

## TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): South Dakota

**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(347)	<b>Transportation Pooled Fund Program - Report Period:</b> <input type="checkbox"/> Quarter 1 (January 1 – March 31) <input type="checkbox"/> Quarter 2 (April 1 – June 30) <input checked="" 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		
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<b>Lead Agency Project ID:</b> HRZ218(01)	<b>Other Project ID (i.e., contract #):</b> 310814	<b>Project Start Date:</b> 10/01/2016
<b>Original Project End Date:</b> 09/30/2017	<b>Current Project End Date:</b> 09/30/2017	<b>Number of Extensions:</b> 0

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
	\$0.00	0%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
\$0.00	\$0.00	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 decision including winter and summer decision support tools. The program also performs substantial research and development in parallel applications for the transportation industry that may either share data with MDSS, or benefit by leveraging technology 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.):**

TPF-5(347) is a successor to TPF-5(054), *Development of a Maintenance Decision Support System*. The pooled fund study was established to continue the work, but under new federal procedures for pooled fund studies. TPF-5(347) was approved by FHWA and all new funding contributions will be made to it. Expenditures of funding will begin when the funding for TPF-5(054) is exhausted in December, 2016.

Work completed under TPF-5(054) included:

- Work continued on the Web-Based MDSS interface. A document was developed during Q1 to help identify items from the MDSS GUI that need to be included into the MDSS web-based interface. During Q2 several items were accomplished and presented to the Technical Panel and from that discussion another set of modules/features were developed during Q3. This included integration of AVL/MDC data into the system, finalizing the graph view for RWIS, METAR, and MDSS plow routes to improve menu functioning, and many miscellaneous bug fixes that were necessary to get the WebMDSS solution in status used for operations during Q4 and 2017 Q1. Progress of these features was presented at the August teleconference along with feedback updates provided by the Technical Panel members.

- The current version of the GUI during Q2 is v12.9 with internal testing to be conducted on Version 13.0. Updates include the inclusion of friction data reported by RWIS sites and improved functionality of the manually reported information via the GUI mobile applications.

- Assessment of recommendation work was accomplished for the upcoming winter season. A tentative plan was reviewed internally and plans to present the information to the MDSS Technical Members will occur in early Q4. The plan includes the expansion of participation providing feedback with additional follow-up necessary from Iteris. This effort will help catch additional events that are not currently captured with the small list of users accessing the assessment of recommendations information.

- Training materials were updated for the upcoming winter season. This included the MDSS GUI manual, MDSS GUI reference guide, the WMRI reference GUI, MDSS Android reference guide, and the MDSS iOS reference guide. All of these documents were posted to the MDSS webpage for viewing and are up to date with the versions of the products they support.

- Work began with MnDOT to help develop their maintenance reports that can easily be viewed for their operations. MnDOT is funding this work through the PFS MDSS project as the information will be beneficial for all agencies. Work was completed on the "actual vs. recommended" report and "speed while applying chemical" report. Starting in late August weekly meetings were held to discuss progress of the reports.

- Route changes were received by several agencies and work is being performed to include them into the system before winter begins.

**Anticipated work next quarter:**

- Major work will be completed on the webMDSS functionality. The list of items will be decided upon during the Q4 MDSS Technical Panel meeting. The webMDSS interface will be released to a small group of DOT users to be used operationally during Q4. This will be the first time the interface will be used to make operational maintenance decisions.

- Operations will begin for all agencies in Q4.

- Iteris will present a plan for the Assessment of Recommendations approach for the 2016/17 year.

- Provide updated MDSS software documentation and 'images' to the PFS, based on the MDSS instance that has been spun up in Amazon Web Services' EC2 infrastructure, but with problems noted by MnDOT in their internal rollout of the MDSS software addressed. Iteris will work with the PFS member agencies thereafter to define the process for software provision and maintenance going forward (under the newly-signed IP agreement).
- Release of Version 13.0 of the MDSS GUI.
- An MDSS Technical Panel Meeting will be hosted in early Q4

**Significant Results:**

- The deployment of the MDSS Dashboard has been met with positive feedback and constructive comments for changes. This feature allows the most basic users to get information in a quick view.
- An operational web-based MDSS solution has been developed during Q4 2015, and Q1/Q2 2016. This effort has taken years' of work within the GUI and placed it into a web application that can be used by decision makers in each agency.

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

- Q4 represents the start of Year 2 for Phase 9. Additional funds were provided by MnDOT to assist with their maintenance reports interface. Although additional funds have been added to the project the scope of work should not be impacted by these changes.

**Potential Implementation:**

- The MDSS research program is now well into its 9<sup>th</sup> phase of work. The core MDSS software / services have been operated 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. During Phase VII, MDSS applications for iOS and Android mobile platforms were developed and made available to PFS member agencies. New features and capabilities continue to be added in the present phase of work.