

# 2011 Annual Report





**Message from Anthony Liberatore**  
**Business Manager/Secretary Treasurer**  
**Laborers Local 860; Member, UTC Advisory Board**

For almost 75 years, the men and women of Laborers Local 860 have built and improved roads, highways and utilities throughout Northeast Ohio strengthening the region's infrastructure to facilitate travel for citizens and move goods and services for industries of all kinds.

Laborers Local 860 members work on 98% of the highway and infrastructure projects in Northeast Ohio, a testament to their skill, productivity and dependability, and a vote of confidence from the region's construction industry which employs these hard-working people.

The highly skilled workers of Local 860 perform their jobs with pride, risking their lives and safety daily on heavy highway and road construction projects that expose them to distracted drivers and work zone conditions that lead to thousands of injuries and deaths annually to workers and drivers alike.

That's why we were proud to join the Advisory Board of the Cleveland State University Transportation Center in 2005 to support its mission to make road construction zones safer for workers and drivers.

With our workers on the front line, we have a vested interest in supporting the UTC's research, education and public outreach to reduce the number of injuries and deaths that occur each year in road construction zones.

Working cooperatively with UTC students and staff, and fellow advisory board members representing the highway construction industry, Laborers Local 860 participates in UTC research projects to test new products and technology, co-sponsors the annual Work Zone Safety Week event to kick off the road construction season, and provides electronic signs in road construction zones to test safety messages directed at drivers. It's a collaboration that we're confident will lead to breakthroughs that make road construction zones safer for all.

We look forward to another great year working with the UTC to make road construction zones safer for workers and drivers alike.



**Message from George Palko**  
**President, Great Lakes Construction Company**  
**Member UTC Advisory Board**

The Cleveland State University Transportation Center (UTC) commenced under the Federal Highway's SAFETEA-LU in 2005. The focus of this Federal Highway program was to construct and update a transportation system to make it safe for all users. The Cleveland State University Transportation Center's mission is a great complement to the Federal program as it focuses on increasing safety in road construction work zones.

The UTC assembled an Advisory Board whose members have a keen interest in supporting its mission to make construction work zones safer for workers and drivers. The Advisory Board is represented by public officials, union officials, and private industry. The varied backgrounds of the members provide a unique resource for the UTC's education, research

projects and outreach to K-12 schools as well as to the general public. With the help of advisory board members, the UTC has been able to gain access to regional construction projects and construction safety products, obtain the ear of our legislators and work with some construction crews to assist in providing safer road construction work zones.

Great Lakes Construction Company has been proud to be a part of the UTC and its industry involvement. The Center has provided hands-on experience to its students through its education programs and participation in several important highway construction industry events. Student involvement in the unique educational opportunities and industry events is a win-win for the students' careers while providing industry a chance to hire experienced local talent.

The Transportation Center continues to make a difference by providing safer highways, safer work zones and better prepared students.

**left to Right: Mark Olivo - Laborers Local 860 • Anthony Liberatore - Laborers :Local 860 • Luke Wolosonovich - Great Lakes Construction • Stephen Duffy - UTC Director • Bruce Owens - Plastic Safety Systems • George Palko - Great Lakes Construction**



## UTC Advisory Board



**George Palko PE**  
President/CEO  
The Great Lakes  
Construction Company



**John Durkos**  
Vice President of  
Technical Support  
& Marketing  
Road Systems, Inc.



**Myron Pakush**  
Deputy Director  
ODOT District 12



**Tracy Scriba**  
Federal Highway  
Administration



**Tom McGlynn, Sr.**  
Director, Highway  
Safety Business Unit  
3M



**Bruce Owens**  
Vice President  
Plastic Safety  
Systems



**Anthony Liberatore, Jr.**  
Business Manager  
Laborers Local 860



**Mark Potnick**  
Director, Labor  
Relations & Safety  
Ohio Contractors  
Association



**Bonnie Teeuwen PE**  
Dir. of Public Works  
Cuyahoga County



**Jeff Lechak PE**  
Cleveland Area  
Manager  
Parsons  
Brinckerhoff



**Jon Bassett**  
Channel Manager  
3M Traffic Safety  
Systems Division

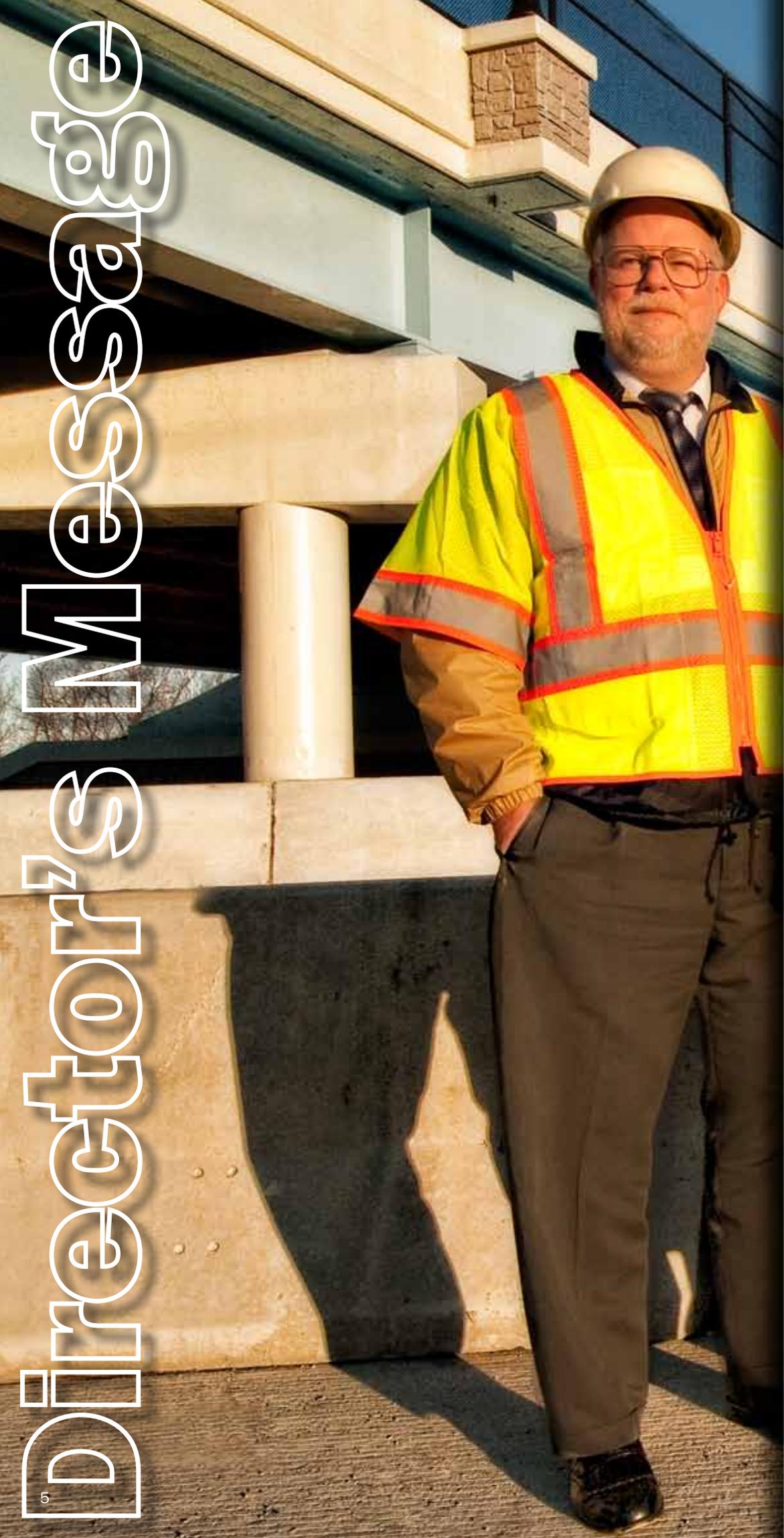
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# Director's Message



