

# fiscal forum

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## TRANSPORTATION: ASSET MANAGEMENT

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In its June 1, 2000 report, "Transportation Funding for the 21<sup>st</sup> Century," the Act 51 Transportation Funding Study Committee presented its recommendations regarding management and funding of the Michigan transportation system.<sup>1</sup> The principal recommendations of the Study Committee involved asset management.<sup>2</sup> The key recommendation was that "a long-term, planned asset management process be extended to statewide use for transportation facilities."

This *Forum* discusses the general concept of asset management as well as specific asset management systems currently used by Michigan road agencies. It also discusses how the Act 51 Study Committee's recommendations might be implemented in Michigan—particularly with regard to the current Act 51 formula distribution of state restricted funds between state and local road agencies in Michigan.

These asset management systems provide companies with a rational basis for determining how best to maintain, repair, and replace capital assets. Asset management systems help companies decide whether to invest in a new factory or close an existing factory; whether to build, buy, or lease new equipment; and how much to budget for maintenance. Among the asset management tools used in such decisions is life-cycle cost analysis.

### *History*

Asset management, as applied to publicly-owned infrastructure, is a fairly new concept, a concept borrowed from private industry. Private for-profit companies, particularly companies with large investments in capital assets (e.g. utilities, telecommunications companies, airlines, railroads, large manufacturers), must manage those assets efficiently in order to maximize the return on those investments in a competitive environment. As a result, companies with large investments in capital assets have adopted a systematic approach for managing those assets.

To date, public entities have not used asset management to the extent that private companies have. One reason is that public agencies exist to serve public functions - functions that involve political concerns of equity and effectiveness, not profitability. Public entities are not expected to make a profit and therefore do not include return-on-investment analysis as part of the budget decision-making process.

In addition, publicly-owned infrastructure assets have not been considered "assets" on governmental financial statements. The balance sheets of governmental financial statements generally show only short-term assets, such as cash and cash equivalents, accounts receivable, and inventory. Expenditures for capital

<sup>1</sup> The Study Committee report included recommendations related to both highway and public transportation programs. However, the asset management recommendations were exclusively associated with highway programs, and the discussion of asset management in this memo is limited to their application to highway programs. Additional information on the Act 51 Transportation Funding Study Committee can be found as Appendix 1 of this memo.

<sup>2</sup> Several other Act 51 Study Committee recommendations were related to the concept of asset management. See "Other Recommendations" for a discussion of some other asset management-related recommendations.

infrastructure, such as roads, bridges, public buildings, and water and sewer systems were just that: **expenditures** with no recognition of them as long-term assets in governmental financial statements.<sup>3</sup>

In recent years, there has been growing interest in the application of asset management principles to the management of public infrastructure, and to the transportation infrastructure in particular. This interest is due to several factors, including:

- Completion of the Interstate Highway System which shifted the focus of federal and state transportation agencies from construction and expansion to maintenance and preservation of the existing highway system.
- Condition of the existing transportation system—much of the national highway system was aging and in need of maintenance, repair or reconstruction. Road agencies realized that they had to systematically manage highway infrastructure in order to avoid the obsolescence of large parts of highway system at the same time.
- Limited state resources for transportation.
- Increased demand for efficiency and accountability in the delivery of government services.
- Availability of information technology and advanced management systems—asset management systems are generally supported by computer database and decision-modeling systems.

Interest in asset management was one of the factors in the development of GASB Statement No. 34 (issued June 1999), which will require the recognition of capital infrastructure assets on governmental financial statements. GASB Statement No. 34 has, in turn, generated additional interest in asset management concepts.

In 1996, the Federal Highway Administration (FHWA) and the American Association of State Highway and Transportation Officials (AASHTO) began to study the application of asset management concepts to transportation systems (highways, bridges, and

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<sup>3</sup> The treatment of infrastructure assets on governmental financial statements will change with the implementation of GASB Statement No. 34. See Appendix 2.

airports).<sup>4</sup> Since 1996, the FHWA and AASHTO have issued several publications on asset management. The FHWA and AASHTO are currently sponsoring the development of an Asset Management Guide for member agencies, with an estimated publication date of April 2002.<sup>5</sup>

## Definition

The following definitions of asset management are taken from recent FHWA and AASHTO publications.

Asset management has been defined as:

*“A systematic process of maintaining, upgrading, and operating physical assets cost-effectively. It combines engineering principles with sound business practices and economic theory, and it provides tools to facilitate a more organized, logical approach to decision-making.”<sup>6</sup>*

The Federal Highway Administration Office of Asset Management defines asset management as:

*“A business process and decision-making framework that covers an extended time horizon, draws from economics as well as engineering, and considers a broad range of assets. The asset management approach incorporates the economic assessment of trade-offs between alternative investment options, both at the project level and at the network or system level, and uses this information to help make cost-effective investment decisions.”<sup>7</sup>*

Asset management systems involve the following basic components:

- Identification of performance goals—such as pavement condition.

