Developing a University Transportation Center

Michigan Technological University Forms the U.S. DOT University Transportation Center for Materials in Sustainable Transportation Infrastructure (MiSTI)

Elizabeth Hoy
MiSTI Coordinator

In 2005, Congress awarded Michigan Technological University (Michigan Tech) a Tier II University Transportation Center (UTC) with funding of up to $500K per year for four years. This award requires a one-to-one non-Federal cost share match. The UTC is housed in the Civil and Environmental Engineering Department (CEE) within the College of Engineering (COE). Michigan Tech boosts the largest CEE department among Michigan universities and one of the largest in the country, averaging enrollments of 450 undergraduates and 110 graduate students annually. In the April 2008 U.S. News and World Report Graduate Program Rankings, Michigan Tech’s Civil Engineering graduate program was ranked 43rd out of more than 200 national programs surveyed increasing its position by six places over 2007.

Michigan Tech students ‘create the future’ in engineering, science, computing, environmental studies, business, technology, the arts and human sciences. Together, faculty and students explore the boundaries of knowledge. Michigan Tech is ranked among the top one-half of 249 national universities by U.S. News & World Report’s America’s Best Colleges. Michigan Tech is also ranked a ‘tech powerhouse’ by the Princeton Review’s “Best 361 Colleges,” and a 2007 “Top 20 Wired College” by PC Magazine; the only university in the state to be sited. MTU is placed among the “Top 100 Values” in all universities by Kiplinger’s Personal Finance Magazine and our research programs are the fastest growing in Michigan, with almost 20 invention disclosures per $10M. Thirty percent of incoming students rank in the top ten percent of their high school graduating class, and ninety-five percent of our graduates are placed with more than 241 employers that actively recruit on campus. Located in the safe, friendly, and beautiful Upper Peninsula of Michigan, students enjoy Michigan Tech’s 500-acre recreational forest adjacent to campus, eighteen-hole golf course, downhill and cross-country ski trails, as well as numerous other outdoor recreational activities.

Coordination

To coordinate the UTC at Michigan Tech, a steering committee was formed to include key faculty and staff. The UTC steering committee selected Materials in Sustainable Transportation Infrastructure (MiSTI) as the theme for the Center at Michigan Tech. The selection was made to capitalize on core competencies of the Civil Engineering program in transportation materials while bringing attributes of sustainability to the foreground of all activities and initiatives. Rising energy costs, natural resource depletion, social, economic and environmental impacts of construction waste disposal and a need for a productive use for industrial byproducts were factors influencing this emphasis on sustainable solutions. Michigan Tech has historically been noted for its emphasis on applied research, focused on helping the industry improve their processes and solve problems with implemental results. By aligning this expertise with sustainability, the steering committee set out to broaden this expertise to embrace sus-
Welcome to the first volume of the UTC-MiSTI newsletter! In this issue we want to take the opportunity to introduce our Center’s people, programs, and partners. First, allow me to introduce myself. I am Dr. Lawrence Sutter, Professor and Director of the Michigan Tech Transportation Institute, and Director of the University Transportation Center for Materials in Sustainable Transportation Infrastructure (UTC-MiSTI). My professional focus is in the area of hydraulic cements and pavements, with a specific interest towards improving the durability of pavement structures while including supplementary cementitious materials, such as coal fly ash, or new cementitious materials, such as geopolymer cements.

Increasingly, the research performed at Michigan Tech on portland cement concrete and other cementitious systems, as well as for asphalt concrete and geotechnical materials, relies on more sophisticated, materials science-based techniques that seek to relate the physical and chemical properties of a material with its performance. Although this progression towards a more scientific-based analysis is needed, we at Michigan Tech pride ourselves on always bringing the science back to “engineering reality”, and providing readily applicable engineering solutions for our clients. Likewise, our educational programs emphasize strongly the most recent theory and science, but towards the end of producing engineers known world-wide for their ability to solve problems.

