Montana Department of Transportation Maintenance Process Improvements Final Report

By

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Advanced technologies have many potential applications in the transportation field, including improving maintenance operations through the coordination and integration of resources. These technologies offer the potential to conduct more highway work with less human resources, open work zones to traffic in a more expedient manner, provide better service without increasing costs, and increase work zone safety for workers and travelers. In order to pursue these potential benefits, WTI has evaluated technologies that may be beneficial to the maintenance division of the Montana Department of Transportation (MDT).

The purpose of this project was to develop new R&D initiatives for advanced technology applications, while improving MDT's maintenance operations. To facilitate this objective, an extensive literature review was conducted to assess the use of advanced technologies in the maintenance field. WTI created an applications matrix that compares MDT's current maintenance activities with the revised state of the practice from the literature review. The applications matrix was then used as a tool to guide discussions with MDT maintenance personnel and determine target areas for candidate projects and demonstrations.

The following target areas have been established as points of focus from the preliminary evaluation of the applications matrix and meetings with MDT maintenance personnel: Information Gathering and Dissemination Technology, Decision Support Systems, and Inventory Tracking and Control Systems. This analysis will facilitate the development of a proposal for design, implementation, and evaluation of a candidate project. The matrices are listed starting on page 2.

SIGNIFICANCE: This project will not only serve MDT, but also provide valuable state of the practice information to all Departments of Transportation exploring the potential of advanced technology to address maintenance needs.

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		System	Systems	Management Systems	Information System (VOIS) and Integrated Maintenance Management Program	Management System	Deteriorating Concrete Bridges: Reliability- Based Optimum Maintenance Planning Strategies	for Network Level Concrete Deck Repair Management	Maintenance Plan for Steel Bridge Protection Systems	for Two-Lane Highway Maintenance Projects	Prioritization Based on Rapid Visual Condition Evaluation			
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		Optimizing Work Zone Lengths for Four-Lane Highways	Reliability-Based Life- Cycle Management of Highway Bridges	Computing Fastest Paths in	Applying Portable Pen- Based Computers Used In Combining Inputs for Short Run Scheduling	Voice Recognition Systems, Electronic Clipboards, and Hand Held Data Terminal and	Roadway Feature Inventory Updating Using Pen-Based Systems With Digitized Map Displays.	Cradle to Grave Sign Inventory and Maintenacne Management System.	Using Telecom Technology for Transmitting Work Reports to Headquarters in a Non-Verbal form.
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		Automated Highway System Infrastructure Diagnostic Vehicle	Teleoperated and Automated Maintenance Equipment Robotics (TAMER)	Teleoperated Hazmat Vehicle	Automated System for robotic excavation and pipe installation.	Teleoperated Remote Control! Caterpillar Bulldozer and Autonomous Loading System for Repetative Backhoe Operations.	GPS and GIS systems used to reduce the errors in measuring distances from mile posts. (Differential GPS)
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