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Idaho Transportation Department Case Study

The Idaho Transportation Department taps into MobileDataforce's wireless technology for collecting and reporting data on maintenance at rest stops.

According to a February 2006 announcement from Gartner, Inc., a computer research company, 14.9 million personal digital assistants (PDAs) were shipped in 2005 worldwide. These sales surpassed the previous high mark set in 2001 and represented a 19 percent increase from 2004. Some businesses already are discarding traditional paper forms and filing practices for these efficient mobile tools and disk storage methods. The result could be long-term savings in overhead costs and resources, improved accuracy in data collection and reporting, and expedited work performance.

Photo: Kevin Benedict, MobileDataforce

Not only are private companies tapping into the potential of PDAs, State governments also are taking heed. In March 2005 the Idaho Transportation Department (ITD) launched a PDA pilot program that would help the agency achieve "enterprise application integration," which is defined by David S. Linthicum in his book *Enterprise Application Integration*as "a method of unifying disparate applications into a unified set of business applications."

In a long-term effort to improve business practices, ITD's managers decided that they would break new ground by introducing PDAs and specialized software from MobileDataforce to field inspectors in a pilot program that would help achieve the agency's goal of implementing programs that use the latest technological advancements. The pilot program provides mobile hardware and software to ITD's Maintenance Section to facilitate the collection and distribution of data on the maintenance of rest areas across the State's six regional districts.

Rest stop inspections help to ensure that government contractors responsible for building and grounds conditions are completing tasks in accordance with contract provisions. In the pilot program, ITD maintenance inspectors replaced the old handwritten methods of collecting data by trading in pens and paper forms for handheld computers, styli (pointed pen-shaped tools that enable users to interact with computer screens), and specialized software.

"We are excited about the innovative use of PDA devices for maintenance activities," says Paul C. Ziman, who is the operations, pavement, maintenance, and materials engineer with the Federal Highway Administration's (FHWA) Idaho Division Office. "ITD has been pleased with the performance of the PDAs. Currently, the main use is as a platform for supporting electronic forms in the field. This method would be ideal for any personnel required to complete paperwork while operating away from their office. The form design software is easy to use, and the forms themselves operate smoothly and intuitively. The hardware has proven to be highly reliable, and the link to the centralized database is both effortless on the part of the user and reliable."

About the Idaho Transportation Department

More than 1,800 employees statewide carry out ITD's commitment to provide safe, efficient travel. The ITD employees are stationed in virtually every part of Idaho, from the headquarters in Boise to ports of entry at the State's borders and at a number of maintenance buildings along rural highways.

The department is divided into six operating divisions, and the Maintenance Section is one of nine agency subsections. Its mission is to provide the best possible services to ITD, other agencies, and the public by keeping Idaho's State highways and associated facilities clean, safe, and reliable.

Among its other duties, the Maintenance Section is responsible for overseeing custodial services for the buildings and grounds at 30 rest areas and 10 fixed ports of entry. These areas are assessed regularly by Maintenance Section inspectors who complete documentation for grading contractor performance. ITD staff review the information during contract renewal periods. Upon request, the agency provides copies of the records to contractors so they can monitor their employee work performance.

The agency chose the Maintenance Section to participate in the pilot program because of the antiquated system previously used for the field inspections, the limited funding available for a pilot, and the small number of employees in the subsection who would need equipment. The aim was to provide maintenance inspectors with a quick and easy method of completing documentation while in the field and a way to share the information with ITD staff by transferring data from the handheld PDAs into a centralized, easily accessed database.

Doing Things the Old Way

Before the launch of the pilot program, Maintenance Section employees manually completed paper forms, a cumbersome task that involved filling in various inspection requirements and scoring the maintenance performance by hand. The field inspectors then submitted the paper forms by mailing them to a central office, where clerks would file them for future retrieval.

When ITD staff needed to check on the effectiveness of a government contractor, office employees located the appropriate paperwork and then faxed or mailed it to the requestors for review. The process was time consuming and prone to error.

The paper forms were sometimes lost in the mail, resulting in the need for additional inspections. Occasionally, the paperwork was misplaced or misfiled, causing employees to put aside other tasks to locate the information. Completed forms often were difficult to interpret or inconsistent with State reporting standards. Because ITD had no computerized database for the rest area inspection records, the only way to retrieve pertinent data and produce statistics was to search manually through stacks of papers and file folders.

Forming a Plan for the Pilot

For many organizations, implementing a new program can be daunting. Employees may have a certain comfort level in doing things the old way. But by setting priorities and goals, focusing on problems associated with current procedures, and planning new problem-solving strategies, change can open the door to new and better opportunities and result in establishing positive work-related procedures that benefit the organization as a whole.

ITD assembled a team of employees who are affiliated directly or indirectly with the responsibilities of the Maintenance Section and who understand current organizational practices and the objectives of the pilot program. Equally important was the team's ability to encourage, influence, and enable others to commit to the project in a positive manner.