Establishment of the UTC-MiSTI has greatly expanded our capabilities to meet these goals. Although we had a strong construction materials research and education program prior to the UTC award, we now have a stronger program, greatly enhanced by the involvement of key stakeholders in the UTC and a strengthened relationship with a variety of transportation partners on campus.

Our first step in charting our course facilitated through a comprehensive strategic planning process. Our process and experience with strategic planning is also detailed in this newsletter. In terms of process, we were guided by a key question that I feel is central to any strategic planning process. That is, “What do we value most?” Answering this question, as an organization, is key to strategic planning as it will establish boundary conditions for future decisions. A pitfall is that the question can be answered superficially. It is important to keep asking the question and approaching it from different perspectives, drilling deeper for the truth, as that process will reveal issues and concerns that must be addressed to develop a sound strategic plan and form the team to accomplish that plan. It is, in essence, the question that forces the organization to bare its soul. The other important part of strategic planning is to keep in mind one very simple truth: “What gets measured, gets done.” Therefore, a strategic plan will only be successfully implemented if progress towards each goal is continuously measured. This is important in any strategic planning discussion and the question continually needs to be asked: “How will we measure that?” When a strategic plan is based on clear, measurable goals, consistent with the organization’s values, then success is within reach.

Finally, I want to take this opportunity to report on a change in leadership within our UTC. Dr. Tom Van Dam served as the Director for the Center’s first year. Tom has since left the University to pursue private-sector opportunities to implement sustainability concepts. We still work closely with Tom as he serves on our center’s technical advisory council. Although we miss his direct involvement here at Michigan Tech, we welcome the new opportunities for industrial collaboration that his current position brings.

- Larry
tainability with research products focused on meeting the needs of the transportation infrastructure industry, increasing efficiency, minimizing environmental impacts and improving quality of life.

MiSTI’s strategic plan was developed over a six month period followed by a three month review by the Research and Innovative Technology Administration Program at the U. S. Department of Transportation. On June 15, 2007 the Center’s plan was approved. By serving the transportation needs of future generations through innovative research, distinctive educational programs and engagement with industry (Mission), MiSTI will create transportation infrastructure through the sustainable use of materials (Vision).

Research

MiSTI conducts activities in four main areas (Goals 1-4) including conducting innovative materials research to improve sustainability of transportation infrastructure (Goal 1). The Center offers developmental support to faculty pursuing externally funded projects that rely on their competencies while improving the attributes of sustainability in transportation infrastructure. This support includes RFP scouting, proposal preparation assistance, project management, student recruiting, technical writing support, outreach and awareness.

Key requirements of proposals being supported include:

- Addresses National and State transportation infrastructure needs
- Provides a possible solution to a current problem or offers innovations that may lead to solving current problems
- Involves students in research
- Expands the portfolio of research being conducted at the university including sponsor, type of research (applied, basic and advanced) and opportunity for new collaborations
- Improves sustainability of materials and transportation infrastructure
- Offers multidisciplinary and multimodal applications

Education

The second goal outlined in the strategic plan is the delivery of distinctive educational programs and opportunities to prepare students to embrace sustainability in transportation infrastructure (Goal 2). This goal includes the expansion of already existing programs at the university and the development of new programs to engage students in the research efforts of Goal 1.

The Pavement Design, Construction and Materials (PDCM) Enterprise program was specifically named and Center resources have been committed to the continued support and expansion of this successful program. Traditionally focused on bituminous materials, the PDCM is a unique undergraduate initiative that promotes experiential learning, the development of critical thinking skills and leadership, through team based projects aimed at addressing actual problems. The Center’s educational activities involve expanding this model to include other transportation materials, for example, aggregates and portland cement concretes as well as introducing problems that engage sustainable attributes in their problem solving.

In the summer of 2007, as the UTC Strategic Plan was being approved, the Center launched the Summer Scholars Program. The Summer Scholars Program offers undergraduate students an opportunity for summer employment, working with faculty and staff on transportation research initiatives. A goal of this program is to support transportation education and awareness while cultivating future graduate students and career professionals for the industry.

