

# RESEARCH SPOTLIGHT

## Project Information

**REPORT NAME:** MDOT Right-of-Way Conversion to GIS

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**PROJECT COST:** \$344,000

**COST SHARING:** 20% MDOT, 80% FHWA through the SPR, Part II, Program

## MDOT Project Manager



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## Modernizing right of way maps with geographic information system technology

Since the Michigan Department of Transportation (MDOT) began archiving right of way (ROW) maps in the 1940s, MDOT has updated the information technologies it uses for map creation and archival. Past efforts to standardize this archive have revealed the need for a coordinated approach. With the goal of modernizing ROW maps using a geographic information system (GIS) platform, research efforts evaluated the mapping formats across the state, including current efforts to modernize the archive, and proposed three options for proceeding. Results of a proposed pilot project for modernization outline the steps, resources and training needed to convert ROW mapping to GIS.

### PROBLEM

The state of Michigan has continually updated its process for creating and archiving ROW maps to take advantage of improvements in information technology and to make the maps easier to search and access over the years. Due to this technological evolution, historical ROW mapping exists in multiple formats, from hand-written documents to searchable data files that are already integrated into existing information systems. In an ideal scenario, all ROW information would be easily searchable and integrated with other related information to benefit state and



Integration with GIS can offer easier access to ROW information.

public users. Due to the amount and types of data, an effort to modernize the archive requires a coordinated process to ensure that all pieces of data can be made part of a single digital system.

*“Making the ROW maps accessible through GIS can significantly increase access and ease of use, saving time and resources for MDOT employees and the public.”*

**Matt Fitch**  
Project Manager

## RESEARCH

In seeking best practices from other states that face the same challenges of integrating historical ROW maps to GIS, the study uncovered some consensus on hurdles and lessons learned. Other states confirmed that the magnitude of the project required sufficient resources and a champion to maintain momentum, consistency and visibility. Moreover, feedback identified skill gaps that limited their team’s ability to modernize and maintain the data. Finally, survey results underscored the need for strong data standards and a process that captures new ROW information as it is created without adding more data in legacy formats.

The investigation also assessed MDOT’s current ROW data and evaluated existing modernization plans. Results outlined a progression from the earliest hand-drafted ROW maps to digitally scanned maps, which then evolved into maps created with computer applications. This effort revealed the opportunity to address current processes that perpetuate existing ROW map formats but that will not facilitate integration with GIS.

Forums were conducted virtually with different MDOT regional offices and other state employees together to collect input on priorities for an integrated ROW archive enabled with GIS. In addition to uncovering specific gaps and opportunities, input from MDOT employees emphasized the

urgency of ROW data modernization and the inefficiencies created by the existing archives. Although interest level has been consistently high, no universal modernization plan is underway. MDOT is, however, currently working to integrate all of the ROW maps into GIS.

## RESULTS

Using information gathered on the current state of ROW data and a needs assessment using employee input, the researchers developed three design plan options for modernizing ROW data. Critical points for consideration included a process to move existing ROW into a GIS database, a process to enter newly created ROW data into the database and a means for users to easily view the ROW data and related information. The research team also took into account the need to connect ROW mapping data with other data managed by MDOT, such as real estate parcel information housed in another database.

The researchers then completed a pilot study using the optimal proposed modernization plan, focusing on Ingham County, which partially encompasses the city of Lansing and towns to the southeast. A draft ROW database was built in GIS format, and following the modernization plan, 20 ROW maps were georeferenced to place the map within an existing GIS database and indicate its location. This pilot effort allowed the research team to test the plan’s efficacy, estimate the time and resources needed for the project and develop further recommendations for modernization efforts.

## VALUE

The plans, recommendations and estimates developed in the study present a coordinated strategy to modernize and standardize ROW mapping information. The approach can make historical data more accessible while also integrating newly created maps into one GIS database. Not only does an integrated GIS make it easier

to search and access ROW information, but it can also establish connections with other information housed by MDOT and frequently referenced in conjunction with ROW queries. Equipped with budget estimates and training analysis from the pilot project, MDOT has the elements it needs to plan for modernization. The research findings may also prove helpful to other states facing similar challenges with their ROW data.

## Research Administration

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**Final report and related materials are available online at**

[MDOTjboss.state.mi.us/TSSD/tssdResearchAdminDetails.htm?keyword=SPR-1724](http://MDOTjboss.state.mi.us/TSSD/tssdResearchAdminDetails.htm?keyword=SPR-1724).

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