**Center Director**  
**Prof. Stephen F. Duffy**  
PhD, PE, F.ASCE

It appears as if we are approaching the end of our beginning. As this annual report was being written, the Research and Innovative Technology Administration (RITA) informed Center Directors across the country that the United States Department of Transportation (DoT) intends to remake the University Transportation Center program by issuing a competitive request for proposals. This is a departure from the funding process mandated in the original SAFETEA-LU legislation and will likely reduce the number of Centers supported by the US DoT. Hopefully, sometime in the next six months I will be able to report good news relative to the proposal the CSU Center will submit for this competition. However, at this point details are scant. So I will dwell on accomplishments over the past years made possible with the \$1.9 million in federal funding from the US DoT, as well as corresponding matching funds from sources such as CSU, private donations, and non-federal grants. In retrospect we have been truly fortunate.

Throughout our existence, and especially during the past year, the Transportation Center as well as the transportation engineering program at CSU have grown both in capability and accomplishments. Since its inception in 2004, the CSU Transportation Center has served as a regional resource for transportation engineers who can effectively participate in the safe rehabilitation of our nation's highway infrastructure. From the beginning we included the provision of training, education, and outreach, along with research that focused on highway construction safety. The Center played an instrumental role influencing the University to hire faculty-researchers that had a major impact on the Civil Engineering program. This includes the current Civil Engineering Department Chair Norbert Delatte PhD, PE and most recently Jacqueline Jenkins PhD, P.Eng. who did her doctoral research at Texas A&M. Dr. Delatte is a pavement design expert and a Fellow of ASCE in addition to the ACI. Dr. Jenkins will join the faculty in September and focus on traffic simulation as well as human factors research. We are fortunate to have both individuals associated with the CSU Transportation Center.

Eight years ago we began laying a curricular foundation for an enhanced transportation program at CSU. In May 2004, a new graduate transportation engineering specialization was approved by the faculty, with one new course in Highway Engineering and two substantially revised courses. At that time an important step was taken to further strengthen the University's position in the transportation engineering field. CSU received a grant from the United States Department of Education (DoEd) for curriculum development in the area of highway work zone safety. The funds (\$248,000) from that grant led to the creation of the Work Zone Safety Transportation Center at CSU. In August of 2005 the Center gained further traction when it was recognized as a Tier II Transportation Center in the SAFETEA-LU legislation. At that point, the transportation engineering program at CSU attained critical mass. Dr. Delatte had joined the Civil Engineering faculty, faculty from several other disciplines were participating in Center activities, and courses such as Human Factors Engineering, Traffic Flow Theory, Urban Transportation Planning, and Construction Safety Engineering were added to the curriculum. As Mellissa Tooley PhD, PE at the Texas Transportation Institute has pointed out on many occasions the federal support given to the University Transportation Center program since 1987 has been a godsend for smaller transportation engineering programs around the country. From my perspective Dr. Tooley could not be more correct in her assessment.

Looking back I have had the good fortune to work with a number of talented individuals both within the Center and external to the Center. This annual report focuses on two individuals from outside the University who supported our endeavors from the beginning. They are Anthony Liberatore, Business Manager for Laborers Local 860, and George Palko, President and CEO of The Great Lakes Construction Company. Both have been active in making the Center a success. George was instrumental in helping the Center gain traction early on and kept us focused as well as organized over the years. Anthony jumped on board early with a simple but compelling comment - "Our guys are the ones with targets on their backs in work zones." Anthony wanted Laborers Local 860 to be involved immediately after the SAFETEA-LU legislation passed, and to his credit they have. Many facets of the heavy highway industry have been involved and supportive of the Center over the years and I want to say "thank you" to all of them. But I especially need to thank George Palko and Anthony Liberatore. Labor and management came together in common cause over the last six years and as a result both shaped the direction that the Center took.

The University Transportation Center at CSU may have sprung from humble origins, but our hard won success is the result of stringing small victories together in a coherent and deliberate manner. We have not avoided the bottom rungs in our ascent to respectability and we do not intend to stop. The personnel associated with CSU Transportation Center believe in what they are working on and have translated that belief into some special accomplishments. Please read on to see the details of those accomplishments over the past 12 months.

# Work Zone Safety Rally Kicks Off Road Construction Season

The CSU Transportation Center and the Ohio Department of Transportation hosted the second annual Work Zone Safety Awareness Week Rally on Monday, April 4 with the theme, “Look Up, Hang Up, and Go Slow in the Cone Zone.” The event was one of many similar rallies around the country as part of the US Department of Transportation’s National Work Zone Safety Awareness Week, a coast-to-coast effort to reduce accidents in highway construction zones.

Over one hundred CSU students, representatives of Laborers Local 860, and construction industry professionals attended the event, which was held at the Wolstein Center on the CSU campus.

UTC Center Director Dr. Stephen Duffy welcomed attendees, and said, “The theme of today’s event, Look up, Hang up, and Go Slow in the Cone Zone, is a reminder to motorists to resist the temptation to engage in activities that distract drivers and lead to accidents.”

He then led attendees in observing a moment of silence in memory of the 12 Ohioans killed last year in road work zones, as represented by 12 traffic cones on the stage; and the 1,909 injured in accidents in road work zones.

Keynote speaker Senator Tom Patton, Chairman of the Ohio Senate Transportation Committee, reinforced the theme of the event as he addressed the importance of increasing safety in road construction zones for workers and drivers. “The challenge of safety doesn’t take care of itself,” said Senator Patton. “Let’s put everything on the table we can to improve safety and figure out what works and put it into practice.”

Following Senator Patton’s remarks, Jeff Lechak, Cleveland Area Manager for Parsons Brinckerhoff and a member of the UTC Advisory Board, led a panel discussion on work zone safety. Panelists included Greg Wood, a foreman and safety training specialist with A & A Safety, who was gravely injured in a hit and run accident in a work zone in 2009; Judge Joan Synenberg, of the Cuyahoga County Common Pleas Court, who handled Greg’s case; and Sergeant Andrew Janu of the Ohio State Highway Patrol.

Each panelist was asked to make a statement about work zone safety from his or her unique perspective.

Greg Wood’s recounting of the night he was nearly killed in a work zone was especially riveting to the audience. “I was confused as I lay there on the ground with crushed glass and debris all around me,” said Wood. “I knew I had done everything to keep myself safe. I didn’t understand why I had been hit.” Wood was proud to say that he is back to work and spends a great deal of time sharing his story with others to help them understand the importance of paying attention in work zones.

The Honorable Judge Joan Synenberg oversaw the trial of Kyle Ross, the motorist who struck Greg Wood in the construction zone. “How can you possibly be paying attention when you are looking at a hand held device,” said Judge Synenberg. “As drivers we must pay attention when we get behind the wheel.”

During more than 20 years in law enforcement, Sgt. Janu has seen his share of work zone crashes. “It’s the impatient drivers who think adding 30 seconds to their trip is too much that cause the accidents in work zones,” said Sgt. Janu. “Everyone needs to follow the rules and a majority of accidents wouldn’t happen.”

Work Zone Safety Awareness Week events around the country recognize road construction workers and drivers injured and killed the previous year, rally transportation professionals and workers to kick off the road construction season, and launch messaging campaigns to remind drivers to observe safe driving habits in road work zones.