Annually, the UTC selects a UTC Student of the Year who receives a $1,000.00 honorarium and an all expense paid trip to attend the Transportation Research Board’s (TRB) annual conference in Washington D.C. At the conference, the UTC Student of the Year is presented a certificate at a formal banquet.

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Other educational activities addressed in the Goal 2 include the following:

- Curriculum development
- On-line learning opportunities
- Teacher Modules for K-12 education
- Career and Science Fair presence to increase awareness of transportation careers and issues
- Workforce recruitment

**Technology Transfer**

Advancing the understanding of sustainable materials in transportation infrastructure through technology transfer will provide a critical link between knowledge and the adoption and implementation of more sustainable materials and applications in transportation infrastructure. The Center supports a number of activities to facilitate this link:

- Development of publications, Web site and other educational material
- Development of a contact management system to provide timely and relevant information to key stakeholders in the transportation industry
- Delivery of online seminars on new discoveries and the dissemination of research results towards practical application
- Strategically support leadership of faculty and staff in key transportation organizations
- Host a regional technical meeting and conference
- Co-host a campus transportation forum to increase awareness and opportunities for multidisciplinary collaboration on the Michigan Tech campus

**Workforce Development**

Concurrent emphasis of workforce development and diversity are present in all of the Center’s activities and initiatives. The Center actively engages students, industry, government officials, and other individuals in the necessity and importance of sustainable practices in their approach to materials in transportation infrastructure.

**Building a Foundation for Success**

The activities and initiatives of MiSTI’s strategic plan will pave the way for the Center to continue advancing the state of sustainable materials in transportation infrastructure well beyond the initial four-year Federal grant. Faculty, staff, and Center personnel are always looking for ways to creatively partner with industry organizations and individuals to create mutually beneficial relationships that advance the industry, provide educational opportunities for students, and support the continuation and long-term growth of the Center.
Strategic Planning Overview
The Pros, Cons, and Woes of Strategic Planning

Elizabeth Hoy
MiSTI Coordinator

Mention the task of strategic planning and it’s rarely met with fanfare. Most agree that in theory, strategic planning has its role within any organization. However, in practice that role most frequently ends up being a cumbersome document of “what we will do,” but never gets followed, “what we want to become,” with little or no connection to where the organization currently is situated and is often limited because it’s never tied to the budget. Located in the back of the filing cabinet or at the bottom of the pile on the bookshelf, most strategic plans serve only as a relic of a one day retreat where everyone agreed to develop “the” plan, primarily as a check box on the organizational list of what needs to be done to be successful.

This Time it Will Be Different

Frequently, strategic planning begins with “this time we’re going to create a document that will guide us, something we can all be committed to...it won’t sit on the shelf collecting dust.” Participants in the strategic planning process agree to participate in the activity, often mandated, but with little hope of the exercise yielding anything more than a day away from the normal office routine. In some cases, the day away creates additional anxiety through loss of work and falling further behind. The exercise itself is framed negatively by this disruption to production. Yet time and time again, with every organization, we set aside the day, or days, to create the document that in our heart of hearts we have little faith will truly rise to the occasion and provide the direction and guidance that it was intended to deliver.

We’ll Do it For The Team

To expedite the process, some organizations choose to draft a plan, in advance of the collective efforts brought forth by group discourse. These plans are often met with resistance, seen as an attempt to push a secret agenda and not where the collective whole believes future success lies. Commonly, one of two groups is charged with the task of developing a draft. A management created draft is often viewed by employees as a threat whereas employee developed plans rarely receive management backing. These attempts most frequently result in a win-lose or a lose-win situation. In either case, without buy-in and commitment from both sides, the exercise rarely yields anything but business as usual or even worse, may negatively impact already vulnerable relationships.

