

MARCH/APRIL 2017

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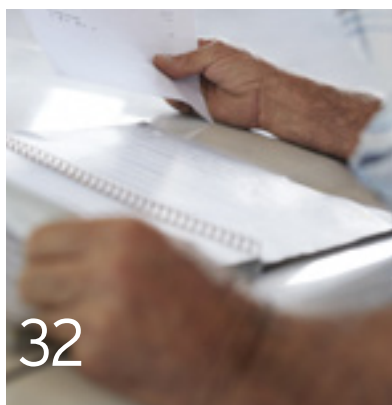
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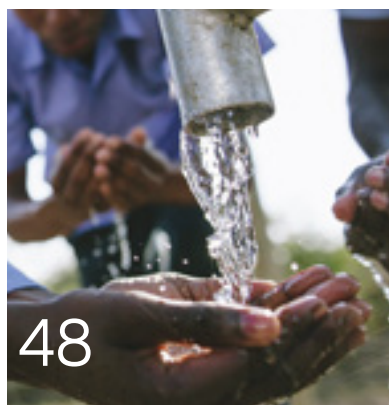
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COVER: ANN CUTTING

THE OFFICIAL PUBLICATION OF THE
AMERICAN COUNCIL OF ENGINEERING COMPANIES
AMERICAN COUNCIL OF ENGINEERING COMPANIES

ACEC/PAC - Not Just About the Money

ACEC/PAC raised a record \$1,010,433 in 2016, propelled by 41 State Organizations which reached—and in many cases exceeded—their fundraising goals.

As the largest PAC in the design industry and in the top 3 percent of all federal PACs, this political program of ours is important because it enhances the Council's strength and prospects for advocacy success. It signals to Congressional members that we have significant resources to help them win elections; it facilitates access to them on important issues that affect the business environment for Member Firms.

ACEC/PAC helped us to achieve major legislative victories in 2016, including multi-billion dollar transportation and water programs, legislation to promote contracting out and expand energy markets, and key tax code changes, among others. Continued strong support for ACEC/PAC in 2017 is necessary as we seek to abolish the so-called "blacklisting" rule, advance significant new investments in infrastructure, and make reforms to the tax code.

This issue of *Engineering Inc.* takes a close look at the way State Member Organizations and Firms generated ACEC/PAC's record fundraising year, including an "Honor Roll" of all PAC contributors (*See page 11*). Our cover feature explores how the Council is combatting a nationwide effort to eliminate state professional licensure for engineers (*See page 26*). Also included is an analysis of the ACEC-commissioned study by New York University confirming the financial and other benefits to government clients of contracting out. (*See page 32*)

Don't miss the upcoming 2017 ACEC Annual Convention—April 23-26, at the Marriott Wardman Park Hotel in Washington, D.C., which will feature nationally noted speakers; expert panels on industry perspectives; a Congressional panel on the legislative landscape, and the 50th Anniversary Engineering Excellence Awards Gala hosted by *Saturday Night Live* alum Kevin Nealon.

We look forward to seeing you there.



Peter M. Strub
ACEC Chairman



David A. Raymond
ACEC President & CEO



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Battery Storage Market Poised for Growth

Battery storage is not yet ready for prime time. It is just too expensive. Although it has cost-effective applications in a few niches, such as island grids or locations where technical constraints require a nonwired solution, it doesn't pencil out for large-scale energy storage.

That dynamic, however, looks certain to change. Given the trend toward renewable energy in U.S. power generation and the rapidly improving value proposition of battery storage technology, the market is poised to grow.

Whether that growth comes sooner or later could depend on an upcoming ruling by the Federal Energy Regulatory Commission (FERC). In November 2016, FERC issued a draft Notice of Proposed Rulemaking (NOPR) looking “to remove barriers to the participation of electric storage resources and distributed energy resource aggregations in the capacity, energy and ancillary service markets.” A final ruling is expected within a year.

With the exception of the frequency regulation market in PJM—the regional transmission operator (RTO), which oversees the mid-Atlantic states—and a few specialized applications, the majority of battery installations to date are attributed to mandates and incentive programs, according to Doug Butcher, central region project director, renewable energy, at Black & Veatch. “For significant growth to occur, widespread market reform is necessary,” Butcher says. “There needs to be some form of stimulus to push battery storage forward. If that happens, I think we'll see rapid growth. If not, we will have to wait a few years for the economics of battery storage to work out.”

CURRENT MARKET

Energy storage is a relatively small market. According to the University of Michigan Center for Sustainable Systems, the U.S. had 21.6 gigawatts (GW) of rated power in energy storage compared with 1,068 GW of total in service installed generation capacity.

Approximately 95 percent of that storage is pumped hydro, in which water is pumped from a low reservoir to a high reservoir and then released to run through a hydroelectric turbine when electricity is needed. Though it's the most affordable form of storage, pumped hydro has two significant market limitations. It is geographically constrained—and it relies upon having large quantities of water available. This makes it impractical for bulk energy storage

in some geographic regions such as deserts in the Southwest.

However, not only can batteries be deployed anywhere, but they are also very flexible. While their most effective use is demand response—regulating transmission systems by instantaneously raising or lowering output to follow moment-by-moment imbalances in generation and load—they can also be used to integrate utility-scale solar and wind resources into the transmission system, replace gas turbine peaker plants and provide stability and peaking capacity at the distribution substation and distribution feeder level.

“The grid of tomorrow is very different from the grid of just 10 years ago,” says Butcher. “With the increased penetration of renewables and declining system inertia, real-time grid imbalances

are a much bigger problem today. Batteries are a great technical solution to that problem because in addition to providing instantaneous capacity when it is needed, they can absorb excess renewable generation rather than curtailing it.”

As a result, batteries—specifically lithium-ion batteries—have come to dominate the market. According to GTM Research, lithium-ion accounted for 96.2 percent of all storage installations in the third quarter of 2016.

Total energy storage deployment in the United States was about 260 megawatts (MW) in 2016, up from 226 MW in 2015. GTM Research fore-

casts growth to accelerate over the coming five years, projecting more than 2 GW in annual deployments by 2021.

“Battery storage is a great technical answer to a number of grid issues, ranging from instantaneous imbalances and short-term overloads to time of day mismatches between renewable generation and load,” says Butcher. “The only thing that is keeping a ceiling on the market is the fundamental economics of bulk energy storage.”

Even as lithium-ion battery prices have fallen dramatically in the past two years, from around \$350 per kilowatt-hour (kWh) to, according to GTM Research, \$200-\$250 per kWh, they are still far above the \$100 per kWh price point that analysts say would make them viable in the market.

The primary driver of that price drop has been rapid growth of the electric car market, and General Motors, which produces the Volt electric car, has said that its batteries will reach \$100 per kWh by 2022. Given the remarkable downward trajectory of battery prices in recent months, however, few would be surprised to see that milestone reached long before then.

**California
mandated that
the state's
power industry
must procure
1.3 GW of
energy storage
by 2020**

REGULATORY MANDATES

Absent price competitiveness, the battery storage industry has relied on regulatory actions to build market momentum. Two of the nation's transmission operators, which coordinate, control and monitor regional electrical power markets, have incorporated storage into their systems.

PJM has included storage in its capacity, energy and ancillary service markets since 2013. Since then, PJM has been the largest U.S. market for energy storage with more than 250 MW of cumulative deployments, according to GTM Research.

In 2013, California mandated that the state's power industry must procure 1.3 GW of energy storage by 2020. The utilities, which are overseen by the California Independent System Operator (ISO) have already deployed 73.8 MW, making the state the second-largest storage market in the nation.

In the past three years, these two developments have accounted for almost all of the nation's energy storage deployments.

Battery storage proponents hope these regional successes will be replicated on a national level if FERC embraces storage in its upcoming ruling. About 70 percent of the nation's electrical grid system is regulated by FERC through its oversight of the RTOs and ISOs. In the rest of the country, vertically integrated utilities manage the grid.

If FERC does embrace storage, that would require each RTO and ISO to establish market rules recognizing the characteristics of energy storage resources and their place in the wholesale market, says Robert Schulte, a partner in Schulte Associates LLC, which performs resource planning and project development work for electric utilities. "It would define distributed energy resource aggregators as a market participant in the organized wholesale markets," he says.

Schulte says the ruling would provide access to the grid for the growing number of storage batteries that are "behind the meter" on customer's premises.

"Unlike traditional generation facilities upon which most of the current market rules are based, these distributed resources are relatively small in size, operate differently and have output duration limitations," he says, "but their capabilities could be useful at the wholesale level if allowed to access it."

Because it would be too complex and cost prohibitive for owners of these distribution-level devices to try to participate in the

market themselves, Schulte says, "The proposed rule would also require the RTOs/ISOs to allow aggregation of such devices, enabling entities to represent groups of devices in the market."

FUTURE MARKET

Schulte says FERC's blessing to storage "is a key to the economics of batteries," but he and other analysts agree that the market will not explode overnight. The regional organizations will need time to incorporate storage into their systems.

"I think you will see measured growth in the sector over the

next two to three years," says Peter Boos, Burns & McDonnell business development manager for the transmission and distribution industry. "After that, with improved battery prices and new regulation, I expect rapid growth."

Even though most analysts expect lithium-ion batteries to be the dominant storage technology for the foreseeable future, they have a serious drawback.

"The Achilles' heel of lithium-ion and most other battery chemistries is that they degrade rapidly with cycle age," says Frank Jakob, a battery storage subject matter specialist at Black & Veatch. "A battery can lose 20 percent or more of its capacity in 3,000 cycles, so you might have to replace it in five to 10 years if the cycle rate is one to two cycles per day."

Engineers are working to solve lithium-ion's degradation problem, but the door is open for other technologies to gain a foothold in the market.

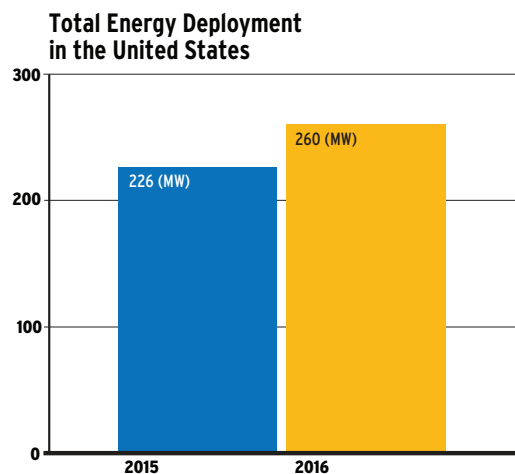
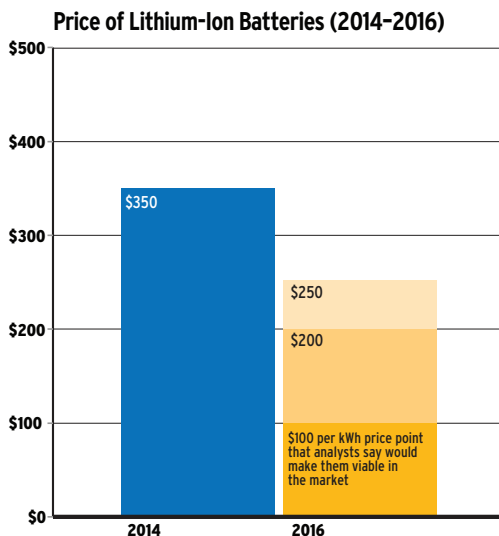
One promising technology is flow batteries, which contain two electrolyte solutions in two separate tanks, circulated through two independent loops. When connected to a load, the migration of electrons from the negative to the positive electrolyte solution creates a current.

Flow batteries don't have any cycling degradation and can be easily scaled up, but they are far more expensive than lithium-ion, and they lack the market backing to drive down the price.

Other potential systems include hydrogen storage, superconducting magnetic energy and synthetic natural gas storage.

"With the amount of investment dollars that are being spent in this space, it's only a matter of time before someone comes up with something better than lithium-ion," says Boos. ■

Gerry Donohue is ACEC's senior communications writer. He can be reached at gdonohue@acec.org.



ACEC Champions Bold Infrastructure Investment

Infrastructure investment continues to garner significant attention from the Trump administration and in Congress, although timing and specific details of a proposal are still under development.

ACEC National and 49 ACEC Member Organizations signed a broad coalition

letter with nearly 400 other stakeholder organizations to President Trump expressing support for, “a balanced infrastructure investment plan that will lift our nation’s economy and improve our transportation network.” The letter called for funding to improve all types of infrastructure throughout the country, including transportation, water, ports and energy projects, both through federal programs as well as incentives for private investment. It also highlighted the need for additional revenue to ensure the long-term solvency of the Highway Trust Fund, which will

private investment. She also discussed the need to speed up project delivery and promote innovation to improve system performance. A more detailed funding and tax incentive proposal is expected to



Bill Shuster, R-Pa.

be unveiled by the administration in the coming months.

Speaker of the House Paul Ryan indicated that the funding parameters for an infrastructure investment package would be worked out in budget negotiations later in the spring.

Prior to his inauguration, President Trump also announced the creation of an “infrastructure council” headed by two New York real estate developers, Richard LeFrak and Steven Roth. The composition and responsibilities of the group are not well known, but they are expected to be involved in overseeing selection and development of large scale, high profile infrastructure projects that could be financed under the new initiative.