This year, every person who attended the UTC Work Zone Safety Awareness Rally received an orange silicone thumb ring that reads “Look Up. Hang Up. Slow Up.” to remind drivers to keep their eyes on the road.

Attendees were also treated to a display of historic traffic control devices, including some of the first safety devices ever used in road construction zones.

Amanda Lee, Public Information Officer, Ohio Department of Transportation, District 12 contributed to this story.



Greg Wood - A & A Safety; The Honorable Joan Synenberg - Judge, Cuyahoga County Common Pleas Court; Sgt. Andrew Janu - Ohio State Highway Patrol



In memory of those we lost



Observing a moment of silence in memory of workers and drivers injured and killed



# Candidates

## Night 2010

## **2010** Candidates Night Raises the Profile of Transportation Issues with Office Seekers

Candidates for the newly created position of Cuyahoga County Executive were invited to address CSU students, faculty, and members of the public on transportation and infrastructure related issues at a forum hosted by the University Transportation Center and regional professional engineering and transportation organizations on Tuesday, October 5.

The first-ever event for the UTC focused on how candidates for County Executive would deal with two important issues facing the region: repairing crumbling roads, bridges and other infrastructure in the county; and qualifications they would use to evaluate candidates for the newly created position of Director of Public Works, previously the elected position of County Engineer. All six candidates for Cuyahoga County Executive attended the forum, which attracted about 150 students, faculty, transportation professionals and reporters.

UTC Advisory Board member, Jeff Lechak of Parsons Brinckerhoff organized and moderated the forum, which opened with an overview of the University Transportation Center by Center Director Dr. Stephen Duffy.

Candidates were asked detailed questions, composed in advance by the regional engineering and transportation organizations designed to reveal how each would address transportation challenges facing the county and the region in the near term. "Transportation and infrastructure issues are rarely addressed by candidates for public office, yet the condition of the region's infrastructure impacts business and the quality of life for residents," stated Dr. Stephen Duffy, UTC Center Director. "We thank the candidates for their excellent preparation, thoughtful answers and attendance. While this was the first candidates forum hosted by the UTC to focus on infrastructure, it won't be the last."

The UTC thanks the following organizations for their assistance and support: American Council of Engineering Companies of Ohio, American Society of Civil Engineers, Cleveland Section; American Society of Highway Engineers, Lake Erie Section; Association of Bridge Construction and Design, Northeast Ohio Chapter; Build Up Greater Cleveland; Institute of Transportation Engineers, Lake Erie Chapter; Ohio Contractors Association; Women's Transportation Seminar, Northeast Ohio Chapter.

# VEX Robotics Championship Grows

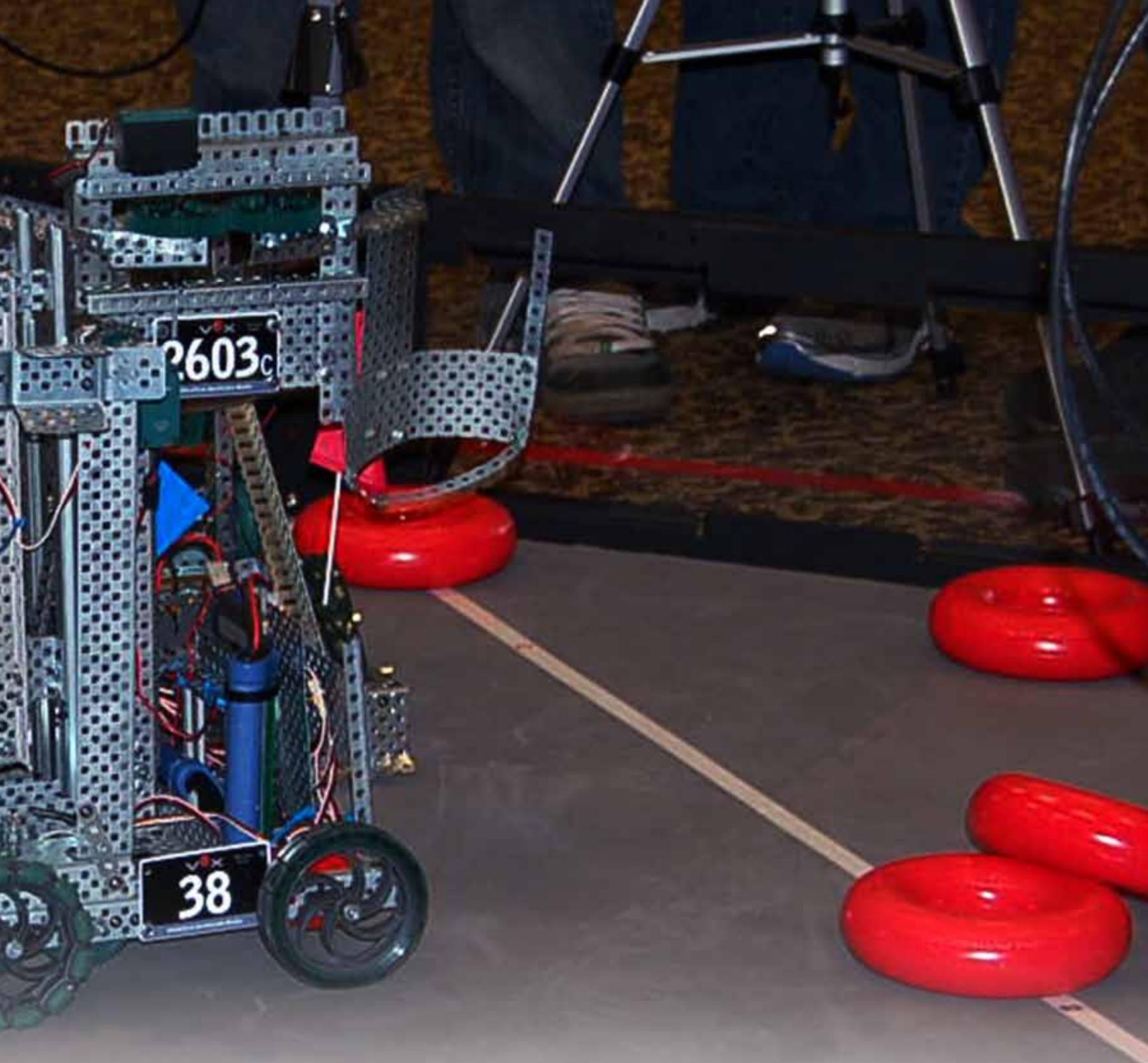


The third annual Cleveland VEX Robotics Championship on March 5, 2011 was the biggest yet with 175 middle and high school students competing to qualify for the World Championship event in Kissimmee, Florida in April 2011. The student competitors, representing middle and high schools from throughout Northeast Ohio and Michigan, along with one home-schooled student, converged on the Wolstein Center on the CSU campus ready to design, build and challenge their robots in a game of “Round Up.”

The students were divided into 34 teams, each of which is required to build robots under specific design guidelines and restrictions before competing in a game against similar robots. The object of this year’s game – “Round Up” – involves moving tubes around a field and through a goalpost in order to score points. To accomplish the task, each robot had to form an “alliance” with another and work cooperatively in addition to exercising its own predetermined strategy.

The day involved a series of matches between teams, including several rounds of qualifying matches in the morning and then, based on seeding, the playoff round in the afternoon. Four teams competed in each match, which lasted 140 seconds.

