Public Water Access Sites Tool: Taking it Mobile and Paperless

State of Minnesota — Minnesota IT Services

CATEGORY:
Emerging & Innovative Technologies

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MINNESOTA IT SERVICES

Executive Summary

The Department of Natural Resources (DNR) Public Water Access Sites Tool (PWA) was developed by Minnesota IT Services (MNIT) in 2019, using the newest available technology to deliver business value.

This new tool is a data collection software application that allows DNR staff to manage Minnesota's public water access site maintenance with both mobile devices and office desktop software. The data collected while at the public water access sites is automatically aggregated into a database, which is available on managers' desktops back in the local offices and statewide at headquarters in downtown St. Paul.

DNR staff can identify locations, type of work needed, materials needed, and prioritize the work using this new tool. The DNR PWA mobile app meets the state's digital accessibility requirements and is fully operable by voice control to accomplish anything that can be done with finger gestures.

Using this new tool and database, DNR supervisors can coordinate the work much more efficiently across the public water access sites in their local management areas. DNR management can run comprehensive queries, showing the priority work and current status of all the public water access sites.

EXEMPLAR

This project is a role model demonstrating MNIT's ability to successfully build and deploy mobile applications to record work activities in the field and document work needed at the site. Implementation of the PWA mobile application results in more efficient management of field sites, more effective prioritizing of work, and best use of time and material resources.

The PWA mobile application improved business processes by providing an easier way to record work needed and work accomplished at sites while "in the field". It eliminated the need for filling out paper forms and then transcribing data from paper to electronic form. It also populates a database that allows management to see a holistic picture of all work done and needed at Public Water Access sites across the entire state that are managed by the agency.

This project used emerging technologies and best practices to apply them to a business process that has not used technology solutions. Managing public water access sites has historically been done by maintenance crews who used rakes, shovels, and heavy equipment a lot, but not pencils and paper. Even when the work was documented on paper, it was not collected into a single database so management could plan the work most effectively. MNIT staff recognized the chance to use mobile devices and software to address the issue.
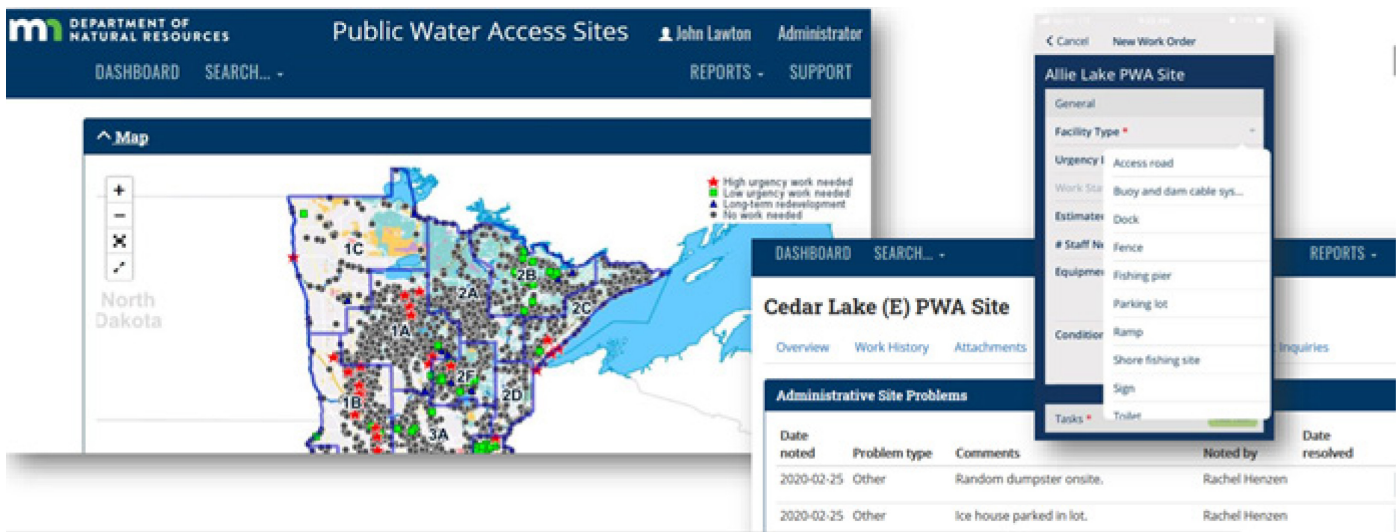