At a kick-off hearing for the House Transportation and Infrastructure Committee, Chairman Bill Shuster, R-Pa., highlighted infrastructure investment as a key priority for 2017 and an area ripe for bipartisan congressional action. “President Trump made a promise to the American people that he would reassert America’s greatness. From my perspective, that means ensuring that America is competitive in the crowded global marketplace of today and tomorrow,” said Shuster. “It means reimagining and building a 21st century infrastructure—leveraging resources from all levels of government and the private sector.”



Elaine Chao, Secretary of Transportation

give state and local transportation agencies the funding stability they need to address deferred maintenance and advance critical improvement projects.

In testimony at her confirmation hearing, Secretary of Transportation Elaine Chao acknowledged the need to increase funding for core federal programs, in addition to promoting public-private partnerships and leveraging additional



DUTCH/THINKSTOCK

ACEC Urges Senate to Pass Regulatory Reform

ACEC and a business coalition led by the U.S. Chamber of Commerce urged Senate leaders to take up the Regulatory Accountability Act of 2017 (H.R. 5).

H.R. 5 would modernize the federal regulation process. It would increase transparency and input by affected citizens, and it would also require agencies to choose the least costly option unless a more expensive approach is needed in order to protect the public.

The House of Representatives voted 238-183 to approve The Regulatory Accountability Act, and the bill awaits action in the Senate.



HAVA/TIKAYHAN/THINKSTOCK

Congress Takes Steps to Repeal Health Care Law

In January, the House and Senate took the first step toward dismantling the Affordable Care Act (ACA) when Congress passed a budget resolution that provides a legislative path to repeal. Congressional committees are now writing legislation that would undo the law.

Although the budget reconciliation process will make repealing certain pieces of the law—such as tax provisions—easier to pass, other parts will need 60 votes in the Senate to move forward. These include insurance reforms and the health insurance exchanges.

At the same time, Congress is focusing on replacing ACA with a plan that centers on access to health insurance and lowering costs. Various ideas are under consideration, including expanded high-risk pools for people with pre-existing conditions, facilitating association health plans (AHPs) like the ACEC Life-Health Trust, allowing insurance to be purchased across state lines and reforming medical liability.

ACEC is working with Congress to support AHPs and to ensure that the ACA replacement provides affordable health insurance options for engineering firms and their employees.

ISSUES ON THE MOVE	WHAT'S NEXT
Infrastructure package	Congressional action in the spring
House passed regulatory reform	Senate action possible in March
Affordable Care Act repeal	Replacement components unveiled before summer

ACEC and Coalition Allies Seek to Limit Project Labor Agreements

ACEC and other construction industry allies are urging President Trump to eliminate current mandates on the use of Project Labor Agreements (PLAs) for federal projects through federal contracting.

Early in his first term, President Obama issued an executive order requiring federal projects in excess of \$25 million to use PLAs, which create a collective bargaining agreement with one or more labor organization that requires companies to recognize unions, use the union hiring hall to obtain workers and pay into multi-employer pension plans that nonunion employees are unlikely to access. This forces employers to pay “double benefits” into existing plans and union plans, and it also places firms opposed to these costly provisions at a significant competitive disadvantage. There are studies showing that PLA mandates increase the cost of construction from 12 to 18 percent when compared to non-PLA projects.

While ACEC was able to secure clarification in the final rule to exclude the engineering industry to ensure the independence of design professionals, the Council has continued to support efforts to eliminate PLAs to prevent potential conflicts with the various roles engineering firms play in project oversight, safety and performance.

The industry groups are calling on the new administration to rescind the executive order and prevent federal agencies from mandating PLAs as a condition for winning federal contracts.

There are studies showing that PLA mandates increase the cost of construction from 12 to 18 percent when compared to non-PLA projects

ACEC SUPPORTS ESTATE TAX REPEAL



TOM WILLIAMS/CONTRIBUTOR/GETTY IMAGES

Rep. Kristi Noem, R-S.D.

ACEC joined with a coalition of business organizations in support of legislation introduced by Sen. John Thune, R-S.D., and Rep. Kristi Noem, R-S.D., to eliminate the estate tax.

The Council has long supported eliminating the estate tax in order to preserve family-owned engineering firms and other businesses. Repeal of the estate tax is one of the provisions in the House Republican tax reform blueprint that was released last year.

Congress is expected to vote on tax reform this year, and ACEC will work with the House Ways and Means Committee to include estate tax repeal in the legislation.



BLOOMBERG/CONTRIBUTOR/GETTY IMAGES

Sen. John Thune, R-S.D.

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MILLION-DOLLAR MAGIC

Millennials, increased political awareness lift ACEC/PAC to its \$1 million fundraising goal

BY STACY COLLETT

There's something magic about the phrase "million-dollar PAC" in Washington's political circles, says incoming ACEC/PAC Chair Charles J. Gozdziwski, executive chairman, Hardesty & Hanover.

"When you have elected officials saying that your organization has a million-dollar PAC, we get a lot of people's attention," Gozdziwski says. "We don't have to knock on a lot of doors. They're coming to us to ask for help and listening to our issues."

ACEC/PAC raised \$1,010,000 last year to support federal candidates on a bipartisan basis who support the engineering industry's agenda in Congress. The 2016 total eclipsed the previous year's record contributions of \$982,000.

ACEC/PAC is currently the largest PAC in the design industry, having tripled in size over 10 years. It ranks among the top 3 percent of all PACS in the United States.

2016 ACEC/PAC Chair Christopher Robertson, who is vice president, Shannon & Wilson, Inc., credited another record-breaking year to a fundamental culture shift in the way Member Organizations and individual engineering professionals view their role in legislation and advocacy.

"Everybody has been working so hard on it for the last few years, and there's been a lot of education and conditioning," Robertson says. "In my office, when fall came around, one senior engineer asked me, 'Isn't this the time of year when you ask me for a PAC contribution?' Now you ring the bell, and they're ready."

PAC contributions continue to have a significant impact on issues facing the engineering industry. In November, 97 percent of the federal candidates ACEC supported won their election to the U.S. House or Senate. "If we can do that in every election, we can have an impact on all issues in the United States," Gozdziwski says. In 2017, ACEC could play a central role in President Trump's plan to allocate a billion dollars to the nation's infrastructure. "It's going to be more and more important for us to have a seat at the table," he adds.

ACEC spent nearly \$2 million on congressional candidates and committees in the 2015–2016 election cycle, an exponential increase from 2007–2008 when ACEC's disbursement budget totaled \$700,000 for the election cycle.

ACEC/PAC broke other records, as well, in the number of states making their individual fundraising goals and number of PAC contributors. Overall 41 states reached their contribution goals, up from the previous record of 38 in 2015. Total PAC donors also increased from 2,750 to 2,800.

Millennials and first-time contributors made a significant impact on 2016 donations, as 758 new contributors gave a total of \$131,500 during the calendar year.

FORMULA FOR SUCCESS

ACEC/Ohio raised a third of its donations from first-time donors this year and reached its fundraising goal for the first time in 10 years.

"We're making marvelous progress. More and more people are understanding the importance of the national PAC," says Thomas Mosure, ACEC/Ohio's PAC Champion. "We're building momentum with a refocus on getting people engaged at our regional meetings, on our board and all our committees."

ACEC/Ohio's formula for success includes expecting members on all boards and committees to contribute to the PAC and electing PAC committees at the start of the calendar year instead of in July, which is customary. "The problem was getting out of the gate," says Mosure, who is also president and CEO of MS Consultants, Inc. "This year, we started the campaign in January—that was a major benefit for us."

Mosure urges all ACEC members to get involved beyond simply donating to the PAC. "If they just pay their dues and that's it, they're not going to understand the small battles that we're winning all the time on their behalf," Mosure says. "Everybody derives the benefit of those few people that give their time."

ACEC/New Jersey reached its fundraising goal for the second year in a row, with key assistance from its Young Professionals Committee, comprised of about 20 engineers under the age of 40. The group helped



"When you have elected officials saying that your organization has a million-dollar PAC, we get a lot of people's attention."

CHARLES J. GOZDZIEWSKI
INCOMING
ACEC/PAC CHAIR



"Everybody has been working so hard on it for the last few years, and there's been a lot of education and conditioning."

CHRISTOPHER ROBERTSON
OUTGOING
ACEC/PAC CHAIR

expand New Jersey's contributor network and chaired a networking event. Other events throughout the year included golf outings and cocktail receptions with local legislators, says Glen Kartalis, ACEC/New Jersey PAC Champion.

Their efforts paid off as ACEC/New Jersey saw a 20 percent increase in new contributors. "We've also gotten tremendous support from each of our committee members," says Kartalis, who is also senior vice president at AECOM.

NEW YORK'S SUSTAINABLE PLAN

ACEC/New York reached its PAC goal for the third consecutive year. "I think we have a sustainable PAC campaign that can easily carry forward to the next PAC Champions," says Gozdziwski, who is New York's co-PAC Champion with Tom Cascino, vice president at AECOM.

Gozdziwski and Cascino took a divide-and-conquer approach to their 2016 PAC efforts. ACEC/New York's membership is scattered among eight regions, with about 60 percent of Member Firms residing in the New York City metropolitan area, Long Island and Westchester. Cascino took the lead in organizing fundraising efforts in upstate New York, while Gozdziwski championed the metro area.

What began as one or two events a few years ago has evolved into annual events in seven of eight regions. "We're looking to tailor the events to the geographic attractions in those regions," says Gozdziwski. A hockey night fundraiser was held in Western New York. Schenectady-area members were invited to a play and dinner. Hudson Valley and Long Island coordinated golf outings, and the New York metro area held a lunch and Broadway play event.

To increase participation in the PAC, "your leadership has to step up to understand it, be able to explain it and be part of the PAC giving," Gozdziwski says.

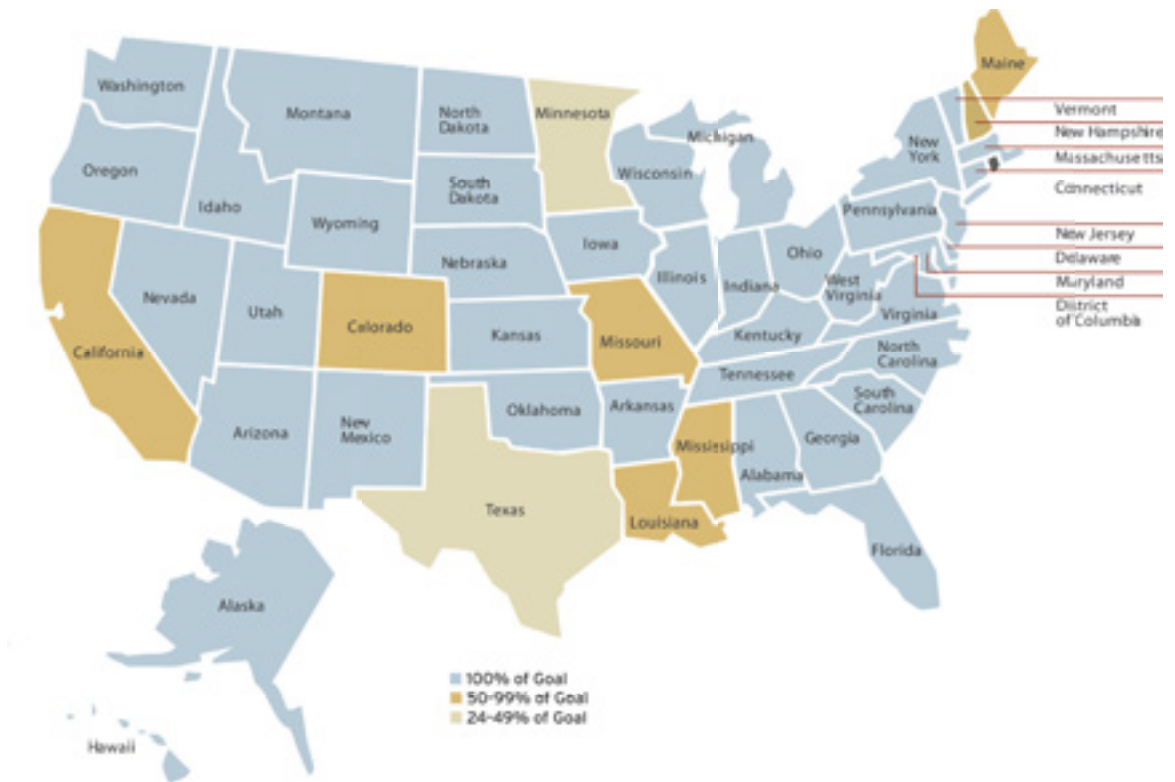
AHEAD OF THE PAC

ACEC/Illinois, which raised more overall ACEC/PAC funds than any state in the country, easily reached its goal again in 2016. "This has become part of our culture," says John O'Neill, one of three Illinois co-PAC Champions, along with Mark Harms, president of geotechnical services at SCI Engineering, Inc., and Charles "Chip" Craddock, executive vice president at Clark Dietz, Inc.

