

# Arkansas Professional

# ENGINEER

Official Magazine of the American Council of Engineering Companies of Arkansas & the Arkansas Society of Professional Engineers



## Now what?

The elections are over, thank goodness. President-elect Trump has promised a trillion dollar infrastructure plan, and his party now controls Congress. In Little Rock, there's a lot more talk about medical marijuana, tax cuts and health care than there is about highways and water systems. As an unpredictable 2016 comes to a close, we look ahead to what might – *might* – happen in 2017.

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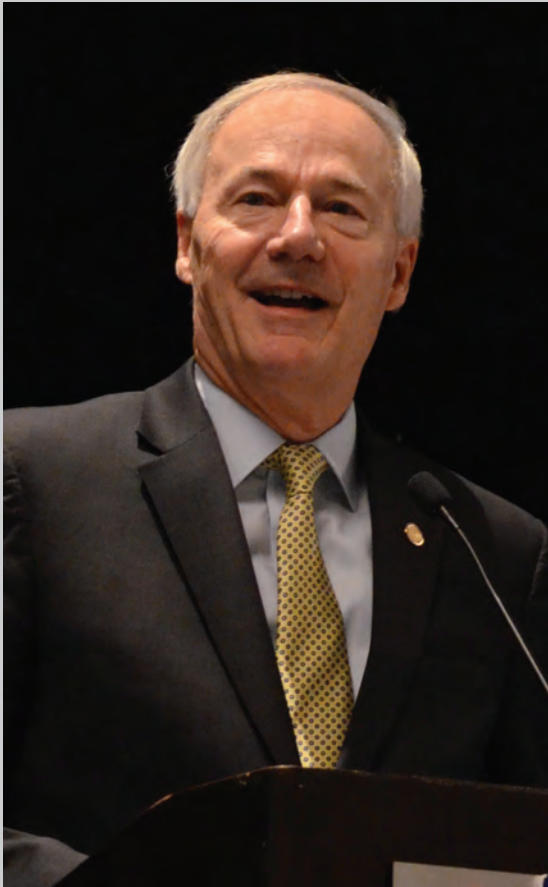
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# Arkansas Professional / ENGINEER

Official Magazine of the American Council of Engineering Companies of Arkansas & the Arkansas Society of Professional Engineers

## News and Features



Gov. Asa Hutchinson enters next year's legislative session with strong Republican majorities in both the House and Senate who, along with him, must implement the state's medical marijuana amendment. Right, Randy Ort with the Arkansas Highway and Transportation Department offers a look at highway needs at the ACEC Industry Update.



### 14 **Engineers updated on economy, roads**

The state's growth is slow and steady, but roads face uncertain challenges, say speakers at the ACEC/A's newly formed Industry Update.

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Donald Trump promised a major infrastructure program. Arkansas voters said yes to marijuana. Here's a look ahead at what might – *might* – happen in Washington and Little Rock in 2017.

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The Arkansas electrical design firm is moving quickly into cybersecurity.

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# A time for change



**Andy Dibble, P.E.**  
**ACEC President**

I am probably straying a little bit from the normal president's column for this issue, but I have had the opportunity lately to think about change in a lot of different forms. The weather (finally!) is turning toward fall, and at the time of penning this column, my wife and I have been able to keep the windows of the house open for almost two solid weeks without turning on the air conditioning. I love having a breeze move through the house and the feeling of breathing fresh, clean air. Summer is an awesome season for getting projects completed at the office and at home, but I welcome this change, even though winter will be on us too soon.

Some change is difficult. My wife and I fairly recently lost both her mother and my father. For those of you who have experienced similar loss, the change can be hard to work through. Not being able to phone my Dad to just talk through everyday things, or to sit down and have a cup of coffee together and laugh about life is a hole that is hard to fill and a change that I don't enjoy, but it is the natural order. Some of you reading this column have experienced this life change as well, and I empathize with your loss.

Change can serve to push you out of your comfort zone and spur you toward growth. After more than 20 years at the same church, my wife and I felt led to step back and out, and resign leadership roles that we feel blessed to have held at a place we loved. Searching for a new church home was so unfamiliar, and listening for guidance was, at times, pretty hard to do. It's easy to get impatient, and so often our timing can try to get in the way, but we have landed at a great place of fellowship and grace, and believe we are where we

should be, even if it is for a season. Making new friends and seeing new opportunities to get involved is pretty exciting!

Not all change is stressful or painful – two of my children have married within the last several years, and sharing that joy is just so awesome! Having our family grow with the addition of their spouses has been such a great experience, and we feel so blessed to have our new son and daughter become integrated into the fold. Seeing our children live their lives, and seeing them happy, productive and immersed in their own lives is gratifying as well. We can't wait to see what life has in store for all three of our children as the future becomes the present.

Another change that I have recently experienced is starting a new job with a new firm. After 29 years with the same company, an opportunity presented itself, and my wife and I have set out on a new adventure. I am so thankful for all of the experiences my former firm afforded me – from actually learning how to be a consulting engineer, to learning how to communicate with clients and city councils, to encouraging active participation in our profession (like serving on the board of ACEC/A), to assuming greater responsibilities within the firm and even to extending the offer to become a partner. I am tremendously thankful for all that they allowed me to accomplish during the years spent there.

Now, I am at a new firm, learning a new corporate culture and a lot of new faces! This opportunity came to me at a good time in my life, and the challenge of making this huge change is very exciting to me. I look forward to new projects, meeting and serving new clients and developing those business friendships that are such a rewarding part of making a living in this important profession.

As the future continues to unfold, I am sure I will have the opportunity to experience more life changes, and to learn how to adapt to them. While change can be hard, it's inevitable, and how we manage it can be a positive or negative force in our lives. Good luck with the changes that are coming to your life! Enjoy the holidays, and have a very merry Christmas!



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# Raise the Bar



**Alan Pugh, P.E.  
ASPE President**

What is the Raise the Bar initiative? At its core, it advocates requiring education beyond a bachelor's degree in order to obtain licensure. Those of us who did not pursue such additional education may initially be skeptical, but I encourage you to research the issue before deciding what you think. Here's why I think it's a good idea.

