Initiatives to Encourage a Data-Driven Approach to Local Roadway Safety

To maximize returns on investment in preparing, utilizing, and maintaining a strong safety data system, the Michigan Department of Transportation (MDOT) has undertaken a number of programs that make use of roadway, traffic, and crash data to improve safety on local- and State-owned roads in the State of Michigan.

Like many states, Michigan faces the challenge of addressing a large number of fatal crashes on non-State-owned highways, which comprise roughly 90 percent of the roadway miles and the majority of roadway fatalities in Michigan. To improve safety on local roads, Michigan has participated in several initiatives that help bolster the State's multifaceted roadway safety program by providing local agencies with meaningful, timely access to crash data, as well as tools for data analysis and training to manage their safety processes.

The Case for Local Roadway Safety Improvements

Over the past several years, MDOT has demonstrated commitment to data-driven safety decisionmaking by developing region-specific analysis tools, supporting local safety analysis, and providing tools and technical assistance to local agencies. For example, MDOT encourages local participation in the Governor's Traffic Safety Advisory Commission's annual Michigan Traffic Safety Summit through a scholarship program for local agencies.

As a key priority for the State, safety improvements typically enjoy support from MDOT's executive management. Often, MDOT staff find that that it is not difficult, or even necessary, to convince leadership to support major safety programs, since the agency's Safety Programs Unit has the capability to undertake such efforts inexpensively using its own staff. Michigan's local safety efforts demonstrate that investment in safety data at the organizational level has widespread benefits to roadway safety statewide.

> ***"To improve safety on local roads, Michigan DOT has established three initiatives that help bolster MDOT's multifaceted roadway safety program."***

Local Safety Efforts

Local Safety Initiative

To address safety throughout Michigan's entire roadway network, MDOT created the Local Safety Initiative in 2004 to offer technical assistance to local agencies. As part of the Local Safety Initiative, MDOT provides participating local agencies with site-specific analysis, including ranking reports for intersections and segments. At no cost to local agencies, MDOT staff visit the agencies to conduct one- to two-day field reviews with staff to discuss locations of interest.

During these visits, MDOT staff review countermeasures and discuss realistic means of obtaining funding for safety improvements, including applying for Federal Highway Safety Improvement Program (HSIP) grants through MDOT. The Local Safety Initiative has helped align local safety efforts with the State's Strategic Highway Safety Plan (SHSP) and has resulted in an increase in the number and quality of HSIP applications in Michigan, while also saving limited local agency staff time.

Roadsoft

MDOT is a national leader in providing local agencies with meaningful access to crash data. As part of its local safety efforts, MDOT supported the expansion of a GIS-based roadway management system known as Roadsoft. Among many other features and functions, Roadsoft provides local agencies timely crash data, as well as tools to analyze crash trends and diagnose crash patterns. Roadsoft and its safety analysis tools were created by the Center for Technology and Training (CTT) at Michigan Technological University.

MDOT funded enhancements to the Roadsoft safety module to make its tools more intuitive to local users. The expanded safety module, which includes collision diagrams, crash reports, aerial imagery, and curve identification features, provides local agencies with access to data and to analysis capabilities that result in safety projects that target locations with high rates of fatal and serious injury crashes.

MDOT also provides funding for CTT to offer the software and training at no cost to local agencies.

Region-Specific Spreadsheets

As an early adopter of the HSM, MDOT participated in AASHTO's HSM Lead State Initiative, which encouraged highway agencies to use the HSM. As part of this initiative, MDOT developed an implementation plan for the HSM that included the regional calibration of predictive spreadsheets and Safety Performance Functions (SPFs) – equations that estimate expected average crash frequency as a function of traffic volume and roadway characteristics.

Like many States, Michigan experiences dramatic differences in road types and Average Annual Daily Traffic between the rural and metropolitan areas of the State. Safety analysis that relies on SPFs that do not reflect the degree of variability in traffic network and travel demand characteristics could impact investment decisions and safety outcomes negatively. To reconcile this issue, MDOT calibrated SPFs, which were developed based on national values, to the unique characteristics of Michigan's roadways. MDOT then further refined SPFs to the regional level to reflect the site types and travel characteristics that are characteristic of MDOT's seven Regional Offices.

As part of MDOT's HSM implementation plan, the agency determined that it has sufficient in-house data and expertise to refine the SPFs to the regional level without the use of external consultants. When this effort is complete, MDOT's diagnosis, countermeasure selection, projects prioritization, and investment evaluation processes will be tailored to the regional characteristics of Michigan's roadways.

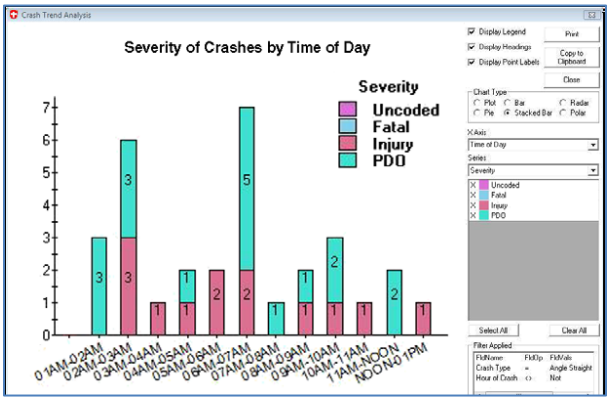

Figure 1: **Roadsoft's safety analysis tools allow users to visualize trends in roadway safety. (Courtesy of MDOT)**

Crash Reporting

Reliable crash data are one necessary component of robust safety analysis. In addition to the Local Safety Initiative, MDOT has also taken steps to address the quality of the crash collected on local and State-owned roadways. MDOT provides input into the Michigan State Police's training programs and materials to ensure quality reporting. Through the program, MDOT is able to emphasize what elements of crash reporting are of particular importance and how exactly they should be documented in the system. Improved safety data allows the State to better understand and address safety challenges on the transportation network through the use of predictive methods, such as those included in Safety Analyst™.[1]

Additional Resources

Roadsoft Introductory Brochure

Case Study on MDOT's Support for Local Safety Data Analysis

State of Michigan SHSP 2013-2016

[1] AASHTOWare Safety Analyst™ is a set of software tools that supports highway safety management at state and local agencies.