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American Council of Engineering Companies of Tennessee

THE VOICE OF TENNESSEE'S ENGINEERING COMPANIES

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## Engaging Engineering Professionals to Create the Workforce of the Future

by *Stephanie S. Ivey, PhD,*  
*Associate Professor of Civil Engineering,*  
*University of Memphis*

**I**ncreasing the number and diversity of students prepared for and interested in science, technology, engineering, and math (STEM) careers is a well-documented need. While demand for STEM employees continues to grow, college enrollment in STEM majors nationwide has remained flat or declined. The U.S. Department of Commerce reports an expected 17% growth in the number of



**Stephanie Ivey**

STEM occupations from 2008 to 2018. In contrast, only a 9.8% growth is predicted for non-STEM jobs. However, nationwide, only 44% of students are meeting ACT college readiness benchmarks in math, and 36% of students are meeting these in science.

A report published by the Tennessee STEM Innovation Network (TSIN) in 2012 (*Future-ready Tennessee: Developing STEM talent for 2018 and beyond: A strategic plan*) highlights that the state of Tennessee anticipates

more than 100,000 STEM-related jobs by 2018, 88% of which will require post-secondary education. However, only 29% of Tennessee students met ACT college readiness benchmarks in math, and only 27% in science. These findings should be particularly concerning for those in the engineering profession, as it is disproportionately affected by both pipeline and diversity issues.

Many initiatives are focused on increasing the number of students interested in STEM professions, but, without simultaneously increasing student mastery of STEM content, significant gaps will remain. Research related to student learning suggests problem-based learning is key to helping students develop deeper content understanding and enhanced STEM skillsets. Integrating real-

world context into classrooms is also proven to increase conceptual understanding and skill transfer and to spark student interest in STEM fields. Moreover, in order to increase the number and diversity of students pursuing STEM majors and careers, it is also necessary to demonstrate the

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*“Engineering professionals have a unique opportunity to become involved in improving the education of Tennessee students in STEM...”*

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role of STEM professionals in society.

The TSIN was established by an Executive Order of the Governor as unique public-

*(cont. on page 2)*

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# Follow Me to Tennessee

by *Chuck Saunders, PE*  
*ACEC of Tennessee President*

Nearly 35 years ago, the State Tourism Department introduced that ad campaign. Tennessee native Dolly Parton was the celebrity centerpiece and truckers delivered the message. Senator Lamar Alexander was Governor at the time and Tennessee started a long run of bringing industries from around the globe to our great state. Tennessee attracted Nissan to build a facility in Smyrna in 1982. Nissan has since brought several facilities, including its North American headquarters. Not only Nissan came; GM and, recently, VW chose Tennessee. A host of great state leaders from both political parties ushered in industries and even major pro sports teams, adding to a flourishing music and tourism base.

It was hard for this farm boy from rural Sumner County to imagine anyone wanting to come here. But over the last 35 years, I have observed many monumental industry additions attracting thousands of new jobs. Sure, the volunteer spirit and southern hospitality are important and, undoubtedly, the low-debt state economy and favorable economic structure is a draw, but repeatedly the defining element that attracts industry, promotes growth, and adds jobs is the infrastructure. Transportation oft is the greatest incentive, but Tennessee



**Chuck Saunders**

is also a major energy hub, offering reliable affordable energy as well. I envision that the boom of domestic energy supply will influence our state positively and the entire nation will see jobs return from abroad; Tennessee has several competitive advantages to its credit.

In January, Pew, citing Moody's Analytics, predicted Tennessee would be in the bottom ten states for job growth for 2014. As of November, the Bureau of Labor Statistics reported Tennessee near the top ten. A question I often hear and ponder is how long can Tennessee support the rapid growth with the current infrastructure? There is no hard and fast answer, but the definitive opinion is not very long. That infrastructure is in jeopardy of falling behind without revision of its funding mechanisms. I commend our Department of Transportation for maintaining the best highway system in the country at one of the lowest user tax rates in the nation. Federal spending bills continue to lag and Tennessee has a very dated mechanism for transportation funding that needs a fresh look to assure continued growth.

With the new state-of-the-art Nashville City Center as the venue, Tennessee will play host to the 13-state Southern Association of State Highway Transportation Officials (SASHTO) convention in the summer of 2015. As an engineering community, we should focus efforts on helping TDOT make 2015 the most successful assembly of SASHTO to date. I hope that there will be some longer-term funding initiative in place by then. It is a key year to focus on infrastructure. Tennessee's electorate has certainly seen the effects it has on everyone's quality of life and the future of Tennessee.