Bring in The Expert

To facilitate what is believed to be a true environment for open communication, a strategic planning facilitator or expert is hired. These individuals, preferably with some level of formal training, work with diverse groups to foster an open environment for communication while directing discussion towards the development of the outline of a strategic plan document. These services can be costly and depending on the process enlisted by the expert, may take more than a day. Some individuals may find the presence of someone from outside the group threatening while others feel that the outside facilitator helps keep personalities and highly opinionated individuals in check. There may also be concern that the facilitators agenda may not allow for the in-depth conversations that can arise, providing healthy insight and clarification on difficult or sensitive issues and occasionally the facilitator is viewed as being allied with one side or the other with a management or employee agenda to push. The facilitator’s role may be limited by the organization’s budget, a deadline or a deliverable.

“The UTC Strategic Planning sessions were the most honest and open strategic discussions I have participated in. Because of this, I believe that the end result was something that everyone felt they were a part of. It is not often that Strategic Planning is energizing. The UTC Strategic Planning was just that.”

Dr. Kris Matilla

“The final approved MiSTI Strategic Plan can be seen at: <http://www.misti.mtu.edu/pdf/approved_utc_strategic_plan.pdf>
Tackling Strategic Planning

Before the strategic planning process could begin, the stakeholders within the University needed to be identified and the task of coordinating the plan needed to be assigned. With the award of the Tier II University Transportation Center (UTC) to Michigan Tech, a group of faculty and staff within the Department of Civil and Environmental Engineering formed a steering committee to tackle these two objectives.

The steering committee nominated Dr. Thomas Van Dam, PhD, P.E., an Associate Professor in the Department of Civil and Environmental Engineering at Michigan Tech as the Center’s director and hired Elizabeth Hoy as the Center’s full-time Coordinator. Dr. Van Dam’s area of expertise was in pavement materials. Ms. Hoy would oversee the day-to-day operations of the Center, including budgeting, administration, program development, outreach and marketing.

The Center theme would focus on materials, an area of growth and success at the University. To grow the program in areas that support the National transportation industry’s needs, the group elected to focus on infrastructure and specifically sustainability. Michigan Tech was currently working on a few projects that included industrial by-products like slag and cement kiln dust within their geotechnical and highway pavement materials programs. The naming of the UTC for Materials in Sustainable Transportation Infrastructure (MiSTI) would facilitate the growth of research and education to help meet national needs in the design, construction, maintenance and repair of transportation infrastructure using more sustainable materials and processes. This would bring into the Center activities additional modes of transportation, including air port pavements and rail track substructures, and civil structures including bridges.

With key personnel in place, the process of tackling the strategic plan was outlined. The concept of the plan being drafted by the Center’s key personnel was quickly rejected by members of the steering committee who wanted input in what the center would be pursuing through its first four years of Federal funding. Wait! People wanted to be involved in strategic planning? This would prove to be critical to ensuring group buy-in and long-term support for the Center. Furthermore, the steering committee felt that the Director needed to be a voice within the strategic planning process, not the person leading the discussions. This would mitigate the possible perception that his own agenda was swaying the direction of the Center’s goals and tasks.

Lawrence Sutter, PhD and Adjunct Professor in the Department of Civil and Environmental Engineering, was selected to lead the strategic planning process. His position as an adjunct faculty member gave him enough insight into departmental boundaries (academia, like most business environments, is subject to internal politics) and faculty personalities that he could objectively guide the process. He had previous experience with strategic planning and was trusted by everyone who would be participating in the Center’s development.

It Takes Time

A broad group of faculty were asked to participate in what became a six month process that led to the development of UTC-MiSTI’s strategic plan. The number of participants fluctuated between six and twelve at any one session with an average size of eight people, often with people coming and going from the sessions to accommodate other obligations. The faculty met frequently, weekly to bi-weekly throughout the six month period) to discuss the elements of a strategic plan. These meetings were held over working lunches or early mornings to accommodate the other aspects of faculty responsibilities including class instruction, student advising, university and industry service, and research. Sessions were scheduled to last from two-four hours each with breaks and refreshments to keep everyone motivated and comfortable.

