

## TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Date: May 22, 2012

Lead Agency (FHWA or State DOT): South Dakota DOT

### INSTRUCTIONS:

*Project Managers and/or research project investigators should complete a quarterly progress report for each calendar quarter during which the projects are active. Please provide a project schedule status of the research activities tied to each task that is defined in the proposal; a percentage completion of each task; a concise discussion (2 or 3 sentences) of the current status, including accomplishments and problems encountered, if any. List all tasks, even if no work was done during this period.*

<b>Transportation Pooled Fund Program Project #</b> <i>(i.e., SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX))</i>  TPF-5(054)		<b>Transportation Pooled Fund Program - Report Period:</b> <input checked="" type="checkbox"/> Quarter 1 (January 1 – March 31) <input type="checkbox"/> Quarter 2 (April 1 – June 30) <input type="checkbox"/> Quarter 3 (July 1 – September 30) <input type="checkbox"/> Quarter 4 (October 1 – December 31)	
<b>Project Title:</b> Development of a Maintenance Decision Support System			
<b>Name of Project Manager(s):</b> Dave Huft		<b>Phone Number:</b> 605-773-3358	<b>E-Mail:</b> Dave.Huft@state.sd.us
<b>Lead Agency Project ID:</b> SD2002-18		<b>Other Project ID (i.e., contract #):</b> 310814	<b>Project Start Date:</b> October 14, 2002
<b>Original Project End Date:</b> April 30, 2003		<b>Current Project End Date:</b> September 30, 2012	<b>Number of Extensions:</b> 29

Project schedule status:

On schedule     
  On revised schedule     
  Ahead of schedule     
  Behind schedule

Overall Project Statistics:

Total Project Budget	Total Cost to Date for Project	Percentage of Work Completed to Date
\$5,476,937.00	\$5,142,713.07	93.90%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
\$296,473.06      (5.41%)	\$296,473.06	95.0%

**Project Description:**

- The Maintenance Decision Support System research program is responsible for research and development related to the implementation of new information technologies to support transportation maintenance decisions, including winter and summer decision support tools. The program also performs substantial research and development into parallel applications for the transportation industry that may either share data with MDSS, or benefit by leveraging technologies developed under the program (for instance, sharing of data between MDSS and other agency systems, or the development of management-oriented tools that leverage MDSS' capabilities).

**Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):**

- Continued development of a prototype MDSS application for Android smartphone and tablet devices. An initial release was posted and announced to the Technical Panel on January 3<sup>rd</sup>, 2012, with regular updates posted thereafter as features were added and stability of the application improved.
  - Continued the development of a suite of MDC/AVL-oriented "Management Tools" for visualization and analysis of data being collected by MDC/AVL-equipped snowplows. An initial release of this toolset was also made available on January 3<sup>rd</sup>, with additional updates automatically made available to users thereafter as development of the toolset continued
  - Identified and resolved various issues affecting the performance of the newly-developed MDC/AVL data processing hub.
  - An MDSS Technical Panel meeting was hosted on February 27<sup>th</sup> to 29<sup>th</sup>, in Sioux Falls, SD. A three hour boot camp was conducted on the 27<sup>th</sup> for those users that wished to participate.
  - Maintenance and enhancement of Version 8 of the MDSS GUI was provided in support of field operations..
  - Provided operational support, including route additions / configuration adjustments, customer support, and weather forecasting support.
  - New Assessment of recommendations tool has been developed in Version 8 of the MDSS GUI for evaluation of recommendations. Tool will be used in 2012-2013 winter season.
  - Efforts were made to update the MDSS GUI Quick Reference guide along with the development of a Quick Reference guide for Management Tools.
  - Assessment of mesoscale modeling for use in lake effect snow prediction and notification has continued with the evaluation of effectiveness of the model predictions and defining of appropriate methods to extract maintenance decision-making features. Efforts have also begun to expand the mesoscale modeling to prediction of high-wind events for regions prone to severe wind events i.e., portions of Wyoming and Colorado.
- 5.1 Assess MDSS acceptance and build strategies for MDSS sustainability- Work has been done on the influence of system effects on the perceived usefulness of MDSS by various states. This analysis will be useful in determining if user perceptions are modified by individual state policies and attitudes towards MDSS, or if no state bias can be seen to be statistically relevant. Follow-up surveys have also been administered to two PFS states, Wisconsin and Indiana, with the analysis of those surveys still pending.

**Anticipated work next quarter:**

- Continue to refine and solicit feedback on an MDSS application for Android smartphone and tablet devices, and initiate work toward the development of an iOS-based application to be released by late summer / early fall.
- Continue to build out the designed suite of functionality for the combined WMRI and MDC/AVL Management Tools.
- Work to improve upon MDSS' precipitation analysis data based on issues identified during the 2011-2012 winter season, and continue the general process of refinement to other MDSS components based on feedback received.
- Testing of Assessment tool to work out any remaining functionality issues, or documentation issues for users of tool for next winter season.
- Work to continue on defining features to be extracted from mesoscale models to support decision-making during periods of lake effect snowstorms and high-wind events for geographical regions prone to severe wind events. Efforts will include identifying how these mesoscale model features are best incorporated within the MDSS display framework.
- Work on Task 5.1 will include assessment of successes and shortcomings from the PFS MDSS experiences in participating states.

**Significant Results:**

- Significant results this quarter include the initial release of a prototype MDSS smartphone app as well as a new MDC/AVL-oriented Management Tool.
- Refinement of operational methods for diabatic initialization of mesoscale models to support fine-resolution models.

**Circumstance affecting project or budget. (Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints set forth in the agreement, along with recommended solutions to those problems).**

- Project was extended 1 year to continue work on the states research priorities and conduct operational field deployment trials.

**Potential Implementation:**

- The MDSS research program is presently in its 7<sup>th</sup> phase of work. The core MDSS software / services have been operational within numerous state transportation agencies for several years or more, depending upon the agency.
- An initial suite of "Management Tools" has been implemented within the past several years, starting first with a WMRI tool to aid managers in quantifying winter severity across their jurisdiction from a winter maintenance perspective, followed up more recently by a complementary suite of MDC/AVL-oriented tools analyzing and visualizing maintenance being performed by the agency's MDC/AVL-equipped snowplow fleet.
- Meridian expects that operational Android and iOS MDSS applications will be available by late summer / early fall of 2012.