

## Chapter 8

# OPERATIONAL AND MANAGEMENT STRATEGIES

SAFETEA-LU legislation emphasizes the inclusion of operational and management strategies to improve the performance of existing transportation facilities to relieve congestion and maximize the safety and mobility of people and goods. The management tools that the Kalamazoo Area Transportation Study uses for these activities are management systems in the following areas:

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| <ul style="list-style-type: none"> <li>■ Pavement (Asset);</li> <li>■ Bridge;</li> <li>■ Safety;</li> </ul> | <ul style="list-style-type: none"> <li>■ Congestion;</li> <li>■ Public Transportation; and</li> <li>■ Intermodal.</li> </ul> |
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The Kalamazoo Area Transportation Study uses the Michigan Department of Transportation's management system known as the Transportation Management System. KATS and its members also maintain and use local transportation system management tools similar to the components of the Michigan Department of Transportation's system but containing local data exclusively. The transportation management systems used by KATS were developed as a result of a requirement introduced by the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) with continued emphasis in the Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21). KATS has replaced its previous Pavement Management System with the Asset Management System that was implemented statewide. The Study has added tools available from Michigan State Police and the Roadsoft asset management programs to augment its Safety Management System. In addition, KATS local members use microsimulation, capacity software, and other methods to optimize traffic signal corridors.

The relationship between the management systems and development of metropolitan transportation plans is clearly expressed by two of the general policy statements in the regulations:<sup>11</sup>

- “The primary purpose of the management system is to provide additional information needed to make effective decisions on the use of limited resources to improve the efficiency of, and protect the investment in, the nation's existing and future transportation infrastructure at all levels of jurisdictional control.”
- “The output of the individual management systems shall be integrated into the metropolitan and statewide transportation planning process . . . and shall be considered in the development of metropolitan and statewide transportation plans and improvement programs and in project selection decisions. . .”

These policy statements express both the importance and linkage between the management systems and the metropolitan and statewide transportation planning processes.

The Kalamazoo Area Transportation Study is not a designated Transportation Management Area (TMA) and has not developed a specific congestion management process as an integral part of the planning process but does conduct work with congestion management activities.

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<sup>11</sup> SAFETEA-LU, 23 CFR Section 500.105

## **OVERVIEW OF MDOT MANAGEMENT SYSTEMS ACTIVITIES**

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) required State Highway Agencies (SHA) to develop management systems in the following areas: Pavement, Bridge, Safety, Congestion, Public Transportation, and Intermodal. The Michigan Department of Transportation (MDOT) collectively refers to the management systems as the Transportation Management System. This system provides a source of information addressing both the condition and the performance of the existing and future transportation networks. This overview of MDOT management system activities presents a review of the development process and product.

The Transportation Management Systems (TMS), designed and implemented by MDOT, serves as an integral decision support tool to feed a project prioritization process. It shows how proposed projects support the State Long Range Plan and the Transportation Plans of the urban areas and other agencies within Michigan.

MDOT maintains a website on a web page dedicated to these management systems. It can be accessed at: <http://mdotwas1.mdot.state.mi.us/public/tms/>. For more detailed information and guidelines as to how to access this information and guidelines to access this information, contact the Michigan Department of Transportation.

## **OVERVIEW OF KALAMAZOO AREA TRANSPORTATION STUDY MANAGEMENT SYSTEMS ACTIVITIES**

The primary purpose of the management systems is to provide the information and data needed to make effective decisions on the use of limited resources to improve system efficiency and protect existing and future infrastructure investments. The states have been assigned the lead role in developing and implementing the management systems. In metropolitan areas, state-Metropolitan Planning Organization cooperation is emphasized. Recognizing that decision making on over 90% of the system miles is vested in local officials at various levels, this cooperative or joint effort is important to the successful implementation and application of the management systems.

Within the Kalamazoo metropolitan area, the local transportation agencies have advanced their management system activities, acting in coordination with and cooperatively through the Metropolitan Planning Organization. Coordination with the system development efforts by MDOT has focused on that same approach. The Kalamazoo Area Transportation Study has been both a direct and indirect participant in the development of the management systems.

## **THE TRANSPORTATION MANAGEMENT SYSTEMS USED BY KATS AND LOCAL AGENCIES**

Each local agency uses a combination of their own and other management systems for their planning, operation, and management of their systems. The Kalamazoo Area Transportation Study also uses a combination of local and state systems for its planning and programming purposes. The following describes the management systems that the KATS and/or its members use.

### **Asset (Pavement) Management System**

The Pavement Management System provides for a systematic process that analyzes and summarizes pavement information for use in selecting and implementing cost-effective pavement construction, rehabilitation, and maintenance projects. The system KATS uses is the PASER<sup>12</sup> system provided through the Local Technical Assistance Program housed at Michigan Technological University's Transportation Institute. The PASER System is included in a software package called RoadSoft GIS. Pavement condition information, traffic volumes, and National Functional Classification information is maintained and updated for all federal aid eligible streets and many non-federal aid eligible streets in Kalamazoo County. The pavement condition for the federal aid system is currently surveyed every other year. One half of the federal aid system is evaluated every year. This management system provides system condition information on an annual basis and is used to evaluate various preservation programs to see how funds can best be allocated to preserve the existing road system. Road condition data is obtained using a team made up of individuals from the Michigan Department of Transportation, the Kalamazoo County Road Commission, the Kalamazoo Area Transportation Study, and the local cities. Currently, data for the federal aid eligible system has been gathered annually since 2003. The Michigan Department of Transportation uses its own pavement management system in addition to the RoadSoft PASER system.

