



# UTC Spotlight

University Transportation Centers Program

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## Today's Learners, Tomorrow's Leaders: InTrans Offers Collaborative STEM Activities Steered Toward Transportation

Knowing well the importance of education to the workforce of tomorrow, the Midwest Transportation Center (MTC, the Region 7 University Transportation Center) at Iowa State University's Institute for Transportation (InTrans) teamed up with the Iowa Department of Transportation (Iowa DOT) to offer a series of annual workshops for Iowa teachers and students. Held during summer 2015, the three workshops exposed students to engineering concepts and transportation-related professions while providing teachers the tools to stimulate team-building, critical thinking, and interest in the transportation field.

provided them with the background knowledge they needed to use the newly developed activities in their classrooms.

### Go! Further Workshop for High School Students

In June 2015, 19 students from classrooms across Iowa, such as Des Moines Public Schools, attended the Go! Further Workshop, which was funded by both the MTC and Iowa DOT. This weeklong educational workshop focused on leadership training and team-building.

Working in teams throughout the whole process, students participated in a ropes course in Marshalltown, Iowa, where they traversed a challenging rope-climbing obstacle course.

At InTrans students were able to test drive the MiniCym—a driving simulator that allowed them as the drivers to respond to various obstacles and hazards. Then students were able to see what a snow plow operator really does by driving in a snow plow simulator housed at the Iowa DOT. And students learned the true value of leadership by giving forward as volunteers at a local area food pantry.



Iowa State University

Transportation Institute teachers receive participation certificates.

The InTrans and Iowa DOT partnership expanded to include the Science Center of Iowa in Des Moines, Iowa, and the three organizations went on to host the first annual Ready. Set. Build! Bridge-Building Challenge in November 2015.

### Transportation Institute for High School Educators

In June 2015, the Transportation Institute, a weeklong professional development workshop, funded, in part, by the Iowa DOT, was held at InTrans. A total of 12 high school and middle school teachers (who reach nearly 1,200 students) attended the workshop, participating in the creation of transportation-related activities (e.g., yellow light timing, runaway truck ramps, etc.) to bring into their STEM (Science, Technology, Engineering, Math) classrooms and after-school programs.

Throughout the week they listened to speakers and transportation professionals from the Iowa DOT, who



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Student test drives MiniCym during Go! Further Workshop.

Knowing that exposure to mentors and input from successful professionals is key to furthering student interest in transportation-related fields, Iowa DOT and InTrans provided speakers who shared their stories and real-world examples of the work they do in the field.

## Teaching in the Fast Lane Workshop for Elementary Teachers

In July 2015, 24 elementary teachers from across Iowa attended Teaching in the Fast Lane, a workshop where teachers participated in activities based on the American Association of State Highway and Transportation Officials (AASHTO) Roadways in Developing Elementary Students (RIDES) kit.

The AASHTO RIDES kit is aligned with national Core Curriculum Standards for math and science and takes students on multiple adventures learning about transportation in relation to both math and science concepts. After the workshop, teachers were provided with a mini kit containing these materials, which would enable them to implement transportation and engineering lessons easily into their classrooms.

Participating teachers also visited actual bridge testing sites and heard from visiting Iowa DOT and InTrans speakers on the importance of engineering education.



Teachers visit Iowa bridge site during Teaching in the Fastlane Workshop.

## Ready. Set. Build! Bridge-Building Challenge

Held on Saturday, November 7, 2015, this competition consisted of 24 teams that included 75 participants. Groups, assembled by age and ranging from two to four participants each, and families, had three hours to design and build their own bridge using balsa wood, wooden clothespins, Popsicle sticks, hot glue, and string.

Age groups included grades 1-3, grades 4-6, grades 7-8, and family. Each group chose a name for their team (e.g., Speedy Builders, 4H ExSPANsion, Cousin Construction, etc.)



Bridge testing during Bridge Building Challenge.

After each team's bridge was tested for productivity, awards were given in the areas of teamwork, innovation, and highest structural efficiency.

## University-Organization Collaboration

This overarching educational project is a collaboration between academic researchers, engineering professionals, and Iowa students and teachers.

By combining knowledge in the areas of transportation and engineering, creating tools and showing how to apply them to a K-12 environment, team members from Iowa State University and the Iowa DOT created an exciting and memorable connection between STEM and transportation.

## Impacts

The summer educational workshops helped reach teachers who were unsure how to include engineering topics in their classrooms.

Daniel Loy, a fourth grade math and science teacher from Beaver Creek Elementary in Johnston, Iowa, was one of those very teachers, that is, until he attended the Teaching in the Fast Lane Workshop. All four programs will be expanding in 2016.

"I have been a long-time advocate of promoting more science in the elementary classroom, but I admit I had never specifically targeted engineering. This workshop completely changed my tactics," he said. "I've now set up an active 'tinker table' in my class where kids could begin independent projects focused on science and engineering."

### About This Project



The director of the Midwest Transportation Center (MTC) is Dr. Shauna Hallmark ([shallmar@iastate.edu](mailto:shallmar@iastate.edu)). MTC is one of 10 Regional University Transportation Centers (UTC) sponsored by the U.S. Department of Transportation under the Moving Ahead for Progress in the 21st Century Act (MAP-21). The UTC focuses its research on data-driven performance measures of transportation infrastructure, traffic safety, and project construction. In addition to research, the UTC supports regional education programs, leadership development, diversity promotion, and outreach efforts.

*This newsletter highlights some recent accomplishments and products from one University Transportation Center (UTC). The views presented are those of the authors and not necessarily the views of the Office of the Assistant Secretary for Research and Technology or the U.S. Department of Transportation.*

