

# MTC

# Asset

MIDWEST TRANSPORTATION CONSORTIUM - SPRING 2001 - Vol. 1, Issue 2

## From the Director

**W**hy all the interest in asset management now?

One trillion dollars—that's the estimated value of all transportation assets (roads and bridges) in the United States, a value close to that of all goods and services produced annually in this country. A typical state—Missouri, for example—has fixed transportation assets worth 20 to 30 billion dollars.

That's roughly equivalent to the financial assets of a large corporation like Procter and Gamble.

In other words, a typical state department of transportation (DOT) parallels

large corporations in terms of the value of the assets it manages and the benefits it generates for its shareholders. (In the case of a state DOT, shareholders include everyone who uses the state's transportation system.)

Unlike large corporations, however, transportation agencies in this country have not historically had a very good idea what their assets are worth, let alone a system to help ensure they maintain that value.

### Factors driving interest in asset management

The sheer scale of transportation assets managed by state and local governments is one important factor behind

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*An asset management system is an information system that helps organizations make better-informed decisions about where they should invest resources to maintain the value of their assets.*

## MTC developing virtual transportation community



**W**hat is a virtual transportation community? It's a web site where transportation researchers and consumers of that research can connect and interact. It's called the Transportation Research Expo (TRexpo), [www.trexpo.org/](http://www.trexpo.org/).

TRexpo has been tested by Iowa State University faculty, and steps to include other MTC partner universities are

underway. Although parts of the site are still under development, researchers from region 7 interested in participating may log in and add contact information and project information at any time.

### How TRexpo works

Imagine you're the research manager for a state department of transportation (DOT). You need some research done on access management. You're not sure who has expertise in that field, but you know where to look—TRexpo.

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The MTC is the U.S. Department of Transportation's university transportation center for federal region 7. It is located at and managed by Iowa State University's Center for Transportation Research and Education (CTRE).

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IOWA STATE UNIVERSITY

# MTC scholar of the year

**I**owa State University graduate student Jerry Shadewald was named the MTC Transportation Scholar of the Year for 2000–2001.

With this honor, Jerry received an award of \$1,000 and a trip to the Transportation Research Board's annual meeting in Washington, D.C., in January 2001. There, along with scholars from other regions, he was recognized by the U.S. Department of Transportation for his outstanding contributions to the field of transportation.

During the past year, Jerry has conducted research in the addition of advanced analysis and quality assurance modules to a GIS-transportation modeling interface for the Iowa Department of Transportation, in

Jerry Shadewald (left) with Mortimer Downey, then deputy secretary of the U.S. DOT, at the January 2001 Transportation Research Board meeting.



the preliminary exchange of data between a GIS system and a traffic simulation program, and in the difference among traffic assignment algorithms used during travel demand modeling. He has also presented at the University of California-Davis for the NSF Integrative Graduate Education and Research Training Program, and at the Mid-Continent Transportation Symposium at Iowa State University. In addition, he was

heavily involved in student-related transportation activities at Iowa State University, and served as president of ISU's Transportation Student Association.

Having graduated from ISU in December 2000, Jerry recently moved to the Kansas City area where he has taken a position with an engineering consulting firm.

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Now imagine you're a university researcher with expertise in transportation. You want to let people know more about your research interests and expertise, and you also want to learn about the

research needs of organizations such as state departments of transportation, metropolitan planning organizations, consulting firms, etc. Where can you do all this? TRexpo.

The MTC anticipates adding

other features to the site such as online discussion forums, requests for proposals, and links to regional and national sponsors of transportation research.

# MTC scholars program is hot

**M**TC's education coordinators are pleased to have nearly three dozen graduate students participating this year in the Transportation Scholars programs at several partner campuses: University of Missouri-Columbia, University of Missouri-St. Louis, University of Northern Iowa, and Iowa State University.

These students are focusing on transportation emphases within various majors, including geography, public policy, civil engineering, and technical communication, or are working toward Iowa State University's multidisciplinary transportation master's degree in transportation. Congratulations, scholars!

## University of Missouri-Columbia

Mohan Akula  
Vannessa Amado  
Venkata Chilukuri  
Ben Davis

Gopalan Ganesh  
Vasantha Gudiwada  
Daifeng Hao  
Deepak Manjunath  
Wuttichai Prachantrikal  
Courtney Rush  
Adam Zentz  
Kai Zhao

## University of Missouri-St. Louis

Kwabena Boaten  
Ersin Ertikin  
Emmanuel Kalogerakis  
Irina Kovshar  
Chia-Lin Wu  
Danai Tsotra

## University of Northern Iowa

Mike Carpenter  
Dan Stanton  
Mark Steger

## Iowa State University

Melanie Auen  
Rajasekhar Basavaraju  
Michael Clay  
Aravind Gottemukkula  
Kyle Kosman  
Kamesh Mantravadi  
Jerry Roche  
Rajendra Sinhaa  
Dan Smith  
Brandon Storm  
Richard Storm  
David Tarries  
Srinivasa Veeramallu  
David Veneziano



From left to right are University of Missouri-St. Louis students Emmanuel Kalogerakis, Danai Tsotra, Kwabena Boaten, Irina Kovshar, Chia-Lin Wu, and Ersin Ertikin.



