

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

Overview

Phase VI third quarter (Q3) 2010 brought continued enhancements to the MDSS GUI and the incorporation of research task items into MDSS. Due to the rapid expansion of operations in many states, training on the MDSS GUI also began across some states in the final month of this quarter. In addition to the operations support, the end of the quarter was used to test and evaluate training versions of the MDSS GUI. These training versions were tested both within Meridian's infrastructure and with individual state computers. This testing was critical to ensure possible issues within MDSS can be resolved before an official winter release is made available to all MDSS users.

Some of the more visible enhancements to the MDSS GUI over Q3 included the development of a forecast verification tool, Map View access to maintenance recommendations, an interface permitting MDSS users to tap into Meridian's METAlerts automated alerting infrastructure, the introduction of a US region, the development and testing of MODSS type functions, and the introduction of a capability for MDSS to integrate agency-specific reference files (i.e. District or Region boundaries). Training materials were also updated during Q3 to reflect these enhancements, in order to provide existing users a medium to know what had changed within MDSS.

Work also continued on Task 16 during Q3, including the development of a database schema for housing the data required for the MMS reports, and the initial release of a non-winter maintenance application extension of the MDSS GUI.

At the conclusion of Q3, users could access and download version 6.96 of the MDSS GUI. A version 7.00 release was planned for early Q4.

Progress by Task

Specific accomplishments on the explicit tasks of the Phase VI work plan during the third 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. From the standpoint of managing and utilizing this information, the development of capabilities for generating reports that leverage the MDC/AVL information has continued to be a focus during Q3. Specifically, Meridian has carried out a design process for a database intended to house the MDC/AVL and corresponding MDSS and weather data in a manner that makes it more readily accessible for report generation and MDSS/MMS/ATIS integration, and has initiated work on tools for generating reports based upon this and similar information.

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

Task 15 efforts during Q3 have largely focused on continuing efforts to improve the capability and performance of MDSS. Recent enhancements include the introduction of a domain covering the continental United States (to permit viewing of conditions outside of the agency's domain extents), an interface that permits access into Meridian's automated "METAalerts" alert system infrastructure, a forecast verification tool, and numerous other minor modifications to the MDSS GUI to address issues and desires brought forth by MDSS users. The server-side infrastructure of the MDSS system has also been improved through the use of "SRV records" to permit load balancing between multiple MDSS servers and provision for the use of content delivery networks as a means of reducing MDSS bandwidth bottlenecks in widespread and/or particularly severe road weather events.

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.

Work toward improving the management reports toolset in the MDSS GUI has continued during the quarter (task 16.1). Efforts during Q3 have focused primarily on identifying and resolving potential configuration issues that were apparent through analysis of data from the 2009-2010 winter.

Work on the agency integration task (16.3) has progressed primarily on two fronts during Q3. First, regarding integration of MDSS with maintenance management systems (MMS), Meridian has been directed to initially focus on the development of tools for generating reports of the nature required by MMS systems. Toward this end, Meridian has designed an SQL database schema appropriate for storing MDSS and MDC/AVL data in a manner that is more amenable to the generation of MMS-oriented reports. The initial design is complete as of the end of Q3, with efforts shifting toward developing the interfaces required to populate, maintain, and query this database, and toward the development of specific reports. Second, regarding MDSS/ATIS integration, Meridian has held several rounds of discussion with representatives of the South Dakota Department of Transportation (chosen by the MDSS/ATIS focus group to serve as the initial testbed for these integration activities) have resulted in the development of a general plan for MDSS/ATIS integration activities during the winter of 2010/2011.

However, given the present concurrent transition of the SDDOT to a new road condition reporting system and traveler information web portal, it is likely that the MDSS/ATIS integration activities will not get fully underway until at least midway through Q4.

Finally, with respect to developing non-winter maintenance application extensions of MDSS (task 16.4), Meridian designed and developed a rudimentary non-winter maintenance extension of MDSS' capabilities during Q3. This capability, which includes Alert Panel, Map View and Route View presentations, is included in current versions of the MDSS GUI, but is hidden from the users' view pending server-side configuration of the appropriate operations and thresholds per agency.

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

No changes were made to the procurement specifications during Q3.

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.

Near the beginning of Q3, all states that will continue funding MDSS operations via the Pooled Fund Study were provided with cost estimates for the coming winter. These cost estimates provided the agencies with an ability to reassess their operations and make decisions on expansions and how training would be addressed during the coming fall and early winter.

Each agency also received a copy of their current route configurations within MDSS. Similar to the past few years, this allowed the states to make an assessment of their MDSS route deployment and make changes if necessary. The cost estimations and route configurations go hand-in-hand as much of the cost is directly related to the number of routes. This explains why these files are sent at the nearly the same time.

As stated earlier, training began in mid September. Table 1 shows the list of states, dates, locations and trainers that were present at the training conducted during Q3.

| <i>State</i> | <i>Location</i> | <i>Date</i> | <i>Trainer(s)</i> |
|--------------|--------------------------------------|-------------|------------------------------|
| <i>NH</i> | Manchester | 9/14 | Ben Hershey & Tony McClellan |
| <i>WY</i> | Cheyenne | 9/16 | Ben Hershey & Gordon Bell |
| <i>WI</i> | Eau Claire, Wisc Rapids, & Green Bay | 9/21-23 | Ben Hershey & Tony McClellan |
| <i>ID</i> | Twin Falls | 9/28 | Tony McClellan |
| <i>KS</i> | Garden City & Hays | 9/30-10/1 | Ben Hershey & Tony McClellan |

Table 1: Training completed during Q3.

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

No activities have been performed for this task during Q3. 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 Q3.