## Engaging Engineering Professionals to Create the Workforce *(cont. from page 1)*

private collaboration between the Tennessee Department of Education and Battelle Memorial Institute designed to promote and expand the teaching and learning of STEM education in K-12 public schools across Tennessee through the above-mentioned best practices. The TSIN engages K-12, higher education, industry, and community partners across the state through a network of regional STEM innovation hubs. Engineering professionals have a unique opportunity to become involved in improving the education of Tennessee students in STEM not only because of the knowledge and skillsets they are able to contribute, but also through serving as role models and mentoring students who may be the first in their family to consider an engineering career. As an example, the West Tennessee STEM Hub, led by the University of Memphis, has engaged individuals and companies in numerous ways, including:

- Providing classroom speakers for career days or to connect content students are learning in the classroom with engineering practice;
- Contributing information for STEM Spotlights that highlight education and career pathways

and help students understand the diverse and exciting opportunities that engineering provides;

- Serving as mentors or coaches for K-12 students in STEM competitions;
- Helping teachers develop engaging projects for students that integrate real-world engineering problems and demonstrate societal impact;
- Sponsoring undergraduate STEM majors as tutors, mentors, and competition coaches for K-12 classrooms.

STEM workers are critical to U.S. growth, vitality, and competitiveness in the 21st century global economy, and engineers are arguably among the most crucial to attract and retain in the field. Engineers can make a significant positive difference in our communities, not only through practice of the engineering profession, but also through inspiring the next generation to follow in their footsteps.

To learn more about how you can get involved, visit <http://www.westtnstem.org> in West Tennessee or [www.tsin.org](http://www.tsin.org) to connect to other STEM Hubs in the state.

# ACEC National Scholarship Winner



▲ Nick True was recognized as the winner of the ACEC National scholarship at a recent meeting in Hawaii. L - R: Dave Raymond, ACEC President; Dick Wells, ACEC Chairman; Nick True; and Miller Love, ACEC Committee of Fellows, Chair

## 2015 EEA Entrants

**A2H, Inc.:** Special Projects - Ripley High School FEMA Safe Room Retrofit, Ripley, TN

**AECOM:** Transportation - I-40 Widening Design-Build, Wilson County, TN

**Alfred Benesch & Company:** Transportation - SR-386 & Indian Lake Blvd Interchange Project, Hendersonville, TN

**AMEC Environment & Infrastructure, Inc.:** Transportation - CSXT Railroad Tunnel Fire Emergency Response, Pikeville, KY

**ARCADIS U.S., Inc.:** Environmental - TDOT SR-37/SR-67 Intersection Improvements, Hampton, TN

**ARCADIS U.S., Inc.:** Water Resources - Volkswagen State Industrial Access Road Wetland Eco-System Restoration, Chattanooga, TN

**Atkins:** Transportation - TRI Runway 5-23 Pavement Rehabilitation, Blountville, TN

**Barge, Waggoner, Sumner & Cannon, Inc.:** Industrial and Manufacturing Processes, Facilities - Carpenter Technology Specialty Steel Mill, Athens, AL

**Brown and Caldwell:** Waste and Stormwater - Whites Creek Pumping Station Improvements, Nashville, TN

**Cannon & Cannon, Inc.:** Industrial and Manufacturing Processes, Facilities - Del Conca Tile Plant, Loudon, TN

**Cannon & Cannon, Inc.:** Studies, Research and Consulting - SBCUD Water Modeling and Flushing Program, Maryville, TN

**Cannon & Cannon, Inc.:** Transportation - Bob Gray Road Roundabouts, Knoxville, TN

**Cannon & Cannon, Inc.:** Water Resources - Northeast Knox Utility District Water Treatment Plant, Knoxville, TN

**CDM Smith:** Special Projects - University Commons Development, Knoxville, TN

**EnSafe Inc.:** Environmental - Sustainable Groundwater Treatment, San Jose, CA

**EnSafe Inc.:** Surveying and Mapping Technology - National Corvette Museum Microgravity, Bowling Green, KY

**Garver:** Transportation - Shelbyville Municipal Taxiway and Apron Rehabilitation, Shelbyville, TN

**Gresham, Smith and Partners:** Small Projects - TDOT - SR-254 over Otter Creek Bridge Project, Nashville, TN

**Gresham, Smith and Partners:** Water Resources - KRH-WTP - Electrical Building and Switchgear Replacement, Nashville, TN

