Midwest Regional University Transportation Center

Volume 3
August 2001

THE MRUTC newsletter

From the Director

Regionalism in Transportation Research, Education, and Training

As the director of a regional transportation center, charged with doing research, education and training, I'd like to make the case for a stronger regional approach to all three of these tasks. The barriers between states, both DOTs, and universities are still much too high. Learning and sharing resources across state boundaries is too rare. The result is wasted resources from duplicative efforts and lost opportunities due to our failure to learn from each other.

Before anyone jumps to the conclusion that I'm arguing that more dollars should come to the MRUTC, let me make it clear that what I am arguing is that we should use the best resources available and that we should make it as easy as possible to share resources and learn from each other. If we do that, dollars will come to the MRUTC, but they'll also flow to many other institutions throughout the region.

The focus too often seems to be on the differences between states rather than on the similarities. The similarities between the six states of Region Five (MN, MI, IL, OH, IN, WI) are striking: All have

- a mixture of urban and rural environments and the unique transportation challenges that accompany each.
- diverse economic bases, including heavy manufacturing, high tech, tourism, service industries, and agriculture.
- diverse transportation systems, including mature highway systems, ports, airports, public transportation systems, and freight rail.

All are …

- struggling with further diversification of their transportation networks, including the addition of regional passenger rail.
- forecasting significant growth in freight tonnage over the next twenty years.
- facing the challenges of rebuilding an aging highway infrastructure.
- facing a near crisis in their workforces as many current transportation professionals prepare to retire.
- facing public demands to do maintenance and construction with minimal inconvenience to the traveling public.
- struggling to find better products and processes to help them meet public expectations within limited budgets.
- struggling with changing environmental and community value issues in transportation.
- None have enough dollars to meet all of the needs and challenges that they confront.

My list could be made longer, but the point should be clear. Since none have enough money to meet their needs, they probably don't have enough money or staff time to individually grapple with all of the issues facing them. Even if they had the money and time, they may not have the best people to tackle the issues within their state borders.

If the common elements of Region Five are not sufficient to cause some thought on the benefits of a more cooperative regional approach to issues, consider what's being talked about nationally. The agendas of at least five national and regional meetings have included the following items:

An aging infrastructure: Much of the nation's freeway system was built in the 1950s and 1960s. It is at the end of its useful life. How can it be rebuilt within existing fiscal limits while carrying existing traffic?

An aging workforce: Some 40% of the nation's transportation workforce can retire in the next 10 years. Universities are not graduating enough people to fill the expected vacancies.

E-government: The public does everything online. Why can't they interact with government online? How can government agencies overcome development constraints, security issues, and other things to go online?

Congestion: Too many cars and trucks are trying to use the nation's highways. How can they be accommodated?

ITS: Everyone seems to agree that ITS use should be extended, but what should be done first? How can you measure its effectiveness? How can you manage it? How can you bridge jurisdictional lines?

Multi-modalism: Almost everyone seems to agree that we need more than cars in our transportation toolbox, but how do we actually plan and implement an intermodal transportation system?

/continued on p. 2, director/

THE MRUTC newsletter
Vol. 3, August 2001

/director, from p. 1/

Product life: How can we build longer-lived pavements and bridges?

Development time: Call it streamlining or increased productivity, the question is how can we shorten the project development time?

Freight: Most projections point to a doubling of freight tonnage over the next twenty years. How will this increase be accommodated?

Land use: Transportation and land use are intimately tied. How can we better understand their interaction and consider each in the planning process?

The items on the national agenda are not all that different than those listed as common to Region Five.

The challenge in making regional cooperation work seems to be in having a mind set that is open to the concept and open to ways of making it work. The very first thing that is needed is a good regional dialog about what's going on in each of the states. My personal experience highlights the benefit of such a dialog. I have learned a great deal about transportation and transportation agencies over the last year with the MRUTC. I did this by having the opportunity to talk with people throughout the region. Most people in transportation agencies don't have a similar opportunity. They are caught up in their daily challenges, constrained by travel budgets or simply do not have an entree to other states and agencies to initiate a real dialog.

