Pooled Fund Study Project TPF-5(054)
SDDOT Project SD2002-18
Development of Maintenance Decision Support System
Phase IV
QUARTERLY PROGRESS REPORT
October-December, 2007

Overview

The primary focus of the Phase IV forth quarter (2007) was the initiation of Field Deployment Transition II (FDT-2) activities. This included the addition of domains associated with the 3 new PFS MDSS states, the addition of 137 new winter maintenance routes into the system (to 511 routes total as of 12/31/07), and the conduction of nearly 40 group training sessions across the 13 member states.

Research and development activities also continued during the quarter, including the release of v4.00 of the MDSS GUI and the development of seasonal simulation capabilities to support the MDSS benefit / cost study being performed by the Western Transportation Institute and Iteris, Inc. Server-side MDSS processing was also modified during the quarter to improve system performance and also to allow the MDSS processing load to be parallelized across several computers.

Several large-scale documentation activities were also a focus of the quarter, including the development of a procurement specification guideline document, a major project report detailing activities of the PFS MDSS to date, and a comprehensive User's Guide.

Progress by Task

Specific accomplishments on the explicit tasks of the Phase IV work plan during the fourth quarter of 2007 follow.

Task 1: Implement version 2.0 of the PFS MDSS in state agency offices in individual and multi-state test regions as determined by the Technical Panel and evaluate its performance during 2005-06 winter operational maintenance activities

Task completed. No additional activities during Q4 2007.

Task 2: Identify required additional research necessary to continue the enhancement of MDSS within an operational environment

Seasonal simulations using MDSS, presently being performed to support the MDSS benefit / cost study, are yielding useful insights into the behavior and performance of the MDSS system and helping to guide present research and development activities.

Task 3: Prepare for the Field Deployment Transition (FDT) to be conducted during the winter of 2006-07

Task Completed. No additional work was performed during Q4 2007. However, similar activities for the FDT-2 2007-08 winter season were carried out as discussed elsewhere in this report.

Task 4: Perform scientific validation of observed weather variables and comparison with input variables to the PFS MDSS

Task Completed. No additional work was performed during Q4 2007.

Task 5: Perform an assessment of the validity, acceptance, utilization and operational requirements of MDSS within State DOT winter maintenance practices

User training was a primary focus of Q4 2007. Table 1 shows a comprehensive list of dates and location where training was conducted across the PFS states.

Table 1: Q4 2007 training dates, states, locations, and trainers.

Date	State	Location	Trainers
10/2	Colorado	Boulder	Gordon Bell
10/3	Colorado	Pueblo	Gordon Bell
10/4-10/5	Colorado	Glenwood Springs	Gordon Bell
10/9	Colorado	Evans	Gordon Bell
10/11	Colorado	Sterling	Gordon Bell
10/15	Minnesota	Deer River and Bemidji	Ben Hershey, Jakin Koll
10/15	Colorado	Brush	Gordon Bell
10/16	Minnesota	Brainerd	Ben Hershey, Jakin Koll
10/17	Minnesota	Thief River Falls and Karlstad	Ben Hershey, Jakin Koll
10/18	Colorado	Denver	Gordon Bell
10/18	Minnesota	Roseau	Ben Hershey, Jakin Koll
10/24	Indiana	Seymour	Steve Gaddy
10/25	Colorado	Wolf Creek Pass	Gordon Bell
10/31	Indiana	LaPorte	Steve Gaddy
11/02	Nebraska	North Platte	Gordon Bell
11/05	New York	Syracuse	Steve Gaddy
11/06	Colorado	Castel Rock	Gordon Bell
11/06	New Hampshire	Concord and Franconia	Steve Gaddy
11/07	Colorado	Empire Junction	Gordon Bell
11/07	North Dakota	Bismarck (all districts present)	Ben Hershey
11/08	Nebraska	Norfolk	Ben Hershey
11/08	New York	Allegany County	Steve Gaddy
11/09	Nebraska	Lincoln	Ben Hershey
11/09	New York	Albany	Steve Gaddy
11/15	Minnesota	Thief River Falls	Ben Hershey, Jakin Koll, Ben Collin
11/26	Kansas	Olathe	Gordon Bell, Bob Hart
11/27	Kansas	LaCrosse	Gordon Bell, Bob Hart
11/29	Minnesota	Morris	Ben Hershey, Jakin Koll
11/30	Minnesota	Brainerd/Baxter	Ben Hershey, Jakin Koll
12/05	South Dakota	Menno	Ben Hershey
12/06	South Dakota	Custer	Ben Hershey
12/06	New York	Binghamton	Steve Gaddy
12/07	South Dakota	Winner	Ben Hershey
12/07	New York	Albany	Steve Gaddy
12/17	Minnesota	St. Cloud	Jakin Koll, Ben Collin
12/17-18	Wyoming	Cheyenne	Gordon Bell

In addition, Steve Gaddy conducted an MDSS introduction and familiarization session in Salem, Virginia on 10/3, and assisted with ESS siting intended to support the Virginia MDSS routes on 11/2. Additional training sessions are still expected over the second half of the FDT-2 field operations.

Task 6: Develop a strategy to transition the MDSS PFS to a broader state DOT audience and full deployment

An issue that has troubled the PFS MDSS system since the outset has been the ability to properly configure routes within the MDSS system. The PFS MDSS provides for an extraordinary amount of configuration and customization, but there is typically little information available to base settings on. The lack of information on how to configure the system has often led to a reactionary situation where changes are made to settings for a particular route or area based upon limited user feedback or observed system performance in one or two events. It has previously been exceedingly difficult to gauge the impact of these configuration changes over the long term. A promising solution to this problem has been evolving over the past two quarters of research. In order to support the MDSS benefit / cost study and the development of a capability for using MDSS as a Winter Maintenance Response Index (or Winter Severity Index) generator, a capability for rerunning past winter seasons through MDSS is being developed. These seasonal simulations provide a glimpse at the magnitude and nature of the maintenance responses required in each given area over time *given system configurations for that area*. The promising aspect of this for longer-term broad deployment is that the simulated maintenance activities can be compared to actual agency records to help tune MDSS settings to yield a maintenance response that is more consistent in magnitude and approach to current operations. It is anticipated that this long-term simulation capability will eventually become a standard part of the route configuration process for an agency.