### **Bridge Management System**

The Kalamazoo Area Transportation Study relies on the Bridge Management System developed and maintained by the Michigan Department of Transportation. MDOT's Design Division has maintained a computerized bridge inventory in accordance with National Bridge Inventory Standards (NBIS) for over 25 years. This inventory covers all Michigan bridges over 20 feet in length, regardless of jurisdiction. MDOT periodically conducts bridge condition surveys. Identical surveys are conducted by the responsible road agency for bridges in county and local jurisdictions and submitted to MDOT. Surveys of all bridges in the State are required as a condition for receipt of federal funding.

The Bridge Management System supplies an analysis and summary of data, uses mathematical models to make predictions and recommendations, and provides the means by which alternative policies and programs may be efficiently considered.

### **Highway Safety Management System**

The highway safety management system addresses all modes of highway transportation safety. Specifically, it addresses safety on public roads, and similar to the other management systems, is integrated into the decision making process. The overall goal of this management system is the reduction of the number, and severity, of highway crashes.

Effective management and reduction of highway related injuries and fatalities is the intent of the highway safety system. This management system may recommend that responsible agencies direct their limited resources to safety projects to receive maximum return on their investment.

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<sup>12</sup> PASER is a product of the University of Wisconsin and uses a surface rating system that links type, number and severity of defects with the type of maintenance needed.

### FATAL AND INCAPACITATING INJURY CRASHES

	2004		2005		2006		2007		2008		2009	
	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
Fatal Crashes	24	.2	26	.3	23	.3	24	.3	28	.3	16	.2
I/I Crashes	184	1.8	131	1.4	153	1.8	157	1.8	119	1.3	105	1.3
Total F/I/I Crashes	208	2.1	157	1.7	176	2.1	181	2	147	1.6	121	1.5
Total Crashes	10034	100	9177	100	8433	100	8844	100	9113	100	8171	100

I/I = Incapacitating and Injury Crashes

Source: Roadsoft GIS

F/I/I = Total Fatal and Incapacitating Injury Crashes

The table shows that despite an increase over 2005 number for Total Fatal and Incapacitating Injury Crashes, in 2006 and 2007, the number of these crashes decreased between 2004 and 2009. 2009 had the lowest number of this type of crash.

The Kalamazoo Area Transportation Study and its members use the safety management features contained in RoadSoft, the data system from the Michigan State Police, and local data to identify, assess, and program improvement strategies to address transportation safety issues in Kalamazoo County. This system is used in planning and programming activities of the Kalamazoo Area Transportation Study.

The Safety Management System is one of the tools used to allow the activities of the Kalamazoo Area Transportation Study and its members to coordinate with the State of Michigan Strategic Highway Safety Plan.

In order to mitigate any known or potential hazards, Kalamazoo County developed a Hazard Mitigation Plan in accordance with state and federal government. The purpose of this plan is to create an ongoing document to “protect the health, safety, and economic interests of the Kalamazoo County residents and businesses by reducing the impacts of natural and technological hazards through hazard mitigation planning, awareness, and implementation.”<sup>13</sup> The plan was formally adopted by the Federal Emergency Management Agency on January 5, 2007.

The plan identifies nine key hazard categories, each with subcategories and action items. The nine hazard items are:

- Civil Unrest and War
- Weather
- Flooding and Drought Hazards
- Infrastructure Failures
- Transportation Accidents
- Geological
- Fire Hazards
- Hazardous Material Incidents
- Public Health Emergencies

<sup>13</sup> Kalamazoo County Hazard Mitigation Plan, Executive Summary

Through the planning process, KATS will continue to consult with Kalamazoo County and its individual units of government in order to assist in mitigating transportation related safety issues.

### **Congestion Management System**

TEA-21 required that needs identified by the congestion management system be considered in developing metropolitan and statewide transportation plans and improvement programs. The MDOT Congestion Management System includes the identification of alternative strategies to alleviate congestion while enhancing the mobility of persons and goods.

The Kalamazoo Area Transportation Study is not a Transportation Management Area and is not required to develop a Congestion Management System. KATS and its local members do use corridor optimization, traffic signal optimization, and other tools to identify and reduce congestion without adding through traffic lanes.

### **Public Transit Management System**

The intent of the Public Transit Management System (PTMS) is to evaluate strategies and project alternatives for inclusion into appropriate transportation plans and improvement programs. The Kalamazoo Area Transportation Study and its member public transportation system operator use the Michigan Department of Transportation developed and maintained Public Transit Management System for this activity. The local public transportation service provider uses the system, updating it with local data. This system is used to maintain capital equipment data, operational data, and to determine future operational and capital needs.

### **Intermodal Management System**

SAFETEA-LU emphasizes intermodal aspects of the transportation system. MDOT has an Intermodal Management System through the Transportation Management System database. The purpose of this management system is to improve integration and coordination in planning and implementing air, water, and ground transportation systems. This management system includes all facilities, both public and private, necessary to establish an efficient intermodal transportation system. An effective intermodal system will consider private sector issues, and many capital decisions affecting transportation facilities and systems made by the private sector. However, government policies and programs have an impact on private sector operations and decision making.

The State is required to develop, establish, and implement an intermodal management system that meets the federal legislation requirements. The data requirements of the intermodal system mandates coordination and integration with metropolitan and statewide transportation planning, the private sector, and other management systems. Because of the complexities of quantifying the intermodal management system, a task force has been formed at the state level to provide for local input into developing this system.

## **FUTURE DIRECTIONS**

The Kalamazoo Area Transportation Study will continue to cooperate with its members and partners to maintain and improve the transportation management systems that it uses in its planning and project development processes.