

The Midwest Transportation Center (MTC)—the U.S. DOT's Region 7 University Transportation Center (UTC) serving Iowa, Kansas, Missouri, and Nebraska—is in the third year of its multi-million dollar UTC award through the Office of the Assistant Secretary for Research and Technology. Housed and administered at Iowa State University's Institute for Transportation, the MTC is a consortium including the University of Missouri—Columbia, University of Missouri—St. Louis, Wichita State University, Creighton University (Omaha, NE), and Harris-Stowe State University (St. Louis, MO), a historically black university. Seward County Community College (Liberal, KS) is a collaborator.

Since the UTC program was initiated in 1987, Iowa State University—led consortia have won four of six regional UTC competitions and one UTC Tier-1 competition.

The MTC's theme is Data Driven Performance Measures for Enhanced Infrastructure Condition, Safety, and Project Delivery. The MTC addresses regional issues related to the theme through a strategically focused program that is synergistic with U.S. DOT priorities and MAP-21 goals, with State of Good Repair as the ultimate objective.

## Making a Real Difference

# Midwest Transportation Center

*... in Iowa and Beyond*

The MTC's dynamic programming makes a real difference through research, outreach, workforce development, and education. A sampling of activities includes the following:

### Research

MTC-funded research results in implementable solutions. For example,

- Multiple projects have resulted in policies and procedures for the Iowa DOT, including **accelerated bridge construction, red light running countermeasures, roadway lighting, roadway rehabilitation, and signal design.**
- A project on use of **recessed grooves for pavement markings** showed a 33 percent savings over surface-applied annual restriping.
- Analysis of the Amtrak capacity on the St. Louis to Kansas City rail line resulted in construction enhancements, resulting in **two years of over 80 percent on-time service.**
- Iowa Pavement Management Program tools are **used by 100 Iowa agencies.**
- Accelerated bridge construction methods reduced construction time by two days. This methodology has the potential to **save trucking companies \$5,000 to \$250,000** in delay per bridge construction, depending on traffic volume.

All MTC-funded projects pool federal funds with **state or local match funds.**

A project in the use of dynamic speed feedback sign (DSFS) systems to enhance roadway safety, for example, **leveraged funding** from two DOTs (Iowa and Texas), the MTC, and the Federal Highway Administration.

And funded projects address practical problems. For example,

- The MTC is helping to fund partner Wichita State University's research on **Google Glass's impact on driving performance** and the potential for wearable devices to detect driver fatigue.



Psychologist Jibo He demonstrates Google Glass in the driving simulator



IOWA STATE UNIVERSITY  
Institute for Transportation

### Leveraging Federal Dollars

By securing match funding, the MTC has **leveraged \$5 million** allocated to date **into more than \$11.5 million** to make a real difference in Iowa and beyond.

- The Center for Earthworks Engineering Research at ISU is studying the **impacts of autonomous and robotic-guided earthworks equipment** on productivity, quality, reliability, and safety. The MTC research grant also funded an international conference on this topic in June 2015.
- The MTC supported an ISU “proof of concept” project to develop a truck firm–size database that provides insights into the **effects of motor carrier size on safety**. The model characterizes risk in the trucking industry.
- Another proof of concept project at ISU, the MTC supported an examination of the usefulness of **modeling full-scale road infrastructure to maximize design opportunities**. A two-way stop control intersection model was developed for the university’s world-class virtual reality environment. Ultimately, the final product will be a framework for deploying dynamic, full-scale modeling of roadway infrastructure.

## Outreach

MTC researchers developed marketing and outreach materials to promote the use of the “safety edge” in state and local roadway construction projects. By providing a sloped surface along the pavement edge, the safety edge allows vehicles inadvertently leaving the roadway to safely return to the pavement. This design adds less than one percent to material costs and **reduces crashes by an estimated five percent**. As a result, the **safety edge was implemented in 82 road projects in Iowa** from 2010 to 2012 (473 miles).

MTC is working closely with the Iowa DOT and other agencies to ensure research results are implemented. MTC is sponsoring a peer exchange meeting with Iowa County Engineers Association which will focus on identifying and addressing obstacles so that **counties can implement research results from four recently completed projects**.

MTC partners at the University of Missouri-Saint Louis compiled a three-volume collection of works on **managing the modern railroad** (*Readings in Modern Railroad Management*) such as regulation, finance, labor, and pricing. The collection is intended for students and practitioners of the railroad industry.

The **Mid-Continent Transportation Research Symposium**, co-sponsored with the Iowa DOT and others, offers a Mid-western venue for a Transportation Research Board–type experience, with professional presentations in several concurrent tracks. This year’s event will focus on an implementation track and **moving research into practice**.

## Workforce development

Some of the MTC’s most exciting initiatives involve actively engaging young people in grades K-12 with information and hands-on experiences related to transportation careers:

The **online magazine for teens, Go!**, along with its Spanish counterpart ¡Vamos!, features stories written by and for students about transportation at home and around the world.

In partnership with the Center for Biorenewable Chemicals (CBiRC) at Iowa State, the MTC offers the Young Engineers and Scientists (YES) program. Qualifying central Iowa high

## Today’s Learners, Tomorrow’s Leaders

Since 2013 the MTC has provided annual support—tuition assistance, research funding, conference activities, etc.—for **45** graduate and undergraduate students in 12 disciplines.

school students participate in **research projects outside their regular classrooms** for nine hours every week for one semester, supervised by a faculty mentor and/or graduate student.

Also in partnership with CBiRC, the MTC sponsors **Research Experience for High School Teachers (RET)**, in which teachers gain first-hand experience in methods and analysis of research and develop related classroom experiences.

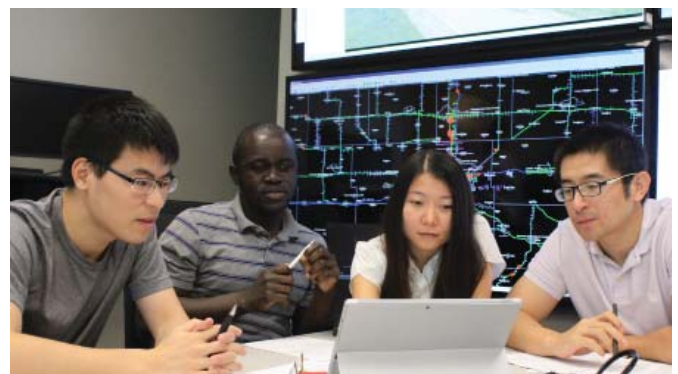
In partnership with the Iowa DOT, educational workshops are being offered to middle and high school students and teachers to stimulate team-building, critical thinking, and interest in the transportation field. Teachers receive mini grants to **create transportation-related activities for the classroom** and learn how to use AASHTO’s Roadways in Developing Elementary Students (RIDES) kit in their curricula.

## Education

The MTC augments university students’ academic programs with enrichment opportunities that prepare them to deal with the transportation challenges of the coming decades. For example,

**Study abroad.** In May 2015 several MTC students studied global transportation topics in Istanbul, Turkey, where they experienced the city’s unique, multimodal transportation system first hand.

**Tom Maze Transportation Seminars.** Presented weekly during the spring semester, these seminars feature nationally and internationally recognized leaders in transportation. Students at the (rotating) host university can ask questions and “pick the brains” of these giants of the industry; the seminars are broadcast in real-time to students at all MTC consortium partner universities.



MTC students have access to state-of-the-art laboratory facilities, like the new Traffic Operations Laboratory