"Illinois has a long history of culturally operating under that model that these contributions are the currency of conversation," says O'Neill, who is also vice president and operations manager for Michael Baker International in Chicago. "It allows us to do things for our industry that make things more stable, expand our capabilities and, as a colleague likes to say, puts us at the table instead of on the menu."

Harms owes the state's fundraising success to the

2016 ACEC/PAC Map



committee's peer-to-peer contact for contributions, a clear expectation by committee members that involvement means participation in the PAC and statewide events, which included a drone raffle and a Bluetooth speaker system giveaway. "It's always some tech element that appeals to them—or it helps rationalize the contribution," Harms says.

He's also proud of the large Illinois contingent that attends ACEC's Annual Convention and Legislative Summit each spring. "You can see the relationships [with representatives] that are made at home when we go to D.C.," Harms says. "We're able to support our industry's objectives, and we make valuable visits [to our representatives] as part of that convention."

MAKING STRIDES

Several states made great strides toward their annual goals.

Texas raised more PAC funds than ever before in 2016 under the leadership of PAC co-Champions Keith Jackson, senior vice president of HNTB Corp., and Gary Raba, chairman and CEO of Raba Kistner, Inc.

Although the state reached only 25 percent of its \$88,000 goal, Jackson and Raba expect the state to do much better this year.

"I think there are real opportunities for us," says Raba. "We've already got a politically sophisticated group of involved members through our Texas Public Policy Committee." Adds Jackson, "We've just got to do a better job connecting the dots for our members and demonstrating that what happens in Washington, D.C. impacts our members every bit as much as what happens in Austin."

In Florida the ACEC/PAC effort was headed up

by co-Champions Andy Cummings of Connelly and Wicker in Jacksonville, Florida, and Emerging Leader Jason Webber of Kimley Horn in Delray Beach, Florida. Despite a fundraising target of more than \$47,000, Cummings and Webber led the state to goal

for the third straight year. They both agree a key reason for their success was the monthly conference calls with their PAC committee of about a dozen ACEC/Florida leaders, where they review progress and create expectations for the group. The committee led by example as everyone gave at least \$1,000 themselves, while Cummings gave at the Chairman's Club level (\$2,500) and Webber, despite being just 31 years old, became ACEC's 14th Capitol Club member (\$5,000 in a calendar year) for 2016.

Now that ACEC/PAC has reached \$1 million, Robertson hopes the organization will sustain that and continue to step up its performance in other ways, such as delivering contributions personally to legislators in their districts and with visits to Washington, D.C.

Robertson is especially pleased that ACEC recently passed an initiative that formally encourages Member Organizations to deliver at least some ACEC/PAC checks back in the state at local candidate events and with other ACEC members. Currently that target is 50 percent of the total PAC contribution to the candidate, but Robertson notes that "we probably are going to move that up a notch each year."

"When we make that personal connection, then we're much more able to get our message through to them." ■



"We're building momentum with a refocus on getting people engaged at our regional meetings, on our board and all our committees."

THOMAS MOSURE
ACEC/OHIO PAC
CHAMPION

Stacy Collett is a business and technology writer based in Chicago.

2016 ACEC/PAC HONOR ROLL

ACEC/PAC's record-breaking 2016 included all-time highs in the total number of PAC donors (2,800) and the number of states (41) reaching their fundraising goals. The following is a complete listing of 2016 donors.

*Means state made its 2016 PAC goal

Bold means PAC Champion(s) for the state

Bold Underlined designates 2016 Capitol Club Member (\$5,000 donor)

^ Designates 2016 Chairman's Club Member (\$2,500 donor)

+ Designates 2016 Millennium Club Member (\$1,000 donor)

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Bruce Altstaetter
Bob Barnett+
Kevin Blake
Renee Casillas
Jeremy Deal
Josh Dogan
Alain Gallet+
Mark McAdams
Jerry McCarley
H. Dean McClure
Jim Meads
Joseph Meads
Jay Morgan+
Guy O'Connor
Heather Page
John Smith
Steven Speaks+
Jason Walker
Forest Wilson
Harry Wilson
Jennifer Wilson

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Duane Anderson
Hans Arnett
Pete Bellezza
Dennis Berry
Bret Coburn
Royce Conlon
Floyd Damron+
Chris Darrah
Stafford Glashan
Elizabeth Greer
Tim Grier
Matt Hemry
Steven Kari
Gary Katsion
Chris Miller
Mark Musial
Kimberly Nielsen
Michael Pochop
William Preston
Mike Rabe+
Charles Riddle
Matthew Stone
Len Story
Michael Story
Willem Van Hemert
Timothy Vig
Paul Witt

ARIZONA*

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Alejandro Angel
Michael Bechtel
Bruce Beenken
Jennifer Bixby

Craig Bolze
Brent Borchers
Maria Brady
Janice Burnett^
Dawn Cartier+
Michael Chase
Donna Chiappini
John Conrad
Bill Cowdrey
Timothy Crall
Gregg Creaser
Chris D'Arcangelis
John Derr
Shameem Dewan
Kent Dibble
Jeffrey Erickson
Len Erie
Lauren Evans
William Ferris
P. Douglas Folk+
Fernando Galvez
Greg Gesicki
Chidambaram
Gnanasambanthan
Gregory Haggerty
Andrew Haines
Dan Hartig
Mark Hartig
Michael Hermann
Ron Hilgart
Sheina Hughes
Paul Iezzi
Fadi Jalaghi
Blake Johns
Michael Johnson
Lance Jones
Jay Koesters
Yung Koprowski
Bobby Lall+
Nguyen Lam
Douglas LaMont
Jim Lee
Julie Leid
Robert Lemke
Dan Levan
Bill Linck
Dan Marum
Douglas Mccants
Scott McKenzie
Chris Monrad
Philip Noonan
Ahmad Omais
Ramon Padilla
Kirk Pangus
Bruce Paton
Christopher Patton
Doug Peters
David Peterson+
Benjamin Porritt

Pierre Pretorius
Steven Rex
Darwin Reynolds
Kevin Roberts
Fran Sanborne
Scott Sayles
Michael Schiller
Scot Schlund
Paul Scott
Randy Simpson
Curtis Slagell
Andrew Smigielski
Christy Smigielski
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Chester Teaford
Rebecca Timmer
Stephen Todd
Stanley Turney
Linda Wallace
Paul Waung
Steven Wilcox
Chris Williams
Darrell Wilson
Mark Yalung

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Kevin Beaumont
Mike Burns
Matt Crafton
Braden Davidson
Andrew Dibble
Roger Dodds
Eddie Kho
Dev Krishnan
Raul Laborin
David LaVelle
Randolph Leptien
Henry Liang
Keith London+
David Long
William Lund
Sam Mansour
Thomas Martin
Jason Matson^
Lisa Maurath
Ryan McLean
Parag Mehta
Pearse Melvin
Ken Meme
Chris Mockus
John Moossazadeh
Samuel Muir
Blake Murillo
Andrew Nickerson
Eric Noel
Walter Okitsu
Richard O'Neill
Harvey Oslick

CALIFORNIA

Mousa Abbasi
Lee Abramson+
Shahnawaz Ahmad
Jeffrey Allen
Dawn Antonucci
Gary Antonucci
Roger Ball+
Thomas Blackburn+
Jonathan Blanchard
Gene Bougdanos
David Caneer
Ryan Carlson
Arvin Chaudhary
Mike Cooper
Garry De Young
Travis Deane
Robert DeWitt
Christopher Diaz
Brad Diede
Donald Druse
Mary Erchul^
Arash Erfani
Allen Evans
George Fares+
Steve Greenfield
Ralph Guida^
Paul Guptill
Michael Hartley
Ted Hopkins
Justin Kempton
David Kennedy+
Francis Kennedy
Eddie Kho
Dev Krishnan
Raul Laborin
David LaVelle
Randolph Leptien
Henry Liang
Keith London+
David Long
William Lund
Sam Mansour
Thomas Martin
Jason Matson^
Lisa Maurath
Ryan McLean
Parag Mehta
Pearse Melvin
Ken Meme
Chris Mockus
John Moossazadeh
Samuel Muir
Blake Murillo
Andrew Nickerson
Eric Noel
Walter Okitsu
Richard O'Neill
Harvey Oslick

Jason Paul
Lisa Penna
Kevin Peterson+
Chad Phillips
Bruce Presser
Richard Prust
Timothy Psomas
Lenny Reidling
Dana Remington
Mark Rodgers
Steven Sanders
Robert Schlesinger+
Michael Sheehy
Clifford Simental
Christopher Squires
Melvin Sukow
Aundrea Tirapelle
Edgar Torres
Robert Torres
Stephanie Wagner^
William Wagner+
Jeff Walker
Kurt Yoshii
Lydia Zabrycki
John Zumwalt

COLORADO

Andrew Amend
Matthew Andrews
Julie Ann Dill
Thomas Anzia
Jennifer Ashworth
Todd Bechtel
Peter Binney
Dean Bradley
Gary Brierley
Allan Brown
Matthew Brown
Holly Buck
James Cable
Ralph Christie
Susan Christie
Nancy Clanton
John Clarke
Scott Colvin
Dave DiFulvio
Peter Dixon
Brad Doyle
Charles Dwyer
Scott Epstein
Lauren Evans^
Christopher Fasching
Robert Felsburg
David Gaboury+
Thor Gjelsteen
Heidi Gordon
William Green
Mark Hamouz

Michelle Hansen
Joseph Hart
Marvinetta Hartwig+
Tammy Heffron
Richard Hepworth
William Hoffmann
David Huelskamp^
Richard Huwa
David Kast
Kurt Kellogg
Mark Kopatz
Jeffrey Kullman
Narender Kumar
Shannon Lucio
Daniel Markham
Michael Martin
David Merritt
Peter Monroe^
John Muscatell
Brian Myers
James Ness
William Newell
Brian Partington
Steven Pawlak
Wyatt Popp
Robert Refvem+
Marilen Reimer
Richard Romig
R. Gregory Roush+
Jeanne Sharps
Christopher Sherry
William Siegel
Elizabeth Stolfus+
Elliot Sulsy
Jeff Temple
Gregg Ten Eyck+
Karlene Thomas
Michael Unger
Ronald Vasquez
Mark Vessely
Matthew Wardlow
Craig Watts
Janet Williams
Shan-Tai Yeh
Jenny Young

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H. James Boice
John Braccio
Paul Brady+
James Byrnes
James Falvey
John Foster
James Fuda+
Gerald Furrier
Gerald Gerletz
John Gilmore

Joseph Hallisey
George Iskra
Abul Islam
George Jacobs+
Raymond Janeiro
Craig Johnson
Vahid Karimi
Susan Labas
Michael Loneragan
Michael McCarthy
Paul McGuinness
Dean McLearn
James Messmore
Tony Moretti
Michael Patenaude
Matthew Robillaud
Paul Schmidt
James Sherwonit
Sandra Stavola
Paul Taormina
Theodore Von
Roseninge
Christopher Wester
Ray Yakaitis
Rob Yirigian

DELAWARE*

Michael Angelo+
Jeffrey Bross
Michael Burcham
David DuPlessis+
Ryan Flickinger
Ted Januszka+
Stephen Johns
Jennifer Laning
Robert McCoy
Alex Meitzler
Scott Rathfon+
J. Michael Riemann
Ted Williams

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Kumar Allady+
Bruce Altstaetter
Leonard Arnold
John Atz+
Rick Baldocchi+
Douglas Barkley
Russell Barnes+
Tom Barry
Donaldson Barton
Robert Behar+
Timothy Brodeur+
Rick Busche
Gail Callaway
David Campbell
Jay Casper
Jordan Caviggia
Wayne Chalfoux
John Coombe+
Andrew Cummings^
Kimberlee DeBosier+
Joseph Debs+
Paul D'Huyvetter
Fermin Diaz
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Angelina Fairchild
Stanley Ferreira
Forrest Foshee
Michael Garau
Charles Geer^
Scott Gilner
Terrance Glunt
Scott Gombar+

Michael Greene+
John Grow+
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Judith Hayden
Myron Hayden
Christopher Heggen
Shahin Hekmat+
Charlie Herndon
Jason Hill
Samantha Hobbs
David Hoff
James Horton
George Huddleston
Robert Hughes
Jon Hull
J.W. Hunter
Jerry Ingram
Brian Kientz
Raj Krishnasamy+
Matthew Landschoot
Bryan Lawson
Antonio Mahfoud+
Dion Marsham
Stephen McGucken
Antoinette Meskel
Mark Mongeau
Aaron Moon
Peter Moore+
Marwan Mufleh
Gary Nadeau
Randall Neuhaus
Leila Nodarse+
Leonardo Offredi
John Padavich
Brooks Peed+
Carlos Penin^
Dow Peters
Jason Peterson
Mark Prochak
Mark Puckett
Carlos Ramirez
Stewart Robertson
Kevin Schanen
Ann Schiola
Michael Schwartz
Ido Shimony
Larry Smith
Jose Sotomayor
James Sumislaski
Shannon Sweitzer
Richard Temple+
Ralph Verrastro
Ken Vogel
David Walthall
Jason Webber
Rick Welch
Thomas Welch
William Wilson
Russell Yaffee

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Kris Allegood
Bruce Altstaetter
Randall Bagwell
John Barlow
Kent Black
Randall Booker
Jody Braswell
Will Cantrell
John Cassidy
Tom Cetti
Allen Chestnut
Thomas Crochet+



ACEC/Illinois members hosted a fundraiser for Rep. Cheryl Bustos, D-Ill., (center) last summer. Also pictured, from left to right: Pedro Cevallos, Primera; Peter Mesha, Wright Co; ACEC/Illinois Executive Director Dave Bender; Dipak Shah, Rubinos; Charles Stenzel, TranSystems; Thomas Hein, HDR; Kim Robinson, ISPE; Gerald Helmsouth, Clorba; Dan Meckes, Crawford, Murphy & Tilly; Brian Welker, Crawford, Murphy & Tilly; and Brian Umbright, exp Global.