Since the engineering profession began more than a century ago, the educational requirements for licensure have remained at a four-year bachelor's degree. However, while the number of years has remained flat, the number of required academic hours has decreased substantially. In 1925, about 156 hours were required, depending on the program. By 1950, they had decreased to below 150. Today, 128 hours are required for a four-year engineering degree from the University of Arkansas, and that is with an exemption from the maximum 120 hours for a degree set by state law. Given this information, perhaps a more applicable name for the initiative would be to Restore the Bar.

While the required hours for a degree have been decreasing, I think we could all agree that the world is more complex than when the profession began, and the technical knowledge required has grown substantially. Technical societies have substantially increased what they believe are the minimum knowledge and skills needed for professional practice. It is becoming increasingly difficult for educators to achieve these minimum requirements given the restrictions in the bachelor's degree. Many other professions faced with similar challenges have increased the number of years/hours of education required for licensure.

It is also worth noting that within the maximum hours allowed for a bachelor's degree, technical courses are competing with general educational requirements. Most engineering programs, at least in Arkansas, have reduced the general educational requirements to the minimum required by law in order to provide the maximum number of hours available for technical engineering courses. However, many technical courses have already fallen

out of the degree requirements, and more will continue as the maximum number of hours available decreases.

NSPE's official position on the educational requirement is defined in Professional Policy Number 168 and states the following: "With the continuing rapid expansion of knowledge required to practice in the basic, as well as the many specialized areas of engineering, NSPE

believes that additional engineering education, but not limited to formal academic education, beyond the four-year ABET/EAC degree should be required to meet the formal preparation necessary for the practice of licensed professional engineering.

"Therefore, NSPE supports the concept of engineering licensure candidates meeting additional academic or other educational requirements as a prerequisite for engineering licensure. Additional education requirements should include formal education (such as a master's degree in an engineering discipline) or alternative approaches (such as additional coursework or professional development education) after obtaining a baccalaureate degree."

Raise the Bar is also supported by many of the technical societies as well as the National Council of Examiners for Engineering and Surveying.

As professional engineers, we cannot ignore our primary mission, which is to hold paramount the safety, health and welfare of the public. We have a duty to recognize the educational requirements to uphold this fundamental cannon. We also should not disregard public perception. Research has shown that one-third of Americans believe licensed professional engineers are already required to have at least a master's degree. The public places its faith in engineers, and that trust, if broken, would be extremely difficult to regain.

Solving the issues facing the world today and into the future demands highly skilled engineers, and we must make a decision about the future of our profession. Do we continue down the path of increasing complexity and decreasing educational requirements, or is a change in order? I invite you to research the issue further at [www.raisethebarforengineering.org](http://www.raisethebarforengineering.org) and make your own conclusion.



## In the News

# Garver's Parker, Johnson named ACEC/A Fellows



Parker

Garver's Bert Parker, P.E., a vice president, and the late Brock Johnson, P.E., were elected as Fellows in the American Council of Engineering Companies Fall Conference, which was Oct. 19-22 in Colorado Springs.

Members of the College of Fellows are selected by their peers in recognition for exemplary contributions to the profession. Election is administered by the Committee of Fellows, which also coordinates all Fellows activities and programs.

Parker, Garver's chief administrative officer, has worked at Garver since 1978, primarily in transportation engineering. He started as a design engineer before becoming project engineer, then manager of bridge design, and later the company's director of transportation. He served as president of the American Council of Engineering Companies of Arkansas in 2013-14.

Johnson spent 40 years at Garver and served as president and CEO from 2003 to 2012, when he passed away. Under his leadership, the company grew from six



**February 2-3**  
ASPE Annual Conference  
Hot Springs  
The Hotel Hot Springs

**March 30**  
Engineering Excellence Awards  
Little Rock

**April 23-26, 2017**  
ACEC Annual Legislative Conference  
Washington, D.C.

offices in four states to 12 offices in seven states.

Other Fellows who work for Arkansas-based engineering firms are Dennis Ford, P.E., of FTN Associates; Rick Geraci, P.E., FACEC, of Brown Engineers; and Carl Yates, P.E., BCEE, FACEC, and CEO of McGoodwin, Williams and Yates.

## Garver's Gilbreath heads Fayetteville lighting society

The Illuminating Engineering Society (IES) established its second Arkansas section with the formation of its Fayetteville chapter, and Garver aviation elec-

trical leader Bart Gilbreath, P.E., has been appointed to serve as the section's first president, according to a Garver press release.

The Fayetteville Section will work locally to support the IES's mission, which is "to improve the lighted environment by bringing together those with lighting knowledge and by translating that knowledge into actions that benefit the public."

Gilbreath plans to establish bylaws and operating procedures and focus on growth at the local level. He also wants the chapter to get involved and attend regional and national meetings and leadership development conferences.

"For us to really succeed in the organization's purpose, we've got to get as many professionals involved in things on a bigger scale," he said. "I want to see more local designers, engineers, and firms submitting to illumination design awards, which will not only make them look good, but it will also showcase the owners and great community we've got in Northwest Arkansas."

The section also named Garver Project Engineer Jared Parr as chair of Emerging Professionals, which will involve reaching out to high schools, universities, and new professionals to advocate IES involvement and IES section recruiting.



Gilbreath

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## MCE adds design experience by hiring six pros

McClelland Consulting Engineers, Inc. (MCE), a regional multidisciplinary consulting engineering firm, has hired six team members.

The new additions are Andrew Dibble, P.E.; Barret Knutson, EIT; Edwin Hankins IV, PLA ASLA; Jace Davis, EIT; Saba Hadid, EIT; and Austin Mayes.

"We continue to experience strong growth company-wide," stated MCE Chief Executive Officer Byron Hicks. "Our past project experience and the projects that are currently on the drawing board are attracting talented and creative people, and I'm delighted to welcome our latest team members."

Dibble comes to MCE as a project manager in the water/wastewater department in the Fayetteville office. He has more than 20 years of engineering design and construction management experi-



**Dibble**



**Knutson**

ence designing water and wastewater treatment and distribution systems, and collection and treatment facilities. Additionally, he is the current ACEC/A president.

Knutson is joining the MCE team as a project designer for the water/wastewater department in the Fayetteville office. He received his bachelor's degree in biological engineering in 2015 from the University of Arkansas. As a student, he was a finalist in a national engineering design competition where he was given the opportunity to present his waste treatment systems research to the American Society of Agricultural and Biological



**Hankins**

Engineers at their annual conference in New Orleans.