So what do we need to do to make regionalism work better? The following are some thoughts. Readers will probably have some as well. There is no right answer. We just have to work at it:

We need to create and take advantage of opportunities for regional discussion. The annual Mississippi Valley meeting is the most obvious opportunity. Transforming it into an opportunity for a serious sharing of ideas will be a challenge. We also have regional consortia related to pavements and other specific disciplines. These are apparently not all that well attended and supported. We could consider more regional meetings or workshops on specific topics. The MRUTC is currently working on four such possible workshops on these topics: 1) deer/vehicle crashes; 2) freight planning issues; 3) highway materials, and 4) diversity in the transportation workforce. The first of these will likely be held in mid-to-late winter. The others over the remaining months of 2002.

We need to look for the best researchers and educators in the region to work on our issues. We have a lot of great educational and research institutions in the region. All have something to offer. None have a corner on the knowledge market. It was not really by design, but I am happy to report that in our first year of operation, the MRUTC has sent research projects to institutions in four of the six states in the region, most of which are not even a part of the consortium.

We need to be more concerned about the flow of ideas and less concerned with the flow of dollars. Some seem to have the notion that dollars from a specific state must be spent within that state–that is, for example, Wisconsin DOT research dollars must be spent at a Wisconsin university. Happily, some states are moving away from this approach. Like free trade, it only works well when everyone looks for the best provider and the best value.

This list could be made longer, but the point should be clear: A more regional approach makes sense, but making it happen will require some work from all of us. •

FOR IMMEDIATE RELEASE

September Workshop Will Have International Audience

"TAKING THE NEXT STEP IN ASSET MANAGEMENT," the Fourth National Transportation Asset Management Workshop, will be held September 23–25, 2001. The workshop, hosted by the Midwest Regional University Transportation Center, and co-sponsored by the American Association of State Highway and Transportation Officials, Federal Highway Administration, National Association of County Engineers, American Public Transportation Association, American Public Works Association, Urban Transportation Center at UI-Chicago, Transportation Research Board, and the Midwest Transportation Consortium, will feature a slate of 57 speakers covering a wide array of asset management techniques and components. The workshop has attracted international attention, including attendees from Canada and the United Kingdom.

At press time, over 200 people were confirmed participants for the workshop. US Rep. **Tom Petri** (R–WI) will

/continued on p. 3, workshop/

The MRUTC Newsletter
Vol. 3, August 2001

/workshop, from p. 2/

give the Congressional view of the challenges and opportunities facing the transportation community. The Bush administration viewpoint will then be presented in this opening session by, as yet unconfirmed participant, USDOT Secretary **Norman Mineta**.

Additional keynote presentations include from New Mexico Highways and Transportation Department Secretary **Peter Rahn**, Dane County Wisconsin Executive **Kathleen Falk**, UW Professor of Public Affairs **Don Kettl**, APWA President-Elect **Richard Ridings**, and Kansas City Public Works Director **Ed Wolf** will also be included in the program.

The full workshop schedule and registration information are available on the workshop website **www.mrutc.org/workshop**.

The workshop will present the next steps for implementing transportation asset management techniques, focusing on policy goals and objectives, integrated analyses of options and tradeoffs, resource allocation decisions, data collection techniques, investment choices, program delivery partnerships, and systems monitoring. This conference marks the first time that an "open invitation" national transportation asset management workshop has been held combining state, local, and transit officials. Getting beyond the buzzword and into actual implementation of these techniques will be the workshop goal.

A number of local official and academic scholarships have been made available through the FHWA Midwestern Resource Center. In order to receive the scholarships, interested persons should email **Jason Bittner**, the Center's program director at **bittner@engr.wisc.edu**.•

MRUTC Awards over $351,000 in New Research Projects

The Midwest Regional University Transportation Center Advisory Committee awarded three new research projects and conditionally approved two other proposals at its July 13th meeting in Chicago. Among the proposals selected for funding were the first proposals funded in the states of Ohio and Michigan. MRUTC research projects have now been awarded to academic institutions in Illinois, Wisconsin, Ohio, and Michigan – 4 of the 6 states in the Region. No proposals were submitted from Minnesota institutions during this general call for proposals.

