AVL/GPS/MDSS for Improving Winter Operations

Allison Porrett, P.E.
Michigan Department of Transportation
6333 Lansing Road
Lansing, MI 48917
(517) 636-4444
Porretta1@michigan.gov

In September 2013, the Michigan Department of Transportation (MDOT) teamed with Parsons and ITERIS, Inc. to deploy a web-based snowplow Automated Vehicle Location (AVL) and Maintenance Decision Support System (MDSS). The system was used by more than 300 MDOT employees and partner agencies this past winter. The AVL system displays live roadway maintenance operations, produces fleet activity reports, and exports data to MDSS. MDSS provides roadway treatment recommendations and targeted, precise weather forecasts to MDOT. By implementing an integrated AVL and MDSS solution, MDOT is able to increase the effectiveness of its winter road maintenance operations.

The operational data collected by MDOT's AVL system is processed and automatically fed into MDSS. The goal of MDSS is to provide a decision-support tool for MDOT staff involved in winter maintenance operations. MDSS recommends maintenance treatments, application rates, and suggested times to apply material to maximize its effectiveness for the snowplow operators. These route-specific treatment recommendations are provided to maintenance garage supervisors on a website as well as transmitted directly to a screen within the truck cab for plow operators to view in near-real time.

The use of AVL to update the actions performed by maintenance operations enhances the validity and accuracy of the MDSS treatment recommendations. In addition to live maintenance information, the MDSS provides decision maker's with treatment strategies, taking into account the incoming weather situations on a route-specific basis.

Now that the AVL/GPS/MDSS project has been implemented and available across the state, MDOT direct garages are finding ways to incorporate the tools from the project as standard practice in winter operations. Using the resources available through MDSS, maintenance garage supervisors can view road condition forecasts for specific snow routes, as opposed to the regional atmospheric forecasts provided by other sources of weather information, to optimize staff and resource deployment planning. The focused nature of the localized forecasts enable MDOT to become proactive in identifying and responding to troublesome areas instead of being reactive during the winter storm event. MDSS forecasts are also being used to assist in the staffing decisions by allowing supervisors to call in more or less operators several hours sooner to formulate an operational plan ahead of the storm rather than an hour or two after the storm started.

In addition to improving winter operation efficiencies, MDOT is looking at ways of disseminating winter operation information to the public through a pilot to display snowplow information on the state's traveler information site, MiDrive. MDOT is continually engaging stakeholders and looking for ways to incorporate relevant information (such as CCTV cameras and ESS sites) all in one location as a tool for winter operations. Looking to the future, MDOT plans to expand access to weather information and maintenance recommendations to include areas of the state maintained by contract county agencies.