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<sup>4</sup> AASHTO is an organization of the state departments of transportation, the US Department of Transportation, and various affiliated transportation agencies and organizations. The Michigan Department of Transportation is a member of AASHTO.

<sup>5</sup> The development of an Asset Management Guide is National Cooperative Highway Research Program (NCHRP) Project 20-24(11) “Asset Management Guidance for Transportation Agencies.”

<sup>6</sup> *Asset Management, Advancing the State of the Art Into the 21<sup>st</sup> Century through Public-Private Dialogue*, USDOT, Federal Highway Administration, Publication No. FHWA-RD-97-046.

<sup>7</sup> *Asset Management Primer*, Federal Highway Administration, Office of Asset Management, December 1999.

- Inventory of assets—such as roads or bridges.
- Recording measurable condition assessment—such as pavement condition – in relation to goals.
- Performance modeling – such as forecasts of pavement deterioration.
- Analysis of alternatives—which is most cost effective, to repair or replace?

The focus of transportation asset management systems is the maintenance, preservation, and operation of the existing transportation system. Although the above examples focus on condition of the physical infrastructure asset (roads, bridges, and pavement) asset management performance measures can be of system function or operational performance, such as safety or congestion, as well.

## Application

The Study Group recommendations clearly envision the development of a statewide asset management system which would eventually guide the distribution of state and federal highway funds to state and local road agencies in Michigan. How would such a system work?

Although the Study Group did not address specific implementation questions, a basic asset management model for Michigan would probably involve the inventory of statewide highway assets (i.e., highways and bridges), the evaluation of the condition and performance of those assets against objective standards, the forecast of asset condition or performance over time, and an assessment of the resources needed to maintain the assets to a desired standard.<sup>8</sup>

In theory, such a system could provide policy makers with an objective measure of whether transportation resources were adequate to maintain the road system at a given standard of condition and performance. If an asset management process determined that current resources were not adequate, policy makers would have to consider alternatives, including increasing dedicated transportation revenue through increased taxes or fees,

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<sup>8</sup> The Study Group anticipated that technical issues related to the implementation of a statewide asset management system would be addressed by a Technical Advisory Panel (see “Other Recommendations”).

increasing revenue for the entire highway system by reallocating other state resources, or increasing revenue for the “high level” highway system by redistributing existing state transportation resources.

The Legislature could also accept lower standards of condition or service on all or part of the highway system. In some cases, acceptance of a lower-level standard of highway condition through deferred maintenance may be more costly in the long run. The failure to maintain assets to a standard necessary to maintain them for their anticipated useful life is a form of “disinvestment.”

There remain a number of technical hurdles which would have to be cleared before a statewide asset management process could actually be implemented.

Both the Michigan Department of Transportation (MDOT) and a number of local road agencies already have a number of asset management systems—pavement management systems, bridge management systems, etc. These asset management systems are currently used by road agencies in project and program planning decisions.

For example, MDOT uses its Pavement Management System to inventory pavement, record pavement condition, and forecast pavement life. This information is then used by MDOT to help identify the most cost-effective method of maintaining pavement life—routine maintenance, capital preventive maintenance, or reconstruction.<sup>9</sup> Many local road agencies use similar systems.

The Study Committee’s vision of a statewide asset management process, which would guide the distribution of state and federal transportation funds across all state road agencies, involves a significant expansion in the scope of current asset management systems. Can current state and local asset management systems, which have been developed for specific road agencies and for specific classes of assets, be integrated into a new statewide system which considers all asset classes? Or will there have to be developed a new statewide system to be adopted by all road agencies?

This brings us to the larger questions raised by the Act 51 Study Committee recommendations. How should the recommendation that “a long-term, planned asset

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<sup>9</sup> MDOT has indicated that asset management systems can also be used to coordinate improvements, such as performing road and bridge work simultaneously and coordinating state and local projects.

management process be extended to statewide use for transportation facilities” be implemented?

- Can asset management be used to help coordinate the allocation of resources between different sets of assets, such as roads and bridges, which are now often considered separately?
- Can asset management be used to help allocate state transportation resources between state and local road systems, or between roads systems with different characteristics (rural or urban) or functions (commercial, agricultural, recreational)?
- Can asset management be used to set statewide priorities between road systems of statewide, regional, and local importance?
- Is it practical or desirable to develop an asset management process to determine the Act 51 formula distribution of Michigan Transportation Fund (MTF) or federal highway funds?