Figure 1: The web application and mobile device display.
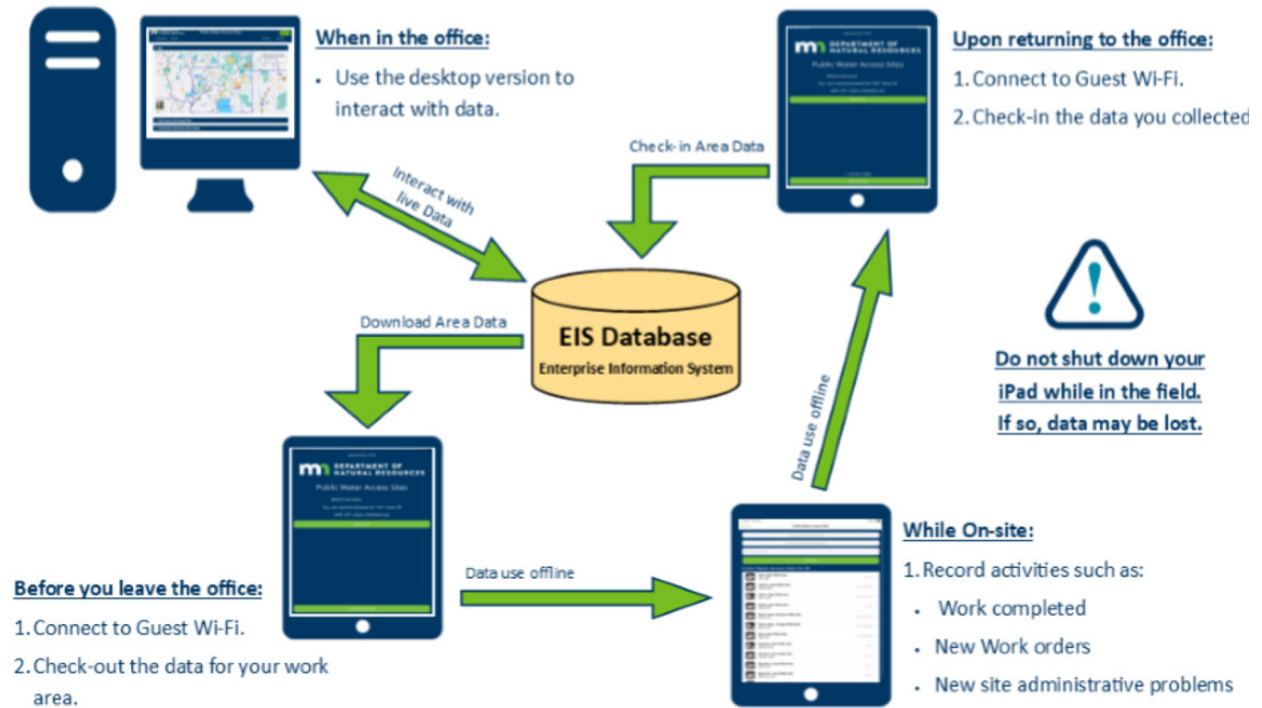
Figure 2: Public Water Access Sites Tool: Use Overview

The illustration above is used to provide simple explanations and steps to users. Before leaving the office, they use their mobile device to connect to wi-fi, and check-out the data for their work area. They access the data offline. Then when they are on-site, they record their activities. Upon returning to the office, they connect to wi-fi, and check-in the data they collected, which is stored in the Enterprise Information System database. Then, when they are in the office, they use the desktop version to interact with data.

Figure 3: The Mobile Side

The illustration above shows the steps (check data out, record the work, check data in), and shows images of the mobile screens for Work Needed, Work Completed, and Administrative Site Problems.

CONCEPT

This project was proposed to management in the DNR's Division of Parks and Trails by field managers that oversee the maintenance of Water Access Sites out of the recognition that across the state, staff were recording work needed and work completed in different ways. Each work area in the state used paper forms to record work and then transcribed them into self-made Access databases, Excel spreadsheets and Word documents which made the data difficult and time-consuming to compile and report on statewide activities.

For this project, we used a hybrid Waterfall/Agile approach. The Waterfall approach was used in the beginning phases of the project to determine functional requirements and technical approach. Once application development began, the project moved into a more Agile approach, with development iterations. Those iterations allowed us to respond to unforeseen or vague requirements.

This project cost $207,000 to develop, which includes project management, business analysis, and application development. The project team included seven IT staff and 10 business staff over the course of 18 months. The project was constantly assessed by quantifying the reporting of work orders and accomplishment reports and the compilation of statewide reports.

The mobile application interface was evaluated throughout the development process to ensure it meets the state of Minnesota's accessibility requirements. The development software had already incorporated the accessibility requirements through enabling voice commands. Information security for the mobile app uses the state networks, user network, and device authentication.

The state is wholly responsible for the oversight of this initiative and its outcomes.