Three teams from among the 34 competing teams qualified to participate in the 2011 VEX Robotics World Championship event in Kissimmee, Florida from April 14-16, 2011. The three Cleveland Vex Tournament Champions were Team 1103 composed of Joshua Wade, home-schooled from Orwell, Ohio; Team 1270A from the Youth Technology Academy at Cuyahoga Community College; and Team 38 from Cranbrook Schools in Bloomfield Hills, Michigan. In addition, Joshua Wade’s robot qualified for the World Championship event as the Robot Skills Winner as well as the Programming Skills Winner. A total of 396 teams comprising over 2000 students from 16 countries participated



in the World Championship event.

An additional three teams qualified for the U.S. National VEX Robotics Championships in Omaha, Nebraska on March 10-12, 2011. Those three Tournament finalists included another team from Shaker Heights High School, one from Highland High School, and another from Cranbrook Schools in Michigan.

Additional awards given that day included the Amaze Award, the Build Award, the Create Award, the Energy Award, the Sportsmanship Award, and the Think Award.

Many of the schools represented at the Cleveland Vex Robotics event, which is co-sponsored by the CSU Transportation Center and Cuyahoga Community College (Tri-C), were repeat participants from previous years. Represented this year were Shaker Heights High School, Westlake High School, Highland High School in Medina County, Wiley Middle School in Cleveland Heights-University Heights,

Horizon Science Academy in Cleveland, the Youth Technology Academy within Tri-C, Cranbrook Schools from Bloomfield Hills, Michigan and a home-schooled student from Orwell, Ohio.

Engineering and Technology students from both Cleveland State University (CSU) and Tri-C, as well as some high school students from local schools, served as volunteers on the day of the event. Several faculty members from CSU's Fenn College of Engineering, engineers from a number of local businesses and engineering students from local universities served as judges for the all-day event.

Cleveland State University will again partner with Cuyahoga Community College for the 2011-12 VEX Robotics Competition. A date has yet to be decided.



**Fourth Annual  
Engineering Education  
Summer Conference**



The 4th Annual Engineering Education Summer Conference (EESC) was held June 14-16, 2011 at CSU, with a trip to NASA Glenn Research Center on the third day of the event. This year, 54 teachers, administrators and staff (18 Elementary, 16 Middle Grade, and 20 High School) attended, representing 17 public school districts, six private/parochial schools, one charter school, and one local university in Ohio. The conference, developed and facilitated by UTC Education Coordinator, Diane Burrowbridge, was promoted as providing “Hands-On Engineering/STEM Activities for Elementary, Middle Grade and High School Classrooms.”

The first two days of the conference were held on the CSU campus in Julka Hall, home to the College of Education and Human Services, with 22 presentations given by 13 K-12 teachers, engineers or CSU staff.

Unlike the first three years of the EESC, when breakout sessions were designed to be grade-specific, this year participants could choose which breakout sessions they wanted to attend. Some of the presentations were given twice during the two days of the conference, allowing attendees more flexibility.

This year's conference featured a mix of returning presenters from previous years as well as rookie presenters, most of whom had attended previous EESC events.

Veteran presenters included Joe Marencik of Shaker Heights High School (“Slow Motion Video in Engineering and Science”), Scott Kutz of Westlake High School (“Design Squad Kick Stick Challenge”), Sandy Vontroba, of Westlake Lee Burneson Middle School (“Heroes in Disguise-Japan Earthquake Challenge”), Kurt Thonnings, from Westlake Lee Burneson Middle School (“The Grow It Project”), and Lynn Marencik, of Royal View Elementary in North Royalton (“It Sounds a Lot Like Science & Engineering!”). Gregg Schoof, from CSU Fenn College of Engineering spoke about Fenn Academy.

The rookie presenters and past EESC attendees were Penny Weiss-Flynn, from Onoway Elementary in Shaker Heights (“Mission:Top Secret & Design Squad Mission Touchdown”), Jim Sweeney, also of Onoway Elementary (“If They Build It They Will Learn It”), Tony Barbuto of Kent Roosevelt High School (“Paper Egg Drop: A Look at Energy, Work, and the Engineering Design Algorithm”), and Lindsey Grospitch, of Marcus Garvey Academy in Cleveland (“Investigating Materials” and “Dart Paper Airplanes”).

Two presenters new to the EESC were Bob Claymier, founder of Technology is Elementary and a retired sixth grade teacher, who traveled from the Columbus area to present a hands-on elementary level demonstration titled, “Rollercoaster Design, Awesome Animals & Electric Answer Boards.” Maria Baker, an electrical engineer and CSU Fenn College graduate, partnered with UTC Education Coordinator and civil engineer Diane Burrowbridge, to present “Assembly Line Design” to middle and high school level teachers. Diane also gave an introductory presentation titled, “What Can I Do with Engineering?”

On the third day of the conference, 39 EESC participants and UTC staff were bused to NASA Glenn Research Center for additional hands-on activities and tours of two of NASA's testing facilities. The day started with an overview and online tour of the Educator Resource Center (ERC), by Monica Boyd, Educator Resource Center (ERC) Coordinator, followed by two breakout sessions, one for elementary teachers and one

for middle/high school teachers. Diane McElwain, Education Specialist, presented to elementary teachers about Lunar Thinking and Problem Based Instructional Units, while Susan Kohler, AESP, kept the middle and high school attendees busy with several different hands-on activities. After lunch, the group was given tours of the 10 X 10 Wind Tunnel and Slope Facility.

Each participant in the 2011 EESC received a binder and CD containing all the handouts from each presentation, additional lesson plans to promote engineering in their classrooms, and other resources and web links for even more information on engineering. Additionally, each teacher received a stipend for attending the EESC, lunch, parking passes, Continuing Education Units, and the opportunity to apply for a Project Stipend of \$250 or more to use for engineering activities back in their classrooms.

Each year, following the EESC conference, UTC staff conducts a survey of participants to provide feedback on the value of the conference and how it can be improved. Comments received from a post-conference survey were very complimentary of the presentations and the conference. One general comment was “Well-done! This was very worthy of my time.”

When asked “How has attending this conference helped you discover ways to integrate engineering in your classrooms?” some of the responses were:

“Ideas from the workshops were excellent. They are very user friendly.”

“Attending this conference will help to motivate students to encourage team work. This means it will involve projects which would help them develop products and find solutions to the problems by themselves. Including STEM in curriculum.”

“I think I will be able to explain to my students the different types of engineering. I will be able to use the design model with my students. I have gained some practical lessons that I can use with my students and have learned about some helpful resources to implement engineering in my classroom.”

“This conference has expanded my view of engineering and helped me see how many different ways I can incorporate it into my lessons—cross-curricularly.”

“It helped me realize that much of what I already do is based around engineering. I have also now realized the importance of encouraging the field of engineering to my students.”

“Lots of simple, useful activities that can be integrated into classrooms at a low cost. Also, many simple activities that students enjoy that they may not realize involve engineering.”

When asked: “Which part of the conference or breakout session(s) was most helpful for you?” Some of the responses were:

“Each session was very well organized. Each session gave: 1) Standards connection 2) Materials 3) Strategies for implementing in class.”

# Undergraduate Activities & Support for Engineering Education

Since its inception, the CSU Transportation Center has supported many deserving engineering undergraduates with scholarship money. Undergraduate scholarships advance the Center's mission to support engineering education by providing financial assistance to promising young people whose work will benefit future generations. The program has been a great success.

**Jeff McComass** and **Marissa Jimenez** are two undergraduate scholarship recipients who deserve special mention because they represent life lessons in opportunity, endurance, accomplishment, tragedy and hope.