Clearly, asset management systems can provide technical information on highway asset condition and performance, and can estimate the amount of money needed to maintain those assets. But just as clearly, decisions regarding taxation and the distribution of state resources involve questions of equity which are the responsibility of political leaders.

## ***Act 51 Earmarks***

The current Act 51 formula for distributing the MTF earmarks funds for a number of specific programs and activities (rail grade crossings, economic development, critical bridges). In addition, the Act 51 “internal” formulas contain additional earmarks for various activities. Act 51 also prescribes how federal highway funds are distributed between the state and local road agencies.

Legislators tend to favor funding earmarks because earmarks are a way for the Legislature to ensure that certain favored activities are funded. There would appear to be a tension between a funding formula driven, at least in part, by an asset management process, and legislators’ desire to create funding earmarks.

Would adoption of an asset management process eliminate earmarks? In place of specific earmarks, would the Legislature set operational standards and performance measures for the state’s highway system as part of an asset management process?

## ***Other Recommendations***

The Study Committee made twelve additional recommendations related to the implementation of a statewide transportation asset management process, including the following:

### **Technical Advisory Panel (TAP)**

The Study Committee recommended the creation of a technical advisory panel (TAP) to be “responsible for oversight of the components of the asset management process.” The report indicated that the TAP could be comprised of representatives of Metropolitan Planning Organizations, the County Road Association of Michigan, the Michigan Association of Counties, the Michigan Department of Transportation, the Michigan Municipal League, the Michigan Public Transit Association, and the Michigan Township Association.

### **Statewide GIS**

The Study Committee recommended that road and bridge data for all jurisdictions be collected and maintained on a statewide Geographic Information System (GIS). The system would be under the direction of the TAP. This statewide GIS would represent the asset inventory component of a statewide asset management system.

### **Performance Measures**

The Study Committee recommended that “system performance measures, along with associated standards and criteria, be selected by the Technical Advisory Panel for all elements of the roadway infrastructure.” The recommendation further notes that performance measures should be of system performance, and not just condition.

### **Life-Cycle Cost Analysis**

The Study Committee recommended that “roadway assets be managed so as to maximize

performance at the lowest life-cycle cost, including agency first cost, lifetime maintenance cost, and user cost.” Life-cycle cost analysis is a tool for evaluating the cost of various capital and maintenance alternatives. Act 51 (Section 1h) currently requires that MDOT develop and implement a life-cycle cost analysis for each project for which pavement costs exceed \$1 million. There are technical concerns related to the accuracy of life-cycle cost analysis.

### Base Funding for Maintenance

This recommendation indicates that “any asset management-based formula take into account the need for a base level of funding for the routine maintenance of all roads.” This recommendation recognizes equity issues in the distribution of public road funds which would not normally be considered in a private entity’s asset management process. Although the recommendation provides for a base level of funding for all roads, it leaves open the question of the hierarchy of, and funding priority for, various state road systems.

### Retain/Revise Current Formulas

The Study Committee also recommended that the current Act 51 MTF and federal aid distribution formula not be changed “until implementation of an asset management process, which may result in future distribution changes.” The recommendation continues: “while not proposing a specific formula revision at this time, we recognize that a proposed asset management-based formula could result in a funding distribution which focuses on the function or use of a road, while taking into account the base level of funding needed for routine maintenance.”

## Conclusion

The principal recommendation of the Act 51 Transportation Funding Study Committee was that “a long-term, planned asset management process be extended to statewide use for transportation facilities.” A number of questions remain regarding this recommendation.

- How should the recommendation be implemented?

Can MDOT and local agency asset management systems be integrated on a voluntary basis?

Or is there a need for legislation to effect state and local cooperation?

Does implementation of a statewide asset management process require the amendment of Act 51, and if so, how?<sup>10</sup>

- Should asset management be used simply as a tool to help state and local road agencies preserve and maintain physical infrastructure assets?

Or should asset management—to the extent that it is technically feasible—be used to allocate state transportation resources between state and local road systems, or between roads systems with different characteristics (rural or urban) or functions (commercial, agricultural, recreational)?

Can and should it be used to set statewide priorities, and to help allocate resources between road systems based on the relative importance of those road systems?

- Is it practical or desirable to develop an asset management process which determines the Act 51 formula distribution of MTF or federal highway funds?
- Would an asset management process be in conflict with legislative earmarks?

In place of specific earmarks, would the Legislature set operational standards and performance measures for the state’s highway system as part of an asset management process?

Whether or not an asset management process is used to set system priorities or to allocate resources between road agencies, it appears reasonable to expect that state and local asset management systems be coordinated to allow the implementation of comparable performance standards by all road agencies. Performance standards need not be identical for all road agencies—different agencies have different road systems—but performance standards should be coordinated to allow comparison between agencies in order to assess the effectiveness of various investment strategies.