Hankins joins MCE in the Little Rock office as a member of the landscape architecture team to assist with site design and land

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## In the News (Cont'd)



Davis



Hadid



Mayes

development. He has almost 15 years of landscape architecture and design experience with a focus on sustainable design, low impact site layout, grading and drainage design. Some of his recent projects include the site design of the LEED® Certified HPER Renovations and 43,227-square-foot expansion at the University of Central Arkansas and numerous LEED® Silver projects at the University of Arkansas at Fayetteville.

Davis joins the Little Rock MCE office as a project designer focusing on water/wastewater design and mechanical applications. He graduated in April 2016 from Harding University, where he earned a bachelor's degree in mechanical engineering while playing NCAA Division II football and completing a summer internship in Uganda with Kibo Group International.

Hadid joined the Tulsa office as an engineer-in-training in the transportation department. She holds a master of

science degree in civil engineering with a focus in transportation engineering from Purdue University. Since completing her master's, Hadid has worked on a variety of transportation design projects and has prepared numerous traffic impact analyses, operations studies and traffic management plans in the Dallas and Houston areas.

As an experienced CAD designer, Mayes will assist the MCE Tulsa office in design and drafting for all departments including arterial roadway projects and waterline, sanitary sewer and storm sewer design. Mayes received his bachelor of technology in civil engineering technology, and an associate's degree in applied science in civil/survey from Oklahoma State University's Institute of Technology in 2011.

MCE is a full-service civil engineering firm with offices in Little Rock, Fayetteville and Tulsa. Its services include civil engineering, geotechnical engineering, environmental engineering, airport engineering, landscape architecture and professional land surveying. For more information, contact Karen Bonvillain at 501.371.0272, or by email at [kbonvillain@mcclelland-engrs.com](mailto:kbonvillain@mcclelland-engrs.com).

## Crafton Tull opens office in Fayetteville

Crafton Tull is opening a seventh office to be located in Fayetteville. The A/E firm has offices in Little Rock, Rogers, Conway and Russellville, as well as two

Oklahoma locations, one in Tulsa and one in Oklahoma City.

The expansion came about as part of an effort to better serve the firm's existing clients based in Fayetteville. One such client is the Fayetteville School District. Crafton Tull President and CEO Matt Crafton said, "In addition to closer proximity to clients, we have several employees who already live in the Fayetteville area, so this will provide them an opportunity to work closer to home."

The office, located at 1450 East Zion Road, Suite 9, is set to open in January 2017. For more information, visit [craftontull.com](http://craftontull.com)

## FTN hires Pruitt as geologist in Little Rock office



Pruitt

FTN Associates, an engineering and environmental consulting firm, has hired Andrew Pruitt as a geologist at its Little Rock location. Pruitt is a graduate of Arkansas Tech

University with a bachelor of science degree in geology, and he's a Conway native.

FTN is an engineering and environmental consulting firm that is headquartered in Little Rock and has branch offices in Fayetteville, Baton Rouge, and Jackson, Mississippi.

## Plans taking shape for ASPE annual meeting

Details are being finalized for the 2017 ASPE Annual Conference, which will be Feb. 2-3 at the Hotel Hot Springs.

Speakers at the conference include the following.

– **John English**, dean of the University of Arkansas College of Engineering, will be the keynote speaker.

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– **Clint Johnson**, director of the Doug McMillon Innovation Studio at the Walton College of Business, plans to speak on the application of autonomous technology.

– **Dr. Brian Haggard** with the University of Arkansas plans to speak on the long-running water quality lawsuit involving Arkansas and Oklahoma.

– **John Coleman, P.E.**, Northwest Arkansas regional manager for Viridian, a consulting firm specializing in LEED services and building testing, will speak on trends in energy efficiency.

– **Heather Richardson**, executive director of the Arkansas State Board of Licensure for Professional Engineers and Professional Surveyors, will discuss licensure updates and the use of the word “engineer.”

– **Rick Geraci, P.E., FACEC**, of Brown Engineers will give a presentation about ethics.

– **Ken Estes** with BancorpSouth Insurance Services will give a presentation on risk management.

– **Julia Harrod, P.E., F.NSPE**, National Society of Professional Engineers treasurer, will speak.

The conference was moved from April to February to create space during the spring, which traditionally has been a busy time. The Engineering Excellence Awards will be March 30 this year, and the ACEC Annual Legislative Conference will be April 23-26 in Washington, D.C.

The conference will be in Hot Springs because that was the preferred choice in an online survey of ASPE’s membership. The event will be in the updated and contemporary Hotel Hot Springs & Spa, a facility that is connected to the Hot Springs Convention Center.

Among the events will be the annual awards luncheon, which will honor the Emerging Leaders, the group of 10 design professionals completing a one-year course teaching skills in management, communication and creativity. Officers with engineering firms are encouraged to come to the luncheon and congratulate this year’s participants.

Also on tap will be the first induction ceremony for the Order of the Engineer. The Order is open to P.E. and E.I. licensees, those with an accredited degree in engineering, and those within one year of receiving a degree. There are no dues or meetings required to be in the Order. Instead, its purpose is to encourage a sense of honor, unity of purpose, and commitment to fulfilling one’s responsibilities.

Also planned is a day at the races in the Oaklawn Jockey Club immediately following the awards luncheon.

## Governor names Taldo to Highway Commission

Gov. Asa Hutchinson has appointed Phillip Taldo of Springdale to the Arkansas Highway Commission. Taldo’s 10-year term begins Jan. 15. He replaces Frank Scott Jr.

*Continued on next page*



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**Taldo**

Taldo is a broker and co-owner of Griffin Realtors Commercial Division and Weichert Griffin Realtors in Northwest Arkansas, according to a release from the governor's office. He also is president of the development corporation One Springdale and is president of Partners Construction, a residential builder.

Hutchinson earlier had appointed Taldo to the Arkansas Economic Development Commission. Taldo has served on the Northwest Arkansas Council, the Northwest Arkansas Regional Airport

Authority and the UAMS Northwest Advisory Board.

Hutchinson said Taldo "understands infrastructure and the connection of infrastructure to our economy, and highways being a key part of our infrastructure. He understands growth and how important that is to me."

The two are longtime friends, having played football together at Springdale High School and attending childbirth classes together. "He's been an ardent friend and supporter of mine," Hutchinson said at the Springdale Rotary Club Dec. 19. "He's been with me through thick and thin, but he's also been with Northwest Arkansas through the good times and the bad times."