Best Practice or Luck?

There were several key aspects to the process adopted at Michigan Tech that lead to the development of a solid initial four year plan. The most important element of the process was the final phase of setting the budget based on the goals and tasks identified by the participants. Our initial attempt yielded a budget of more than $6 million dollars that was eventually trimmed to the maximum $4 million target. We also identified in each goal or task possible sources of cost share. Of the maximum $4 million, up to $2 million would be received through the US DOT award. The remaining $2 million would need to be identified to meet the one-to-one cost share match and provide the resources to meet our budgeted needs. Identifying in advance potential sources of cost share and which budget category they would fall into was not an easy task, and something that still requires close management by Center personnel.

The final step in the process was the development of the formal strategic plan document which was submitted to the Research and Innovative Technology Administration (RITA) in March 2007 for review. Final approval was received on June 15, 2007. A complete copy of the approved strategic plan is available on the Center’s Web site at <http://www.misti.mtu.edu>.

“This was a very healthy process for the faculty and staff engaged in the UTC’s Strategic Planning. In the end, the plan reflects the input of more than a dozen people. The ease with which the UTC now operates as a result of clear defined goals is allowing our small Center to accomplish big things.”

Dr. Theresa Ahlborn, P.E.
The following Michigan Tech faculty and staff were instrumental in the U.S. DOT University Transportation Center for Materials in Sustainable Transportation Infrastructure strategic planning process. Their individual and combined experience was an invaluable asset, and without their assistance and involvement the entire process would have been extremely time consuming and almost insurmountable.

**Dr. Theresa Ahlborn, P.E.**

Dr. Ahlborn has an active research program in the area of structural concrete materials related to prestressed concrete bridges, including high performance and ultra-high performance concrete (UHPC) applications for structural durability. As director of the Center for Structural Durability, Dr. Ahlborn provides a solid research link between industry and government seeking sustainable solutions related to the long-term durability of prestressed concrete structures. Dr. Ahlborn is a licensed professional engineer with industrial experience in the design of bridges, dams, and hydropower support structures and is an active member in several professional organizations including the Precast/Prestressed Concrete Institute (PCI) and the American Concrete Institute (ACI).

**Dr. George Dewey, P.E.**

Dr. Dewey's teaching interests include civil engineering materials and reinforced concrete design. His research interests include freeze-thaw durability of concrete and concrete aggregates, classification of coal fly ash for use in concrete, and microscopic characterization of construction materials. Dr. Dewey has published in the Proceedings, 19th International Conference on Cement Microscopy, and the Journal of Environmental Engineering.

**Dr. Ralph Hodek, P.E.**

Dr. Hodek's research interests include soil mechanics, foundational engineering, and mechanical and chemical stabilization of highway materials. He is also involved in the behavior of mine tailings during deposition and consolidation and the reuse of both the tailings and mine waste rock.

**Dr. Lawrence Sutter**

Dr. Sutter is a Professor working with the Michigan Tech Transportation Institute. He has an extensive background in materials characterization and conducts research on the characterization of construction materials including aggregates, concrete and asphalt. He is currently involved in a number of projects investigating concrete pavement durability and performance. Dr. Sutter completed his Ph.D. in Civil Engineering at Michigan Tech. His dissertation focused on the identification of materials related distress in portland cement concrete pavements. He is an Officer of the International Cement Microscopy Association where he serves as Proceedings Editor. Additionally, he is a member of ASTM Committees C01 (Cement) and C09 (Concrete) and serves as Chairman of Committee 9.24 Task Group 2 on Coal Fly Ash (ASTM C 618). Additionally, he is a member of ACI and serves as an ACI Concrete Field Testing Technician Examiner.