From left to right are University of Northern Iowa students Dan Stanton, Mark Steger, and Mike Carpenter.



Front row from left to right are Iowa State University students Aravind Gottemukkula, Dan Smith, and Melanie Auen. Back row, left to right, Srinivasa Veeramallu, David Veneziano, David Tarries, Rajasekhar Basavaraju, Rajendra Sinhaa, and Michael Clay.

# National transportation asset management workshop

**Sept. 23–25, 2001  
Madison,  
Wisconsin**

**T**ransportation agencies—especially state departments of transportation, larger cities, and counties—looking for effective ways to develop asset management systems will benefit from this

program, co-sponsored by the MTC.

The workshop will focus on topics in

- state, county, municipal, transit, and planning practice
- academic research
- consultant experience

The following asset management implementation techniques will be addressed:

- policy goals and objectives
- integrated analyses of options and tradeoffs, including maintenance, capital, and operations
- resource allocation decisions, including data

collection and investment choices

- program delivery and partnerships
- systems monitoring and performance results

## Sponsors

In addition to the MTC, this workshop is sponsored by the American Association of State Highway and Transportation Officials' Task Force on Asset Management, the Federal Highway Administration's Office of Asset Management, the Midwest Regional University Transportation Center at the

University of Wisconsin-Madison, the Urban Transportation Center at University of Illinois-Chicago, the American Public Transit Association, and the National Association of County Engineers.

## For more information

A copy of the preliminary program is available online at [www.mrutc.org/septworkshop.htm](http://www.mrutc.org/septworkshop.htm). You can also request more information through this web site.

## Best student paper

**I**owa State University graduate student Anil Kurian won the MTC Outstanding Paper Award for best research paper at the fall 2000 Transportation Scholars Conference at Iowa State University.

Anil received this honor, as well as a \$1,000 prize, for his paper "Analytical Modeling of Glued Laminated Girder bridges Using ANSYS." He is a student in ISU's civil and construction engineering program.

This conference is part of region 7's Transportation Scholars Program for exceptional students in transportation-related fields.



**Anil Kurian**

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the growing interest in asset management, a concept borrowed from the private sector and from other nations (particularly Australia, Great Britain, New Zealand, and Canada). Other factors include the following:

- **Build-out.** With few exceptions, the transportation system that will serve our mobility needs for the next 50 years is firmly in place (see illustration).
- **Aging.** Many of our transportation assets have reached or surpassed their intended life span and are displaying the wear and tear of age.
- **Limited resources.** Transportation organizations face complex and competing needs with limited resources. The option of raising user fees and fuel taxes to support new or modernized transportation infrastructure is no longer an easy option.
- **Shareholder expectations.** The U.S. transportation system provides unprecedented mobility for people and freight. Transportation shareholders expect and demand that such service will continue.
- **Information and accountability.** The public increasingly demands better information and

accountability from government.

- **Privatization.** Government agencies are being pressured to “right-size,” or even privatize some services.
- **Regulations.** Recent regulations like Government Accounting Standards Board (GASB) Statement 34 are forcing governments to account for the value of their infrastructure assets.

**A new era**

While these pressures on agencies to manage their assets more effectively have been building for several years, only within the last 10 years have information technology and data become available to support effective asset management systems. Now, however, precursors to asset management, such as pavement and

bridge management systems, are already in place and working well in many states and localities.

Clearly, these factors point to an emerging era in which we are moving from building the transportation system to managing it, from *building* more roads and bridges to *maintaining* them and *maximizing* their *capacity and safety*. Asset management will help states, cities, and counties do just that.

