Maintenance and Operations Decision Support Tool

Clarus Regional Demonstrations

Weather affects almost all maintenance activity decisions. The Federal Highway Administration (FHWA) tested a new decision support system for maintenance in Iowa, Indiana, and Illinois called the Maintenance and Operations Decision Support System (MODSS). MODSS can dramatically improve how an agency schedules its maintenance activities based on real-time and predictive weather conditions, which saves departments of transportation labor and materials costs, time, money, and frustration.

MODSS is part of the *Clarus* Initiative's regional demonstration projects where state and provincial departments of transportation provided ideas for five new potential uses for *Clarus* data.

The *Clarus* Initiative, a joint effort of the U.S. Department of Transportation Intelligent Transportation Systems (ITS) Joint Program Office and FHWA's Road Weather Management Program (RWMP), is a six-year effort to develop and demonstrate an integrated weather observation data management system that can reduce the impact of adverse weather conditions on surface transportation.

This screenshot shows the types of data that are available from MODSS. Screenshot courtesy of Mixon-Hill, Inc.

What Is MODSS?

Most maintenance activities have their own set of rules on the conditions under which they operate.

These rules can involve surface temperature, air temperature, wind speed, humidity, precipitation, and visibility. In some cases, knowing the conditions 24 hours before and after a weather event may be critical to the safety and operating conditions of the roadway.

The objective of MODSS is to expand decision support beyond snow and ice control and incorporate *Clarus* weather data that can assist maintenance-, operations-, and construction-related scheduling decisions during other weather events such as rain, fog, wind, etc.

Using *Clarus*-enhanced weather forecasts, MODSS assists agencies with more specific information, which leads to better and faster decisions. The system can also archive weather-related data for use in investigating claims of delay and performance based on the weather, training, strategic planning, or documenting lessons learned.

MODSS Uses

Vegetation management
    Weed control
    Pruning and trimming
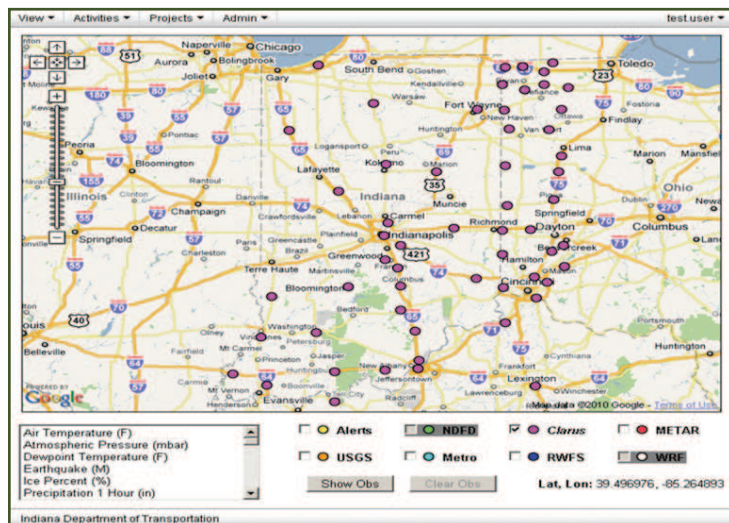   Planting and mowing

Pavement
    Striping
    Resurfacing and curing
    Crack sealing
    Pothole repair
    Surveys

Shoulders
    Drainage remediation
    Edge/drop-off repair
    Guardrail repair
    Sign deployment and repair

Inspection
    Bridge
    Construction
    Foundation

How It Works

MODSS uses *Clarus*-enabled Enhanced Road Weather Forecasting that includes data from the following:

- Observations from *Clarus* and other available stations, i.e., Automated Surface Observing System (ASOS), Automated Weather Observation System (AWOS), etc. (shown in web shot on page 1);

- Advisories, watches, and warnings;

- Satellite, radar, and lightning;

- General and/or agency specific rules of practice; and

- Activity planner input (the desired activity, schedule, and location along with the preferred materials and the methods).

Once an activity is programmed, MODSS analyzes the rules of practice coupled with the available weather data to provide optimal schedule recommendations. These recommendations can create crew work schedules, help with ordering appropriate supplies, and allocate equipment resources.

In addition to recommendations, the System provides weather-related information through map-based graphic, and/or text-based formats.

MODSS can help states determine the best time for maintenance activities such as striping. Photo courtesy of the Missouri DOT.

Potential information displayed may include the following:

- Weather alerts;
- *Clarus* observations;
- Road conditions;
- Radar and satellite images;
- Schedules; and
- Forecasts.

The system can grant access rights for users, and DOTs may choose to give contractors access to this tool as an additional resource for activity scheduling.

Benefits

MODSS has a number of benefits for state DOTs, including the following:

- Safety – DOTs avoid sending crews out in difficult or dangerous conditions;

- Labor and Time – Optimized crew scheduling results in less down time;

- Frustration – Informed decisions lead to less worry and greater confidence;

- Materials and Equipment – Better use of resources results in less waste and wear and tear;

- Environment – herbicides are spread in ideal conditions which is more effective and good for the environment; and

- Quality Control/Quality Assurance – Better record keeping for asset management and enforcing performance requirements.

Overall MODSS regional demonstration project showed how states can use information from *Clarus* to make the decision-making at a DOT less cumbersome, more accurate, and ultimately less costly.
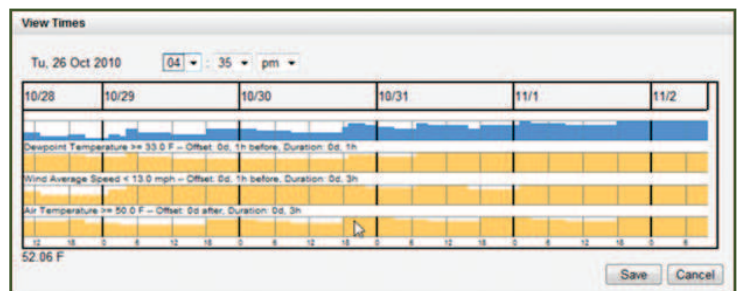
This screenshot, courtesy of the Clarus Initiative, shows dew point temperatures, wind speed, and air temperature at various times over several days.

To obtain a copy of the software, please contact Paul Pisano of the RWMP.

All photographs courtesy of RWMP except as otherwise indicated.

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Federal Highway Administration
Research & Innovative Technology Administration

"Anytime, Anywhere Road Weather Information"

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