National Summer Transportation Institute Hosted by Michigan Tech

Twenty-seven highschoolers from Michigan and New York were selected through a competitive application process to participate in Michigan’s second National Summer Transportation Institute, hosted by Michigan Tech with financial support from the FHWA (Federal Highway Administration).

The UTC-MiSTI staff involvement included curriculum coordination and delivery, role model speaker identification and scheduling, and other general programming support. The Center also assisted in application distribution and program awareness.

During the 2010 National Summer Transportation Institute at Michigan Tech, 27 participants:

- Used hands-on activities to explore different areas of transportation, including planes, trains, automobiles, and ships
- Learned from role-models working in transportation fields about topics such as bridge design, airport construction, and snow roads across Antarctica
- Discovered team skills and applied the knowledge learned about transportation during group projects
- Went on field trips to local attractions, such as Eagle River, Portage Canal Lift Bridge, and Isle Royale
- Went on a weekend long excursion to Sault Sainte Marie, MI and St. Ignace, MI to tour the Soo Locks, the International Bridge, and the Mackinac Bridge
- Became acquainted with college life and extracurricular activities on campus
- Met other talented teens with similar backgrounds and interest

Almost 80% of the participants reported they felt more likely to have a career in transportation after participating in the program. Ninety-two percent agreed that the transportation industry has a significant impact on solving problems throughout the world, and 83% plan to take more science and math courses in high school and college.
**Director’s Corner**

In addition to conducting research, enhancing educational opportunities and supporting technology transfer, University Transportation Centers (UTCs) are charged with attracting and preparing the next generation of transportation professionals. Ensuring there is a pool of educated and skilled youth who will be responsible for designing, constructing, maintaining and repairing the transportation system is not as simple as it may seem, but it’s something that universities are already in the business of doing. This national mission is a natural fit for the 60 UTCs and their partner institutions. Universities are a natural conduit for students seeking advanced education and career preparation, but encouraging them to focus on transportation is more of a challenge. Why? Some say that, as an industry, transportation hasn’t done a very good job of selling the profession. Our transportation system lacks glitz and intrigue and we’ve allowed it to become something we unconsciously expect to be there. The industry, across modes, is facing a workforce crisis which is now causing it to wake to the realization that transportation is evolving. Our needs are growing and we need to find a better way to “sell” the profession.

This newsletter features a number of distinct programs each aimed at addressing the problem of attracting and retaining a diverse pool of future transportation professionals to respond to the changing and growing needs of our transportation system. Our Center (UTC-MiSTI) is pleased to be a partner in the implementation and leadership of these workforce development initiatives.

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**Michigan Tech Women Receive Scholarships**

Two Michigan Tech students were awarded scholarships from the Women in Transportation Seminar, (WTS) Michigan chapter. WTS is an international organization dedicated to the advancement of women in transportation.

Erin Bertocchi, an undergraduate civil engineering student from Gwinn, MI, received the Sharon D. Banks Memorial Scholarship awarded for women pursuing an undergraduate degree related to the field of transportation. Erin discovered her interest in the design and construction of roads through two previous summer internships with MDOT’s Transportation Service Centers in Newberry and Escanaba.

Mary Christiansen, a graduate student from Shelby, MI, pursuing her PhD in Civil Engineering, was selected to receive the Helene M. Overly Memorial Scholarship, awarded annually to a graduate student pursuing a degree related to the field of transportation. Mary is a scholar in the University Transportation Center for Materials in Sustainable Transportation Infrastructure and is being advised by Dr. Larry Sutter.
Houghton Middle School LEGO® League Focuses on Transportation Issues
LEGO League Encourages Students to Think About Transportation Challenges

The UTC-MiSTI helped sponsor the Houghton Middle School LEGO League for an annual competition in 2009 which focused on the importance of transportation and solving transportation related problems.

Nineteen middle school students worked long hours after school and at home to prepare for a regional competition held in Marquette, MI. The competition consisted of several parts. One aspect required the students to use problem solving and logic to move a robotic LEGO vehicle through an obstacle course while performing various tasks along the way. The second component of the competition challenged the students to assess an area of transportation in their community which could be improved upon and come up with a proposal for implementing their solution to the problem.

Chris Gilbertson, a graduate student at Michigan Tech, represented the UTC-MiSTI at several LEGO League team meetings. He worked with the middle school students and served as a mentor in fleshing out ideas for solutions to areas of potential transportation improvements to the community.

One team came up with a concept named Rent-A-Ped, in which there would be stations of motorized pedal bicycles available throughout the local community. The students felt that many of the most accessed areas of the community were too far for most people to walk, however, driving often seemed excessive. Their solution was to provide a service where bicycles were available on an as-needed basis to travel between these hot spots. The students also wanted to implement small electric motors on their bicycles to assist users in navigating Houghton’s many hills.