The research grants will include the following projects:

- Optimal Resource Allocation for the Purchase of New Buses and Rebuilding of Existing Buses as part of a Transit Asset Management Strategy, awarded to Wayne State University under the direction of Dr. Snehamy Khasnabis for $98,285,
- Optimizing Transportation Investments Within the Lac Courte Oreilles (LCO)/ Sawyer County Transit System, awarded to Lac Courte Oreilles Ojibwa Community College under the guidance of Tracey Mofle for $34,094.68, and
- Development of an Interactive Multi-objective Decision Support Framework for Transportation Investments, awarded to the University of Dayton under Dr. Mashrur Chowdhury for $143,284.

Conditional approval was given to UW-Milwaukee Professor of Civil Engineering Dr. Alan Horowitz to fund a proposal entitled "Long Range Optimal Deployment of ITS Strategies: Concept Definition" in the amount of $84,055. In addition, the MRUTC Advisory Committee approved a portion of a project entitled "Evaluation of Shipper Requirements and Potential Cargo Required to Establish a Rail-Truck-Marine Intermodal Terminal in the Twin Ports of Superior, Wisconsin and Duluth, Minnesota" submitted by UW-Superior and UW-Milwaukee. This project was approved at an amount equal to its indicated matching component (approximately $16,000), with the hope that additional local matching funds will be generated.

The Wayne State University proposal will develop a methodology for optimizing the investment in new buses versus various rehabilitation strategies under budget limitations. This proposal will be the first transit proposal the Center funds, meeting its thematic research thrust area of multi-modal systems. The Lac Courte Oreilles Ojibwa Community College proposal will assess the community's transportation research needs, strengthen collaboration between Sawyer County, Wisconsin, and the Lac Courtes Oreilles community, and determine opportunities for optimizing local and regional transportation investments. The project will be matched with $6300 from the Wisconsin Department of Transportation and over $8000 from

/continued on p. 4, awards/

/awards, from p. 3/

other community sources, including Sawyer County Health and Human Services, Northwest (WI) Regional Planning Commission, Bureau of Indian Affairs, the Lac Courte Oreilles Planning Department, and the LCO Consolidated Family Services. The multi-objective decision support framework will allow transportation decision makers to analyze and evaluate transportation investment alternatives, allocate resources optimally among competing systems/projects, generate a number of investment alternatives based upon available resources, and develop an interactive process that will provide a graphical demonstration of the relative trade-offs between the most desirable investment options based on the objectives selected for the project. The project will fund two female graduate students at UD and will be completed by next August.

Proposals were submitted during this round from Michigan State University, University of Toledo, University of Akron, UW-Milwaukee, University of Illinois-Chicago, Illinois Institute of Technology, University of Dayton, Lac Courte Oreilles Ojibwa Community College, and Wayne State University. The Advisory Committee also opted to reissue an RFP on Capital Preventative Maintenance.

The MRUTC has received proposals on its best practices for linking strategic planning to resource allocation and implementation decisions using elements of a transportation asset management program proposal. Should the committee choose to fund this proposal, awards will be announced by the end of August.

Additional information on these and all of the MRUTC's ongoing research projects is available through the Center's website at **www.mrutc.org**. For specific information, please contact Center Research Director **Aileen Switzer**, **aswitzer@engr.wisc.edu**.•

An Experiment In Education

An experiment in education is over, but it remains to be evaluated. The experiment was CEE 679, a special topics summer class at the UW–Madison. The subject of the class was Transportation Management and Policy. It was offered to both graduate students at the UW and to guest students at four Wisconsin Department of Transportation sites. It featured 25 guest lecturers on topics ranging from GIS to environmental justice. Five of the lecturers appeared via video telecasting. The four remote sites also took part through interactive video. Nine graduate students took the class for credit. Another 24, largely non-traditional students working in the transportation industry, officially or unofficially audited the class. A few auditors sat in on campus; most saw it through the interactive video system.

The class, which was the result of a collaborative effort of UW faculty member **Bob Smith** and MRUTC Director **Ernie Wittwer**, focused on the four basic parts of asset management: 1) establishing goals and objectives; 2) planning and programming; 3) collecting and using data; and 4) implementing programs. Lecturers spoke about the techniques that can be used to accomplish each of those four parts. Speakers included other UW faculty members; representatives from the Wisconsin, Michigan, Minnesota and Montana DOTs; the Federal Highway Administration; and contractors and consultants.

