

TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Date: 8-1-14

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.

Transportation Pooled Fund Program Project # <i>(i.e., SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX))</i> TPF-5(054)		Transportation Pooled Fund Program - Report Period: <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)	
Project Title: Development of a Maintenance Decision Support System			
Name of Project Manager(s): Dave Huft		Phone Number: 605-773-3358	E-Mail: dave.huft@state.sd.us
Lead Agency Project ID: SD2002-18		Other Project ID (i.e., contract #): 310814	Project Start Date: October 14, 2002
Original Project End Date: April 30, 2003		Current Project End Date: September 30, 2014	Number of Extensions: 30

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
\$7,755,260.00	\$7,300,071.44	94.13%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
\$318,079.73 (4.10%)	\$318,079.73	95.83%

Project Description:

The Maintenance Decision Support System (MDSS) research program is responsible for research and development related to the implementation of new information technologies, including winter and summer decision support tools, to support transportation maintenance decisions. The program also performs substantial research and development into parallel transportation applications 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.):

- Completed and implemented the restructuring of the MDSS server-side road condition analysis and forecast system codes. This restructuring was done in order to permit fast-tracked responses from MDSS to user-submitted reports.
- Also completed and implemented a new mechanism for collecting, storing, and applying segment-specific data, intended to reduce duplication of intensive data queries required to support regular updating of route-based information for map overlays and the pending MDSS dashboards.
- Identified multiple-scattering of solar radiation off of snowpack in the ambient environment surrounding roadways as one source of the late-winter daytime cool biases in MDSS' road temperatures across parts of the country (i.e., the snowpack reflects sunlight, which is then reflected back to earth again by clouds or normal atmospheric scattering processes).
- Implemented system for intensive data collection at selected locations, with the goal of supporting an effort to get more objective evaluations of various aspects of MDSS' performance (to complement the more subjective approaches that have historically been taken). Selected MDSS routes that have ESS, camera, and MDC input for continuous record of conditions to support both objective and subjective analyses and road conditions.
- Performed case studies of winter storms in conjunction with DOT recommendation analyses to assess reasons for accept/decline decisions and discussed at March technical panel meeting. Completed design of assessment of recommendations interface to merge with fast-tracked MDSS response processing. Discussed direction of the assessment of recommendations project with sub-committee and addressed issues in technical panel meeting based upon DOT feedback.
- Fixed bugs in both the iOS and Android MDSS apps discussed at the Fall 2013 Tech Panel meeting implemented 'static' layers in both platforms (e.g., 24-hr and 48-hr accumulated snowfall maps). Added MDC/AVL data layer to the iOS map view. Added legends to most map layers, and implemented improved looping controls, in both platforms.
- A final Phase VII report was submitted for review and comment.
- Operations consumed much of the effort during Q1 which included new users added to the system, training, customer support activities, along with weather forecasting support. All agencies have experienced varying degrees of winter weather during Q1 allowing agencies to use MDSS in their operations.
- The sub-committee tasked with helping the development of MDSS dashboards held another meeting. Several ideas were shared during regarding current development activities and progress. It was important for the sub-committee to provide direction on the placement of information along with specific content. The status of the dashboard research and development was presented during the March technical panel meeting..

Anticipated work next quarter:

- Continue research and development will occur with the MDSS dashboards for the MDSS apps and GUI. Progress will be presented at the Q2 technical panel meeting.
- Implement the initial MDSS dashboards in the iOS and Android mobile applications.
- Implement the additional capabilities in the WMRI tool discussed with members of the MDSS Tech Panel subcommittee for the Management Tools at the March, 2014 Tech Panel Meeting. This includes capabilities for creating groupings of routes, as well as capabilities for creating side-by-side graphs of various winter severity metrics across routes (or groups of routes), or across different timeframes.
- Operations will continue for some agencies during Q2 while others will end on April 15th of Q2.
- Effort will be spent on using MDSS and historical weather information to better define Level of Service for each agency. This work falls under the assessment of recommendation work and is a result of discussions during the March technical panel meeting. This work will involve an iterative process of collecting the weather information, defining the route configurations with the agency, and running the simulations. Initial results will be presented during Q2's technical panel meeting.

Significant Results:

- Identified at least one of the contributing causes of a longstanding cool bias in MDSS' late-winter daytime road temperatures.

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).

- None this quarter.

Potential Implementation:

- The MDSS research program is now in the beginning of its 8th phase of work. The core MDSS software and 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. During Phase VII, MDSS applications for iOS and Android mobile platforms were designed, developed and made available to PFS member agencies.