The second team proposed developing a system of small tunnels between Upper Peninsula towns and some of the larger cities in Lower Michigan and Wisconsin. The students recognized that many of the items used by residents of the UP must travel by truck. They envisioned vacuum tunnels loaded with pods of packages traveling back and forth between cities instead of trucks. The tubes and pods were based on the system used at bank drive-thrus, and would help alleviate traffic congestion and improve transportation safety. One of the students was particularly excited about the possibility of using the tubes to transport cheese from Wisconsin.

LEGO Facts:
• There are over 3900 different types of LEGO pieces in 58 different colors
• The LEGO manufacturing process is so precise that only 18 out of every million LEGO bricks is considered defective
• On average, every person on earth has 70 LEGO bricks
Source: www.lego.com
At Michigan’s 2010 Construction Career Days (MICCD), Michigan youth were given the opportunity to see how they could change the world by choosing careers in construction trades. The goal of the MICCD event was for youth to experience the variety of career choices that support the built environment, including roads, bridges and buildings. The 2010 event was held on April 27 and 28 at Springfield Oaks County Park in Davisburg, MI, north of Detroit.

Michigan Tech’s exhibit team included faculty and students from the UTC-MiSTI, the School of Technology’s construction Management and Surveying programs, the Department of Civil and Environmental Engineering, the Michigan Tech Transportation Institute’s Rail Transportation Program, and University Admissions Office. Students were challenged with transportation trivia, and received information on college and pre-college programs available at Michigan Tech.

Since the program’s introduction to Michigan in 2008, the UTC-MiSTI has been a platinum sponsor providing funding support specifically to offset school transportation expenses thereby increasing participation and the opportunity for youth to learn more about the construction industry.

Each year the MICCD Board looks for new opportunities to improve the event. In 2010, the Detroit and Lansing chapters of the national Association of Women in Construction created the “Girls Can Too!” program emphasizing the opportunities for women in construction. UTC-MiSTI participated in the “girl’s only” information scavenger hunt.
TRAC Scholarships Awarded at Michigan Tech
TRAC Scholarships Awarded to Michigan Tech Students

In 2008, the UTC-MiSTI entered into an agreement with the Michigan Department of Transportation (MDOT) to provide first year university scholarships to students enrolled at Michigan Tech in the four-year Civil Engineering program. Students are required to complete a Transportation and Civil Engineering (TRAC) Pipeline Internship with MDOT. The TRAC Pipeline Internship program is an extension of the TRAC Program created by the American Association of State Highway Officials (AASHTO).

The TRAC program curriculum applies math and science skills using transportation modules which expose high-school students to the unique challenges faced by civil engineers. The student spotlights showcase the importance of hands-on learning and mentors in attracting students to the field of transportation.

Past TRAC scholarship recipients:
Morgan Hansen (2008)
Richard Poljan (2009)
Kodi Padilla (2009)
Bradley St. Germain (2009)
Cody Ponchaud (2009)
Brooke Milkiewicz (deferred to 2011)
Kevin Wilks (2010)
Micah Tate Trierweiler (2010)
Logan Walz (2010)
Christian Velasano (2010)

TRAC Student Spotlight
Kevin Wilk’s Experience with the TRAC Program

Written by Kevin Wilks

My name is Kevin Wilks. My senior year of high school was spent at three different schools. My base school, Rogers High School of Wyoming Public Schools, did not have enough students to fill an AP statistics course, so I took the course at Wyoming Park High School of the same district. I was also interested in architecture and engineering so I took an architectural CAD course at Kent Career Tech Center of Kent Intermediate School District. It was there that my instructor introduced me to the TRAC Bridge Module. Participating in this program made me eligible to apply for the TRAC internship, so I jumped at the opportunity.

To prepare for my application for the internship, I spent my spare time in class learning several different CAD programs, including Micro Station Power Draft – the software made available to students by MDOT. I was always ahead in drafting and CAD classes in high school, so I had plenty of time to learn more than what was required by the class.

I have known I wanted to be an engineer of some sort since fifth grade. I later found that I was interested in architecture and structures, so I decided that civil engineering would be the best career path for me to take. It was my senior year of high school that I started to narrow my choice down to structural engineering – especially bridge design.

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I did not know a whole lot about what I would actually be doing during the internship, but I knew I wanted it. As it turned out, I was the first TRAC Intern in the Grand Region, so I was a test subject of sorts. My mentor, Jason, coordinated my schedule, and worked with other engineers to find appropriate times for me to work with them. Throughout the seven week internship, I met and worked with many great people throughout the region, doing all sorts of jobs. I learned about scoping roads and bridges for maintenance, surveying, project management, aggregate sampling, road design, and many other jobs. I never knew how much work went into a project that seemed so simple.