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Jason Dickerson
Warren Dimsdale
Susan Earney
Richard Edinger
Lee Edmond
Linda Edwards
Eldon Evans
Charles Ezelle+
Chris Farnie
Forrest Foshee
Larry Genn
Charlie George
Erik Grandowski
Lorraine Green
Larry Gregory
Richard Gurney
Adolfo Guzman
Jeff Halliburton
Chris Haney
Mark Hanson
Justin Harbeson
John Heath+
Mark Hellerstedt
J. Tyler Hewitt
Laury Hodges
Carl Hofstadter+
Ken Houseman
Thomas Hruby
Hunter Hyde
Rob Jacqueline
Marc Johnston
Doyle Kelley
Jim Killingsworth
W. Allen Krivsky+
Robert Lewis+
James Littlejohn
Stan Livingston
J. Ellen Long+
Joseph Macrina+
Mario Macrina
Mike Magahey
Mike Marcus
Randy Martin+
Samuel McCachern^
Wayne McDonald
Kevin McOmber+
Shaugh McReynolds
Emily Meador
Jeff Meier
Joseph Mercer
David Miller
Scott Monson
Peter Oram
Ron Osterloh

Tony Parker
Michael Planer+
Al Pond
Elizabeth Porter
Carolina Pria
Phillip Ravotti
Roseana Richards
Brad Robinson
Darrell Rochester^
Barry Roziewski
Brian Schiessle
Bobby Shayan
Diwan Singla
Santanu Sinharoy
Bill Sloan
Angela Snyder
Nick Stanley
Michael Sullivan
Daniel Taylor
William Toole+
Timothy Van Echo
Kenneth Warren
J. Stephen Willenborg
Mark Willey
Edgar Williams
Doris Willmer+
Deborah Wilson
Ashley Wolverton
Jerry Wolverton
David Wright
Taylor Wright

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Terrance Arashiro
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William Bow^
John Chen
Liana Choy
Lauren Evans
Matthew Fujioka
Lester Fukuda
Tracy Fukuda
Aaron Hamada
Ken Hayashida
William Hollingsworth
Beverly Ishii-Nakayama
Jeff Kalani
Kyle Kaneshiro
Ronald Katahara
John Katahira+
Ken Kawahara
Susan Kawata+
Robin Lim

Bryan Lum
Janice Marsters+
Garret Masuda
Paul Matsuda
Corey Matsuoka+
Russell Mori
Teri Moritomo
June Nakamura
Ivan Nakatsuka
Ardalan Nikou
Jon Nishimura+
Lennox Nishimura+
Sheryl Nojima
Gary Okamoto
Gerald Seki
Sean Sugai
Daniel Tanigawa
Dennis Toba
Ginny Wright+
Roy Yamashiro
David Yogi

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Heather Carroll
Tracy Ellwein
Jon Gellings
Timothy Haener
Jack Hand+
Rex Hansen
Vance Henry
Richard Jacobson
Brandon Keller
Rod Linja
Dave Mitchell
James Porter^
John Ringert
William Russell
Lynn Schloesser+
Pete Szobonya
Cameron Waite
Justin Walker
Jeff Werner

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Marti Ahlgren
Edmond Alizadeh
John Ambrose
David Andalco
Eric Bachman+
Raspal Bajwa
Gary Baker
Matthew Baldwin
Jeffery Ball

Rick Barfield
Pat Barker
Timothy Barry
William Bartolucci
Rick Beal
Philip Beer
Dave Bender+
Jennifer Bennett
Reginald Benton
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James Bishop
David Borkovec
Geri Boyer+
Elizabeth Braband
Brooks Brestal
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Brian Buchheit
Jeremy Buening
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Thomas Burke
David Burroughs
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Patrick Cassity
David Castillo
Daniel Cecchi+
David Claassen
John Clark
John Clinnin
Edward Coffey
Ted Coffey
Michael Collins
Thomas Collins
Mary Coombe Bloxdorf
Charles Craddock^
Joseph Crowe
Abdul Dahhan
Ilene Dailey
Darryl Dawson
Ramon Dela Cruz
Roger Di Giulio
Steven Donahue+
Emily Druckery
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Karen Dvorsky
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 Douglas Hansen
 Stan Hansen
 Scott Harding
Mark Harms+
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 Brian McPartlin
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 Scott Rodseth
 Eric Rose
 Timothy Ross
 James Roth
 John Rowlette
 Andrew Runde
 Donald Rutledge+
 Mohammed Saleem+
 Bradley Sanderson
 Brett Sauter
 Greg Schaapveld
 Bruce Schopp+
 Jerrel Shaffer
 Dipak Shah
 Ahsan Siddiqi
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 Harvind Singh
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 Erica Spolar
 Anand Sridhar
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 Karen Stephens
 David Tallman
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Roland Thouvenot
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 Cathy Valente
 Jonathan Vana
 Paul Vanduyne
 Joesph Vondra
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 Richard Walther
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 Tony Wolff
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 R. Murty Yedavalli
 Mary Young
 Mei Zhu

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 John Brand^
 Keith Bryant
 Marvin Burns
 Cash Canfield+
 Walter Charles
 Mark Chmeliwskyj
 Stephen Christian
 Michael Cline
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 Cheryl Cunningham+
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 Michael DeVoy
 Jeff DeWitt
 Dreama Doolittle
 Elizabeth Dwyre
 Mark Eckert
 Michael Eichenauer
 Ken Fleetwood
 Gabriel Franco
 Chris Gale
 David Garwood
 Sherly George
 Timothy George
 Stephen Goddard
 Robert Gray
 Steven Gress
 Michael Guzik
 William Hall

Gregory Henneke^
 Shari Hinds
 Mike Hinton+
 Gregory Holden
 Robert Holden
 Scott Hornsby
 Paul Hummel
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 Ed Jolliffe
 Steven Jones
 Thomas Karis
 James Kaufman
 Mak Knowles
 Philip Kuntz
 Gary Ladd
 David Lahey
 Sheena Lee
 Kevin Loiselle
 James Longest^
 Thomas Longest^
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 David Matson
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 M. David Mohler
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 Grant Niemeyer
 Michael Obergfell
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 Steve Osborn
 Chester Parsons
 Sanjay Patel
 Hans Peterson
 Gary Pohl+
 Christopher Pope
 Lise Powers
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 Lori Rushin
 Todd Schultheis
 Ryan Scott
 Paul Shaffer
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 Brian Stanoch
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 Scott Sutton
 Shelby Swango
 Abe Swidan+
 Bradley Watson
 Martin Wessler
 Chris Wheatley
 Michael Wigger
 Susan Wood
 Pattie Yount

IOWA*

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 W. Ken Beck
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 Steven Bradley
 Bryan Bross
 Milton Butzke
 Carrie Canning
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 Fouad Daoud
 Michael Davis
 David Dougherty
 Craig Erickson
 Timothy Fehr

John Gade
 Andre Gallet
 Eric Hendrickson
 Mark Henthorn
 Keith Hobson
 Greg Kanz
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 David Logemann
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 Andrew Moats
David Moeller
 Timothy Monson
 Patrick Mullin
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 George Parris
 Paul Parry
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 Victor Ritter
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 David Scott
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 Steven Sweet
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 Steve Van Dyke
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 Jacob Young

KANSAS*

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 Michael Berry
 Joseph Bichler
 Joseph Brand
 Ryan Brantfort
 Don Breit
 Joseph Caldwell
 Paul Clark
 Jason Davis
 Mike DeBacker
 Michael DeMent+
 Douglas Doerr
 Troy Eisenbraun
 Wayne Feurborn
 Ryan Fleming
 Doran Geise
 Tyler Glissman
 Jon Halbgewachs
 Leslie Hamilton
 Jeff Hancock
 Kenneth Hancock
 Bruce Hattig
 Michael Hess
Kevin Honomichi
 Gretchen Ivy
 Mark Johnston
 Kenzil Lynn
 Joseph Marsh
 Michael McKenna
 Jeff McKerrrow
 Matt McQuality
 Clarence Munsch
 David Nolte
 Mike Odrowski
 Tom Orazem

Chris Price
 Clinton Robinson+
 Timothy Ross+
 Richard Schlitt
 Clifton Speegle
 Kip Strauss
 Simon Sun
 Kelly Sunderland
 Joe Surmeier
 Keith Warta
 Mark Wentzel
 Richard Worrel
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KENTUCKY*

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 Ben Edelen
 Ben Fister
 Ron Gilkerson
 Randall Gnaou
 Clint Goodin+
 E. Brad Gregory
 Leslie Haney
 Harvey Helm
 Robert Hench
 Joseph Henry
 James Hilborn
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 David Lindeman
 Mark Litkenhus+
 William Maynard
 Brad Montgomery+
 Rob Mullins
 Ben Quinn+
 John Schneider+
 Randolph Scott+
 Robert Smallwood
 Mark Sneve
 Shawn Washer+
Karen Wood+

LOUISIANA

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 Lawrence Blanchette
 Sam Briuglio
 Andree Cortez
 Andrew Craig
 David Dupre
 Kurt Evans
 Sergio Girau
 D. Brad Graff
 Joe Harman
 Ralph Junius^
 Jerry Lazenby
James Ledet+
 David Leslie
 Michael McGaugh
 Alison Michel
 Daniel Mobley
 Anthony Mumphy
 Raymond Reaux
 Steven Robertson
 Lynne Roussel
 Matthew Sacks
 Robert Schmidt
 Rick Shread+
Kenneth Smith
 William Smith+
 Janet Tomeny

ACEC spent nearly \$2 million on congressional candidates and committees in the 2015-2016 election cycle

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Arthur Bolduc
Timothy Boyce
Richard Davee
Peggy Duval
John Kenney
Evan Lowell
Rick McCarthy
William McCormick
Owens McCullough
Douglas McKeown
Dale Mitchell
John Nelson+
Theresa Patten
Eugene Shephard
Ryan Wingard

MARYLAND*

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Matt Allen
W. Arthur Barrett
Nathan Beil
Ryan Bellatti
James Blake
David Borusiewicz
Peter Bourne
Kenneth Briggs
Daniel Cheng
Debra Cohen Gordon
Belinda Connor
David Dee
James Deriu
Kenneth Derrenbacher
Kenneth Dill
Jim Dorsey
Steve Drumm
Mark Dumler
Art Ebersberger
Michael Ebner
Harvey Floyd+
John Furman
Kunal Gangopadhyay
Adam Gardner
Bruce Gartner
Malini Glueck
Douglas Goldsmith
Christopher Griffith
Billie Hall
Steven Hawtof
Michael Hild
Barbara Hoage
John Hudacek
Rob Hudson
Scott Hursh
Jerry Jannetti
Tammy Jones
Dana Knight+
Christine Koski
Leon Kriebel
Charles Kumi
Thomasz Labuda
Michael Lambert
Paul Lee
Marco Legaluppi
William Lyman
Rick MacInnes
Donald MacLean
Michael Maguire
Joseph Makar
Peter Maldini
Antonio Mawry
Jeffery McBride
Sean McCone

Gary Miller
Fred Mirmiran
John Moeller
Thomas Mohler
Brian Morgan
Stacy Morin
Chirantan
Mukhopadhyay
Michael Myers
Paul Navarro
Terry Neimeyer
Gregg Noha
John Nolan
Christopher Overcash
Richard Pagano
Harish Patel
Melinda Peters
Charles Phillips
Vince Pielli
Nadia Pimentel
David Raymond+
David Reese
Kerry Rexroad
Scott Reynolds
Cathy Ritter
Thomas Ritter
Stuart Robinson
Ronald Rye
Eric Sender
James Shumaker
Vic Siaurusaitis
Manpreet Sidhu
Brian Skimmons
William Smith
Richard Smulovitz
Laura Soprano
Thomas Sprehe
Harry Stephen
Raymond Streib
Stuart Taub
Dan Voeltner
Frank Waeche
Michael Wiercinski
George Wirth
Timothy Wolfe

MASSACHUSETTS*

William Ashworth
Dennis Baker
Mark Bartlett+
David Bohn
Sandra Brock
Lisa Brothers+
Matt Card
Cynthia Carleo
Michael Carragher
David Chappell
Chelsea Christenson
Dennis Coffey
David Cohen
Dawn Connelly
Deborah Danik
Ken DeCosta
Joan DeLorey
Lisa Dolan
Judy Eburn
Emad Elsakka
James Falvey
Nicola Ferzacca
Edward Fitzmeyer
Heather Ford
Joseph Freeman
Ileen Gladstone
Abbie Goodman
Joel Goodmonson+