In the press release, Taldo said, "I am both excited and equally humbled by the opportunity and the trust Governor Hutchinson has given me. The governor has consistently exhibited thoughtful leadership and a conservative approach to government while in office, and I am delighted to continue my service in his administration."

"I understand the key role our highways play in the economic growth and overall future of our state. This connection is vitally important, and I look forward to working with this already stellar group of commissioners to strengthen and improve Arkansas' roadways, economy and quality of life for years to come."

## Now that the votes have been counted ...

The election season is over, and it was not an easy one. Elections are always divisive – in fact, they're supposed to be – but this year's reached a new level. Still, as much as we would all like to take a breather, now is when the real work occurs – when the people we elected actually begin to pass laws and spend money.

At the national level, President-elect Trump has promised a \$1 trillion infrastructure program. While he hasn't offered any specifics, this does seem to be a priority of his, and his party does control Congress. Republicans often describe themselves as being opposed to increased government spending, but if there's a consensus about anything in Washington, it's that more money should be invested in the nation's decaying infrastructure. In 2015, when Congress could agree on hardly anything else, it passed the Fixing America's Surface Transportation Act, a long-term highway funding bill. So while Congress probably won't invest \$1 trillion, some kind of infrastructure program might be passed.

ACEC/A will do all it can to move the conversation in the direction of investment. Our political action committee will continue donating to elected officials who prioritize the country's future.

Meanwhile, our focus will be where we can have the most impact – at the state level, where the Legislature meets in January. At the same time that the United States must invest more in infrastructure,



**Angie W. Cooper**  
Executive Director

so must Arkansas. ACEC/A will support such efforts, but it will be an uphill battle amidst many other state priorities with active lobbying efforts.

Meanwhile, many of the same issues we have successfully opposed in the past will resurface. ACEC/A may again have to defend the practice of qualifications-based selection, making the argument that the lowest bid isn't always the best one. Meanwhile, another effort likely will be made to change the state's licensing structure, an issue arising across the country. Arkansas is among the most licensed states in the country. Some legislators justifiably believe there's no reason to obtain permission from the government to braid hair, and as long as it stops there, we have no problem with that.

The problem is when engineering gets caught up in all of that. When public safe-

ty and welfare are involved, practitioners must be qualified. On that, we will not compromise.

To promote good bills and stop bad ones in the Legislature, you have to be there – and we will be. I'll be spending the months of January through April camped out at the Capitol.

But being effective requires more than one voice, which is why ACEC/A has a Government Affairs Committee that is open to everyone – civil, structural, electrical and mechanical. It does not have a membership limit; in fact, it can't have too many members.

The great thing about this committee is that it doesn't require its members to leave work to meet. In fact, it doesn't really meet much at all. Instead, almost all of its work is done online and in real time. When an important issue affecting engineering arises, you'll be armed first with the information you need to contact your legislators.

Casting an informed vote is a fundamental responsibility of an American citizen. But actual governance happens after the election, when most people stop paying close attention. Unfortunately, ignoring elected officials won't make them go away. Now is the time when engineers should pay attention. The next election isn't for two years, and a lot of governing, some of which greatly will affect engineering, will take place between now and then.



## Engineering Marketplace

### UA researchers help firm achieve innovation honor

University of Arkansas researchers again have been recognized for contributing to Fayetteville's Wolfspeed being included among R&D Magazine's top 100 technological product innovations.

Wolfspeed, which is the largest university-affiliated company at the Arkansas Research and Technology Park, was honored for its wide bandgap automotive traction inverter, which converts energy from battery packs to power that drives hybrid and electric vehicle motors.

The University of Arkansas' National Center for Reliable Electric Power Transmission, the nation's highest-powered power electronics test facility at any university, was the product's primary test facility.

"We're very happy for Wolfspeed and proud to be a part of this project," said Alan Mantooth, distinguished professor of electrical engineering and executive director of the center, in a University of Arkansas press release. "For me personally, it's extremely gratifying to see Wolfspeed continue to succeed and, really, to be an international leader in innovative technologies for electric and hybrid vehicles."

Developed with Toyota, the inverter converts direct current stored in the battery pack to a three-phase alternating current power energizing at least one electrical load. It has higher power density and is smaller, lighter and more efficient than the inverter now used in the Prius.

Previous R&D 100 award honorees have included the flash-cube, the automated teller machine, the fax machine and high-definition television.

Wolfspeed was founded in 1999 as Arkansas Power Electronics International. It specializes in high-performance electronics for customers in the defense, aerospace and hybrid/electric vehicle and other markets. It made the R&D 100 list in 2014 for a battery charger, and in 2009 it did so for a power module, both developed in collaboration with the University of Arkansas.

### New Water Systems offering two new product lines

New Water Systems is offering two new product lines: Glasco UV disinfection systems and Sensaphone remote monitoring and telemetry systems.

Glasco serves wastewater and drinking water systems for residential, commercial, industrial and municipal clients. The company specializes in system replacements and retrofits. The systems are oriented both horizontally and vertically. The company has been using flow-through fluoropolymer tube reactor technologies since 2006.

Sensaphone provides a variety of systems. Its remote monitoring systems allow users to monitor environmental conditions and equipment status over the internet and can store, view and graph datalogged records. Appropriate personnel can be

alerted through email, phone or text. For more information, go to [www.newwatersystems.com](http://www.newwatersystems.com), or call 501.888.0500.

### ICM seeing rebound in market in state, NWA

ICM is seeing a strong comeback in Northwest Arkansas. In fact, the market is coming back strong statewide, says Mark McFadden, manager of the Arkansas offices. The firm has been gearing up in the surveying and underground markets, and GPS equipment and supply items also are seeing an increase. Road construction and infrastructure have significantly increased as well.



**McFadden**

The company says it is looking forward to helping its customers stay on top of their work. The firm has recently opened a location in Bethel Heights managed by Mike Blake, who can be reached at 479.531.4087.

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**AHTD's RANDY ORT** along with Gil Rogers, government relations officer, and Ashley Smith, an engineer in the program management division, discuss the state's roadways at the ACEC/A's first annual Industry Update Nov. 9.