Together, the ITD team documented who was responsible for various aspects of the work, the process by which the maintenance inspections were completed manually, and how those processes interacted with the work practices of other agency employees. The team also identified problems and discussed potential solutions.

Researching various handheld computing options and data collection software, the team began the task of selecting the hardware and software that would assist inspectors in performing their jobs more efficiently and enable ITD to integrate inspection records into a central database. The team purchased software from MobileDataforce and standard handheld computers at a cost of $445 each and, to help ensure device durability, protective cases at $50 each. Vehicle power adaptors, purchased for $26 apiece, completed the hardware package.

These items were distributed to 10 agency field inspectors. To ensure an efficient workflow, handheld computers also were provided to the ITD database developers and managers, enabling them to test new forms, applications, and synchronization processes before installing software changes or enhancements on the field devices.

ITD selected MobileDataforce a company headquartered in Boise, ID, to generate customized electronic forms for the handheld computers.

The company developed a basic form capable of field input and synchronization with the central database. Using various components of the company's software, ITD then was able to implement its own updates, corrections, adjustments, and customizations to the form as necessary. The agency's IT staff uploaded the inspection forms to the field staff's handheld devices. The IT employees used their own agency-issued PDAs to revise existing forms or create new ones and test them in-house before distributing them to field personnel. "The electronic forms are very easy to create and modify for our specific needs," says Ernest.

Once the original process was implemented, ITD listened to feedback from those participating in the pilot program and made necessary modifications. The agency found, for example, that distributing assorted forms to field inspectors was

challenging. In managing a widely dispersed workforce of inspectors and various versions of forms, the agency needed a timely means of deploying new and updated documents. As a solution, the ITD team selected a proprietary application that automatically publishes new forms or updated versions of forms to various mobile devices. The agency's IT staff was able to distribute forms quickly and conveniently to field personnel and easily track which staff members had successfully installed the most recent forms.

ITD continues to monitor program results and make adjustments as needed.

Buy-In From Management

A modest financial investment, coupled with strong support from the managers in ITD's Maintenance Section, played a vital roll in obtaining approval for the pilot program. The maintenance managers saw the value that technological advancements could bring to their section and had the authority to budget the necessary funding.

Managers in the Maintenance Section were able to garner additional support, both up and down the chain of command because the project was small, simple, and could be done through a low-cost proof of concept, and a positive result could affect many other areas of ITD. Further, the Maintenance Section was able to link the rest area inspection data to an existing database used for tracking other ITD facilities, further reducing initial funding requirements and helping it sell the project as a useful upgrade to an existing system.

Introducing the Technology

ITD required Maintenance Section employees to attend a 2-hour training session presented by MobileDataforce to learn the fundamentals of using PDAs for data collection and synchronization. During the classroom instruction, the employees were led through the process of completing forms using handheld devices.

Once the forms are downloaded on the field devices, the inspectors complete their documentation by tapping their styli on the appropriate options available in various drop-down menus. The menus contain the most common answers to the questions on the forms.

When the inspectors return to the office, they place the handheld device into a cradle attached to a desktop computer. The information is automatically transferred from the device to the agency's central database. Inspectors have the opportunity to revise or add comments directly to the database from their desktop computers after the synchronization process has taken place.

"The new process is very useful in the field," says Cathy Ford, administrator of ITD's Roadside Program. "The old way was very time consuming, and inspectors had to handwrite individual scores, tally up the scores, and provide detailed comments. With this new technology, we are able to reduce the time it takes to enter the information and allow the inspectors to choose from a variety of options using drop-down menus. The data is also stored on a central database, making it easy to access by anyone with permission."

Dick Powell, district maintenance manager with ITD, is pleased with another aspect of the new system. He says, "The process makes the reports uniform and legible."

Because the pilot program is a new undertaking, ITD is still developing the central database, fine-tuning it to be capable of running customized reports based on specified preferences.

Leading by Example

As a State agency rather than a commercial enterprise, ITD is not geared to measure data on a true return on investment for any project. Savings in manpower, time, and resources are an ongoing consideration, but in the case of this pilot program, the agency has not yet reported significant cost savings. The implementation of ITD's pilot program has, however, significantly improved the agency's inspection-related business practices.

"The PDAs have increased the ease and efficiency of the inspection process, making it less prone to error; enhanced the consistency of inspection standards across the State; and eliminated inconsistencies and errors due to illegible handwriting or poorly completed forms," ITD's Ernest summarizes. "The most vital improvement is the safe and efficient storage of inspection information, which makes complete and accurate historical data readily available and thus makes it much easier for district and headquarters decision makers to develop sound options for rest area maintenance. Further, the program was implemented without placing any additional burden on State personnel."

By balancing new ideas and available resources with long-term benefits, ITD is showing a way for State transportation agencies to use advanced communications technology.

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