Pooled Fund Study Project TPF-5(054)
SDDOT Project SD2002 – 18
Development of Maintenance Decision Support System
Phase V
Fourth Quarter Progress Report
October - December, 2008

Overview

The primary foci of the Phase V fourth quarter (Q4) 2008 were ramped up support for Field Deployment Transition III including extensive training and route expansion in many of the 14 states. Work also continued on the cost/benefit study and the Winter Maintenance Severity Index (WMSI).

Many internal changes were made with the MDSS GUI including enhancements to both behind-the-scenes processing and to user display capabilities. At the end of the quarter version v5.29 was available to all users.

Progress by Task

Specific accomplishments on the explicit tasks of the Phase V work plan during the fourth quarter of 2008 follow.

TASK 13: Provide weather forecast support, MDSS configuration support, live MDSS operations, and necessary training for continuing deployment field trials in the participating highway agencies throughout the 2007-2008 and 2008-2009 winter seasons.

MDSS operations were the major effort during this period as most states began their winter operations. Many of the states also used this quarter to increase their route coverage. The Meridian team also spent significant time coordinating with states to ensure route information previously entered for the state was still as accurate as possible. This effort was necessary to capture not only actual changes to the routes that have occurred since their inception, but also to incorporate more accurate data now that a better understanding of the need for certain data, and how it is used in MDSS, is more widespread throughout the states. It is also now realized by all that this process is critical due to the importance of accurate metadata to ensure the most accurate treatment recommendations.

Training has clearly been an important part of deployment of MDSS within the PFS states. As states move to full deployment of MDSS, training new users is a crucial portion of this deployment. The retraining of existing users is also crucial to not only explain new features, but also provide users the opportunity to ask questions in face-to-face meetings as their level of maturity with the system increases. As such, several Meridian members spent significant time with users in the field training on the MDSS GUI and the overall concept of MDSS. Table 1 shows the extensive list of training locations, dates, and trainers present.

Table 1: Training table from Q4 of Phase 5. Each state is broken down to show the extensive training that was conducted during this quarter.

Date	Location	Trainer
California		
No Training Requested		
Colorado		
October 3rd	Evans	Gordon Bell
October 7th – 8th	Glenwood Springs	Gordon Bell
October 14th – 15th	Denver	Gordon Bell
October 16th	Aurora	Gordon Bell
October 23rd	Colorado Springs	Gordon Bell
October 24th	Sterling	Gordon Bell
October 27th – 28th	Denver	Gordon Bell
November 10th	Colorado Springs	Gordon Bell
November 12th	Trinidad	Gordon Bell
Indiana		
October 6th	Indianapolis TMC (statewide champions training)	Steve Gaddy
October 7th – 10th	Laporte & Fort Wayne Dist. (4 sessions ea.)	Steve Gaddy
October 14th – 17th	Crawfordsville & Greenfield Dist. (4 sessions ea.)	Ben Hershey
October 28th – 31st	Vincennes & Seymour Dist. (4 sessions ea.)	Ben Hershey
Iowa		
No training requested		
Kansas		
December 8th	Olathe (Topeka also present)	Ben Hershey
December 15th	LaCrosse	Gordon Bell
Kentucky		
November 10th	Frankfort (statewide training)	Steve Gaddy
Minnesota		
October 9th	St. Cloud	Jakin Koll
October 15th – 16th	Brainerd & Rochester	Jakin Koll
November 13th	Albert Lea	Jakin Koll
December 10th	Detroit Lakes	Jakin Koll & Adam Chambers
December 11th	Morris	Jakin Koll
Nebraska		
October 21st-22nd	Scottsbluff/Gering & Grand Island	Gordon Bell & Ben Hershey
October 23rd	Omaha	Ben Hershey
December 1st-4th	Omaha, Lincoln, Norfolk, Grand Island & North Platte	Ben Hershey
December 17th	Scottsbluff/Gering	Gordon Bell
New Hampshire		
November 12th-13th	Franconia, Thornton, Concord TMC & Hooksett	Steve Gaddy
New York		
October 14th – 17th	Potsdam, Lockport, Pittsford & Syracuse	Steve Gaddy
October 21st – 24th	Hornell, Binghamton, Utica & Albany	Steve Gaddy
October 27th – 28th	Poughkeepsie & Hauppauge	Steve Gaddy
North Dakota		
All Training was conducted during Q3 of Phase V		