# Engineers updated on economy, roads

State's growth slow and steady, but roads face uncertain challenges, say speakers at Industry Update

By **Steve Brawner**  
Editor

Arkansas' economy should enjoy slow but steady growth, but income growth has been uneven and the state has lagged behind the rest of the nation since the recession, the state's economic forecaster told engineers at the ACEC/A's first Industry Update.

The Update occurred Nov. 9, the day after the election, at the Arkansas Regional Innovation Hub in North Little Rock. It

replaced the Agency Forum, which in the past occurred in December.

Dr. Michael Pakko, the University of Arkansas at Little Rock's chief economist, said the state lagged behind the rest of the country in the eight-year economic recovery. The recession was deeper here, and the recovery slower. He said the country has never enjoyed a big spike during the recovery, instead averaging 2 percent growth annually. Arkansas saw a 5 percent jump in 2010-11, and then its economy decelerated in 2012-13. In fact, the state actually experienced a double-dip recession. The state's economy picked up in 2014-15, but there has been a slowdown in 2016.

The state's unemployment rate has beaten the national average, dropping from more than 8 percent during the recession to 4 percent, compared to the national average, which hit 10 percent and is now 4.6 percent.

But Pakko said those numbers can be misleading. Many people have stopped looking for work and are not included in the unemployment rate. After dropping in 2013-14, the labor force has recovered to 2011 levels but not to pre-recession levels. Also, the state's employment rolls spiked this year based on household surveys but not on more accurate payroll surveys, and he expects a downward adjustment in the figures.





**DR. MICHAEL PAKKO**, Arkansas' economic forecaster, said growth has been slow and steady but uneven, and is lagging behind the rest of the nation.

In Arkansas, income growth has been uneven. Income has increased for dividends, interest and rent – typically going to the owners of capital – by 5 percent since the recession ended, which is more than the national average of 4.7 percent. But in wages and salaries, a measure most tied to working people, Arkansas has fallen behind the rest of the country. The growth there has been less than 3.5 percent, and with inflation, it's less than 2 percent compared to about 2.5 percent growth nationwide. Because wages and salaries aren't increasing while rent is, consumers are slowing down their spending, and the state's retail sales and taxable sales has grown more slowly (2.6 percent) than the national average (4.5 percent). One state positive has been home sales, which have increased three consecutive years.

#### **Low prices increase buying power**

Pakko said the standard of living in Arkansas is higher than the income statistics suggest. The state's per capita income is about 80 percent of the national average: \$38,000 compared to \$48,000 nationwide. Twenty or 30 years ago, it was about 75 percent.

But Pakko said income is only part of the story because Arkansas is the nation's

*Continued on next page*

#### **Manufacturing jobs down, but ...**

The nature of those jobs has changed, Pakko said. Since 2007, manufacturing jobs have fallen by 34,000, and many are not coming back. Meanwhile, education and health services jobs have increased

by 28,000, and professional and business services jobs have increased. He warned attendees not to be too enamored by industrial announcements involving hundreds of jobs. These create splashy headlines but are only a drop in the bucket.

A large advertisement for Van Horn Construction. The background is a scenic view of a body of water with mountains in the distance. In the foreground, there is a wooden dock and a white hard hat. The Van Horn Construction logo, featuring a circular seal with "VH C" and "VAN HORN CONSTRUCTION" around it, is overlaid on the left. The company name "VAN HORN CONSTRUCTION" is written in large, bold, white letters across the center. At the bottom, contact information is provided: "790 Tyler Rd. Russellville, AR 72802 479-968-2514 www.vanhornconstruction.com".

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**MORE INDUSTRY UPDATE SPEAKERS.** Top left is Randy Hathaway, deputy district engineer, for the U.S. Army Corps of Engineers Little Rock district. Top right is Metroplan's Jim McKenzie. Above left is Capt. Mark Chinery with the Little Rock Air Force Base's 19th Civil Engineer Squadron, while above right is Dr. Larry Whitman, dean of UALR's Donaghey College of Engineering and Information Technology.

second cheapest state to call home, just above Mississippi. Prices here are 12.5 percent below the national norm. When prices are considered, Arkansans' spend-

ing power is 92.5 percent of the national average.

Randy Ort, assistant chief – administration with the Arkansas State Highway

and Transportation Department, said highway funding remains a challenge despite new money being available this year through the five-year Fixing Amer-





**MORE SPEAKERS.** Pictured from left is Lance Jones, chief engineer with the Department of Health; John Ruddell with Garver offered an update on the replacement of the Broadway Bridge connecting Little Rock and North Little Rock, and Trey Scallion, vice president – professional division with BancorpSouth Insurance Services.

ica's Surface Transportation Act passed by Congress in 2015. The act made \$200 million in extra money available each year so long as the state raised about \$50 million, which it did in a 2016 special legislative session on highways.

The concern about the state funding is that it relies largely on general revenue surplus funds and \$20 million a year

from a securities reserve fund from state investments, Ort said. Neither are as secure as a simple appropriation. Ort said a long-term solution on state highway funding is still needed. Gov. Asa Hutchinson has asked the Arkansas Good Roads Foundation to lead a consensus-building effort to find a long-term solution, with a report that will be delivered in January.

Ort said the AHTD has a little more than \$1 billion available annually and spends about \$585 million on construction not including the Connecting Arkansas Program, which is funded by a half-cent sales tax. But only \$330 million of that is flexible, and only 20 percent is available for capital improvements. He

*Continued on next page*

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said the system must “do a better job of taking care of what we have.”

Ort said the AHTD performs most of its engineering in house, aside from the Connecting Arkansas Program, but engineering firms will have opportunities to work on projects in two areas. One is the \$8.4 million Transportation Alternatives Program available each year to local governments, school districts and other government entities to build trail facilities, sidewalks, bike paths, and other projects. The AHTD also has \$1.4 million annually for a recreational trails program.

### Metroplan looking for solutions

Attendees also received a report from Jim McKenzie, the retiring executive director of Metroplan, the agency in charge of long-range infrastructure planning for central Arkansas. McKenzie said the long-proposed “north belt freeway” is no longer a viable option, but Metroplan is still searching for ways to connect the northern parts of central Arkansas, with the simplest way being Highway 89. Metroplan and the AHTD are studying how to expand capacity in the metropolitan area – perhaps through toll lanes on the only roadways where it’s possible, I-30 and I-40. Metroplan has several “jump start” projects in regional communities funded by the Department of Housing and Urban Development that have been awarded to Garver, Crafton Tull and McClelland Consulting Engineers. The projects help those communities build higher-density, compact, mixed-use, pedestrian- and transit-friendly nodes and will begin advancing in the next year or two. Progress is being made toward the planned Southwest Trail between Little Rock and Hot Springs, with a single engineering contract possibly awarded to create the route. McKenzie said other issues to consider include how climate change could affect central Arkansas’ drainage systems, which are designed for even dispersal, while the models indicate future periods of heavier rainfall followed by droughts. He said 2016 saw four 1,000-year flood events nationally.