**Dr. Stanley Vitton, P.E.**

Dr. Vitton’s research focus is applied geomechanics. He has 8 years of industrial experience with the Shell Oil Company, where he worked in Shell’s Mining Ventures Group which later became the Shell Mining Company. While with the Shell Mining Company, he was the Engineering Manager of their R & F Coal Company located in Cadiz, OH. His research is concentrated in the applied area and has a number of field based research projects. Dr. Vitton conducts research in the mechanics of seismic signals generated from hydrodynamic phenomena such as the interaction of tornadoes with the ground.

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Dr. You Li
Dr. Li’s research interests include structural reliability analysis, probabilistic design, natural and man-made hazard mitigation, structural load modeling and combinations of loads, structural monitoring and condition assessment, bridge engineering, performance-based engineering, earthquake engineering, wind engineering, and wood engineering. He received Michigan Tech Research Excellent Fund Award in 2006. He has published in such journals as Journal of Structural Engineering, Engineering Structures, and Structural Safety. His teaching interests include basic structural engineering, probability, statistical and engineering decision analysis, structural reliability and performance-based structural design. He has worked as a structural engineer for five years, and was involved in the design of new international terminal at Hartsfield-Jackson Atlanta International Airport.

Dr. Zhanping You, P.E.
Dr. You’s research interests include pavement engineering, transportation materials (such as asphalt materials) characterization and pavement design, transportation infrastructure performance evaluation and rehabilitation. Dr. You is a member of a number of technical committees in American Society of Civil Engineers (ASCE), Transportation Research Board (TRB), and other organizations. He has served as a grant reviewer or panelist for the NSF, FAA, and EPA. He has organized a number of national and international technical conferences.

Dr. Amlan Mukherjee
Dr. Mukherjee’s interests are in the areas of Construction Management and Transportation Infrastructure Management Systems. He is currently teaching a course in Construction Estimation, Planning and Control. His research interests lie in developing interactive and adaptive process simulation platforms that can be used as decision making aids, in training decision makers and also to better understand human cognitive and decision-making processes in construction. The broader goal of the research is to study the construction management (CM) domain as a tightly coupled system of human and resource interactions and to integrate it with existing construction theories to develop a systemic perspective of the complexities in the CM domain. Dr. Mukherjee is also interested in Engineering Education research.

Dr. Kris Mattila, P.E.
Dr. Mattila has focused his research on projects that will have a direct application to the construction industry. In order to gain cooperation and acceptance from practitioners, his research has focused on the needs of the owners or contractors. There is a need for better scheduling methods for highway contractors and he believes that linear scheduling may offer the solution and has done research in the area. His watershed research has focused on the project management issues related to all projects. As his career continues, he wants to diversify into safety related research based upon his experience as a commission member and a company safety officer. Specifically, there is a need to improve the education of field personnel, and provide better training techniques and methods.

Mr. Terance McNinch
Mr. McNinch’s primary effort is directing Michigan’s Local Technical Assistance Program (LTAP) and the Technology Development Group (TDG). The LTAP serves the transportation technology transfer needs of Michigan’s local transportation agencies. The TDG develops and maintains RoadSoft - a roadway asset management system designed specifically for the needs of counties, cities and villages; and MERL - a construction project estimating software used by public agencies and private companies throughout Michigan. He directs a staff of twenty in activities such as: training development; organizing, facilitating and leading training workshops and conferences; producing technical publications; developing training videos; along with other technology transfer activities. With other members of his staff, he assists the Michigan Transportation Asset Management Council in implementing its statewide asset management initiative on 44,000 miles of federal aid roads throughout Michigan, and serve as advisors/trainers under contract with the Council.
Dr. Bernie Alkire, P.E.

Dr. Alkire has 30 years experience teaching highway design courses at Michigan Tech. Prior to this, he worked for six years with the Michigan Department of Transportation (MDOT) as a road design engineer. He has conducted geotechnical research in frost penetration in road subbase materials. In addition to his teaching duties, Dr. Alkire is also the director of the Tribal Technical Assistance Program. He has provided technology transfer to tribal governments since 1992 and works with the Federal Highway Administration (FHWA) and Bureau of Indian Affairs (BIA) to provide transportation related assistance to all tribes located in the Eastern part of the United States. He is well acquainted with the federal and state government contracting process and in addition to his TTAP contracting experience, he has completed several contracts associated with the Local Technical Assistance Program sponsored by the FHWA and MDOT.