**Jeff** entered the Civil Engineering program after completing a two-year degree in construction technology at Columbus State University. Jeff had received a partial scholarship from the Ohio Contractors Association (OCA) during his last year at Columbus State. The Transportation Center has a long-standing relationship with the OCA and part of that relationship includes offering OCA scholarship recipients at two-year programs the opportunity to finish a four-year degree program in Civil Engineering at CSU. We're proud of Jeff's outstanding work which will culminate in his graduation with a Bachelors of Civil Engineering and a minor in Business Management after spring semester of 2012. Jeff will have accomplished a great deal when he receives his second degree, but the real measure is how hard he worked to achieve what he aspired to.

**Marissa** entered the Civil Engineering program at CSU with a full scholarship after she graduated from high school. Marissa, of Munroe Falls, Ohio, was popular and well respected among her peers and professors, and was an inspiration to young women considering entering the engineering field. She served as a CSU tour guide to high school students considering applying to the Fenn College of Engineering at Cleveland State, was a member of the American Society of Civil Engineers, and the Treasurer of Engineers Without Borders Student Chapter. She inspired her peers as well as prospective students.

She was nearing completion of her studies when tragedy struck.

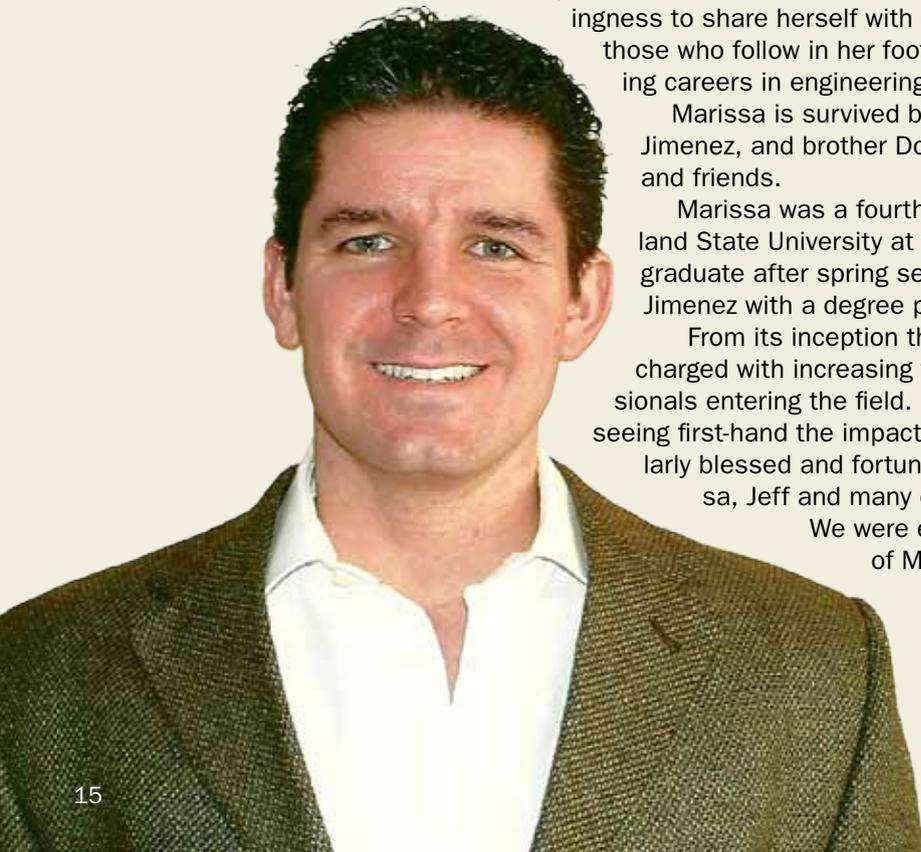
Marissa lost her life in a horseback riding accident on November 20, 2010. It is difficult to find a way to express the deep loss represented by her death. We know that though her life was too brief, her impact in the world is undeniable – triumph and tragedy intermixed. Marissa's beautiful smile, can-do attitude, and willingness to share herself with others will stand as a lasting legacy to those who follow in her footsteps, particularly young women pursuing careers in engineering.

Marissa is survived by her parents, Tony and Gabriela Jimenez, and brother Dominic Jimenez and hundreds of relatives and friends.

Marissa was a fourth year civil engineering major at Cleveland State University at the time of her death, on track to graduate after spring semester 2012. CSU will award Marissa Jimenez with a degree posthumously at ceremonies this Spring.

From its inception the Transportation Center has been charged with increasing the number of transportation professionals entering the field. The reward in supporting students is seeing first-hand the impact they have. The Center has been singularly blessed and fortunate in our ability to have helped Marissa, Jeff and many others in their educational aspirations.

We were especially fortunate to have been a part of Marissa's life, if only for a short time.







## Undergraduate Support

A bedrock principle of the federal University Transportation Center is student support. At the undergraduate level, this means involving students in research efforts through work/study efforts part-time as well as undergraduate stipends. To this end, the CSU Transportation Center provided \$35,957 in scholarships and work/study efforts to the following undergraduate students during the past year:

**Marissa Jimenez**  
(Civil & Environmental Engineering)

**Jeff McComass**  
(Civil & Environmental Engineering)

**Joe Gotschall**  
(Civil & Environmental Engineering)

**Lina Keidunate**  
(Civil & Environmental Engineering)

**Sarah McClure**  
(Civil & Environmental Engineering)

**Alice Sommerville**  
(Civil & Environmental Engineering)

**Jayleen Melendez**  
(Psychology)



## Graduate Support

For the graduate students, the CSU Transportation Center provided \$35,362 in graduate student stipends; and CSU gave a corresponding \$10,628 in tuition waivers for six graduate students. Those graduate students are:

**Micah Arafah**  
(College of Education)

**Adriane Trombetta**  
(College of Education)

**Jason Samsa**  
(College of Science)

**Lina Keidunate**  
(Civil & Environmental Engineering)

**Arpit Agarwal**  
(Electrical & Software Engineering)

**Sharmila Kollipara**  
(Electrical & Software Engineering)

**Sriram Sanka**  
(Electrical & Software Engineering)



**WELCOMES DR. JENKINS**

## **Dr. Jacqueline Jenkins Joins Center Staff**

The Civil & Environmental Engineering Department conducted a faculty search this past spring for an individual with expertise in transportation engineering. The Department and the Transportation Center at CSU are pleased to announce that Dr. Jacqueline Jenkins will join the faculty as an assistant professor of Civil Engineering in August 2011. Her decision to come to CSU was greatly influenced by the achievements of the University Transportation Center and the opportunity to further develop the Transportation Engineering program.