South Dakota		
November 13th	Watertown	Ben Hershey
November 17th -20th	Mitchell, Murdo & Rapid City	Ben Hershey
December 9th	Pierre	Ben Hershey & Leon Osborne
Virginia		
November 6th	Salem	Steve Gaddy
Wyoming		
October 29th – 30th	Casper & Gillette	Gordon Bell
November 4th	Thermopolis	Gordon Bell
November 5th	Laramie	Gordon Bell, Ben Hershey & Leon Osborne

Along with extensive training conducted during Q4 there was also route expansion seen in many of the PFS states. Table 2 shows the comparison of routes at the start and end of Q4.

Table 2: Route number comparisons for each state.

State	Start of Q4	End of Q4	State	Start of Q4	End of Q4
California	6	6	Nebraska	34	97
Colorado	100	102	New Hampshire	4	7
Indiana	121	153	New York	19	25
Iowa	67	67	North Dakota	77	77
Kansas	18	18	South Dakota	24	81
Kentucky	0	4	Virginia	9	9
Minnesota	150	185	Wyoming	38	59

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.

Enhanced in-vehicle MDSS software developed during previous quarters (associated with subtask 14.2) is still in the process of being implemented as of the end of Q4 2008. In addition, Meridian has 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.

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

Efforts to improve the capability and performance of MDSS are ongoing. Subtask 15.1 was completed during Q4 alongside the implementation of other optional 'precautionary' recommendations such as marginal refreeze or blowing snow situations where the system does not anticipate trouble, but where extra caution is warranted (Subtask 15.7). Subtask 15.2 was also completed during Q4, with logic for both traffic volume and speed reductions in the presence of unfavorable road and/or weather conditions added to MDSS. Subtasks 15.4, 15.5 and 15.8 were completed in previous quarters. Numerous enhancements and adjustments to other MDSS'

modules, falling under Subtask 15.10, have also been completed during Q4. Perhaps the most significant of these is the addition of a loose (unbonded) form of ice to the modeling system that appears to be helpful in improving MDSS' performance during sleet events. Additionally, GUI modifications were also continued during Q4 2008, to include the addition of several features and resolution of numerous longstanding bug fixes.

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.

Support of the MDSS cost/benefit study was completed during Q4. The final datasets associated with simulations of a Colorado Department of Transportation (CDOT) route were provided to the Western Transportation Institute on October 13th. Follow-up support in interpreting the data was provided to WTI thereafter, as was a 15-page report supplement describing the simulation methodology intended for inclusion in the MDSS cost/benefit study final report.

Research into the potential for application of MDSS as a tool for generating a Winter Maintenance Response Index also continued during Q4. Efforts during the quarter continued to focus upon developing methods for aggregating and analyzing data (both actual and simulated) and methods for differentiating between trustworthy and questionable data – both in terms of weather observations and maintenance information.

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

Three draft MDSS procurement specification documents have been circulated to date. The first specification document, created and circulated in previous quarters, was designed for a procurement situation in which an agency desired weather and maintenance decision support services be provided as a package by a single entity. This document provides specifications for an MDSS and service provision that are similar in nature to what has been provided by Meridian during the MDSS field deployment tests.

Upon review of this first document, the MDSS Technical Panel members also expressed a need for two additional specification documents: one for the provision of weather services to support MDSS and another for operation of the MDSS system. A draft MDSS weather services specification was completed and circulated to the Technical Panel members during Q2. A draft of the specification for operation of the MDSS system was completed and circulated to the Technical Panel members during Q3. No further feedback has been received on either document during Q4, and as such the documents have remained unchanged during Q4.

TASK 18: Prepare a final report summarizing methodology, findings in performance, conclusions and recommendations.

No activities have been performed for this task during Q4. A Major Report on the study to date was created during the Q1 and will eventually serve as the basis for the Final Report as the project winds down.

TASK 19: 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 Q4.