Brett Gough
Peter Grabowski
Robin Greenleaf+
Dean Groves
William Hadge
Mary Hall
Kevin Hanley
William Hardy
David Hayes
Mike Herlihy
Francis Hoey
Jennifer Howe
Ko Ishikura
Abdelmadjid Lahlaf
Francis Leathers+
Evan Lowell
Jared Maxwell
Filomena Maybury
Scott Miller
Colleen Moore
Judith Nitsch
David Pinsky
Marc Richards
Michael Scipione
Elizabeth Tyminski
Brian Vaillancourt
David Vivilechia
Michael Walsh
Mark Walsh-Cooke+
Susan Wisler
Paul Yarossi+
David Young

METRO

WASHINGTON*

George Anastasi
Mary Ann Emely
Brian Banks
Katherine Bohny
Maureen Brown
Elizabeth Burkhardt+
Hugh Cannon
Pedro Capestany
Theresa Christanti
Alan Crockett
Jason Davis
Barry Doyle
Diana Dunham
Virginia Finley
Andrew Fort
Katie Goodman
Michael Grimes
Matthew Grzelak
Leo Hoch
Regina Hockaday
James Hoffman
Grace Hui
Jerry Kavadias
Andrea Keeney
Charles Kim
Manish Kothari+
Barry Lucas
Kate Lucey
La'Creshea Makonnen
Matthew Martin
Deirdre McKenna
Katharine Mottley
Kathleen Murphy
Rachael Ng
Michael Pramstaller
Eric Rehswoldt
Matthew Reiffer
Michael Retton+
Robert Rosenber
Jessica Salmoiraghi



ACEC/Ohio members hosted a fundraiser for Sen. Rob Portman, R-Ohio, last fall. From left to right: Peter Lee, Resource International; Fred Seling, Engineering Associates; Sen. Portman; Chris Preto, Mott MacDonald; and Nabil Farah, TranSystems.



ACEC/New York members meet with Rep. Dan Donovan, R-N.Y. From left to right: ACEC/N.Y. President Jay Simon; Rep. Donovan; Charles Gozdziwski, Hardesty & Hanover; and Angel Vazquez, ACEC/N.Y.

Maria Schaff
Leonard Schneider
Donald Sherman
Rizwan Siddiqi
Simon Simon
Gregg Spagnolo+
Mark Steiner
Heather Talbert
Marie Ternieden
Jessica Torrero
Kathleen Walsh
Mary Wiedorfer
John Woods+

MICHIGAN*

Roland Alix
Eric Barden
Jeffrey Bartlett
Kendall Beck
Scott Buchholz
Richard Burns
James Canham
Michael Colvin
John Condie
Christopher Cook
Michael Cooper
Christopher Cruickshank
Robert Czachorski
Matt Davis
Phillip Davis
Kamal Deddeh
John DeVries
Don DeVries
Kent Early
Ron Engel

Amy Feindt
Lawrence Fleis
Daniel Frendall+
Victor Frendo
Lawrence Gilbert
William Gipson
Thomas Gray
Cheryl Gregory
Rhett Gronevelt
Elizabeth Harding
Noel Hargrave-Thomas
David Harvey
John Hiltz
Kevin Hoppe
Eric Hugger
Tricia Huneke+
Victor Judnic
Timothy Juidici
Vytautas Kaunelis
Sean Kelley
John Kosnak
Jonathan Kramer
Mark Kramer+
William Laditka
Christopher Lamus
Brian Lieberg
Mark Loch
Brenda
Longman-Escamilla
Jie Luo
Michael MacDonald
Barbara Marczak
Gary Markstrom
Kenneth Mazurek
Andrew McCune+
Timothy McNamara
Dustin Miller

Danial Mitchell
Bhushan Modi
Jon Moxey
Jayson Nault
Stephen Nichols
Michael Nowicki
Debra Osuch
Leanne Panduren
Stephen Pangori
Philip Porte
Mark Prein
Jeff Pugh
Vicki Putala
Kyle Ramakers
Gnanadesikan
Ramanujam
Matthew Rathasack
Robert Rayl
Brian Rice
Todd Richter
Charles Roarty
Jacqueline Roehl
Doug Sabin
Roger Safford
Donald Scherzer
Jeffrey Schumaker
H. Blair Selover
Thomas Sereseroz
Craig Shumaker
James Smalligan
Mark Smolinski
Joseph Sopoliga
John Stadnicar
James Susan
Keith Swaffar
Amy Trahey
Jesse Van De Creek

Brad Venman
Matt Webb
Michael Weingartz
Thomas Wheat
Michael Wiercinski
Bruce Wilberding
Robert Wilcox
Kenneth Wiley
Hosam Yaldo

MINNESOTA

John Ahern
Mike Anders
Greg Barlow
Brett Burfeind
Jon Carlson
Peter Carlson
Kristine Cassidy
Douglas Cooley
Jacqueline Corkle
Kevin Cullen
Paul Danielson
William Deitner
Mark Dierling
John Dillingham+
Mitzi Dillingham
Bret Farmer
Bruce Firkins
Randall Geerdes
Dean Gratz
Robert Green
David Hersh
Ken Holte
Jim Horn
James Hoschka
Jason Hoskins
Tom Jensen
George Klumpke
Melissa Langowski
Daniel Larson
Leslee LeRoux
Tom Losey
Richard Lucio
Patrick McGraw
David Montebello
Robert Moore
Holly Newman
Bridget Osborn
David Oxley
Thomas Parker
Brent Paulsen
Dennis Postler
Abigail Rieckman
Matt Ruble
Sirish Samba
Glenn Schreiner
Thomas Stoneburner
Terrance Swor
Barbara Szopinski
Avedis Toghramdian
Douglas Trangsrud
Andrew Wagstrom
Nicole Wilson

MISSISSIPPI

Judy Adams
Randy Ahlrich
Dax Alexander
Jeffrey Allen
Hunter Arnold
David Bowman
M. Scott Burge
William Burle
Ronald Cassada
Michael Corkern
Marty Crowder
Edwin Dedeaux
W. David Dennis
Robert Diamond
Jeff Dungan
Robert Eley
Gregory Gearhart
Kenneth Geno
Jeff Graves
Carey Hardin
Charles Kaiser III
Paul King
Darrell Martinek
Elmore Moody
James Morrison
Sergio Pecori
Jon Rice
Mark Seymour
Richard Simon
Stanley Spradling
Tom Wagner
Kyle Wallace
Charles Williford
Ottis Wolverton

MISSOURI

Edmond Alizadeh [^]
Marc Alper
Michael Carroll
Mike DeBacker+
David Diestelkamp
Robert Goodwillie
Thomas Gredell
Joseph Hagerty+
Michael Herleth
Gene Hinshaw
Mark Jansen
Vicki LaRose
Kristen Leathers
Daniel Meckes [^]
Linda Moen+
Edward Mulcahy
Clarence Munsch
Steve Prange
Steve Rhoades
Timothy Ross
Linda Rottinghaus
Ty Sander
Steve Schmidt
Charles Touzinsky
Robert Ubben
Kevin Wallace

MONTANA*

Carl Anderson
Christopher Anderson
Scott Bell
Mark Brooke
Lee Cammack
Nancy Cormier
Rick Donaldson
Letha Ebel
Matt Ekstrom
Alan Erickson
Phill Forbes
Gunnar Getchell
Casey Hanson
Chad Hanson
Tom Heinecke
Wade Irion
Debbie Johnston
Ryan Jones
Kurt Keith
William Lloyd
Donald McCammon
Amanda McInnis
Jason Mercer
Robert Morrison
Scott Murphy
Craig Nowak
Craig Pozega
Darryl Rensmon
Ken Salo
Jack Schunke
Shaun Shea
John Shoff
Gary Simonich
Byron Stahly
Denice Street

NEBRASKA*

Kyle Anderson
Terry Atkins
Ryan Beckman
Robert Brigham
Michael Gerdes
Mike Gorman
Shane Hennessey
Tyler Hevlin
Douglas Holle
Kristina Horn
Craig Hunter
Steve Kathol
Jackie McCullough
Matt McFadden
Michael McMeekin
Stephen Moffitt
Thomas Nussrallah
Eric Obert
Virgil Oligmueller
John Olsson
Steven Parr
Leslie Peterson
Mike Piernicky
Kevin Power
Nancy Pridal
Daryoush Razavian

Jeffery Sockel+
Brad Strittmatter
Tom Svoboda
Daniel Thiele
Matthew Tondl
Mark Westergard
Amy Zlotzky

NEVADA*

Ken Akeret
Shannon Ahartz
Ken Bosma
Larry Carroll
James Caviola
Michael Colety
Dan De Battista
Harshal Desai
Gregory DeSart+
James Duddleston
Ruedy Edgington
David Frohnen
Kurt Goebel
Kenneth Hanifan
Gene Krametbauer
Ken Lambert
Scott Plummer
Dave Salter
Linda Shields
Ben Sprague

NEW

HAMPSHIRE

Christopher Bean
Daniel Bisson
Pete Clary
Barret Cole
William Davidson
Joseph Ducharme, Jr.
James Errico
Robert Furey
Martin Kennedy
Peter King
Ken Koornneef
Alex Koutroubas
Chris Mulleavey
Abhijit Nobis
Frank O'Callaghan
Michael Penney
Matthew Poirier
Mark Zydel

NEW JERSEY*

Nickitas Alexiades
Dean Angelakos
Kashfia Billah
Edward Brady
Michael Brescia
William Brooks
Thomas Costello
Beth DeAngelo
Nicholas Denichilo+
Stephen Dilts
Samuel Donelson
James Dziedziak
Bruce Easterly
Gary Etter
Joseph Fiordaliso
Kenneth Fulmer
Jody Herkloz
Thomas Howell+
Craig Johnson
Gary Johnson
Gregory Johnson

Patrick Kane
Glen Kartalis

George Kelley
Peter Kuhne
Jon Livingston
John Maiorana
Arif Malick
Nicholas Masucci
Robert McAnally
Michael McDonnell
William McGarrigle
Richard McGuire
Bernard McNeilly
Lisette Miquel
Samir Mody
Gill Mosseri
Matthew Murello+
Sanjay Naik+
Tom Napolitano
Patrick Natale
William Ommundsen
Anand Paluri
Hina Patel
Joseph Pomante
Marshall Robert
Russell Saputo
M. Kamal Shahid+
Sterling Smith
Kaz Tabrizi
Richard Tangel
Christine Tiernan
H. Ali Vaezi
James Weinstein

NEW MEXICO*

Reid Allan
Chris Baca
Peter Brakenhoff
William Brewster
Brian Burnett+
Todd Burt
Barbara Crockett
David Daffron
Michael Dexter
Peter Fant
Rebecca Fink
Eric Froberg
James Heimann
Debra Hicks+
Paul Karas
Clay Koontz
Conrad Ley
Michael Malloy
Jennifer Martinek-House
David Maxwell
Derek Meier
Doug Mize
Jerry Paz
Scott Perkins
Tod Phinney
Andrew Robertson
Julie Samora
James Smith
Dawn Tibbetts
Karl Tonander
Scott Verhines
David Wilson
Sean Wolfe

NEW YORK*

Husam Ahmad+
Joseph Amato [^]
Michael Anderson
Dean Angelakos

Anthony Arbore
Erich Arcement
Robert Badger
John Balison
Laura Barca
Paul Bello
Michelle Bodewes
Christopher Bond+
Paul Boyce
Cristina Brosio
Dolores Buckenberger
Serge Budzyn
Natasha Burns
Karen Carling
M. Denise Carter
Robert Cartwright
Thomas Cascino+
Joseph Celentano
Deborah Chase
Andrew Cancia
Ann Clark
Maureen Clegg
Gregory Cummings
John Cunningham
Raymond Daddazio
Jamie Davis
Tina Deale
Beth DeAngelo
Frank Delsignore
Katherine Dewkett
Stephen Dolson
Julie D'Orazio
Daniel Duprey+
Lee Ecker
Kenneth Ellsworth
Joseph Engels
Robert Eschbacher
Cletus Ezenwa
Richard Fischer
Will Flores
Charles Franzese
Hamilton Garney
Thomas Garrett
Robert Goossen
William Gorton
Brett Gough
Charles Gozdziowski [^]
Paul Grosser+
D. Guglielmo
Keith Harlock
Steven Hearl
Jitendra Hirani
John Hubert
Daniel Hurley
Greg Hutter
Anoosheh Jannesari
Shelly Johnston
Kathy Kaefter Smith
Mark Kastner
Patrick Kenneally+
Dennis Kennelly
James Krapf
Mark Laistner
Mark Lang+
Christopher Latreille
James Laurita
Erica Lavigne
Michael Leydecker
Bruce Liker
John Liptak
Herbert Litts
Gary Loesch
Jeffrey Lookup+
Patrick Lynch
Orrin MacMurray [^]

ACEC/PAC is currently the largest PAC in the design industry, having tripled in size over 10 years. It ranks among the top 3 percent of all PACS in the United States