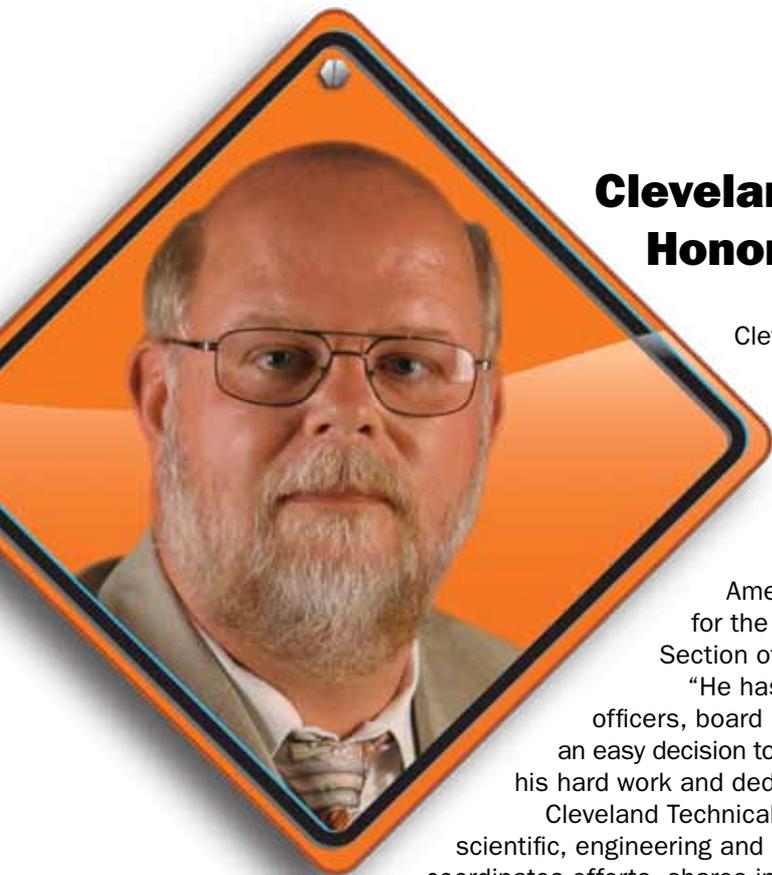
Since 1997, Dr. Jenkins' academic and research efforts have been grounded in transportation safety. She spent two years as an accident reconstructionist at the Vehicle Safety Research Centre at Ryerson University in Toronto, Canada fulfilling a research contract for Transport Canada to investigate collisions involving air bag deployments, side impacts, and large vehicles.

In January 1999, as the first recipient of the AAA Foundation for Traffic Safety Fellowship, Dr. Jenkins began her graduate studies in Civil Engineering at Texas A&M University. During her ME and PhD programs, Jacqueline was a Graduate Research Assistant with Texas Transportation Institute, initially in the Design and Operations Division and later with the Center for Transportation Safety. Her doctoral thesis, funded by the Southwest University Transportation Center, included the development of an integrated traffic and driving simulation and its application to study the impact of large vehicles on passing behavior.

Since obtaining her doctorate in Civil Engineering from Texas A&M University, Dr. Jenkins has held a tenure track appointment as an assistant professor at the University of British Columbia, where she developed a driving simulator laboratory.

We welcome Jacqueline to Cleveland State University and look forward to the impact her expertise will have on the Civil & Environmental Engineering program and the Transportation Center.





## **Cleveland State Engineering Professor Honored With Prestigious Award**

Cleveland State University Engineering Professor Stephen Duffy has won the 2011 Technical Educator Award by the Cleveland Technical Societies Council (CTSC). The Technical Educator Award is bestowed upon an educator in Northeast Ohio who makes a substantial contribution to technical education methods and has uniquely inspired students to pursue technical careers.

“Dr. Duffy has made significant contributions to the American Society of Civil Engineers Cleveland Section (ASCE) for the past 12 years,” said Brian Meluch, president of the Cleveland Section of the ASCE.

“He has been a leader and advisor to many of the past ASCE section officers, board members and student members throughout the years. It was an easy decision to nominate Dr. Duffy for this well-deserved honor in recognition of his hard work and dedication to the education community.”

Cleveland Technical Societies Council is a consortium of professional, technical, scientific, engineering and educational societies in Northeast Ohio. The organization coordinates efforts, shares information, promotes programs, sponsors educational endeavors and recognizes outstanding professionals in the technical fields.

Dr. Duffy has 27 years experience as a civil engineer with an international reputation for designing components fabricated from ceramic materials. His primary fields of practice are geotechnical engineering, site engineering and various types of structural engineering design. He has edited one book and authored and co-authored eight book chapters; authored and co-authored 20 peer reviewed journal articles; and has had 19 successfully funded research grants totaling \$1.2 million.

## **UTC Helps Center for Emergency Preparedness Evaluate Coursework**

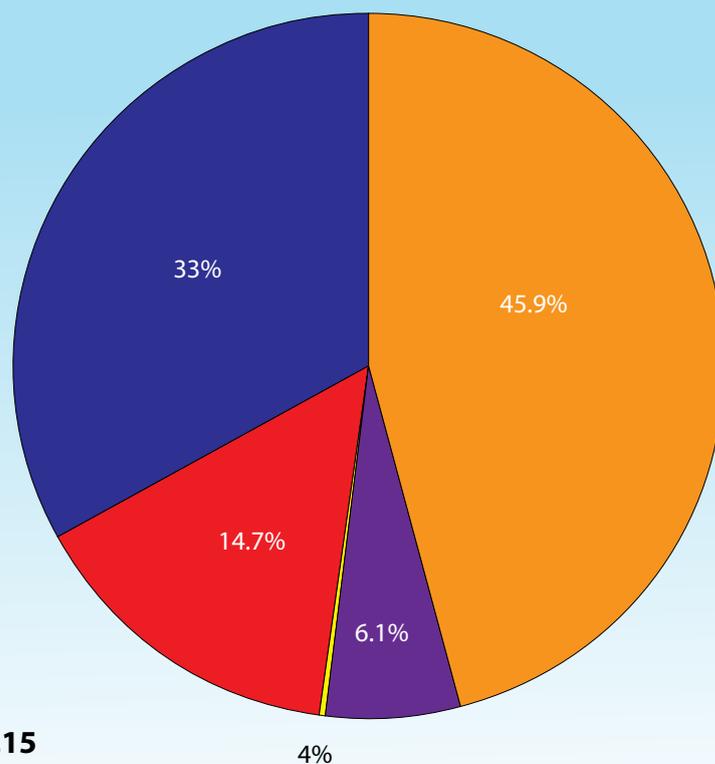
In January 2010, the UTC began collaborating with CSU's Center for Emergency Preparedness. The Center for Emergency Preparedness (CEP) began in 1984 and provides high quality hazardous material, homeland security and business continuity training, taught by professionals utilizing industry standards and best practices (<http://urban.csuohio.edu/cep/>).

The CEP offers courses in: Hazardous Materials (Haz Mat), Confined Space, National Incident Management System (NIMS), Business Continuity and Emergency Planning, Occupational Safety and Health Administration (OSHA), Hospital Healthcare First Receiver, and various specialty courses. The UTC is particularly interested in the Haz Mat and Confined Space courses as they cross into the transportation and work zone safety arenas.

During the spring semester, Dr. Debbie Jackson, the UTC's Associate Director for Education and Training, began developing participant assessment tools for use in the Haz Mat and Alternative Fuel Vehicles courses. The assessments were developed to provide information to the CEP about what the participants are learning from the courses. To date, the assessments have been developed. During the 2011-2012 academic year the assessments will be used with the courses, the data analyzed, and the information learned will be shared with the CEP staff creating a continuous improvement loop for the courses. The CEP is hopeful that this continuous improvement loop will assist them in refining their course offerings and ensuring maximum participant learning at each course.

