

Pooled Fund Study Project TPF-5(054)
SDDOT Project SD2002 – 18
Development of Maintenance Decision Support System
Phase VI
First Quarter Progress Report
January - March, 2010

Overview

The foci of the Phase VI first quarter (Q1) 2010 activities included the continued operational support as winter continued in all states across the country, continued enhancement of the MDSS software, and the continued work and development related to the Winter Maintenance Response Index (WMRI) and other research tasks. Operational support included customer support for users with operational issues, the adjustment of newly configured routes to match operations, the provision of follow-up training, and attention to other operational tasks as they arose. As stated in the previous quarterly report several states had not reassessed their route configurations which were initially done a number of years ago; thus the new changes generated questions requiring Meridian to work with the state coordinators and individual users in the field. Meridian was also busy making changes to the MDSS GUI (graphic user interface) per user comments during Q4 training. Key changes included the ability for administrative users to make permanent changes to maintenance recommendations for a defined period of time and the color coding of trucks on the map. Development was also ongoing with enhancements and expansions of the Winter Maintenance Response Index (WMRI) project.

Progress by Task

Specific accomplishments on the explicit tasks of the Phase VI work plan during the first quarter of 2010 follow.

TASK 14: Refine and evaluate techniques for acquiring, managing, using, and reporting information from mobile data collection equipment mounted in winter maintenance vehicles and for providing information to maintenance operators via the same equipment.

Meridian continued to work with a number of PFS member agencies to incorporate new data feeds and to resolve issues reported from the field relating to the provision of MDSS information back into maintenance vehicles. During Q1 this included working to initiate data feeds and processing associated with MDC/AVL systems from Precise, Inc. for the Wyoming and Wisconsin DOTs and Intelligent Devices, Inc. for the Nebraska Department of Roads. From the standpoint of managing and utilizing this information, the development of capabilities for generating reports geared toward management personnel in agencies using MDSS has continued to be a focus during Q1. An initial management reports toolset including these capabilities was made available to users with appropriate group affiliations.

TASK 15: Refine and evaluate the capability and performance of MDSS software components, including surface condition prediction models and graphical user interface.

Efforts to improve the capability and performance of MDSS continue on an ongoing basis. Recent enhancements include numerous minor modifications to the MDSS GUI to address various issues noted by users, as well as introduction of a few new capabilities, including a Map View color-coding scheme to indicate truck status and capabilities, and an ability to add agency-specific district and sub-district boundaries to Map View overlays. A significant amount of time was also expended during Q1 continuing to diagnose the cause of occasional lock-ups of the MDSS v6.0 GUI. All of these enhancement and adjustment activities fall under Subtask 15.10. Subtasks 15.1, 15.2, 15.4, 15.5, 15.7, and 15.8 were all completed in previous quarters, while 15.6 is presently being addressed through the inclusion of capabilities for generating management-oriented reports via the MDSS GUI.

Progress was also made on MDSS Subtasks 15.12 and 15.14 during Q4. An initial overview of the findings of the expanded literature review (Subtask 15.12) was presented at the late February 2010 MDSS Tech Panel meeting. With regard to Subtask 15.14, a beta version of an improved precipitation estimation system was made operational during late Q4 of 2009. Enhancements to this system have continued during Q1, with hourly precipitation and snowfall images from the system made available in the MDSS GUI approximately midway through Q1. Work on this system is expected to continue during the next several quarters, with the system slated for full operational use within MDSS' processing before the end of Q3 2010. Meridian was able to leverage external (non-MDSS) funding for a significant share of the work related to the initial development of this system. However, continued enhancement of the system will be necessary going forward, and funding responsibility for this enhancement is returning to the MDSS Pooled Fund Study (as originally envisaged).

TASK 16: Recommend, develop, and evaluate methods for enhancing highway agencies' management through interfaces between MDSS and other management systems, analysis of winter maintenance practices, and extension of MDSS techniques to non-winter applications.

Research into the potential for application of MDSS as a tool for generating reports tailored to high-level management within state transportation departments has continued during Q1. Efforts during the quarter continued to focus on building and enhancing a capability for generating management-oriented reports into the MDSS GUI. Initial reports that have been generated under this new capability focus primarily on the visualization and analysis of data coming out of the MDSS WMRI simulation system as well as out of agency MDC/AVL systems. An initial functioning version of the Management Reports interface was released to select users during Q1 2010. Feedback from initial users led to some initial refinements to the system, which were made available to users immediately because of the plug-n-play nature of these components of the MDSS system. There are still concerns that the plug-and-play nature of these tools (which are not distributed with the GUI executable) may be responsible for the MDSS v6.0 GUI lockups some users have noted. This theory has not yet been proven or disproved.

With regard to Task 16.3, improving MDSS' integration with agency information systems, information about the ATIS and MMS systems within the PFS states was collected during Q1. Separate focus groups for guiding efforts associated with these integration efforts were appointed at the February 2010 Technical Panel meeting. The initial meetings of these focus groups will take place in Q2 of 2010.

TASK 17: Develop a model MDSS procurement specification suitable for use by public highway agencies.

No changes were made to the procurement specifications during Q1.

TASK 18: Provide weather forecast support, MDSS Configuration support, live MDS operations, and necessary training for continuing limited deployment field trials in the participating highway agencies.

The first quarter of 2010 was spent working closely with the states on their winter deployments of MDSS. During the final week of Q4 2009 much of the country experienced a nasty winter storm and the start of Q1 2010 provided an opportunity for Meridian to follow-up with many of the states regarding MDSS usage. This storm created extensive use of MDSS and highlighted a few issues, but in general there was considerable positive feedback regarding the dynamic guidance and the maintenance recommendations.

As mentioned previously several states had to revisit route configurations to ensure all information was accurate and up to date. The major storm(s) at the end of Q4 2009 provided these states a great case to test these changes. There were some locations that needed to tweak and reassess changes made in the fall. Meridian provided guidance and direction when questions were presented. Changes to these routes were made when states defined which changes were necessary. Meridian also conducted training sessions in locations requesting follow-up training or those states that waited till after the first of the year. Retraining was conducted in Twin Falls, ID and provided Idaho Transportation Department an opportunity to ask questions as this was their first winter season with MDSS. Meridian also provided Wisconsin DOT an overview presentation to the 15 counties in the state that are involved in the initial deployment of MDSS. Training was also conducted across the state of Nebraska providing users information about changes to the GUI and how their AVL/MDC will be feed into the system.

TASK 19: Prepare a report summarizing methodology, findings in performance, conclusions and recommendations.

No activities have been performed for this task during Q1. A Major Report on the study to date was created during the Q1 2008 and will eventually serve as the basis for the Final Report.

TASK 20: Make an executive presentation to the project's technical panel and provide electronic copies of the presentation material to participating states.

No activities have been performed for this task during Q1.