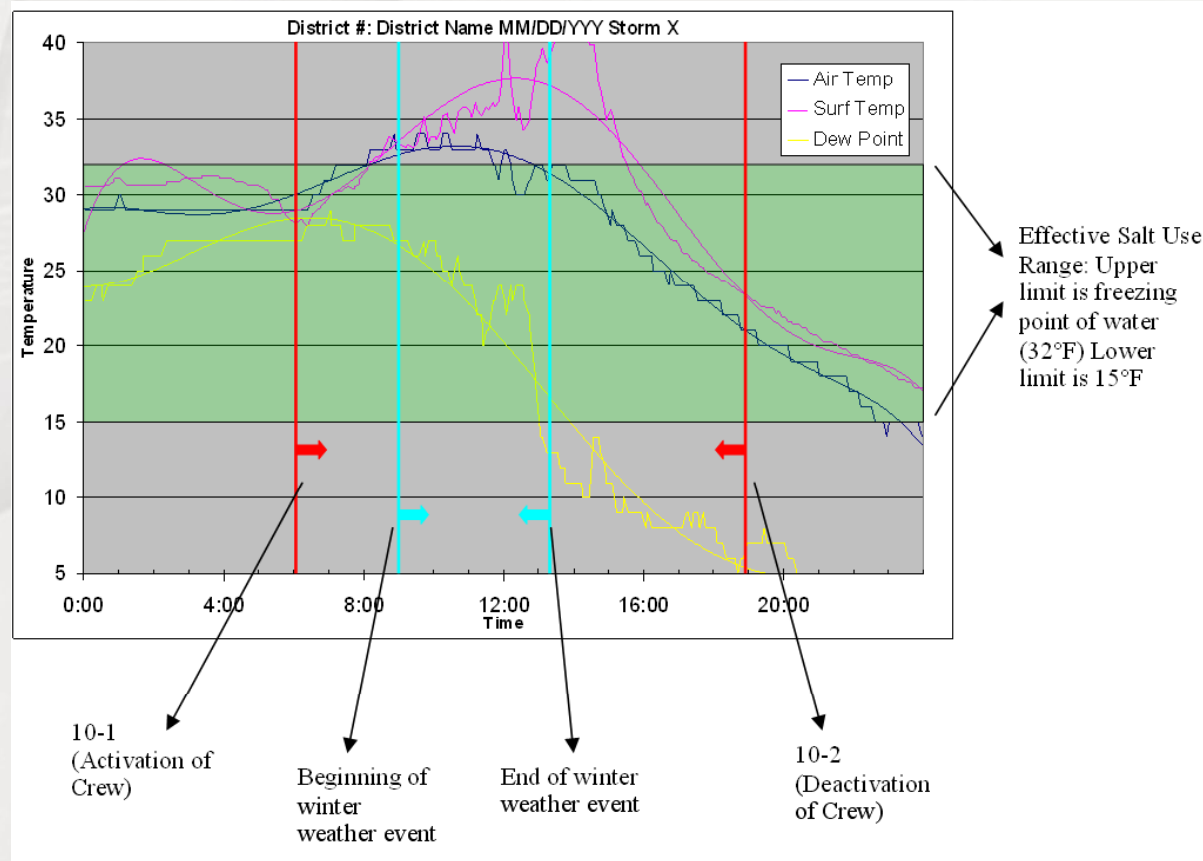
TMC Operators certified in
Weather Forecasting through
Penn State On-line Courses



PSU Task #2: Map RWIS Data to Storm Activations

- TMC Operators Track Storm Paths
- Alert Notifications sent to District Offices of impending Storm Arrival
- Actual Storm Arrival Tracked
- Activation of Personnel mapped to Storm Arrival