Part of the experiment was the topic itself. The UW had never before offered quite the wide-sweep of transportation issues in one class. The range of speakers was another part of the experiment. The use of the interactive video was the third part.

While the formal evaluation awaits a student survey, some preliminary conclusions can be offered. First of all, the topic was well received. A DOT employee and a consultant had basically the same reaction: I wish someone had put all of this together 25 years ago when I was just starting out. Secondly, the guest lectures did very well. All of the participants appreciated the wealth of experience and knowledge that guests so eagerly shared. Almost without exception, the guests expressed their pleasure at being asked to speak and at having the opportunity to interact with students. In fact, several speakers opted to travel rather than to use the interactive video, so that they could speak directly to the students.

Overall, the video system was also a success. Graduate students said that they appreciated hearing from real

/continued on p. 5, CEE 679/

THE MRUTC newsletter
Vol. 3, August 2001

/CEE679, from p.4/

practitioners as a part of the class. DOT employees said they appreciated having access to the class. The system also allowed a number of great speakers, who would not have been able to travel, to join the class. Having such experts from other places and agencies added depth to the program that would have been difficult to duplicate in other ways. The video did have some drawbacks.

Generally, those drawbacks related to the greater difficulty in achieving a truly interactive dialog. If the experiment is repeated, the instructors will have to try to improve their skills in using the system. •

Goals and Objectives in Asset Management

The ongoing NCHRP study of asset management has divided the subject into four basic processes:

Components of Asset Management

- Establishing goals and objectives
- Planning and programming
- Collecting and analyzing data
- Implementing programs

Each of these processes is critical to an effective asset management program. Since establishing goals and objectives is in many ways the most basic and the most difficult, it is the part to which this article is dedicated.

Since it is so difficult, some help from the works of a great American philosopher might be useful in discussing it. At a recent TRB meeting Dave Margolis, of PennDOT, described his agency's odyssey in strategic planning and performance measurement with the help of quotes from Yogi Berra, the great baseball player and manager. Yogi probably does not know much about asset management as it applies to transportation; but, since he won pennants as a manager in both leagues, he probably knows much about the topic as it relates to managing the human asset. In any case, this great master of the English language did give us words to help us think about the use of asset management in transportation and the importance of goals and objectives.

"You can observe a lot by watching."

You can observe a lot by watching, but in the complex world of most transportation agencies you need some framework within which to understand what you're seeing. For example, if you're responsible for managing a 12,000–mile highway system and you can report that you spent $500 million on construction contracts and $150 million for maintenance and operations, are you doing well? Who could tell? On the other hand, if you have defined a goal for your highway system of eliminating all poor pavements, and if you have defined a strategic plan of improvements to reach that goal, you should be able to track progress in reaching your goal. Have you implemented the planned program of projects? How many miles of poor pavement exist now versus the number expected in the plan and the number at the start of the plan? A stated goal, a plan for attaining it, and data to monitor progress will help you, as a transportation manager to observe a lot more about the progress of your system.

"It's déjà vu all over again."

If you have been a transportation manager for any length of time, you probably understand the thought that triggered Yogi's muddled words. Your current problems are very much like the problems of last year or five years ago. No matter how hard you try, the outcomes remain the same. The real problem may not be lack of effort. It may not even be insufficient resources. The problem may be the lack of clearly defined, measured and monitored objectives. Defining a set of goals and thinking about what must be done to attain those goals forces a manager and an agency to evaluate how it does business. It encourages them to think of new ideas and approaches. It may even lead them to adopt new ideas, helping to overcome the momentum of tradition. Different outcomes require different actions. Doing the same old things will almost certainly produce the same old outcomes.

"The future ain't what it used to be."

Just as goals and objectives can help to break the momentum of tradition,

/continued on p.6, Goals/

/Goals, from p.5/

they can also help to reflect changing needs and desires. The public is different than it was a few years ago. The taxpayers who support transportation agencies want and expect different things than they did ten or twenty years ago. Technology allows engineers and planners to provide different services than was possible only last year. Those changes can be brought into a transportation program incrementally on an ad hoc basis, or they can be incorporated within a plan and implemented in an orderly manner. Defined goals will facilitate the planning process.