Dr. Larry Whitman, dean of UALR’s Donaghey College of Engineering and Information Technology, said the school has grown to 1,247 students in its six departments, a 6 percent increase, and it



**MARK BENNETT III**, chief-water development, Arkansas Natural Resources Commission, discussed the commission’s funding situation.

grew 8 percent the year before. Of that, 263 students are in the college’s construction management and civil engineering program. Its graduation rate over six years is 46 percent, while 11 percent enter another program at UALR and graduate with another bachelor’s degree. The 46 percent is about equal to other colleges that also are “moderately selective” with their students, he said. The school has students from 64 of the state’s 75 counties and 26 other states.

He said the school is trying to ensure its graduates are ready to work for engineering firms sooner. It’s one of the few in the country that requires civil and construction engineering students to pass the Fundamentals of Engineering exam in order to receive a degree.

### Corps faces declining budgets

Dr. Randy Hathaway, deputy district engineer for the U.S. Army Corps of Engineers Little Rock District, told attendees that the Corps has faced declining budgets for several years, resulting in fewer starts: nine Corps-wide last year, and the Little Rock District received one of them for improvements to the problematic confluence of the Arkansas, Mississippi

and White Rivers. The Corps is engaged in a cost-sharing process with the state of Arkansas to consider engineering solutions that would involve a combination of relief and gated structures.

Hathaway said the district has 700 employees and probably 100 engineers and is tasked with regulatory work, water supply projects and military construction.

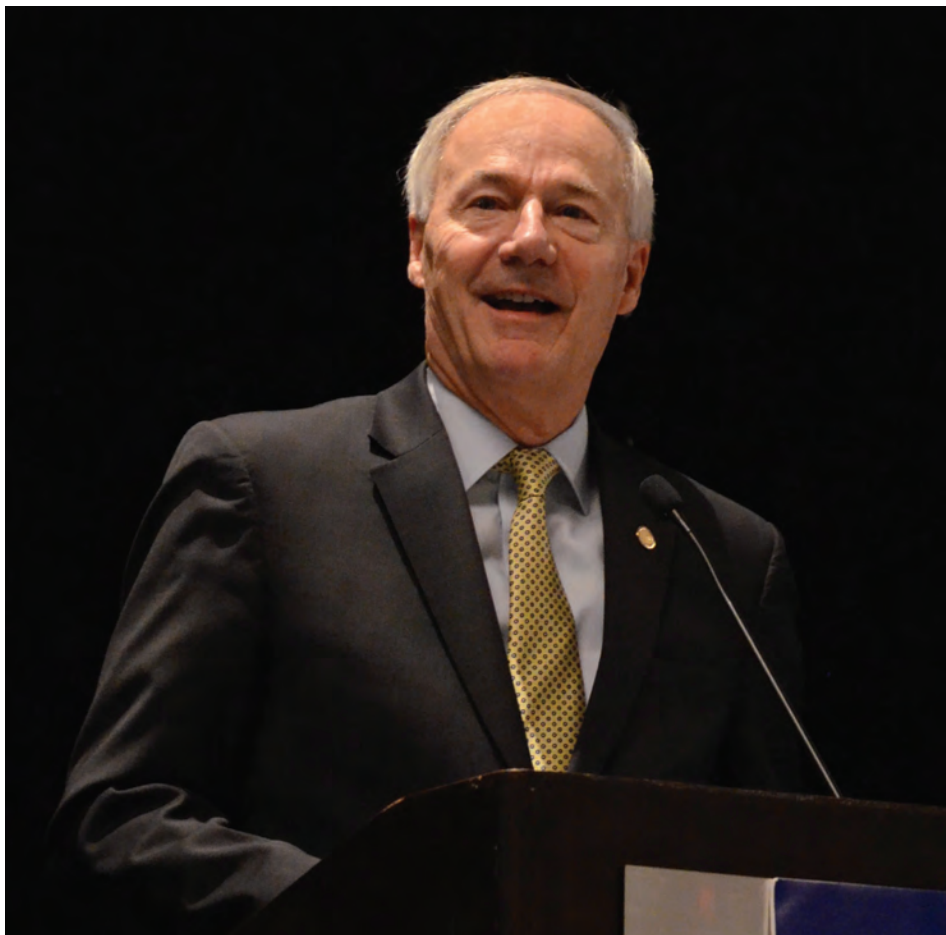
Asked about the possibility of the Corps dredging the Arkansas River to 12 feet, which would open up opportunities for new shipping, Hathaway said that project is “dead right now” because of a lack of funding and the requirement for a new start. He said there is some interesting in dredging the Arkansas portion of the river only.

Attendees also heard from another military presenter, Capt. Mark Chinery, with the Little Rock Air Force Base’s 19th Civil Engineer Squadron. The LRAFB has the world’s largest concentration of the Air Force’s large C-130 cargo planes – more than 60 are “on the ramp” at any given time, he said. Among the squadron’s current missions is a \$124 million repair of the base’s 12,000-foot runway. Another was a \$22 million completion of a fuel cell hangar that replaced aging infrastructure that had required planes to be completely defueled in order to perform maintenance.

Lance Jones, P.E., chief engineer with the Department of Health, said the department is seeing an increasing number of violations because of the implementation of the stage 2 disinfectant byproducts rule. Jones said some plants are not well equipped to remove total organic carbon as is required by the rule. Solutions include offstream storage so that water is available when the source water has an issue, and having multiple intakes. Jones was hopeful that the number of violations would drop because the same thing happened in 2008 when the stage 1 rule went into effect: Violations increased and then fell.

Other speakers were Mark Bennett III, chief – water development, Arkansas Natural Resources Commission; and John Ruddell, P.E., a bridge design manager with Garver, who gave an update on the replacement of the Broadway Bridge connecting Little Rock and North Little Rock across the Arkansas River.