Dr. William Sproule, P.E.

Dr. Sproule’s areas of expertise include transportation engineering and planning, airport planning and design, public transportation, automated people movers, engineering education, and transportation planning for major activity centers. Sproule has taught and helped develop a number of courses in his fifteen years of teaching experience, including classes on airport planning and design, geometric design, transportation engineering, traffic engineering, technical report writing, public transport, surveying, and goods movement.

Dr. Pasi Lautala, P.E.

Dr. Lautala was appointed in October, 2007 as a Research Assistant Professor and Director of Rail Transportation Program. Pasi has his BS from Tampere, Finland and his MSc. and Ph.D. degrees from Michigan Tech University. He also leads the Summer in Finland Program and teaches courses related to rail transportation; International Railroad Engineering and Track Engineering and Design. His previous experience includes work with Finnish Railways prior to his arrival to US in 1996 and five years of railroad and highway engineering consulting experience in Chicago.

Dr. Thomas Van Dam, P.E.

Dr. Van Dam is an Associate Professor in Civil and Environmental Engineering, having specific interest in pavement materials, evaluation, design and performance. He is currently involved in a number of projects investigating concrete pavement durability and performance. His clients include MDOT, NCHRP, SDDOT, WisDOT, and the Innovative Pavement Research Foundation (IPRF). Dr. Van Dam conducted doctoral work at the University of Illinois studying the design and performance of general aviation airport pavements. As a Project Manager for four years at ERES Consultants, Inc., he supervised the airport pavement evaluation and design services division. Dr. Van Dam’s international experience includes two years of service in Tanzania, East Africa, as a U.S. Peace Corps volunteer and more recently working as a consultant to the Asian Development Bank in Malaysia. He is the Chair of TRB Committee AFN30, Durability of Concrete and an active member of ACI Committee 201, Durability of Concrete.
Michigan's Local Technical Assistance Program (LTAP) is a joint effort of the Federal Highway Administration's Office of Professional Development and the MDOT Office of Research and National Best Practices. LTAP provides the transportation technology (T2) to local government organizations (counties, cities, and villages) throughout Michigan. The LTAP mission is to bridge the gap between research and practice by conducting training sessions and demonstrations and by serving as a clearinghouse for information related to state-of-the-art technology in the construction and maintenance of roads and bridges. For more information, visit www.michiganltap.org.

Michigan Tech’s University Transportation Center for Materials in Sustainable Transportation Infrastructure (MiSTI) is creating the future of transportation infrastructure. MiSTI supports innovative research, distinctive educational programs, and engages industry in a partnership to explore the sustainable use of materials in the construction, maintenance, and repair of transportation infrastructure. MiSTI promotes the most efficient use of naturally occurring resources, the sustainable use of industrial by-products such as fly ash or recycled materials, across many modes and systems. For more information, visit www.misti.mtu.edu.

Technology Development Group (TDG) engages in research and development that supports the transportation management needs of state and local governments. Its primary product, the RoadSoft GIS Integrated Roadway Management System, provides county road commissions, cities, and villages with a state-of-the-art system for managing roadway assets. From pavements, signs, pavement markings, culverts, and traffic crashes, RoadSoft offers assistance in developing repair and construction strategies for streets and highways. Other development projects include the MERL Project Estimator, crash location software, GIS tools, and online data submission. For more information, visit www.roadsoft.org.
**Tribal Technical Assistance Program (TTAP)** is part of a nationwide effort sponsored by the Federal Highway Administration and the Bureau of Indian Affairs. TTAP explores technology transfer initiatives focusing on technology and information on tribal roads and bridges, tourism, and recreation, and related economic development to tribal transportation and planning personnel. TTAP provides technology transfer through training workshops, a quarterly newsletter, and the operation of free publication and videotape training libraries. For more information, visit [www.ttap.mtu.edu](http://www.ttap.mtu.edu).