My favorite part of the internship was the practical experience. I have never had the opportunity to witness real life engineering work, and it was great to see what goes on outside of school.

Now, as a first-year student at Michigan Technological University, I feel more confident in my ability to succeed in earning my degree in civil engineering. Having the experiences from my internship proved to be extremely rewarding. The most notable reward of having internship experience, so far, occurred at the Fall 2010 Job Fair. I walked in as a college freshman, waiting in line with a bunch of second and third year students can be very intimidating, and even more intimidating is the look on the interviewers face when they see that I had graduated from high school just that spring. But that man’s facial expression sure changed when I pointed out that I had an internship with the Department of Transportation. I got another interview two days later, where I was informed that I was a good candidate for the co-op position, but they felt it would be more appropriate to give it to an older student who had fewer chances to get experience by graduation. That is a perfectly reasonable statement, and even though my chances at getting a position are low, I was able to come back to my dorm and tell everyone who said I had no chance that they were wrong, and it’s all because of a TRAC internship.

Written by Kodi Padilla

My name is Kodi Padilla and I am from the small town of Amasa, Michigan. I graduated from Forest Park High School in Crystal Falls, Michigan with a 3.7 GPA. In High School, I was on the varsity pom/dance and Cheerleading teams and a member of the National Honor Society. I also participated in two High School drama productions, A Midsummer Night’s Dream and Twelve Angry Jurors.

In Middle and High School, I always enjoyed hand and computer drafting. This helped me realize quite some time before I graduated that I wanted to major in Engineering. To decide what field of Engineering I wanted to pursue, I participated in Michigan Tech’s Women in Engineering Program. During this program, I decided I wanted to be a Mechanical Engineer, so I applied during my junior year of High School to various colleges to major in mechanical engineering.

When I received all of my letters of acceptance, I decided to attend Michigan Tech. I had considered a variety of colleges, but knew that being close to home would help ease the stresses of being away at college. Other than the frigid winters (which I was already accustomed after growing up in the UP), nothing has made me regret my decision to attend Michigan Tech.

So, I knew where I wanted to go to college and thought I knew what I wanted to major in. It was not until the last half of my senior year that I decided to switch my major to Civil Engineering. When my Calculus/Physics teacher, Mr. Todd Waurio, told me about the Civil TRAC Internship program through the Michigan Department of Transportation (MDOT), I knew it was something I needed to be a part of. I had always loved drafting and excelled in math and science. So, I applied for the Internship and was taken on as an Intern the summer after my senior year.

During the TRAC Internship, I performed various civil engineering duties. These included
My name is Buddy (Richard) Poljan and I am a second year student at Michigan Tech from Hillsdale, MI where I graduated from Hillsdale High School in 2009. I decided to come to Tech because I thought that I wanted to be an engineer, and because I was given the opportunity to play football for the Huskies. In high school I was active in sports, Business Professionals of America and I took dual-enrolled college classes at Lansing Community College. In the spring leading up to graduation my mother asked me to try out TRAC modules before she started teaching the program at the school where she works. I agreed and found that I really liked the lessons. After attending a TRAC training session, my mother suggested I apply for a TRAC summer internship with MDOT to learn more about the engineering profession. At first I was skeptical about an engineering internship. Sitting behind a computer all day making Excel spreadsheets did not seem like a good idea before football season. Thankfully, Dee Parker and the rest of the people who ran the TRAC program were very good about keeping me involved and active.

The first department I was assigned to was surveying. The main project I worked on was using a laser scanner to create a 3D computer model of the capitol building. This took quite a while because the scanner had to be set up in many different locations in order to record all the details and intricate art work on the building. The people at the state surveying office were all very helpful to me and made my stay on the first floor of the Van Wagner building (where the main office was located) very enjoyable and informative.

After working in the surveying office I was transferred to the Traffic and Safety department where I spent one week in each of the four major divisions; Signals, Pavement Markings, Safety, and Geometrics. In Signals I used a computer program to create a traffic signal pattern that would optimize traffic flow on state trunk lines such as U.S. 41. In Traffic and Safety I went on a field visit to see some state roads where an invasive reed species was growing along the side of the road causing low visibility for drivers trying to pull out into the roadway. In Pavement Markings I learned about the different types of road markings from lane lines to corner arrows. The Geometrics Unit staff are responsible for making sure that road curves have the appropriate radius for their design speed and other geometric features.

The TRAC program was a great opportunity for me to meet many quality people and to learn about real world applications of Civil Engineering.

**TRAC Scholarship Recipient - Richard Poljan**
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 ultrahigh 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 Website: www.misti.mtu.edu