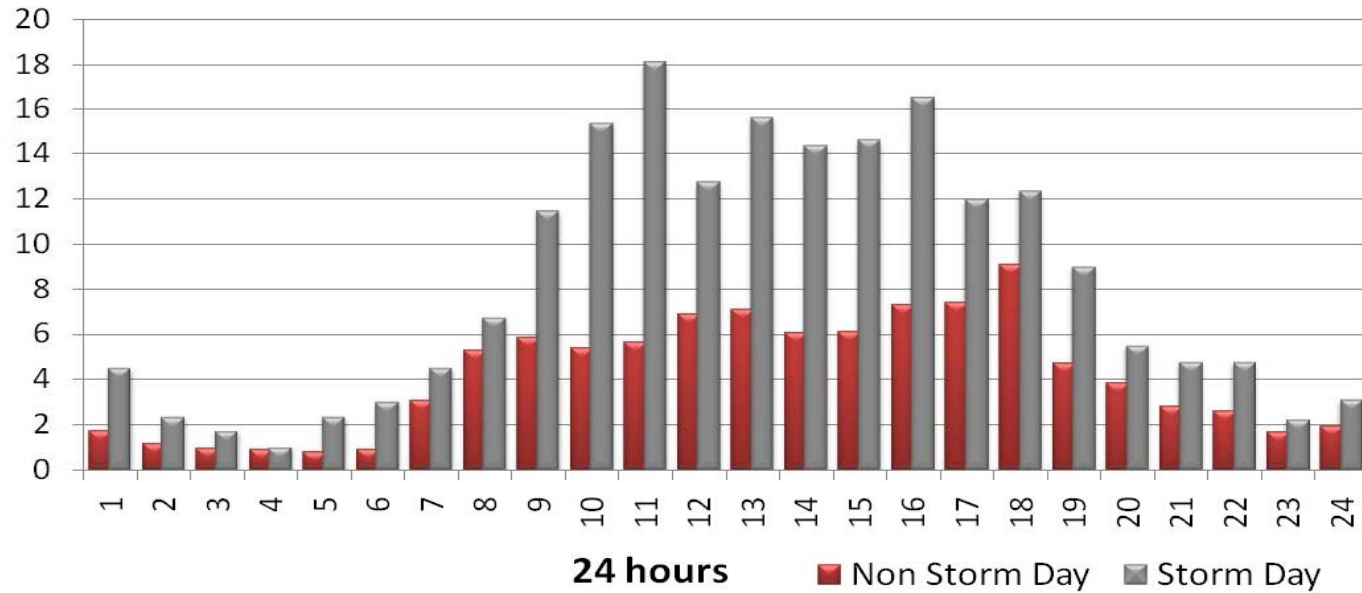
RWIS Storm Activation Mapping



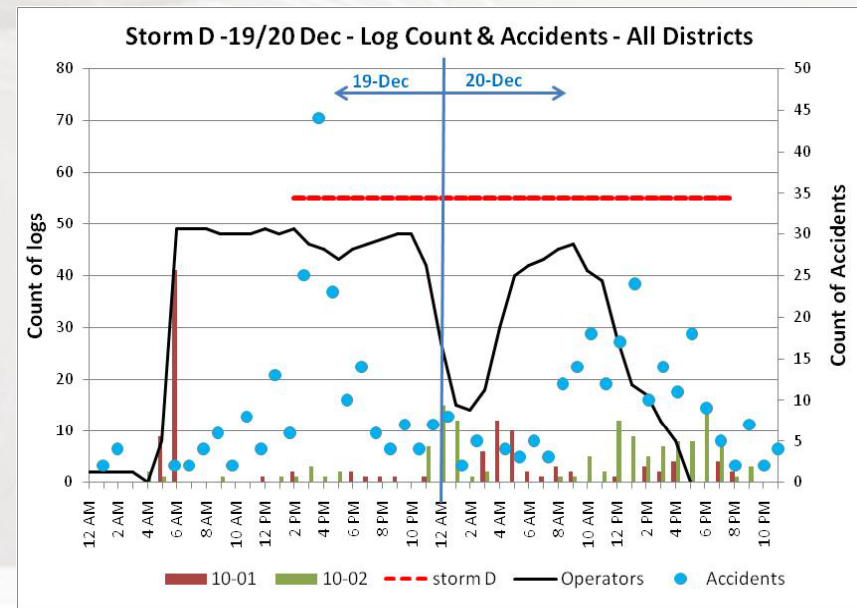
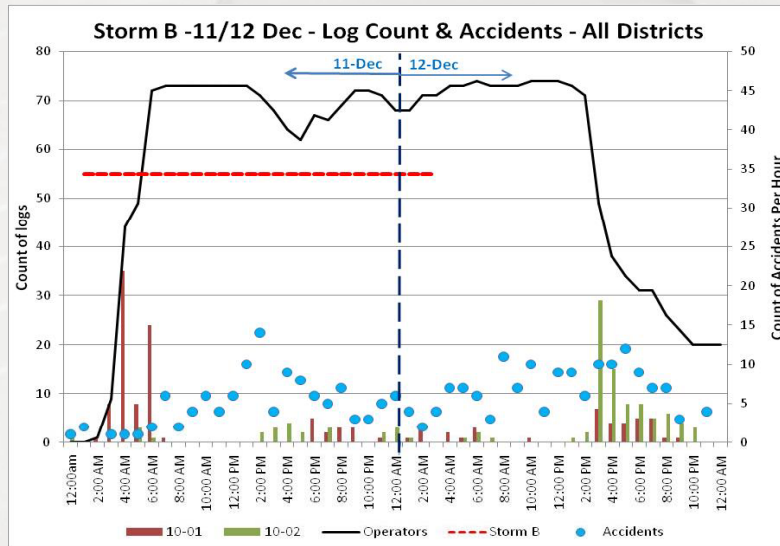
Goal: To close the gap with activations and de-activations

Map Accidents to Time of Day

December 2008



Road & Weather Operations



Goal: How can we minimize personnel costs and maximize safety?

In Summary:

- Improve Reliability
- Ground truth the RWIS data
- Respond to PSU Validation Study Tasks
- Mapping the R&W Alerts to Storm Activation Data
- LTG: Evaluate Operational & Material Costs

Questions??

Denise Markow, P.E.
TMC Program Manager
NHDOT
Dmarkow@dot.state.nh.us