# Sources of Funds as of June 2010

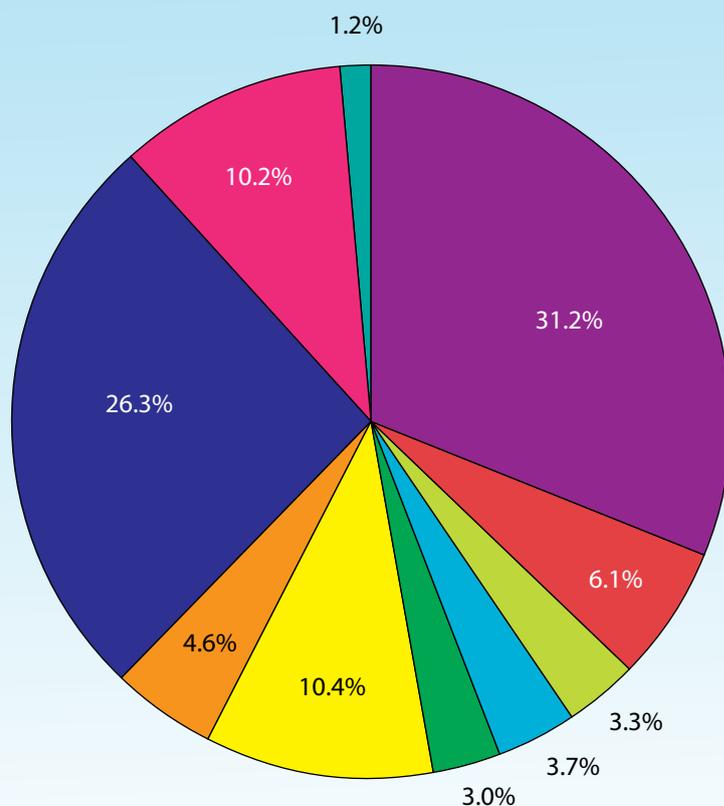
US DOT	45.9%	\$410,917.54
Department Scholarships	6.1%	\$54,500.00
Donations	0.4%	\$3,546.50
CSU Cost Share	14.7%	\$131,300.34
PUCO grant	33%	\$295,144.77



Total: \$ **895,409.15**

# Expenditures as of June 2010

Salaries & Wages	31.2%	\$207,903.97
Center Undergraduate Scholarships	6.1%	\$40,517.00
Graduate Assistantships	3.3%	\$22,214.41
Undergraduate Employment	3.7%	\$24,921.10
EESC, Work Zone Awareness Week	3.0%	\$19,913.46
Fringe Benefits	10.4%	\$69,344.51
Outside Research Contracts	4.6%	\$30,965.26
Other Expenses	26.3%	\$175,442.54
Indirect Costs	10.2%	\$67,843.58
Travel	1.2%	\$8,042.44



Total: \$ **667,108.27**

# Research Funding Since UTC Inception

The CSU University Transportation Center has funded 12 transportation research projects since its inception, with federal and/or matching sources of funding. Four of the projects are considered basic research and six projects are categorized as applied research. A brief synopsis of the research projects is below:

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## **Acquiring Driving Simulator**

Principal Investigator: N.L. Grugle, Cleveland State University

Date: August 2006

Funding Source(s) & Amounts:

*National Science Foundation: \$107,051*

*Cleveland State University: \$40,000*

*CSU UTC: \$11,000*

## **Demonstration of Innovative Techniques for Highway Safety Data Analysis**

Principal Investigator: N. L. Grugle, Cleveland State University

Date: July 2006 – July 2009

Funding Source(s) & Amounts:

*Ohio Department of Transportation: \$57,142*

*CSU UTC: \$128,006*

## **Mandatory Speed Reductions in Work Zones—Implications for Driver Safety**

Principal Investigator: N. L. Grugle, Cleveland State University

Date: April 2007 – December 2008

Funding Source(s) & Amounts:

*CSU: \$32,627*

## **Garrett A. Morgan Technology and Education Program—Women and Minorities in Transportation**

Principal Investigator: S. F. Duffy, Cleveland State University

Date: August 15, 2007 – July 31, 2008

Funding Source(s) & Amounts:

*US Department of Transportation: \$100,000*

*Shaker Heights School System: \$41,833*

## **Sensor Network Systems for Measuring Traffic Behavior in Short-term Work Zones**

Principal Investigator: N. Sridhar, Cleveland State University

Date: July 1, 2008 – December 31, 2010

Funding Source(s) & Amounts:

*CSU Engaged Learning Research Program: \$18,187*

## **A Distributed Instrument for Measuring Traffic in Short-term Work Zones**

Principal Investigator: N. Sridhar, Cleveland State University

Date: July 1, 2008 – December 31, 2010

Funding Source(s) & Amounts:

*CSU UTC: \$30,144*

## **Teachers and Graduate Students Partnering to Incorporate Engineering in Middle School Mathematics and Science Classrooms**

Principal Investigator: D. Jackson, Cleveland State University

Date: January 1, 2010 – December 31, 2010

Funding Source(s) & Amounts:

*CSU UTC: \$14,007*

## **Enhancing the DriveSafety Driving Simulator for Research on Short-term Construction Work Zones**

Principal Investigator: W. Zhao, Cleveland State University

Date: July 1, 2009 – December 31, 2010

Funding Source(s) & Amounts:

*CSU UTC: \$44,767*

## **Evaluation of Transverse Rumble Strips for Work Zones**

Principal Investigator: D. McAvoy, Ohio University

Date: January 1, 2010 – December 31, 2010

Funding Source(s) & Amounts:

*CSU UTC: \$99,067*

## **Evaluation of Work Zone Safety Messages**

Principal Investigator: D. McAvoy, Ohio University

Date: January 1, 2010 – December 31, 2010

Funding Source(s) & Amounts:

*CSU UTC: \$43,044*

## **Elementary Flow at Boulevard: Seeding Inquiry into Engineering**

Principal Investigator: D. Jackson, S.F. Durry, Cleveland State University

Date:

Funding Source(s) & Amounts:

*Garrett A. Morgan Technology & Education*

*Program: \$21,421*

## **PUCO First Responders Program**

Principal Investigator: D. Jackson, Cleveland State University

Date:

Funding Source(s) & Amounts:

*Ohio PUCO and CSU Urban College: \$400,000*

**Total budgeted costs for the projects reported above is \$1,188,296**



## UTC Research Publications and Performance

The Center has issued 17 reports as a result of the transportation research projects outlined in the previous section. In addition, eight research papers have been presented at academic/professional meetings that resulted from projects funded by the Transportation Center grant.

### PEER-REVIEWED ARTICLES

#### “Sensor Network System for Measuring Traffic in Short-Term Construction Work Zones”

Manohar Bathula, Mehrdad Ramezanali, Ishu Pradhan, Nilesh Patel, Joe Gotschall, Nigamanth Sridhar. Proceedings of the 5th IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS '09). June 8–10, 2009. Marina Del Rey, CA, USA. *To appear*

#### “Measuring Traffic in Short-Term Construction Work Zones”

(Poster paper) M. Bathula, M. Ramezanali, I. Pradhan, N. Patel, J. Gotschall, and N. Sridhar. Proceedings of the 8th ACM/IEEE International Conference on Information Processing in Sensor Networks (IPSN '09). April 13 – 16, 2009, San Francisco, USA.

#### “Simulator Study of Precipitating Factors for Work Zone Crashes”

D. McAvoy, S.F. Duffy and H.S. Whiting, TRB 90th Annual Meeting, Session: Driver Response in Work Zones, 11-2693, January 23-27, 2011 (accepted for publication in the Journal of the Transportation Research Board)

### EXTERNAL PROJECT REPORTS

OPREP Research Project: Demonstration of Innovative Techniques for Work Zone Safety Data Analysis



- Quarterly Report [2007-1]
- Quarterly Report [2007-2]
- Quarterly Report [2008-1]
- Quarterly Report [2008-2]
- Quarterly Report [2008-3]
- Quarterly Report [2008-4]
- Quarterly Report [2009-1]
- Quarterly Report [2009-2]

### CONFERENCE PAPERS

#### “Using Driving Simulators for Highway Safety Research”

Grugle, N.L. Presentation given at the Ohio Transportation Engineering Conference, Columbus, OH 2006.