**J. R. Wauford & Company Consulting Engineers, Inc.:** Waste and Stormwater - Lewisburg Wastewater Treatment Facilities, Lewisburg, TN

**KCI Technologies, Inc.:** Small Projects - Richland Creek Dam Removal, Nashville, TN

**K. S. Ware & Associates:** Energy - Piedmont LNG Facility-Seismic Retrofit & Concrete Integrity Analysis, Nashville, TN

**Kimley-Horn and Associates, Inc.:** Energy - Carrier Facilities Wastewater Capital Project, Collierville, TN

**LDA Engineering, Inc.:** Studies, Research and Consulting - Alcoa Duck Pond, Alcoa, TN

**Littlejohn:** Waste and Stormwater - WKUD Sanitary Sewer Rehabilitation, Knoxville, TN

**Sain Associates:** Transportation - Mack Hatcher Parkway Extension SR-96 to SR-6, Franklin, TN

**S&ME, Inc.:** Studies, Research and Consulting - Knoxville EPA-Funded Brownfields Assessments, Knoxville, TN

**Smith Seckman Reid, Inc.:** Building/Technology Systems - Methodist Olive Branch Hospital, Olive Branch, MS

**Smith Seckman Reid, Inc.:** Waste and Stormwater - Driftwood Equalization Basin, Nashville, TN

**TTL, Inc.:** Studies, Research and Consulting - Columbia State Community College Williamson Campus, Franklin, TN

**Water Management Services, LLC:** Water Resources - Hendersonville Utility District Water Treatment Plant Additions, Hendersonville, TN

## CALENDAR

### DECEMBER 8

Southeast TN Chapter Meeting  
Chattanooga Choo Choo at 12 noon  
Senators Watson and Gardenhire will speak

### DECEMBER 10-12

Crow Friedman Group Roadshow & AE Board Update  
8-12n and 1-3 pm  
10th - Knoxville  
11th - Nashville  
12th - Memphis

### DECEMBER 24 - JANUARY 2

ACEC office closed

### MARCH 3

Engineers' Day on the Hill

### MARCH 3

Engineering Excellence Awards Banquet

Tennessee Engineering Center  
800 Fort Negley Boulevard  
Nashville, TN 37203

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## Welcome New Member!

Civil-Site Design Group, PLLC  
630 Southgate Avenue, Ste. A  
Nashville, TN 37203  
615-248-9999  
www.civil-site.com

**Key Contact:**  
Sean DeCoster, Project  
Manager  
seand@civil-site.com

Civil Site is a full service civil engineering and landscape architecture company specializing in land development, master planning, infrastructure, site planning and design. We deliver accurate, cost effective and environmentally sensitive solutions to the projects we are awarded.

## FROM THE EXECUTIVE DIRECTOR

### Preparing for Leadership

by *Candy Toler*  
Executive Director, ACEC of Tennessee

**T**he election is finally behind us and my thoughts have turned to getting ready for 2015. It will be a year of change from several perspectives.

Change in the composition of the 109th General Assembly, which will select leaders this month and convene for business on January 13 at noon. The Republicans increased their majorities to 73 in the House of Representatives (where there will be 26 Democrats) and 28 in the Senate (5 Democrats). Will the dynamics be different? That remains to be seen.



**Candy Toler**

What is not changing is our Governor, who was reelected last month and is expected to be sworn in on January 17.

After the inauguration, the legislature will get down to its business. The only thing it is *required* to do is adopt a balanced budget, but there will be a slew of bills introduced on a variety of topics. Several bills have already been introduced to reduce the sales tax and phase out the Hall income

tax. Will the session be different this year? My crystal ball is cloudy.

Another change for ACEC of Tennessee and the Tennessee Society of Professional Engineers will occur on April 30th, when I retire after serving as executive director for almost 16 years. The Search Committee is diligently looking for the organizations' next executive director. The plan is for my successor to work with me through the 2015 legislative session. When I write my next newsletter article, we will probably know who the person is. These dynamics will definitely be different.

On ACEC's agenda for 2015 is getting to know the 22 new legislators - we need your help in supporting ACEC by educating the new legislators and reminding the veterans of the role engineers play in protecting the health and safety of Tennesseans. On March 3, we will be out in full force to tackle that job. Mark your calendars now, please.

As we have for more than 20 years, we will celebrate engineering excellence. The banquet will also be on March 3. Plan to attend the banquet to see what cool new things engineers are doing to make the world a better place!

We hope that your holidays are great and that 2015 is a fabulous year for engineering firms!