Michael Mangione
 Charlie Manning
 Jessica Mariani
 Richard Maxwell
 Mark McAnany[^]
 Bill McCarthy⁺
 William McCormick
 James McDuffee
 Richard McFadden⁺
 Thomas McLaughlin
 Donald McMahon
 Bernard McNeilly
 Walter Mehl
 Martin Meriwether
 Jennifer Michniewicz
 Brian Miller
 Kevin Mulligan
 Mia Nadasky
 Hannah O'Grady
 Christopher Paolini
 Fotios Papamichael
 Jennifer Pawenski
 Mark Pawlick
 Richard Perrin
 Richard Peters
 Nicholas Pinto⁺
 Charles Pisano
 Jason Pitingaro
 Om Popli
 Gina Potfora
 Robert Radley
 Mike Randall
 Jim Richert
 Milo Rivero[^]
 John Robson⁺
 Joe Rock
 Karl Rohde
 Lorenzo Rotoli
 Mary-Beth Rumble
 Lee Sacker⁺
 Andrew Sandor
 Roseann Schmid
 Matthew Schooley⁺
 Martin Schwartzberg⁺
 Mike Shamma
 Linda Shumaker⁺
 Mitch Simpler[^]
 Jay Simson[^]
 Chris Sklavounakis
 Glenn Smith
 Michael Smith
 Scott Smith
 James Stewart
 Mark Stier
 Richard Straut
 David Tanenbaum
 Susan Tangel
 Lina Telese
 Mark Torre
 Joseph Tortorella
 John Trimble⁺
 Mark Tytko
 Richard Venvertloh
 Mike Villarosa
 Joseph Viola
 Edwin Vopelak
 Timothy Walck
 Campbell Wallace
 James Walrath
 John Waltz
 Patrick Waterman

**NORTH
 CAROLINA***
 Andy Abernathy

Richard Adams
 Bruce Altstaetter
 Charles Archer
 Laurie Arensdorf
 James Attaway
 Julie Beauvais
 Susan Bostian
 Eddie Brock
 Walter Brock
 Stephen Browde
 Keith Brown
 Adam Browning
 Michael Calhoun
 Brian Cannella
 Matthew Carslaw
 Richard Catlin
 Dan Caton
 Donald Chandler⁺
 Derek Clyburn⁺
 Trenton Cormier
 Lori Crossland
 Joshua Dalton
 Justine D'Andrea
 Matthew Daves
 Colin Davis
 Jeff Dayton
 Jeffrey Douglas
 Tre Dugal
 Valoree Eikinas
 Brian Elam
 Phyllis Elikai
 Charles Flowe
 Tyler Fowler
 Michael Frawley
 James Gellenthin
 Glenda Gibson
 William Gilmore
 Brian Glidewell
 Stephen Greene
 Stephanie Hachem⁺
Gary Hartong
 Dwain Hathaway
 David Hawkins
 Jill Heath
 Scott Hinesley⁺
 Phillip Hobbs
 Allen Hodges
 Bill Hood⁺
Montell Irvin⁺
 Morris Israelnaim
 Paul Jacob
 John Jamison
 Brian Johnson
 Alexis Kaiser
 Kraig Kern
 Michael Krannitz
 Henry Liles
 Jonathan Lockleer
 Dennis Lonkey
 John Lucey
 Brian Lusk
 William Martin
 Gene Matthis
 John McAdams
 Ron McKaskel
 Brad Mclester
 Paul Meehan⁺
 Steven Miller
 Wayne Moody
 Timothy Morris
 Kevin Nadeau
 Randall Neuhaus[^]
 Paul Norton
 John Nunnally
 Eric Olsen

James Parker
 Ana Passman
 Howard Penny
 Elizabeth Phipps
 David Pond
 Jeremy Potter
 Lou Raymond
 Thomas Raymond
 Amit Sachan
 Stephen Safran
 Greg Sallee
 Lisa Samples
 Reggie Scales
 Eric Shaffer
 Ben Simpson
 James Smith
 Wendee Smith
 Greg Stewart
 Stuart Sutton
 Shannon Sweitzer
 Dewayne Sykes
 Bryan Taylor
 Michael Wayts
 Richard Wells[^]
 Doug Wheatley
 Jeff Wilson
 Jon Wilson
 Mark Wilson⁺

**NORTH
 DAKOTA***
 Holly Beck⁺
 Gary Brennan
 Dan Brosz⁺
 Jeff LeDoux⁺
 Jeffrey McElwain
 Eric Michel⁺
 Dain Miller
 Barry Schuchard⁺
 Dustin Scott
Jeffrey Volk[^]

OHIO*
 Laurie Adams
 Michael Avellano
 Michael Bandwen
 Douglas Batt
 Matthew Bell
 Ronald Bender
 Joseph Bolzenius
 David Breitfeller
 Raymond Briya
 Daniel Bucher
 Michael Buettner
 Brad Bush
 Aaron Call
 Kevin Carpenter
 Tim Casto
 Michael Ciotola
 Michael Couvreur
 Jon Cox
 Ruth Crane
 Brian David
 John Dingeldein
 Aaron Domini
 Sandy Doyle-Ahern
 Mark Droll
 Michael Duffey
 Ben Dusina
 Frank Eisenhower
 Ronald Erb
 Eugene Esser
 Michael Frank
 Elizabeth Fulton



ACEC/South Carolina members meet with Sen. Tim Scott, R-S.C., last spring during the ACEC Annual Convention in Washington, D.C. From left to right: Larry Hargrove, M&S Engineering; Sen. Scott; Melvin Williams, S&ME; and Adam Jones, ACEC/S.C.

Bronson Funke
 Craig Galecka
 Rocco Gallo
 Matt Gardner
 Clifford Gordon
 Joseph Grani
 Christopher Hall
 J. Wesley Hall
 Charles Hammontree
 Mohammed Haque
 Jacqueline Harmon
 Stanley Harris
 Greg Heaton
Mark Henderson
 James Houk
 Daniel Hoying
 John Hyre
 Laurie Iulgi
 Ali Jamshidi
 Bipender Jindal
 Jack Jones
 Matthew Justus
 H. Matthew Kairouz
 J. Timothy King
 Eric Kistner
 James Kleingers
 Steven Korte
 Thomas Kramer
 Michael Kratofil
 David Krock
 Heather Lacey
 Peter Latta
 Thomas Laubie
 Brad Lowery
 Marcia Majidzadeh
 Lampman
 Stephen Mary
 James Mawhorr
 Mark McCabe
 Nicholas McCullough
 Richard McGuckin
 Bethanie Meek
 Kimberly Messer
 Troy Messer
 Lynn Miggins
 James Miller
 Kevin Miller
 Nolan Miller
 Marc Montgomery
 David Mosure
Thomas Mosure[^]
 Stephen Nichols
 Katrina Nolan
 Bret Oakes
 Stephen Pasternack
 Scott Peyton
 John Pierko
 Darren Pleiman
 Christopher Preto
 David Pyzoha
 Glenda Randall



Rep. Fred Upton, R-Mich., with ACEC/Michigan representatives last summer. From left to right: Former ACEC/Michigan National Director Jim Escamilla, Byce & Associates; Rep. Upton; and Board Director Chris Cook, Abonmarche.

Kevin Reichert
 Joshua Reinicke
 Tracey Riepenhoff
 Scott Ross
 Frances Rourke
 Michael Rowland
 C.K. Satyapriya
 Dan Schertler
 David Schierloh
 Ronald Schultz⁺
 Evan Scott
 Gary Sebach
 A. Frederick Seling
 Fred Seling
 Steven Shadix
 Andrew Shahan
 Clifford Shrive
 Jay Shutt
 Mark Skellenger
 Anthony Slanec
 C. Michael Smith
 Rod Sommer
 Daniel Springer
 Dan Steeley
 Jay Stewart
 Michael Sturdevant
 Michael Sugrue
 David Tomasula
 Timothy Van Echo
 Stephen Way
 Kevin Wilcox
 David Wiles
 Gary Williams
 Randy Wolfe
 David Wright

Todd Yeung
 Chiranjiv Zutshi

OKLAHOMA*
 Greg Allen
 Hollis Allen
 Reza Amini
 Karl Baldischwiler
 Jeremy Basler
 Russell Beatty
 James Benson
 John Blickensderfer
 Jeremy Boswell
 J. Bret Cabiness
 Brandon Claborn
 Todd Cochran
 Geoffrey Covalt
 David Cross
Joe Davis
 Bill Diedrich
 Edward Donwerth
 Rhonda Dudeck
 Gary Evans
 Lauren Evans
 Tommy Evans
 Chad Grinsteiner
 Denise Hale
 Tricia Hatley
 Jim Hemphill
 Thomas Hendrick
 Martin Hepp
 Sharri Hiller
 Mike Homan
 Rich Horrocks

Felicia Jackson
 Steven Johnson
 Joshua Johnston
 Jose Joseph
 Sumesh KC
 Kristin Killgore
 Stacy Loeffler
 Kirsten McCullough
 Janet Meshek
 Chuck Mitchell
 Mike Morrison
 Helene Murdock
 David Neuhauser
 Sam Pappas
 Aaron Peck
 Sergio Pecori
 Liesel Polwort
 Tim Purkeypile
 Karthik Radhakrishnan
 Robert Rose
 Vaughn Rupnow
 Jenny Sallee
 Brian Schmitt
 Brent Schniers
 Alan Soltani
 Karl Stickley
 Michael Vahabzadegan
 Marvin Valencia
 Ronald Weltzheimer
 Adam West
 Cort Westphal
 Robert Williams

OREGON*

Ken Ackerman
 Tina Adams
 Brian Bayne
 Darren Beckstrand
 Brian Bierwagen
 Brent Black
 Timothy Blackwood
 Jason Bock
 Thomas Boland
 Troy Bowers+
 Christopher Brehmer
 Marc Butorac+
 Chris Carpenter
 Michael Carr
 Ed Chamberland
 Peter Coffey
 Gabe Crop
 Alison Davis
 Helen Devery
 Michelle Dodgson
 Mary Erchul
 Tonya Finley
 Lawrence Fox+
 Steve Fox
 Doug Gates
 Benjamin George
 Joshua Grenzsund
 Terry Hosaka
 Daniel Houf
 John Howorth
 Jason Kelly
 Greg Landau

Mark Leece
 Jay Lyman+
 Keith Martin
 Ransford McCourt
 Travis McFeron
 Michael Meyer
 Scott Nettleton
 Timothy Oliver
 Peter Olsen
 Andy Perry
 Erik Peterson
 Stan Petroff
 Risheng Piao
 Cindi Polychronis
 Cindy Potter
 Allison Pyrch
 Jerald Ramsden
 Michael Reed+
 Mike Reynolds
 Christopher Robertson
Tony Roos+
 Gregg Scholz
 Mel Sears
 Matthew Shanahan
 Craig Sheahan
 David Simmons
 Sean Sullivan
 Mark Swank
 Karen Tatman
 Jason Tell
 Kevin Thelin
 Daniel Trisler
 Gene Tupper
 Larry Van Dyke
 Ronald Vandehey
 D. Andrew Vessely
 Rawley Voorhies
 Steven Walker
 Thomas Westover
 Jeff Whitson
 Fred Wismer

PENNSYLVANIA*

Keith Angier
[Anthony Bartolomeo](#)
 Victor Bertolina
Christopher Borton+
 Michael Bougher
 Matthew Cummings
 Steven Cumor
 Charles DiCello
 Michael Dukes
 Barry Epley
 Michelle Erste
 Eric Flicker+
 Gerald Fry
 Stanley Gavlick
 Donald Gennuso
 Michael Girman
 William Gough
 Mark Greenholt
 Bill Gross
 Ernest Hanna
 Janet Helsel
 Katie Hodgson
 Troy Holloway

Frank Joanlanne
 Kevin Johnson
 Brian Keaveney
 Joel Keels
 Shannon Koeninger
 David Kozel
 John Kweder
 Gregory Lang
 Gregory Lebo
 Jon Livingston
 James Lombardi
 Eric Madden
 Thomas Maheady+
 Joyce Markosky
 Mark Markosky
 Matthew Marquardt
 Roseline Marston
 Eric Martz
 Esther McGinnis
 Todd Morris+
 Rachel Murawski
 Kenneth Nadler
 Lea Nadler
 Matthew Natale
 Donna Newell
 Joseph O'Neil
 Andrew Pennoni
 Chuck Pennoni+
 Marc Pinto
 John Pocius
 John Prybella
 Daniel Riddle
 Thomas Riester
 Milo Riveroso
 David Scherer
 Perry Schweiss
 Curtis Shugars
 William Stout+
 D. Eric Veydt
 Sharmon Winters+
 Scott Zeevaart

SOUTH CAROLINA*

Kent Alexander
 Robert Atkinson
 Eric Burgess
 Jeff Burkett
 Ernest Capps
Jerry Carter+
 Allen Chestnut
 David Eberspeaker
 Rick Fauteux
 Robert Fei
 James Fitz Morris
 Carlos Gittens
 Joseph Greenburg
 Larry Hargrove+
 R. Thomas Haselden+
 Adam Jones
 Joe Jones
 Tom Jordan
 Merritt King+
 Stanford Lummas
 Chris Magaldi
 Jeff Mulliken