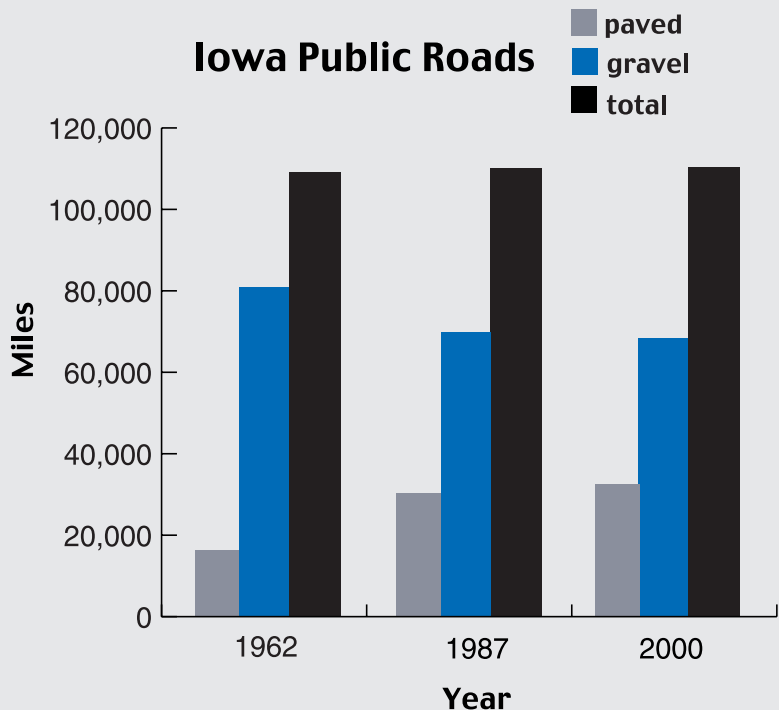
Transportation agencies that do not adopt a system, such as asset management, for making better-informed decisions about where they should invest their resources will struggle to operate effectively in this new era.

**An example**

A few states and local governments have pioneered efforts in transportation asset management. The Arizona DOT

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**The end of the road-building era: an example**  
 The number of miles of public roads in Iowa has been stable since 1960, and the paving of gravel roads has slowed dramatically since the early 1980s.



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recently developed the first 10-year income statement (the sort of analysis that any corporation does regularly, and an important asset management task) for its state-administered system of highways and bridges. Arizona found that (1) it is responsible for a system of roads and bridges worth over 5.5 billion dollars, and that (2) it is barely generating enough revenue to recapitalize the system, that is, to maintain existing roads and bridges at their present condition and value. Because Arizona is a rapidly growing state that needs to add considerable new highway capacity to support its metropolitan growth centers, this analysis suggests a large funding shortfall looming in the Arizona DOT's future.

Other states and localities conducting similar analyses will likely find themselves in similar circumstances. The analyses themselves, however, will provide a sound foundation for investigating and managing solutions.

## Embracing asset management

"All transportation agencies try to manage their assets," Charles Nemmers, associate director of the Midwest Transportation Consortium,

recently quoted Darrel Rensink, former director of the Iowa DOT. "But not all transportation agencies are practicing *asset management*."

There are primarily two reasons why agencies haven't yet jumped on the asset management bandwagon: the need for training, and the need for more research into various details of asset management (see sidebar).

The MTC is working to fill both needs. Together with the American Association of State Highway and Transportation Officials (AASHTO), the MTC is planning a conference on asset management (see page 4). Second, the MTC is building expertise in transportation asset management through its region 7 research and education program.

Through a combination of traditional as well as cutting-edge coursework and research projects, the MTC's member institutions are educating transportation professionals of tomorrow. A key component of this education is asset management, which will allow transportation experts to make better decisions about maintaining the worth of their incredibly valuable asset—the transportation system.

*David Plazak, Director*

## Possible topics for asset management research

- How to make better-informed tradeoffs between system preservation and system expansion. (Would a system expansion project such as adding lanes to an urban freeway generate more value for the public than a larger number of pavement preservation projects?)
- How to make more informed tradeoffs between transportation modes. (Would it make more sense in a corridor to invest in additional highway capacity, public transit capacity, or a combination of the two?)
- How to manage the economics of major maintenance and construction projects. (Does it make more sense to keep highways and airports partially open while we repair/reconstruct them or to close them for reconstruction so that project is completed more quickly?)
- How to measure the benefits of systems or individual pieces of infrastructure to our shareholders. (What does it cost our shareholders in terms of lost benefits when a bridge must be embargoed or closed, or when a winter storm shuts down an interstate highway?)
- How to assess the value of infrastructure assets. (What is the value of a bridge that, based on any reasonable useful life and depreciation schedule, is fully depreciated, yet continues to carry traffic every day? What is the value of a road that is functionally obsolete in terms of its vertical and horizontal curvature but is still in service?)
- How to get the most out of operational assets. (Can artificial intelligence technology help us use limited snow removal equipment more effectively?)
- How to integrate most effectively the management systems we already have in place—pavement, bridge, and safety management systems—to create an overall asset management system.
- How to identify and to collect the new data needed to develop asset management systems. Issues include data quality, cost, format, and storage.