**GOV. ASA HUTCHINSON** will lead the Legislature through an uncertain time when it meets in January as legislators grapple with medical marijuana, changes in health care and tax cuts.

# Now what?

Donald Trump promised a major infrastructure program. Arkansas voters said yes to marijuana. Here's a look ahead at what might - *might* - happen in Washington and Little Rock in 2017.

**By Steve Brawner**  
**Editor**

A new president takes office in January promising to spend big on infrastructure with his party enjoying a majority in both houses of Congress. Meanwhile, the elections gave the Arkansas Legislature more of a Republican makeup but didn't change its overall outlook. The big change there is a medical marijuana amendment passed by voters.

What does it all mean for engineering? At the very least, an interesting year.

President-elect Donald Trump has promised a major commitment to infra-

structure - at times using a figure of \$1 trillion without offering any specifics. In his acceptance speech the night he was elected president, he specifically mentioned making the nation's infrastructure "second to none."

That's a hopeful sign, said Rep. Bruce Westerman, R-Ark., a professional engineer. He'd like to see Trump and other policymakers prioritize road-building projects affecting his 4th District such as Interstate 49 and the proposed Interstate 69, as well as navigation projects on the Arkansas, Ouachita and even the Red Rivers.

The key, of course, is paying for such investments. One way would be to develop energy resources on federal lands and then using some of the royalties for infrastructure projects, Westerman said. Another source of income could be in-

*Continued on next page*

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creased tax collections coming from a simpler tax code.

"I think the bottom line is that there are definitely infrastructure needs out there and instead of just throwing a lot of government money at infrastructure projects, there needs to be adequate planning and prioritizing and a long-term sustainable path to funding infrastructure," he said.

Rep. Rick Crawford, R-Ark., who serves on the House Transportation and Infrastructure Committee, doesn't expect an immediate highway plan. He also hopes to see greater investment in the Mississippi River and its tributaries, as well as on inland waterways such as the White River. He said the country is lagging behind the Panama Canal expansion and needs to catch up. But as with Westerman, funding for him will be an issue.

"You can outline an investment strategy all day long, and if you don't have a way to pay for it, then that's going to be a problem," he said.

Steve Hall, ACEC vice president, government affairs, is hopeful that a Trump presidency will mean more infrastructure funding. He said Trump's agenda "is in many ways very, very consistent with the engineering industry's agenda." That includes not only increased infrastructure spending but also spending for energy production and pipelines, which he said have become overly politicized in recent years.

Hall sees another source of funding coming from repatriating American companies' profits that are currently being held overseas, and then using part of that money for infrastructure – a solution also mentioned by Westerman. If that money could be brought home, some of the tax proceeds could be dedicated to the Highway Trust Fund and water projects. In fact, infrastructure spending tied to repatriation could be in the same bill.

"The assumption all along has been that these two may actually ride together in a single package," he said.

Hall said that infrastructure is a bipartisan issue that attracts support not just from the two parties but also from different parts of the political spectrum. The U.S. Chamber of Commerce and the AFL-CIO – business and labor – both support greater investment and potentially even



**U.S. REP. BRUCE WESTERMAN, R-Ark., a professional engineer, says infrastructure could be a priority in Washington, but funding must be found.**

raising the gas tax. While there's limited support for doing that in Congress, elected officials on an individual level seem to appreciate the need to ensure the funding stream stays updated.

Hall said the parties approach infrastructure spending in different ways in that Republicans place more of an emphasis on public-private partnerships. ACEC would like to see those partnerships but also an increase in core funding.

"This is still very much part of our objectives and part of our agenda, and we're going to constantly remind lawmakers that the Highway Trust Fund right now is unsustainable," he said.

Westerman said the administration and Congress will push "pro-growth policies" such as tax cuts and regulatory relief. The Dodd-Frank lending law will be changed early in the administration, freeing up capital. The growing economy will affect all aspects of manufacturing and engineering, he said.

"I think engineers should be optimistic," he said. "I don't even know if I'd use 'cautiously optimistic.' But I think we're going to see some growth in the economy, which is going to mean more work for engineers. ... I think there's a lot of pent-up energy and funding out there that is just waiting to be released."

Congress will have a full plate when it returns next year. Republicans will want to take advantage of the fact that they

control both branches of government. Westerman said the calendar for next year has Congress in session more days than it's been each of the past two years, with five-day workweeks scheduled in Washington.

The potential roadblock is the Senate, where key administration officials and a Supreme Court justice must be confirmed and where the rules naturally slow things down.

"It's like we're looking down a long street with a lot of stoplights on it, and all the lights are green right now," he said. "There may be one that's yellow up there. That's the cloture rule in the Senate. But there really are no excuses any more not to get some things done and get some of these major issues addressed."

Another issue that will affect engineering companies – and all Americans – is health care. Westerman said a process for repealing and replacing the Affordable Care Act, otherwise known as Obamacare, will begin early in 2017 using the budget reconciliation process. He expects the debate to be more open than it was when the Affordable Care Act was passed in 2009. The "replace" part would come in phases, just as Obamacare was introduced over time.

"You can't just flip a switch and undo everything that Obamacare has done," Westerman said. "It's going to take an unwinding of it and implementation of something new, so it's going to be a process, but I think that process will start fairly rapidly after the new president's sworn in."

Hall said ACEC will be watching health care changes closely to see how they affect engineering. The Affordable Care Act took too much of a punitive approach, so future reforms hopefully will be based more on incentives – in other words, more carrot, less stick.

"It's still a bit early to tell," he said. "That's an area where there's a lot of campaign rhetoric on that but very little in the way of details in terms of what policies are going to come forward."

Hall expressed hope about the president-elect overall.

"He's a successful business guy and I think seems to be displaying a level of pragmatism that I think is needed in the job, and he's making some good appoint-



ments in key positions, so all of that I think is adding to the optimism that we can get some things done in 2017," he said.

### In Arkansas, medical marijuana is the issue

In Arkansas, the elections – and three party-switchers – increased the Republican majority in the Legislature to 102 of the 135 seats – the same number Democrats had in 2008.

But Republicans already had strong majorities in the Legislature and already occupied the governor's office. Instead, the big change occurred elsewhere on the ballot, with a medical marijuana amendment passed by voters.

Much work on that issue remains to be done. A system must be set up – quickly – to make a drug legal in Arkansas that is still illegal in the United States. Rep. Doug House, R-North Little Rock, who is serving as a point person on the issue in the Legislature, said about 135 issues must be clarified or modified legislatively.