Cameron Nations
 Kylie Page+
 Randall Patrick
 Howard Perry+
 Frederick Quinn
 John Richards
 Kevin Shoemake
 Peter Strub+
 Emily Swearingen
 Cole Webb
 Melvin Williams
 Sheri Williamson
 Tony Woody

SOUTH DAKOTA*

Terry Aaker
 Bob Babcock
 David Berg
 Kristin Bisgard
 Gail Boddicker
 Trent Bruce
 J. Mike Coleman
 Doug Feterl
 Phil Gundvaldson
 Chad Hanisch
 Kevin Heiberger
 Terry Helms
Steven Hoff
 Dawn Horner
 Randall Hoscheid
 Todd Kenner
 Beau Koopal
 Robert Kummer
 Gabriel Laber
 Josh Larson
 Jason Love
 Krista May
 Jeffrey McCormick
 Kim McLaury
 Derek McTighe
 Monty Miller
 Robert Morcom
 David Odens
 Jody Page
 Peter Rausch
 Rod Senn
 Brad Stangohr
 Trevor Wegner
 Brad Wermers
 Douglas Wessel
 Sig Zvejnieks

TENNESSEE*

Kasey Anderson
 Mark Askew
 James Bearden
 Gerald Bolden
 Jason Brady
 Michael Burgett
 Angela Cannon+
 W. Harold Cannon Jr.+
 Rodney Chester
 Tom Clinard
 Justin Eckel
 Robert Elizer
Steven Field+
 Randy Gibson
 Danl Hall+
 David Harrell+
 Michelle Harris
 Jonathan Haycraft
 Michael Hunkler
 Alexander Jackson
 Robert James

John Kenny+
 Ted Kniazewycz
 Stephen Lane+
 James Littlejohn
 Andy Lucysbyn
 Sammie McCoy
 Jim McGirl
 Logan Meeks
 Antonio Montiel
 Robert Murphy+
 Craig Parker
 John Perry
 Jon Perry
 Robert Polk
 Elizabeth Porter+
 Alan Pramuk
 Nathan Rainwater
 Michael Ray
 John Reidy
 Larry Ridlen
 Tyra Rowley
 Thomas Saunders+
 Sandra Sclafani
 Kenneth Stewart
 Michael Stomer+
Gerald Stump+
 J. Michael Sullivan
 Elizabeth Surface
 Ronald Tazelaar
 Bryan Tharpe
 Brad Thompson
 Kevin Tilbury
 Jody Vance
 David Verner
 Tim Verner+
 David West
 William Whitson
 Don Williams
 Rick Wilson
 Joseph Wimberly
 Brad Winkler
 Ken Zyga

TEXAS

Oscar Aguirre
 Scott Arnold
 James Binkley
 Sommer Boecker
 Cal Bostwick
 John Bostwick
 Mehmet Boz
 Gregory Burns
 Timothy Buscha
 Melissa Byler
 Jose Cardenas
 James Chee
 Dilip Choudhuri+
 Jeff Collins
 Terry Conn
 Willis Conner
 David Covarrubias
 Chris Crosby
 Edwin Davis
 Paul Denham
 Don Durden
 Jay Edwards
 Edwin Friedrichs+
 Karen Friese+
 Garland Galm
 Kyle Gass
 Donald Glenn
 Christine Graygor
 Dawn Green
 Chuck Gregory
 V.K. Gupta

Rachel Hayden
Keith Jackson+
 James Jones
 Kent Kacir
 Sandee Khoury
 Tony Kimmey
 John Lamb
 Lee Lennard
 Alan Lindsog
 Robert Maxwell
 Jack Miller
 Mike Moss
 Derek Naiser
 Michael Nichols
 Joe Nix
 Mark Pacheco
 George Peck
 Michael Perez
 Pamela Puckett
 Christopher Qualls
[Gary Raba](#)
 Bennett Ratliff
 Stephen Redding
 Robert Rollo
 JJ Roohms
 Melvin Spinks
 Scott Stockburger
 Matthew Strong
 Catherine Tinkler
 Mark Tomlinson
 Coy Veach
 Terry Watson
 Cynthia Whitehead
 Roy Wilshire

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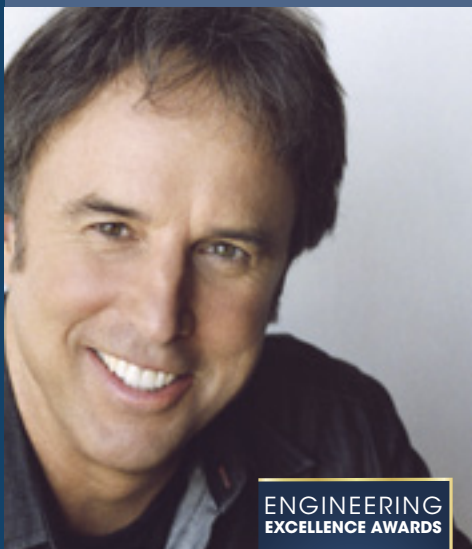
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50TH ANNIVERSARY
of the
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AWARDS



with Special
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ACEC's Engineering Excellence Awards Turns

50

MORE THAN 7,000 PROJECTS HAVE BEEN ENTERED

This year's fiftieth anniversary awards program on April 25, will be hosted by Kevin Nealon, noted actor, comedian and current co-star of the CBS sitcom *"Man with a Plan."*

Since 1967, when the annual EEA competition was established, more than 7,000 projects have been submitted.

And what began as an awards luncheon has now evolved into at an elegant, black-tie dinner attended by more than 600 members and guests.

Top-honored "Grand Conceptor Award" projects have been wide-ranging—from the Boeing Space Simulation Laboratory (*Andersen, Bjornstad & Kane, 1968*) to the Gills Onions Advanced Energy Recovery System (*HDR, 2010*); from the Space Shuttle Launch Complex (*Sverdrup & Parcel and Associates, 1985*) to the Olympic Sculpture Park (*Magnusson Klemencic Associates, 2008*); and from the AEOS 3.67 Meter Telescope Facility (*Sato & Associates, 2000*) to the Kauffman Center for the Performing Arts (*Arup, 2013*).

Turn the page for a timeline of top EEA winners over the years.



GRAND CONCEPTOR AWARD WINNERS (1967 - 2016)

1967

Cornell, Howland, Hayes & Merrifield, Inc.
Lake Tahoe Wastewater Reclamation Plant
Corvallis, Oregon

1968

Andersen, Bjornstad & Kane
Boeing Space Simulation Laboratory & Structural Test Floor
Kent, Washington

1969

Ryckman, Edgerley, Tomlinson & Associates
Equalization Basin for Industrial Wastewater Treatment
St. Louis

1970

International Engineering Co.
New Bullards Bar Dam
San Francisco

1971

Sandwell International, Inc.
Draft Tissue Mill
Portland, Oregon

1972

Midwestern Consulting, Inc.
Site Engineering for Land Reclamation
Ann Arbor, Michigan

1973

Ketchum-Konkel-Barrett-Nickel-Austin
Hangar Structure for TWA's Airframe Overhaul Facility
Denver

1974

Greenleaf/Telesca - Kellerman & Draggett
Hangar No. 2 for National Airlines
Miami

1975

Howard Needles Tammen & Bergendoff
Rio-Niteroi Bridge - Main Steel Spans
Kansas City, Missouri

1976

Tippetts-Abbett-McCarthy-Stratton
Marine Terminal
Anchorage, Alaska

1977

Kramer, Chin & Mayo
The Seattle Aquarium
Seattle

1978

CH2M HILL
Bioconversion Facility
Denver

1979

URS/Madigan-Praeger, Inc.
Unique Dry Dock for Floating Factory for Universe Tankships
New York

1980

Williams & Works, Inc.
Pilot Project to Increase Final Clarifier Capacity
Grand Rapids, Michigan

1981

McClelland Engineers/CBM Engineers, Inc.
Texas Commerce Tower
Houston

1982

Williams & Works, Inc./Environmental Data, Inc.
Cleanup of a Chemical Spill - Woodland Park
Grand Rapids, Michigan

1983

Sverdrup & Parcel and Associates, Inc. (New Sverdrup Corp.)
Interstate 205 Columbia River Bridge
St. Louis

1984

Greiner Engineering Sciences, Inc.
Widening & Replacement of Concrete Deck - Woodrow Wilson Memorial Bridge
Washington, D.C.

1985

Sverdrup & Parcel and Associates (New Sverdrup Corp.)
Space Shuttle Launch Complex, Vandenberg AFB, California

1986

Sverdrup/Parsons Brinckerhoff
Ft. McHenry Tunnel
Baltimore

1987

Howard Needles Tammen & Bergendoff
I-90 Mt. Baker Ridge Tunnel Bore
Seattle

1988

Briley Wild & Associates
Breakaway Trails-Engineered Microcosm Breaks with Tradition
Ormond Beach, Florida

1989

Boyle Engineering Corp.
Water Conserv II
Newport Beach, California

1990

Howard Needles Tammen & Bergendoff
Dame Point Bridge
Jacksonville, Florida

1991

CH2M HILL
Carolina Bay Natural Effluent Disposal System
Charleston, S. Carolina

1992

Michael Baker Jr., Inc.
Vine Expressway
Philadelphia

1993

Michaud, Cooley, Erickson and Associates, Inc.
Centralized Laser Smoke Evacuation System
Minneapolis

1994

Environmental Engineering & Technology, Inc.
First U.S. Alum Recovery Facility
Durham, North Carolina

1995

Sverdrup Civil, Inc.
St. Louis Metrolink Rail Transit System
St. Louis

1996

Skilling Ward Magnusson Barkshire, Inc.
KeyArena
Seattle

1997

Parsons Brinckerhoff Quade & Douglas, Inc.
The Coleman Bridge Replacement
Yorktown, Virginia

ENGINEERING EXCELLENCE AWARDS TIMELINE

1967

ACEC launches its first Engineering Excellence Awards with a luncheon in Washington, D.C. The first Grand Conceptor Award for the year's most outstanding project is presented to Cornell, Howland, Hayes & Merrifield (predecessor of CH2M), for the Lake Tahoe Water Reclamation Plant.

2000

First EEA Gala held as a formal black-tie dinner during the ACEC Annual Convention.

2002

Comedian and T.V. talk show host Ross Shafer emcees his first EEA Gala and would continue through 2014.



2007

To enhance EEA suspense, the Grand Conceptor Award winner is revealed at the Gala without the firm's prior knowledge, and includes a commemorative video.

1998
Bechtel
Infrastructure/
Dames & Moore/T.Y.
Lin International
 S. F. Muni Metro
 Turnback Project
 San Francisco

1999
KPFF Consulting
Engineers
 Doernbecher Children's
 Hospital
 Portland, Oregon

2000
Sato & Associates,
Inc.
 AEOS 3.67 Meter
 Telescope Facility
 Honolulu

2001
American Consulting
Engineers, PLC
 Maysville Cable Stayed
 Bridge
 Maysville, Kentucky

2002
TAMS Consultants,
Inc. /Arup
 JFK Terminal 4
 Queens, New York

2003
Jacobs Civil, Inc.
 Removable Spillway
 Weir
 Pomeroy, Washington

2004
Weidlinger
Associates, Inc.
 World Trade Center
 Forensic Study
 New York

2005
Burns & McDonnell
 Everglades Restoration,
 Stormwater Treatment
 Palm Beach/Broward
 County, Florida

2006
Magnusson
Klemencic
Associates
 United States
 Courthouse
 Seattle

2007
MWH Americas, Inc.
 Montgomery Point Lock
 and Dam
 Desha County, Arkansas

2008
Magnusson
Klemencic
Associates
 Olympic Sculpture Park
 Seattle

2009
CDM
 Orange County
 Groundwater
 Replenishment System
 Fountain Valley,
 California

2010
HDR Engineering, Inc.
 Gills Onions Advanced
 Energy Recovery System
 Oxnard, California

2011
HDR, T.Y. Lin
International, Jacobs
Engineering
 Hoover Dam Bypass
 Boulder City, Nevada

2012
Tetra Tech/INCA
 Lake Borgne Surge
 Barrier Project
 New Orleans

2013
Arup
 Kauffman Center for the
 Performing Arts
 Kansas City, Missouri

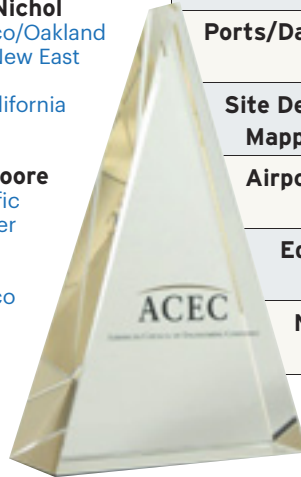
2014
TranSystems; Alfred
Benesch & Co.; T.Y.
Lin International;
Burns & McDonnell
Infrastructure
Engineering; Parsons
Brinckerhoff; Lochner
 Wacker Drive/Congress
 Parkway Reconstruction
 Chicago

2015
T.Y. Lin International/
Moffatt & Nichol
 San Francisco/Oakland
 Bay Bridge New East
 Span
 Oakland, California

2016
Walter P Moore
 SFO Air Traffic
 Control Tower
 & Integrated
 Facility
 San Francisco

TOP 24 EEA AWARD WINNERS BY PROJECT TYPE (1980 - 2016)

Water Supply/Wastewater Facilities	151
Bridges	106
Energy Efficiency	68
Cultural/Sport Facilities	55
Highways	48
Railway/Transit/Subways	45
Buildings/Structural	38
Environmental/Wetlands Restoration	37
Stormwater Management	35
Power/Renewables	25
Ports/Dams/Reservoirs	21
Site Development/ Mapping	18
Airports	16
Education Facilities	15
Native Species Protection	12



2007

To recognize all entries as examples of national engineering excellence, those not selected for top honors receive National Recognition Awards.

