MDSS Functional Prototype Display System Preview – June 2002

Bill Mahoney & Paddy McCarthy

National Center for Atmospheric Research
MDSS Display System - Overview

The display system allows the user to:

a) View weather information for each user defined forecast point in the State

b) Alert users when weather or road conditions are predicted to deteriorate in the future (current default = 48 hrs.)

c) View road condition information at each user defined maintenance route

(continued)
d) Calculate winter maintenance treatment plans (e.g., chemical use, plowing, timing of treatment, and location) for each route

e) Review the predicted impact of the recommended treatment plans

f) Perform *what if* scenarios using user-defined treatments to assess the impact of various user defined treatment plans

g) Compare treatment plans and shift schedules
This page allows the user to login to the MDSS FP.

The system is designed to allow the user to configure the system to pop up the initial view of choice (e.g., State View or Route View) depending on user preferences.

Other user-defined settings could be added in the future.

For the demo, type in any name and password and click OK.

MDSS FP Demonstration
The State View allows the user to get an indication of upcoming weather or road condition problems in the next 48-hrs.

Weather and road condition alerts for each DOT maintenance zone are provided for 3 time periods. Alerts are color coded as OK, Marginal, Poor, or Extreme.

This graphic shows that southern MN will have poor to extreme conditions within 48 hrs. The user can then mouse-over the zones to see detailed information on the cause of the alerts.

Time Selector. Slide with mouse to select time of interest.

Click on legend to see alert definitions.

Mouse-over state to see active route regions. Indicates domain of a route view. Click to go to the route view.
From the *State View* page, the user can select weather (wx) parameters and view the data at points within the State.

The user can also mouse-over any prediction point and see a graphic of the alert category over time and the reason for the alert.

The user can move the cursor along the time bar to see data at different times. The user can animate the graphic to see how the weather changes with time.
The user can also view weather data *Time Series* pages for each weather prediction point by double-clicking on the prediction points.

The time series application shown on the right is temporary and will be upgraded to a more sophisticated capability in early May 2002!
The Route View page allows the user to see weather and road condition prediction information. A mouse-over on the route or wx prediction points allows the user to view the alert category and information related to treatment plans.

In this example, the Morris domain was selected. Two routes are included in this view.

From this page, treatment plans can be generated by clicking on the “Select Treatments” button.
A mouse-over of the route shows the road conditions (e.g., mobility) if no treatment was performed.

In this example, with no treatment, ~3.8 inches of snow would accumulate and because there was no treatment, the chemical concentration at 1200 CST on February 24th is predicted to be zero and mobility decreases to 0.5 (where 1.0 is a dry road).
The Treatment Selector Page for the TH-28 Morris route has been selected.

The user asked for the “recommended treatment” to be calculated.

The recommended treatment indicated the NaCl should be applied at 1 am at a rate of 400 lbs per 2-lane mile.

The time series graphic shows the snow depth results of no treatment and the recommended treatment. If the recommended treatment is performed, no snow accumulates on the road.

Chemical amounts could also be presented in other units (e.g., yards/lane mile)
From the *Treatment Selector* Page, the user can view other parameters for each selected treatment.

The example shows the road temperature and chemical concentration 48-hr time series with and without the recommended treatment.
The user can also view road condition *Time Series* pages for each active route and assess the impact of various treatment options.

Double clicking on any active route will pop-up a road condition time-series page. This example shows the time series data for TH-28 Morris if the *Recommended Treatment* were selected.

The time series application shown on the right is temporary and will be upgraded to a more sophisticated capability in early May 2002!
Once treatment options are selected, the user can view the results via the *Time Series* pages or *Route Page* via mouse-over. In this example, the user can see that at 12 pm on TH-28, the chemical concentration is predicted to be 3.6% and the snow depth on the road will be zero indicating that the recommended treatment plan (NaCl @ 400 lbs per 2 lane mile at 1 am) is predicted to melt the snow.

Two treatments are recommended for I-94 near Alexandria.
From the Define Treatment Scenario page, the user can edit or add their own treatment plan. The results can be viewed on the time series windows. This allows the user to perform “what if” scenarios for each route to determine the best course of action.

Pre generated alternatives are used in the demo. Select OK to view the alternatives.
Once the user has edited the treatment plan and created their own alternative(s), they can view the results.

In the example, the recommended treatment (red line) of two applications of NaCl will keep the snow off the road (select to view snow depth on road), while the single application of NaCl will fail at noon and snow will accumulate. Other parameters such as chemical concentration can also be viewed for various treatment options.
The Database view allows the user to view the ESS observations for the selected route, input constraints for treatment planning, and input shift information. The user can also select to split shifts.

It also allows the user to view current stocks and how the stocks would be depleted for chosen treatment plans.

This page assumes that an operational version of the MDSS would interface with the DOT operational database to input and export data.
The **View Selected Treatments** window allows the user to see a simple text version of the chosen treatments for each route. It is envisioned that this information would be printed, sent via email or cell phone to operators for easy reference.