<sup>10</sup> SB 1274 was introduced by Senator Hoffman in May 2000, to amend several sections of Act 51. The bill included amendments to section 9a to provide for the implementation of an ongoing statewide asset management process. Language regarding asset management was not included in the enrolled bill (2000 PA 188).

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## APPENDIX 1

### The Act 51 Study Committee

#### **Public Act 51 of 1951**

This act, known simply as “Act 51,” governs appropriations for most state transportation programs.

Act 51 controls transportation appropriations by channeling state-restricted transportation revenue—primarily from motor fuel taxes and vehicle registration fees—into special revenue funds and by directing how those funds are spent. Act 51 creates the Michigan Transportation Fund (MTF) as the main collection and distribution fund for state-restricted transportation revenue—estimated to be almost \$2 billion for FY 2000-01.

Act 51 provides formulas for the distribution of the MTF to other state transportation funds, to special program accounts, and to local units of government. The primary recipients of MTF funds are:

- **State Trunkline Fund** for the construction and maintenance of state trunkline roads and bridges and for administration of the Michigan Department of Transportation (MDOT).
- **Local road agencies** for 83 county road commissions and 535 cities and villages.
- **Comprehensive Transportation Fund (CTF)** for public transportation programs including capital and operating assistance to the state’s 72 public transit agencies.

In addition to guiding the distribution of state-restricted funds, Act 51 allocates federal highway funds between MDOT and local road agencies. Act 51 requires that 25% of most federal highway funds be allocated to local road agencies with the 75% balance to MDOT. Over \$915 million in federal transportation funds were appropriated in the FY 2000-01 state transportation budget including over \$211 million for local road agency road and bridge construction programs.

Finally, Act 51 establishes the “rules” for state and local transportation programs, such as conditions for expenditures, criteria for bonding, audit requirements, reporting requirements, etc.

#### **PA 308 of 1998**

This act amended PA 51 of 1951, and provided for the creation of a study committee to “review transportation funding options, transportation investment priorities, and potential strategies for maximizing returns on transportation investments.”

The Transportation Funding Study Committee was appointed on February 17, 1999, and included four members of the Michigan Legislature (State Representatives Rick Johnson and Thomas Kelly, and State Senators Phillip Hoffman and Joe Young Jr.) as well as five non-legislative members. The Study Committee submitted its final recommendations in letter dated May 19, 2000. With the exception of Senator Joe Young Jr., all Study Committee members signed the recommendation letter. Senator Young submitted a minority report. The recommendations are contained in a report dated June 1, 2000 and entitled “Transportation Funding for the 21st Century.” The complete report can be found at:

**<http://www.mdot.state.mi.us/ACT51/finalreports/index.htm>**

PA 308 indicated that the Study Committee “after holding appropriate public hearings, shall recommend, if it considers necessary, alterations of formulas for transportation funding and alterations to the distributions of transportation responsibilities by July 1, 2000.” The Study Committee recommended that the current MTF distribution formula remain unchanged “until implementation of an asset management process, which may result in future distribution changes.”

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## APPENDIX 2

### Asset Management and GASB Statement No. 34

The Governmental Accounting Standards Board (GASB) is a private non-profit organization formed in 1984 to develop and improve accounting and financial reporting standards for state and local governments. The GASB is the governmental equivalent to the Financial Accounting Standards Board (FASB) which sets financial accounting standards for private industry. **GASB is not an agency of the federal government.**

Governmental agencies generally follow GASB accounting principles in order to get "clean opinion" financial statements. In addition, Michigan's Uniform Budgeting and Accounting Act, (PA 2 of 1968) was recently amended by PA 493 of 2000 to require that local units of government comply with GASB standards.

In June 1999, GASB issued Statement No. 34. Among other things, this statement required reporting on "infrastructure assets." Prior to GASB Statement No. 34, governments did not recognize roads, bridges, water and sewer systems, or other government-owned infrastructure in financial statements.

Governmental Accounting Standards Board Statement No.

34 requires that governments maintain an inventory of infrastructure assets including a condition assessment at least every three years, and estimates of the annual amount needed to maintain the assets. These requirements are intended to identify *disinvestment* in public infrastructure assets.

Governmental Accounting Standards Board Statement No. 34 requires that the government agency document that it is providing sufficient maintenance effort to preserve infrastructure assets.

The State of Michigan will have to comply with GASB Statement No. 34 reporting requirements for new infrastructure assets starting with the 2001-02 fiscal year and will have to implement retroactive reporting of old infrastructure improvements beginning with the 2005-06 fiscal year.

Asset management systems can help governmental agencies to comply with GASB Statement No. 34 through the inventory of infrastructure assets and the assessment of asset condition.