

Maintenance Decision Support System (MDSS): Beyond Winter Operations

Primary Author: Bill Hershey, Meridian Environmental Technology, Inc.

Secondary Author: Tony McClellan, Meridian Environmental Technology, Inc.

Since the late 1990s there has been a push to develop and deploy a system that can integrate maintenance and weather data for winter maintenance operation decision makers to conduct safe and effective maintenance strategies on the roadway. In 2002, a group of states joined together (Pooled Fund Study Maintenance Decision Support System PFS-MDSS) to develop a maintenance decision support system (MDSS) that could augment current winter operation techniques with weather information and provide a one-stop-shop for decision makers regarding snow and ice. As states deployed MDSS technology within their maintenance operations, their benefits included: actual dollars saved, improved internal communications, and a more consistent level of service on the roadway. A new question arose as these benefits were realized: are there more benefits to be realized with this data, and could it be integrated with other traffic related decision-making processes? As the understanding of MDSS technology has grown so has the realization of MDSS' utility beyond winter maintenance operations. New uses for MDSS data include the use of MDSS as a tool to determine winter severity; the integration of MDSS information into TMC operations; and, expanding the route-specific recommendations to non-wintertime operations performed by agencies. Winter severity, when viewed in terms of highway maintenance, can be used to compare levels of effort (dollars, labor, equipment usage) from winter to winter. Analysis of maintenance actions can be used to identify areas of proficiency. An area of growing potential for MDSS data is in traffic management center (TMC) operations. Knowledge of the presence of maintenance vehicles and their current operational status on the roadway could be used as an indicator of non-ideal road conditions. Lane locations of slow-moving maintenance vehicles could be provided to travelers to warn of obstructions downstream of their current position. TMC operators can take advantage of knowing the location of maintenance vehicles, weather conditions along a road corridor, and the application of materials by these maintenance vehicles on the roadway to provide better information to the highway user. This same data could also be used to better inform first responders and law enforcement. A new development within the MDSS software is the ability to use weather information to provide guidance for non-wintertime operations. These operations include but are not limited to pavement repair, pavement painting, herbicide spraying, or any other highway operation that is dependent on the weather and road conditions. These added features provide agencies a larger cost benefit when deploying a fully operational MDSS within their agency. This paper and presentation will investigate and illustrate possible uses of MDSS data and current methods to communicate that data. Examples will be presented assessing winter severity with the use of MDSS. Integration of MDSS data into TMC operations will be discussed and the use of MDSS for non-wintertime operations decisions will be presented.