"It ain't over 'til it's over."

Defining goals and objectives is the easy part of managing. Planning actions that will allow an agency to attain those goals and monitoring the implementation of those plans is much harder. It requires a hierarchy of goals and measures. For example, an agency might set a goal of reducing crashes by 5% over a two-year period. Using past experience, data and analytic models, a specific program of actions could then be defined to reach this goal: More safety improvements, more enforcement, more education, etc. Once this implementation plan is in place, it must be monitored and managed, so that when it is over, the goals are attained. Some agencies differentiate higher-level goals from implementation actions by using the term scorecard, or strategic goals, to refer to the higher order goal and dashboard—as in the controls of a car—to refer to the lower level goals. Whatever you call them, you need them both, and you need to manage both.

"When you come to a fork in the road, take it"

Yogi once explained this quote by saying that he was just trying to get people to his house. He lived on a residential loop, so when you came to the fork in the road, either would get you there. Transportation goals share something with the location of Yogi's house. While any road will probably will not get you to where you want to be, inaction will only keep you where you've been. Do it thoughtfully; involve a wide range of managers and stakeholders in defining goals; but take the fork in the road. If the goals don't work out, change them later. You almost certainly will have to change them as you progress.

"I didn't really say everything that I said."

I'm not sure what Yogi really meant by these words, but I'll use them as a way of pointing out the difference between what we say and what we do. Management systems have been around for more than a decade. Asset management has been talked about in transportation for nearly as long. After all of this time, some agencies have made real progress on some aspects of asset management, but almost none have been able to pull all of the parts together to do a comprehensive asset management process. One of the goals that we, as a transportation industry should set is to get beyond the buzzwords and to really get on with implementing asset management.

Getting Beyond The Buzzword is the title of the closing session of the Fourth National Asset Management Conference. I'll be moderating that session, which will offer conference participants a chance to question some experienced people on how they have made progress in their agencies. I hope you'll be able to join us for what should be an informative session. ▪

Marquette University's Center for Highway and Traffic Engineering

The Center for Highway and Traffic Engineering (CHTE), based in the Department of Civil and Environmental Engineering at Marquette University was created to conduct research, perform testing, and provide training in the areas of transportation facility maintenance and operations, traffic engineering, highway pavements, and transportation materials and construction.

Under the direction of Professor **Ronald Sonntag**, ongoing research areas include facility snow and ice control, highway design, facility materials, highway pavements, concrete and asphalt technology, facility structures, non-destructive testing, pavement drainage systems, traffic engineering, traffic control devices, traffic safety, clean air act–demand management, and transportation planning.

/continued on p.7,UWM/

/UWM, from p.6/

The center, according to its website, **http://chte.marquette.edu/**, was created in response to the infrastructure crisis facing the nation's highways. Since this system is nearing the end of its useful life and requires wholesale repairs in many areas, and with an increased demand to address environmental concerns like clean air, traffic noise, and global warming, the fields of training and research are even more critical today.

Research & Training

Research is conducted in highway operations, snow and ice control, highway design, highway materials, highway pavements, concrete and asphalt technology, highway structures, non-destructive pavement testing, pavement drainage systems, traffic engineering, traffic control devices, traffic safety, clean air act–demand management, and transportation planning.

Marquette University has laboratories for structures, asphalt, concrete, and soils/aggregates testing, as well as an environmental service lab that the CHTE faculty and students have at their disposal. In addition to the research facilities, the center also maintains libraries in concrete, asphalt, traffic engineering, highway maintenance, and winter maintenance.

Credit and non-credit course work and seminars are offered in highway planning and design, transportation demand management, traffic engineering, pavement and bridge design, asphalt concrete and aggregate materials, and public works administration. The department offers undergraduate degrees in civil engineering with structures or transportation options. Master of Science and Doctor of Philosophy degrees are offered in civil engineering with concentrations in transportation, structures, or construction and public works management.

