New Jersey Department of Transportation
Bureau of Research
Technical Brief

Implementation of Maintenance Decision Support System in New Jersey

This project developed a maintenance decision support system, which is called NJ-MDSS to assist the New Jersey Department of Transportation (NJDOT) for winter highway maintenance activities by providing weather forecast and recommended roadway treatments.

Background

In order to combat snow and ice conditions on state roads, it is urgent for NJDOT to have a winter roadway advisory system based on NJDOT's rules of practices, which can efficiently gather and disseminate information to help maintenance supervisors make timely and accurate decisions based on large amounts of information under a wide range of winter conditions.

Research Objectives and Approach

The primary goal is to provide a safe and dependable transportation infrastructure for the movement of people and goods throughout the State. The NJ-MDSS (Figure A) notifies NJDOT of up-to-the-minute conditions and suggests optimal maintenance treatments for future changes in conditions.The research team developed and implemented MDSS for NJDOT, within which state-of-the-art weather forecasting and data fusion techniques will merge with computerized winter road maintenance rules of practice.

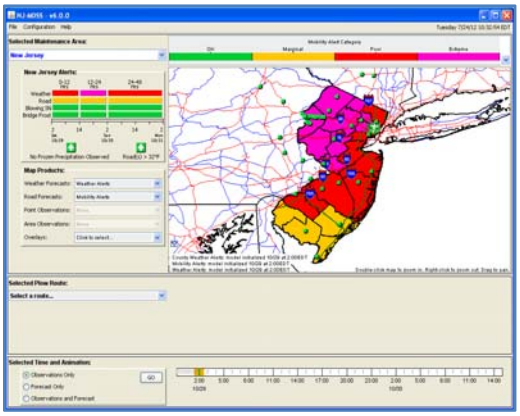

Figure A

Findings

The NJ-MDSS application is equipped with exceptional functionalities for winter storm road maintenance operation and planning. The findings of implementing NJ-MDSS are summarized as follows:

- Provide real-time winter weather information (Figure B) for both atmospheric and road surface conditions, and present a large quantity of data in an efficient and effective manner
- Integrate a variety of critical weather data into a GIS-based platform, which can assist NJDOT to make timely winter road treatment decisions, including the timing, rate, and type of de-icing materials application
- A consolidated set of recommended treatment alternatives (Figure C), which are easily accessible to the crews, to support winter road treatment decisions
- Act as an important learning and training tool by evaluating "what if" scenarios in road conditions with different treatment applications
- Allow NJDOT to customize road treatments to the particularneeds and locations of maintenance yards, considering maintenance crews' observation of road surface temperature with trend forecasts (Figure D)

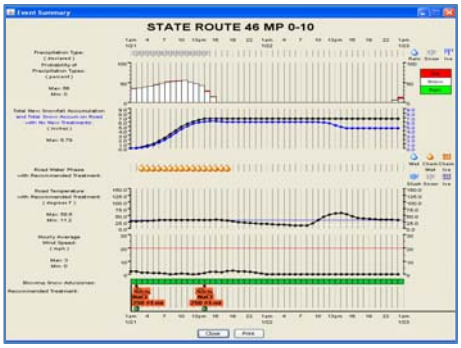

Figure B

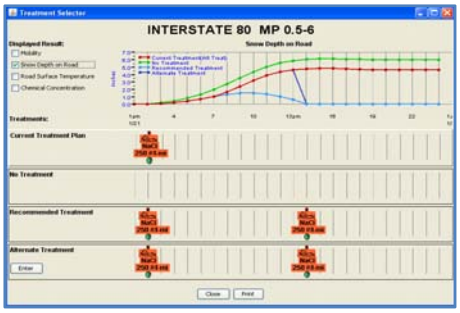

Figure C

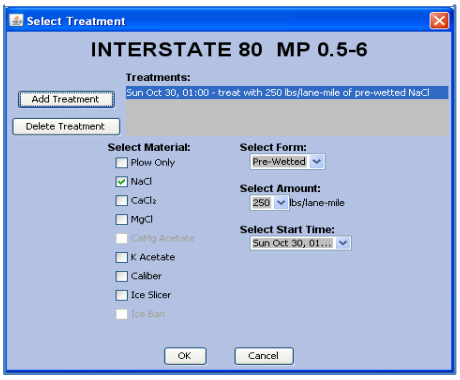

Figure D

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A final report is available online at: http://www.state.nj.us/transportation/refdata/research/.If you would like a copy of the full report, send an e-mail to:Research.Bureau@dot.state.nj.us.

Implementation of Maintenance of Decision Support System
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