

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

**Overview**

Phase VI second quarter (Q2) 2010 provided the conclusion to another operational winter season across all states. For most states operational MDSS support concluded on April 15<sup>th</sup>. As the 2009-2010 winter finished during the quarter efforts were already underway to make changes and improve the GUI to make it more user friendly. Activities include adding more documentation within the GUI, color coding information/icons, and incorporating more agency specific data (i.e. region/district boundaries). In addition to operational activities, research and other MDSS work was completed during Q2. During Q1 sub-committees were established to facilitate the integration of MDSS with two other transportation related activities, 511/ATIS and Maintenance Management Systems (MMS). Conference calls were held for both integrations during Q2 with findings and future directions presented during the Technical Panel meeting held in the middle of June. Strides were also made to make the Winter Maintenance Response Index (WMRI) tools more accessible to all agencies.

**Progress by Task**

Specific accomplishments on the explicit tasks of the Phase VI work plan during the second 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 Q2 this included continued work to initiate data feeds and processing associated with MDC/AVL systems from Precise, Inc. for the Wyoming and Wisconsin DOTs, as well as adjustments to handling of AmeriTrak data based on new developments relating to the Minnesota DOT deployment. 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 Q2. Specifically, Meridian has recently initiated the 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 management report generation and MDSS/MMS/ATIS integration.

**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 Q2 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), interface development associated within integration of the MDSS GUI with Meridian's automated alert system infrastructure, and numerous other minor modifications to the MDSS GUI to address various issues and desired brought forth by MDSS users.

**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 on the WMRI toolset in the MDSS GUI has continued during the quarter (task 16.1). This includes continued work toward stabilizing and streamlining the simulation process as well as work toward improving the MDSS GUI components for display and interactivity with the WMRI data. As an example, the WMRI calculator tool was completed and released, permitting users to define custom winter severity / maintenance demand indices. This tool was later modified to permit further manipulation of such existing custom indices.

In regard to agency integration (16.3), the kickoff teleconferences for the MMS/MDSS and ATIS/MDSS integration task forces were both held midway through the quarter. A number of possible forms each of these integration tasks could take were discussed, and a preferred path for the pursuit of the related research and development was established. MDSS/ATIS integration will initially focus dually upon getting data collected by agency MDC/AVL systems integrated into agency road condition reported systems (RCRS), and upon integrating MDSS-generated forecast information into traveler information systems. The South Dakota Department of Transportation was nominated as the best candidate for initial integration work. The MDSS/MMS integration will initially focus on getting the MDC/AVL data into a form that is more amenable to the generation of reports and data required by MMS systems, and creating a toolset for the creation of these reports and datasets. Due to the wide variety of MMS systems in use among the states, automatic export of data to MMS systems will come at a later date, once the nature of the data is better understood.

Finally, with respect to developing non-winter maintenance application extensions of MDSS (task 16.4), a series of questions regarding various non-winter maintenance activities and the associated weather and/or pavement condition criteria were circulated to the PFS member agencies. The responses to these questions were aggregated and used to develop an initial concept for how an "MODSS" application extension to the MDSS GUI might be structured. This concept was presented to and approved by the MDSS Technical Panel at the June meeting.

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

No changes were made to the procurement specifications during Q2.

**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 second quarter of 2010 marked the end (April 15<sup>th</sup>) of MDSS operations across most agencies. Up to the last day of 2009-2010 winter operations states were running and using MDSS as a means to make day-to-day decisions. Following the conclusion of MDSS operations, efforts were made to provide each state a review of their current route status. This is designed to assist agencies assess their deployments for the up coming operational season and make necessary adjustments to existing routes.

At the conclusion of the 2009-2010 winter season, the PFS MDSS had a total of 1163 maintenance routes. Table 1 shows the breakdown of the number of routes per state. Figure 1 also shows the geographic distribution of routes across the U.S.

State	# of Routes	State	# of Routes
Colorado	130	New York	17
Idaho	9	North Dakota	105
Indiana	156	Pennsylvania	1
Kansas	22	South Dakota	106
Kentucky	12	Virginia	24
Minnesota	264	Wisconsin	129
Nebraska	119	Wyoming	60
New Hampshire	9		

Table 1: Status of routes across each state at the conclusion of Q2.

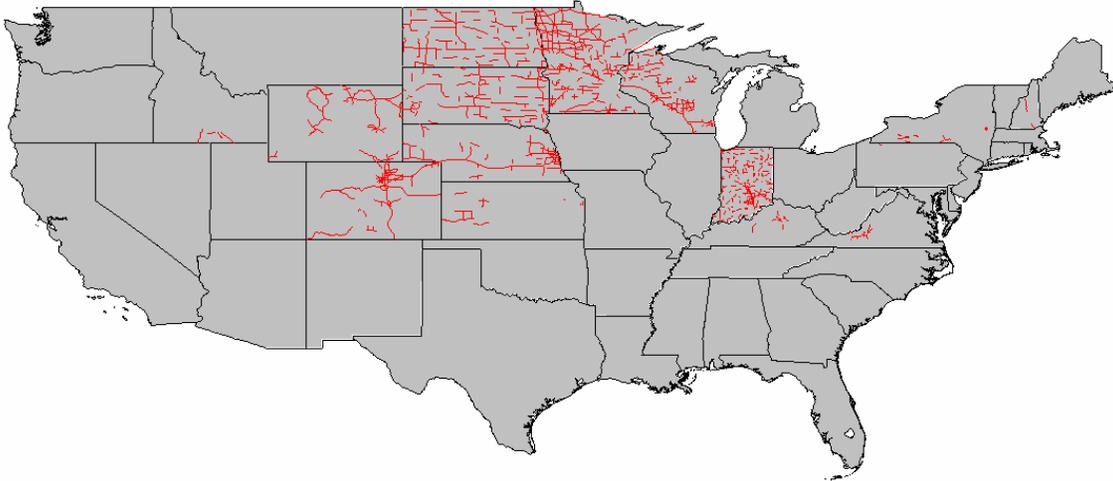


Figure 1: Image of the routes across all PFS states at the end of Q2.

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

No activities have been performed for this task during Q2. 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 Q2.