Faculty Members

Ronald G. Sonntag, M.S.C.E., has thirty-three years experience in highway and traffic engineering, freeway operations and traffic management, including five years as chief freeway engineer and systems operations manager for the Wisconsin Department of Transportation, Southeast Region.

Dr. James Crovetti, Ph.D., has ten years experience in teaching and professional practice. Crovetti's research interests include the analysis of material properties using non-destructive test data, mechanistic pavement design incorporating nonlinear material properties and seasonal effects, laboratory modeling of pavement systems, and measurement of load induced deformation behavior.

Dr. Alex Drakopoulos's, Ph.D., research interests include geometric design of highways, accident analysis, emergency response services, traffic control devices, left-turn control, alternative (clean) fuels, older drivers, and human factors.

Dr. Christopher M. Foley, Ph.D., has ten years of practical, teaching, and research experience in structural engineering and structural analysis with research interests including analysis of highway structures, highway bridge analysis and design procedures, optimal design, and finite element analysis.

Mr. David A. Kuemmel has over 40 years experience in transportation engineering and public works managements, including six years as commissioner of public works for the City of Milwaukee. In addition, Kuemmel is the primary contact for the Midwest Regional University Transportation Center.

Dr. Thomas Wenzel is the department chair and also an active participant in Marquette's transportation research center activities.

Activities

Current and recently completed work includes a study on the public perception of the midwest's pavements, heralded as the nation's largest public perception study on the nation's roadways.

In addition, projects have been included in the Center's activities to develop an absolute dynamic system calibration device suitable for use with non-destructive deflection testing equipment. This system will assess the impacts and public perception of grinding of PCC pavements and to assess the environmental impacts of relative safety and textures of various pavement surfaces.

The CHTE has also developed a pilot project to develop a chemical

/continued on p.8,UWM/

/UWM, from p.7/

demand index for Minnesota DOT, a project to document the safety performance of highways treated with abrasive/salt mixtures and compare them to highways treated with salt only, a synthesis of management options for snow and ice control for the Transportation Research Board, a rutting study of hot mix asphalt using the Georgia loaded wheel tester funded by the Wisconsin Department of Transportation, and a study in the use of fly ash in concrete mixes and its effect on the behavior of concrete properties.

For more information, contact Professor **Ronald Sonntag**, **ronald.sonntag@marquette.edu**. •

University of Wisconsin Transportation Society

by Travis Gordon

When a student interested in transportation arrives at UW–Madison, he or she has several academic options. Transportation issues are addressed in many programs on campus, from business and urban planning to engineering and economics. One result of this diversity is that students within a certain program, such as urban planning, may not be exposed to the other aspects of transportation, such as logistics.

About five years ago, a group of transportation engineers within the civil and environmental engineering department created a student organization that would bring together students who have an interest in transportation at UW–Madison. They formed a club that would help students explore different areas of transportation, improve research collaboration, and provide a one-stop place for transportation information on campus. This group is called the University of Wisconsin Transportation Society, or UWiTS.

UWiTS is continuing to pursue those original goals. Last spring, activities included presentations on freight logistics by Bill Braddy of Schneider Logistics, and Intelligent Transportation Systems in Wisconsin by Jay Obenberger of the Wisconsin Department of Transportation.

UWiTS also sponsored a high speed rail forum on the proposed Milwaukee to Madison rail line. The panel discussion featured representatives from three organizations: Stop the Train, a high speed rail support group, and the Wisconsin DOT.

In early May, UWiTS planned and sponsored a field trip to Chicago. That overnight trip featured tours at the Illinois Department of Transportation ITS program office, the Chicago Area Transportation Study (CATS) and the Chicago Transit Authority operations center.

The organization is fortunate to have a solid foundation of support that makes these activities possible. Both the UW College of Engineering and the Midwest Regional University Transportation Center were financial supporters last year.

UWiTS will use the momentum built up last spring for planning more activities this fall, and more importantly, growing their membership base. The group would like to work with other departments to increase its exposure on campus.

Opportunities for collaboration with other student transportation groups within the state and region will also be explored. By having a diverse spectrum of members and activities, the group hopes to better prepare its members for their future in transportation.

For more information on the University of Wisconsin Transportation Society, please visit **www.cae.wisc.edu/~uwits**. •