**Transportation Materials Research Center (TMRC)** provides technical expertise and state-of-the-art laboratories to support the Michigan Department of Transportation (MDOT) transportation materials research and investigation by maintaining highly qualified technical staff and certified facilities. Specific areas of research include the behavior and performance of materials including asphalt, concrete, unbound aggregate, and soils. For more information, visit [www.tmrc.mtu.edu](http://www.tmrc.mtu.edu).

**Center for Structural Durability (CSD)** explores research in the area of durable structural highway systems. Areas of expertise include:

* Ultra high-performance concrete
* Rapid construction for prestressed concrete bridges
* Inspection and repair for transportation systems and bridges

Structural durability-related research helps DOT, Federal and industry clients achieve their performance goals of safety, mobility, and productivity of the transportation system while exploring long-term solutions to improve the condition and durability of transportation structures. For more information, visit [www.csd.mtu.edu](http://www.csd.mtu.edu).

**Rail Transportation Program (RTP)** - The vision of RTP is to expand its service to the rail industry by offering an interdisciplinary program in railroad engineering and urban rail transit that will provide opportunities for our students and faculty to participate in the development and operation of rail transportation for the 21st Century. The RTP sponsors the annual Summer in Finland program and the Rail Engineering Activities club, pays for students to travel to rail-related conferences, hosts and helps plan various rail-related meetings and symposiums, and participates in research projects.
About Michigan Technological University

Michigan Technological University is a leading public research university, conducting research, developing new technologies, and preparing students to create the future for a prosperous and sustainable world. Michigan Tech offers more than 120 undergraduate and graduate degree programs in engineering, forestry and environmental sciences, computer sciences, technology, business and economics, natural and physical sciences, arts, humanities and social sciences.

About the University Transportation Center for Materials in Sustainable Transportation Infrastructure

The University Transportation Center for Materials in Sustainable Transportation Infrastructure (UTC-MiSTI) at Michigan Technological University is a tier II UTC. The Center conducts research, educational activities, technology transfer and workforce development in the areas of sustainability and infrastructure materials that address state and national transportation needs. Faculty, staff, students and industry work collaboratively to identify creative solutions to construct repair and maintain highway and airport pavements, bridges and rail systems.

Areas of material specialization include bituminous materials and asphalt binders; portland cement and ultra-high performance concretes; material characterization through petrographic analysis; aggregates, soils and geotechnical applications; and the use of recovered industrial materials including fly ash, slag, and cement kiln dust, and recycled asphalt and concrete materials. For more information on the activities of the UTC-MiSTI, visit the Center's Web site: www.misti.mtu.edu

About University Transportation Centers

The University Transportation Centers (UTC) program, initiated in 1987 under the Surface Transportation and Uniform Relocation Assistance Act, authorized the establishment and operation of transportation centers in each of the 10 standard federal regions. The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) reauthorized the UTCs for an additional six years and added four national centers and six University Research institutes (URI). The mission of the 14 UTCs was to advance U.S. expertise and technology transfer. The six URIs each had a specific transportation research and development mandate.

In 1998 the Transportation Equity Act for the 21st Century (TEA-21) reauthorized the UTC Program for an additional six years and increased the total number of Centers to 33. In addition to the ten regional Centers and six University Research institutes (URI), the legislation created 23 other Centers at institutions named in the Act. TEA-21 established education as one of the primary objectives of a University Transportation Center and institutionalized the use of strategic planning in university grant management.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act, enacted on August 10, 2005, authorized up to $76.7 million per year from Federal FY2005-2009 funds for grants to establish and operate up to 60 University Transportation Centers (UTCs) throughout the United States. Twenty of these centers were competitively selected during 2006, and forty centers are located at institutions named in the legislation.

The UTC program is managed by the Research and Innovative Technology Administration, U.S. Department of Transportation.