Medical marijuana is especially important to engineers, said Rep. Andy Davis, R-Little Rock, a licensed professional engineer, because so much of their work is contractor related. Under the amendment, employees cannot be discriminated against or penalized by employers for being a medical marijuana patient. However, patients are not allowed to perform tasks under the influence of marijuana that would "constitute negligence or professional malpractice." The amendment does not allow patients to operate motor vehicles while under the influence, does not require employers to accommodate the use of marijuana at work, and does not allow marijuana to be used in a public place.

House said legislators are working to clarify what an employer can do using rules that would mirror those for other drugs causing impairments.

"It is complicated, but worker safety is paramount," he said.

Still, design and construction firms must proceed with caution. Unlike alcohol, marijuana can't be tested with a breathalyzer, so it's difficult to prove an employee is under the influence.

"If you're just a survey office or a little engineer office with five employees, do these rules apply to you?" Davis said. "We don't know right now. ... Right now, it's kind of vague but (firms) may have to start doing more because some of the requirements are now constitutional."

At the state level, a major highway program "seems highly unlikely," Davis said. The state Legislature found \$50 million a year over five years in a special session in 2016 so Arkansas would be eligible for \$200 million a year in federal funds under the Fixing America's Surface Transportation Act. But that \$50 million depends on a state surplus that must materialize even though it's not included in Gov. Asa Hutchinson's budget, along

with state investments that must show positive numbers. Legislators have been awaiting an Arkansas Good Roads Foundation report that was to be sent to the governor in January that offers long-range solutions. But if the report's recommendations depend on the Legislature presenting a tax increase to the voters, it probably won't gain much traction, Davis said.

Davis has some concern about the budget producing the surpluses needed to fund highways. Meanwhile, the governor is calling for \$50.5 million in income tax cuts, while other legislators are looking for more. Meanwhile, health care expenses continue to rise during a time of uncertainty and change in Washington.

"How do you still generate \$100 million surpluses if you're cutting revenue like that and not cutting expenses in other places?" Davis asked.

Some other engineering-related issues that have appeared in the past likely will reappear in the future. Arkansas is one of the most heavily licensed states in the country, and legislators are looking for ways to let people do their jobs without having to get a permission slip from the government. But engineers will have to ensure engineering isn't caught up in the movement. A bill filed in the last session regarding all licensing would have affected engineering.

"I don't think you'll see the same bill, but I think we should be on the lookout for legislation that would affect professional licensing," Davis said.



**STATE REP. ANDY DAVIS, R-LITTLE ROCK, a professional engineer, says the industry must be ready to protect licensure when the Legislature meets.**

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## ACEC/A Member Spotlight

# Brown focusing on cybersecurity

Encrypted system in Clarksville is first of its kind; more to follow

Clarksville Light & Water is home to a first-of-its-kind cybersecure industrial control system installed by Brown Engineers. It will not be the last one Brown installs.

The system by Bedrock Automation provides the utility's new SCADA system with deep encryption on the controller with an embedded root of trust protecting it from hacking and outside attacks. It was installed in June – the first time it had been installed anywhere, resulting in the firm giving a presentation at the Smart Industry conference in Chicago. Brown also installed the SCADA system itself, which allows managers to see everything that's happening with their system using a smart phone or tablet.

The cybersecurity space is a growing one for Brown Engineers, with limitless potential. According to Dee Brown, P.E., ATD, one of the firm's principals and founders, many industrial control systems in use today are 25 years old and lack even basic cybersecurity provisions. Those systems are largely forgotten about because they're hidden away and doing their jobs. But as recent events have shown, cybersecurity can no longer be ignored by anyone these days.

"We're actually chasing several projects right now that we're looking at retrofitting some entire utilities with this type of technology," he said.

Brown Engineers committed to beefing up its cybersecurity capabilities within the past two years. The pool of potential clients is deep, including not only municipalities but also commercial entities. This summer, Dee Brown attended a class offering a national perspective by the Department of Homeland Security's Cyber Emergency Response Team at the Idaho National Laboratory. Moving forward, he said the firm is ready to take advantage of the increasing opportunities.

"I think we have a lot of the right tools in place to be able to offer these kinds of



**DEE BROWN, P.E., ATD**, is one of the founders of Brown Engineers. Above, a SCADA system installed in Clarksville provides utilities managers with continuous, up-to-date information.

solutions to anybody in the control system environment," he said. "Particularly the water/wastewater utilities and electric utilities have a lot of interest in keeping the lights on, keeping the water running. So these are big issues for them."

The firm was founded by Dee Brown and Bruce Brown, P.E., who aren't related but shared a belief that they could find a niche by specializing in power and controls. Later that first year, Nick McNeill, P.E., joined the firm as its other principal. At first, the firm focused on electrical work but then added mechanical engineering. Today, it employs nine licensed professional engineers, including Rick Geraci, P.E., FACEC, who in 2013 was inducted into the prestigious ACEC College of Fellows.

Among the firm's signature projects was replacing the chiller in Little Rock's 43-story Simmons Tower. Because it was

located in a tight basement area, the firm developed a 3D software model so new equipment could be installed while keeping the building heated and cooled. The company does most of its work in Arkansas and Oklahoma but will go where the business is.

In 2012, Brown Engineers won the ACEC/A's Grand Conceptor Award for reprogramming and repurposing inexpensive electric "smart meters" to monitor 3,000 residential grinder lift stations around Lake Hamilton in Hot Springs. Prior to the project, the utility trusted homeowners to report problems – a particularly unreliable method considering many of the residences were summer homes. The project was expected to cost as much as \$60 million, but Brown Engineers helped it lower the costs to \$1.3 million.

The next year, the firm won the ACEC/A's People's Choice Award for lighting Little Rock's Main Street Bridge, Junction Bridge, and the Clinton Presidential Park Bridge. More than 1,300 LED fixtures were installed – each able to produce 16 million colors. Systems can be lit statically or be animated, and they can operate independently or synchronistically across all three bridges. A nearly infinite number of light shows are possible.



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*"The online program at the University of Arkansas offered me the flexibility to pursue a well-respected graduate education while working full-time. The instructors provided a world class educational experience with individual attention. I would highly recommend this program to prospective students." - Michael R., MSEE 2015*

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