Communications were managed by the DNR Water Access site consultant and were communicated to staff via division newsletters, presentations at meetings across the state, and a mandate by the division director that staff use the PWA mobile app. User documentation was developed, and training sessions were held before the field season to educate users. These trainings were recorded for others to view.

SIGNIFICANCE

The scope of this initiative covers 2,994 public water access sites managed by the Department of Natural Resources across the 87 counties in Minnesota.

The beneficiaries of this project are all Minnesotans, tourists, DNR staff, and emergency response crews who use water access sites to gain access to Minnesota lakes and streams for recreation, research, fish population assessments, and emergency response.

This initiative is innovative and distinct from other projects because it moved data entry into the hands of the maintenance crews, and consolidated work that was accomplished and work that was planned into a database that allowed management to use efficient best management practices.

Successful implementation means that DNR staff use these tools to record work needed and work accomplished at Minnesota's Water Access Sites. This is important because it enables the most efficient management of staff time, materials needed, and equipment deployed.

MNIT and the state benefit financially from a more efficient and effective deployment of staff, materials, and equipment. Minnesotans benefit from well maintained and safe public water access sites as well as being able to obtain timely and accurate information. For example, when a dock is installed or removed, that information is immediately funneled to the web site so that citizens are well informed.

This initiative fits into the larger picture by aligning with Minnesota Governor Walz's Building One Minnesota's recommendations:

- Public Safety and Asset Preservation: ensures public water access sites are well maintained.
- Quality of Life: provides access to our public lakes and rivers for all citizens and tourists. Boating and fishing is a major player in our state's recreational and tourism industries.

This initiative also meets Minnesota IT Services' Five Year Strategy for providing technology leadership and education to state agencies to improve processes and enhance decision-making.

This initiative fits into the larger picture by addressing six of NASCIO's State CIO Top Ten Priorities:

- (2) Digital Government, by providing new online data collection tools for DNR Parks and Trails division staff.
- (4) Consolidation/Optimization, by consolidating operations across multiple sites across the state to record work done and work needed in the same way and centralize the data gathered so management can see the entire picture of all the resources needed.
- (5) Customer Relationship Management, by providing MNIT's DNR partners with an easy to use online interface to enter their data and give them a way to see all the work done and needed across the state at 2,994 different sites.
- (6) Budget, Cost Control, Fiscal Management, by providing a way for DNR managers to reallocate staff, equipment, and material resources more efficiently.
- (8) Data Management and Analytics, by providing a standardized database to accumulate data over the years which will allow them to predict how much and where future work will be needed at the various sites.
- (10) Innovation and Transformation through Technology, by using newly available hardware and software tools in a maintenance operation domain where it was never used before.

IMPACT

State government is more efficient because public water access site maintenance workers are now recording their findings in real-time using the PWA mobile application. This allows agency management to get a clear

vision of the overall amount of work accomplished, future work needed, and effectively prioritize deployment of staff, equipment, and materials.

The immediate impact of this initiative saved time and increased accuracy of documenting and reporting the work done and work needed at every public water access site. Prior to this initiative, a DNR area office supervisor would provide a formal report at the end of the season to the Water Recreation Coordinator. Once those reports were received, they were reviewed and consolidated into a single report. Coordinating the recording of activities and consolidating the report was tedious and time consuming and relied on staff from around the state to provide their reports on schedule. Using the mobile app allows the workers to complete statewide reports of public water access in a matter of minutes.

The longer-term impact of this initiative is to enable more effective deployment of staff, equipment, and materials. Hence, better maintenance of public water access sites and safer conditions for citizens and tourists using those sites to access our lakes and rivers.

State budgets are under constant scrutiny and staff are being asked to do more with less. The efficiencies and cost savings, mainly staff time, gained using this tool is anticipated to pay for the development costs in the near term. A conservative estimate of staff time saved is one hour per site visit by eliminating transcription of notes on paper forms and then later, typing those handwritten notes into a spreadsheet. Forecasting a single visit to each site each year provides 2,994 hours of staff time saved annually. Non-financial impacts include more effective and timely communication with people using the water access sites and to DNR Management and the state legislature.

Not only has this initiative saved time for the maintenance crews who enter the data, but it also eliminated long delays in consolidating the data from hundreds of locations. The most substantial benefit is better maintained and safer public water access sites for our Minnesota citizens and visiting tourists.

The mobile application is in its first season of use and in three months there have been more than 4,137 work records submitted and 2,062 completed. In addition, there have been 541 site checks indicating a high level of use within the division. Prior to this initiative, there was no statewide account of how many site checks were done or work records submitted or completed. With the automated aggregation of this data captured using the mobile application, management know exactly how much work was done this season and can make the most efficient use of staff and equipment in the years to come.