#### “Issues in Cellular Traffic Probe Data Evaluation”

Yang, Saini. Invited presentation in Ohio Transportation Engineering Conference, Columbus, Ohio, 2007.

#### “Integrating Engineering into High School Curricula”

J.E. Marencik, S.F. Duffy, D.E. Burrowbridge, and N. Sridhar. Proceedings of the 2009 Northeast American Society of Engineering Education Conference, April 3 - 4, 2009, Bridgeport CT, USA.

#### “Incorporating Engineering in Science Curriculum”

“An Example Activity and a Wealth of Resources,” D.K. Jackson and D. Burrowbridge. Proceedings of Science Education Council of Ohio 2010 Conference, February 25-27, Columbus, OH. *To appear*.

#### “Widening the Pipeline: One Center’s Attempt to Influence Each Level”

D.K. Jackson, D. Burrowbridge, M. Arafah, S.F. Duffy, and N. Sridhar. Presented at the P-12 Engineering and Design Education Research Summit 2010, August 11-13, 2010, Seaside, Oregon.

#### “Engineering in K-12: Addressing the Need for Change in Ohio STEM Education”

M. Arafah, A. Trombetta, D.K. Jackson, S.F. Duffy, and D. Burrowbridge. Presented at the P-12 Engineering and Design Education Research Summit 2010, August 11-13, 2010, Seaside, Oregon.

**Cumulative number of transportation seminars, symposia, distance learning classes, and K-12 outreach conducted by the UTC for transportation professionals.**



**5 Conferences**

- Transportation System Security Conference  
S.F. Duffy (Chair),  
October 2007, Cleveland, Ohio
- Engineering Education Summer Conference (EESC)  
D. Burrowbridge (Chair),  
June 2008, Cleveland, Ohio
- Engineering Education Summer Conference (EESC)  
D. Burrowbridge (Chair),  
June 2009 Cleveland, Ohio
- Engineering Education Summer Conference (EESC)  
D. Burrowbridge (Chair)  
June 2010, Cleveland, Ohio
- Engineering Education Summer Conference (EESC)  
D. Burrowbridge (Chair)  
June 2011, Cleveland, Ohio

**3 Short Courses**

- OCA Work Zone Supervisor Course
- ATSSA Traffic Control Technician Course
- OSHA Competent Person - Trenching and Excavation Course

**13 On-campus visits hosted for K-12 students and/or teachers by Center personnel**

**35 K-12 schools visited by Center personnel**

**3 Information tables at career fairs staffed by Center personnel**

**5 Science, engineering and technology fairs – Center staff serve as judges**

**2 Technology competitions hosted by the Center (*Vex Robotics*)**

**1 Technology competitions — Center staff serve as team advisors (*electric car*)**

**Cumulative number of transportation professionals and K-12 teachers participating in outreach activities.**

**97 Transportation professionals and students involved in conferences and short courses**

**300 K-12 teachers participating in outreach activities**

**2458 K-12 students participating in outreach activities**

**329 Parents interacting with Center personnel at outreach activities**



## Transportation Course Offerings at Cleveland State University

Listed below are catalog descriptions for the transportation-related courses that have been added since the beginning of the grant. The courses include three undergraduate courses and four graduate courses.

### Undergraduate Courses

**CVE 441 Traffic Flow Theory** - The basic concepts and theories of traffic flow characteristics and the associated analytical techniques. This course reviews the foundations of traffic science and presents the major classes of models derived for traffic flow. Recent developments and topics of current research are introduced. The course also addresses the implications of the models and the traffic system properties for traffic operations and control.

**CVE 442 Urban Transportation Planning** - Focus on factors involved in the process of urban planning and regional transportation systems, encompassing all modes. Provides students with theory and applications of urban transportation planning studies, traffic models, investment models, programming and scheduling.

**CVE 490 Construction Safety Engineering** - A study in safety principles as they relate to construction sites and projects with a focus on heavy highway construction. Elements include accident record-keeping, reporting, requirements of the OSHA code; inspection for safety and hazards, risk control; and management issues related to these. Learn how to develop and implement a company safety program which includes identifying hazards as well as communicating safety policy to workers. Guest lecturers from industry will provide practical, hands-on experience.

### Graduate Courses

**IME 505 Human Factors Engineering** - The physical and mental capabilities and limitations of the worker are studied and applied to the design and analysis of equipment, occupational tasks, and the environment. Topics include research methods, cognition, visual and auditory systems, controls, displays, anthropometry, and workplace design

**CVE 541 Traffic Flow Theory** - The basic concepts and theories of traffic flow characteristics and the associated analysis techniques. This course reviews the foundations of traffic science and presents the major classes of models derived for traffic flow. Recent developments and topics of current research are introduced. The course also addresses the implications of the models and the traffic system properties for traffic operations and control.

**CVE 542 Urban Transportation Planning** - Focus on factors involved in the process of urban planning and regional transportation systems, encompassing all modes. Provides students with theory and applications of urban transportation planning studies, traffic models, investment models, programming and scheduling.

**CVE 593 Construction Safety Engineering** - A study in safety principles as they relate to construction sites and projects with a focus on heavy highway construction. Elements include accident record keeping, reporting, requirements of the OSHA code; inspection for safety and hazards, risk control; and management issues related to these. Learn how to develop and implement a company safety program which includes identifying hazards as well as communicating safety policy to workers. Guest lecturers from industry will provide practical, hands-on experience.

## Doctoral Dissertations

### **“Laboratory Evaluation of Fatigue Behavior of Thin Bonded Overlays on Roller-Compacted Concrete Pavements”**

N. Amer, Doctoral Dissertation, Cleveland State University, May 2007.

## Masters Theses

### **“Investigation and Evaluation of Portland Cement Pervious Concrete Using Nondestructive Testing and Laboratory Evaluation of Field Samples”**

A. Mrkajic, Masters Thesis, Cleveland State University, May 2006.

### **“Field Performance of Portland Cement Pervious Concrete in Freeze-Thaw environments”**

D. Miller, Masters Thesis, Cleveland State University, May 2006.

### **“Effects of Secondary Tasks on Driving Performance in Work Zones”**

A. Gosh, Masters Thesis, Cleveland State University, May 2007.

### **“Reducing Concrete Cracking for Structures and Pavements”**

J. Cleary, Masters Thesis, Cleveland State University, December 2007.

### **“A Sensor Network System for Monitoring Temporary Work Zones”**

M. Bathula, Masters Thesis, Cleveland State University, December 2008.

### **“Broader Use of Steel Slag Aggregates in Concrete,”**

J.P. Patel, Masters Thesis, Cleveland State University, December 2008.

### **“Evaluation and Comparison of MAC Protocols in Wireless Sensor Networks”**

Sharmila Kollipara, Masters Thesis, Cleveland State University, May 2011.

### **“Results from a Study on the Effectiveness of One Professional Development Workshop Promoting Engineering in K-12 Education”**

Micah Arafah, Masters Thesis, Cleveland State University, May 2011.

## Human Resources

Over the life of the grant, eight undergraduate students have participated on transportation research projects. In addition, 16 graduate students have participated in research projects. Moreover, 91 graduate students have enrolled in transportation-related advanced degree programs. To date, one doctoral candidate has obtained his degree with support from the Transportation Center.

## Technology Transfer

The center has conducted one conference for transportation professionals which is described below: “Transportation System Security Conference,” S.F. Duffy (Chair), 29 October 2007, Cleveland, Ohio. Thirty-seven transportation professionals participated in this event.