2013

Gala after party introduced, featuring live music and dancing.



2015

Customized online awards entry system enables paperless submission and judging process.

2017

Television and movie star Kevin Nealon hosts 50th anniversary celebration. Number of awards increased from 24 to 36.



CAMPAIGN FOR THE **Engineering takes on the challenge of defending state professional licensure** CREDENTI

P

rofessional licensure is under assault in

America. Many of the political principles that helped to elect populist candidates to high office—limited government and a free market—have fueled legislative efforts to limit or even eliminate the need for professional licensure at the state level for a host of occupations, including engineering.

To date, and largely due to aggressive responses by ACEC Member Organizations, the de-licensing campaigns have not been successful—although in Arizona, for example, professional geologist licensing was undermined. Everyone involved, however, agrees that the licensing fight is just getting started.

“Most of these efforts claim as their inspiration the libertarian viewpoint that government should not be in the business of preventing people from getting jobs,” says Doug Folk, an attorney with Clark Hill’s national construction law practice group in Scottsdale, Arizona.

“As a simple statement of principles, you can’t disagree with that, but there’s so much more at stake. These professions were regulated because people were losing their lives when structures were improperly engineered or constructed. Engineering and other design professions are regulated to protect the public through a combination of testing and licensure that has worked well for almost 100 years.”

ANN CUTTING

BY GERRY DONOHUE

ALED

Certificate of Registration

THIS CERTIFIES

JOHN J. DOE

IS HEREBY AUTHORIZED TO PRACTICE AS A

Professional Engineer



A LONG AND SUCCESSFUL HISTORY

In 1907, Wyoming became the first state to license engineers, and today every state, plus the District of Columbia, Guam, Northern Mariana Islands, Puerto Rico and the U.S. Virgin Islands, licenses professional engineers.

Since 1920, the National Council of Examiners for Engineering and Surveying developed and offered standard examinations for engineering and surveying licensure across all the states. (Architects have a parallel organization, the National Council of Architectural Registration Boards.)

"In part, our current system of professional licensing across the states has been so flexible and effective, that its purpose became invisible to those who would change it," says Folk. "We need to explain to critics why this system isn't broke, and in no need of fixing."

MANICURISTS AND ANIMAL MASSAGERS

While the state licensing system may not be broken for engineers, architects and other highly skilled professions, one could argue that it doesn't work for others.

In the early 1950s, less than 5 percent of the U.S. workforce was covered by state licensing laws. That level ballooned to 20 percent in 2000, Department of Labor and Census data show. In 2003, the Council of State Governments estimated that more than 800 occupations were licensed in at least one state, and in a 2008 Westat survey, 29 percent of workers said they were required to have a government-issued license to do their job.

Reasonable people might question the reasoning behind state licensing of yoga instructors (Arizona), animal massagers (Florida) or manicurists (many states). Licensing in lower-income professions might act as a barrier to entry, possibly preventing people who can't afford the required training or the license fee from even entering the profession.

A recent study by the Goldwater Institute, which opposes licensing laws, found that states that license more than 50 percent of lower-income occupations have an 11 percent lower entrepreneurship rate than the national average; states that license less than a third had an entrepreneurship rate that is 11 percent higher.

A 2009 study by Morris Kleiner and Alan Krueger reported that licensed professions enjoy a 14 percent wage premium in the market. And the American Legislative Exchange Council (ALEC), which also opposes licensing, asserts that the system increases unemployment by 1 percent.

Given this situation, it would make sense for licensing opponents to target lower-income professions, while retaining the system for professions where the public health, safety and welfare would be affected.

"A lot of them understand that," says Dennis Ford, president of FTN Associates in Little Rock, Arkansas, who helped lead a recent fight in his state against delicensing. "Rather than address each occupation on its merits, though, they want to take the matter on wholesale."

POLICY AND POLITICS

Two events have spurred efforts to limit or eliminate professional licensing.

In 2008, ALEC developed its model law titled *The Occupational Licensing Relief and Job Creation Act*, to ensure "that an individual may pursue lawful occupation free from unnecessary occupational regulations, and protect against the use of occupational regulations to reduce competition and increase prices to consumers."

ALEC is an organization of conservative state legislators and private sector representatives that drafts model state-level legislation for distribution among state governments. ALEC's mission is "to advance the fundamental principles of free-market enterprise, limited government and federalism at the state level."

ALEC's model bill has been the basis for efforts in several states to limit licensing, including Arkansas, Arizona, Indiana, Missouri and Florida. If passed, the bill requires that the state prove in court or in administrative hearings that it is enforcing an occupational law for health and safety reasons and not as a barrier to entry.

The second event occurred in 2015 when the U.S. Supreme Court ruled against the North Carolina Board of Dental Examiners in its

The Supreme Court said that licensing boards that are dominated by the professionals being regulated...and don't have "active supervision" from the state are not immune from antitrust challenges

efforts to stop nondentists from offering teeth-whitening services. The Supreme Court said that licensing boards that are dominated by the professionals being regulated—eight of the 10 North Carolina board members were dentists—and don't have "active supervision" from the state are not immune from antitrust challenges.

"This ruling lands at the interface of policy and politics," says Folk. "The North Carolina case was correctly decided based on some very bad facts, but it is not representative of how professional licensing boards for design professionals operate. Politicians who are so inclined misuse that decision to justify deregulating a profession or bringing state licensing boards under direct control of elected officials."



"If a legislature deregulates the practice of engineering, firms in a deregulated state cannot gain reciprocity registrations in other states because their licenses are not comparable."

DOUG FOLK | CLARK HILL



“Taking on the engineers would have been quite a feat because they are the largest professional group.”

DOUG BARTLETT | CLEAR CREEK ASSOCIATES

WHAT IS A TRAINED GEOLOGIST?

Both of these issues came to the fore in Arizona in 2016, when Gov. Doug Ducey and his allies in the legislature proposed H.B. 2613, aiming to abolish state licenses for geologists and landscape architects, as well as yoga instructors, food-packing contractors, driving school teachers and assayers.

Doug Bartlett, a geologist and principal of Clear Creek Associates in Scottsdale, helped to lead the Arizona section of the American Institute of Professional Geologists (AIPG) opposition to the bill. “Taking on the engineers would have been quite a feat because they are the largest professional group,” he says. “I think they figured we wouldn’t have the resources to fight.”

The bill also called for rolling all independent state regulatory boards—including the Arizona State Board of Technical Registration, which licenses engineers, architects, landscape architects, geologists and assayers—into the state’s Department of Administration, putting them under Ducey’s control.

“Two previous governors analyzed the costs and benefits of consolidation and determined that it didn’t benefit the public or save the government any money,” says Folk. “With consolidation, if the board made a decision the governor didn’t like, he could veto it. Or, if he didn’t like the executive director, he could fire her. That’s not what the legislature had in mind when it created this board.”

The landscape architects were able to extricate themselves from the legislation, leaving the geologists to fight, although Bartlett says the engineering community helped a lot. “They lobbied against the bill with their legislators, voicing their concerns,” he says.

Bartlett says the arguments supporting the bill were flimsy.

The governor’s office asserted in a press release that the bill included geologists because “licenses should only be required when they are truly designed to protect the public health and safety.”

By that logic, geologists should be licensed, Bartlett says. “Geologists are involved in countless instances that involve public safety,

such as water quality, seismic issues and underpinning for highway overpasses,” he says.

Licensing isn’t a barrier to entry, Bartlett says, and doesn’t prevent anyone from getting a job as a geologist. “What it does is prevent an inexperienced geologist from getting into a position where they are making decisions that impact public health and safety,” he says.

Furthermore, Bartlett argues that independent licensing boards are not expensive and inefficient. He points out that the board is funded entirely through licensing fees and provides revenue to the General Fund.

One argument that wasn’t raised, but may have played a part, is that licensing increases the salaries of professionals. “I think there’s a motivation to reduce the cost of hiring professional consultants,” Bartlett says.

A modified version of H.B. 2613 eventually passed the legislature and was signed into law by the governor, creating a new unregulated category of “trained geologist.” While trained geologists do not need to have a license, they are required to have a geology degree from an accredited university, have at least four years of experience and must disclose their lack of licensing to a prospective employer or client.

“Unfortunately,” says Bartlett, “since the trained geologists are not licensed, there is no regulatory agency that has the authority to police them to ensure that they are conforming to these standards.”

ADEQUATE REGULATORY OVERSIGHT

Licensing for engineers has faced legislative challenges in at least two other states.

In 2014, the Indiana Legislature formed the Jobs Creation Committee (JCC) to look at deregulating occupations under the Indiana Professional Licensing Agency, which oversees 38 boards that issue more than 70 professional licenses to 490,000 professionals in the state.

In 2015, the JCC recommended by a 5-0 vote that the state stop regulating and licensing engineers and 10 other professions, including home inspectors and hearing aid dealers. In its recommendations in the meeting minutes the committee wrote, “It is the JCC’s opinion that there is adequate regulatory oversight from other governmental agencies when it comes to the work performed by the engineer in their construction/design.”

The engineering community, led by ACEC/Indiana, mobilized. “We assembled a coalition of stakeholders that would be affected,” says Ross Snider, president of USI Consultants, Inc., in Indianapolis. “We provided testimony on the value of registration, both for public safety and because it actually helps businesses in the state, allowing engineering firms to operate across state lines.”





“We provided testimony on the value of registration, both for public safety and because it actually helps businesses in the state, allowing engineering firms to operate across state lines.”

ROSS SNIDER | USI CONSULTANTS, INC.

The coalition reached out to then-Gov. Mike Pence, urging him to add his voice to the debate, and in late July 2015, Pence's office released a statement, “The governor believes it is a mistake not to license engineers and will make sure the recommendation to do so does not stand.”

At a JCC meeting a short time after the governor's statement, the committee voted to drop the issue of delicensing engineers.

“Gov. Pence's public support was essential to help these other decision-makers see the value in retaining engineer licensing,” says ACEC/Indiana Executive Director Beth Bauer.

Licensing opponents took a much broader approach in Arkansas in 2015.

“It was a real fight,” says FTN Associates' Ford. “They introduced what they described as a ‘Right to Work’ bill that said that anybody who felt they were qualified to do something could do that job. It didn't wipe out existing licenses, but you would no longer have needed one to work in the state, and it covered

everything, from plumbers to doctors to engineers.”

Again, the engineering community, led by ACEC/Arkansas, was quick to respond.

“We were extremely active,” says Ford. “Our members contacted their legislators and told them it was not a good bill, and it was not good for the state. We worked with the state Chamber of Commerce and together we kept the bill from making it to the floor of the House.”

START EARLY

Though the anti-licensing effort failed in Arkansas, looking ahead to 2017, Ford says, “I would not be at all surprised if it doesn't raise its ugly head again.”

Folk expects to see de-licensing efforts expand to many other states. “This is now an issue at the national level because we have a lot of people who have come into power who think it is their mission to cut the size of state government,” Folk says.



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Given that reality, these experienced veterans have some advice on how to defeat de-licensing.

"Start early," says Folk. "Don't wait until a bill is introduced. Take steps now to be prepared."

He recommends that Member Organizations confer with their state licensing board and responsible legislators to assure that the structure, composition and operations of their board comply with the Supreme Court's North Carolina Board of Dental Examiners decision. He believes most do and that should be emphasized.

"Look at the existing board structure, rules, and how it enforces its statutes," Folk says, "make sure it's balanced, protecting the public interest and is not susceptible to antitrust challenges. Independent review of board rules for their market impact and the availability of independent administrative law judges to decide disciplinary and unauthorized practice cases also satisfy antitrust concerns while not undermining a board's unique role in regulating professional practice."

Build as broad a base of support as you can, says Snider. ACEC/Indiana brought the Indiana Association of Cities and Towns and the National Federation of Independent Businesses into their coalition and had verbal support from the Chamber of Commerce.

"The coalition was a key factor," he says. "Having other stakeholders who weren't PEs demonstrated that the issue reached

beyond those who were affected."

Bartlett says one of the best decisions AIPG made in Arizona was to hire lobbyists. "They provided strategies for a grassroots letter writing campaign, set up meetings with the bill writers and arranged for several of us to testify before the House and Senate committees," he says.

In discussions with legislators and in testimony, two messages had the most impact.

"Public health and safety is a powerful argument. Ask them if they would like to choose between a licensed or unlicensed doctor," says Folk. "When you bring it down to the level of their lives and their health, they quickly understand why licensing is necessary."

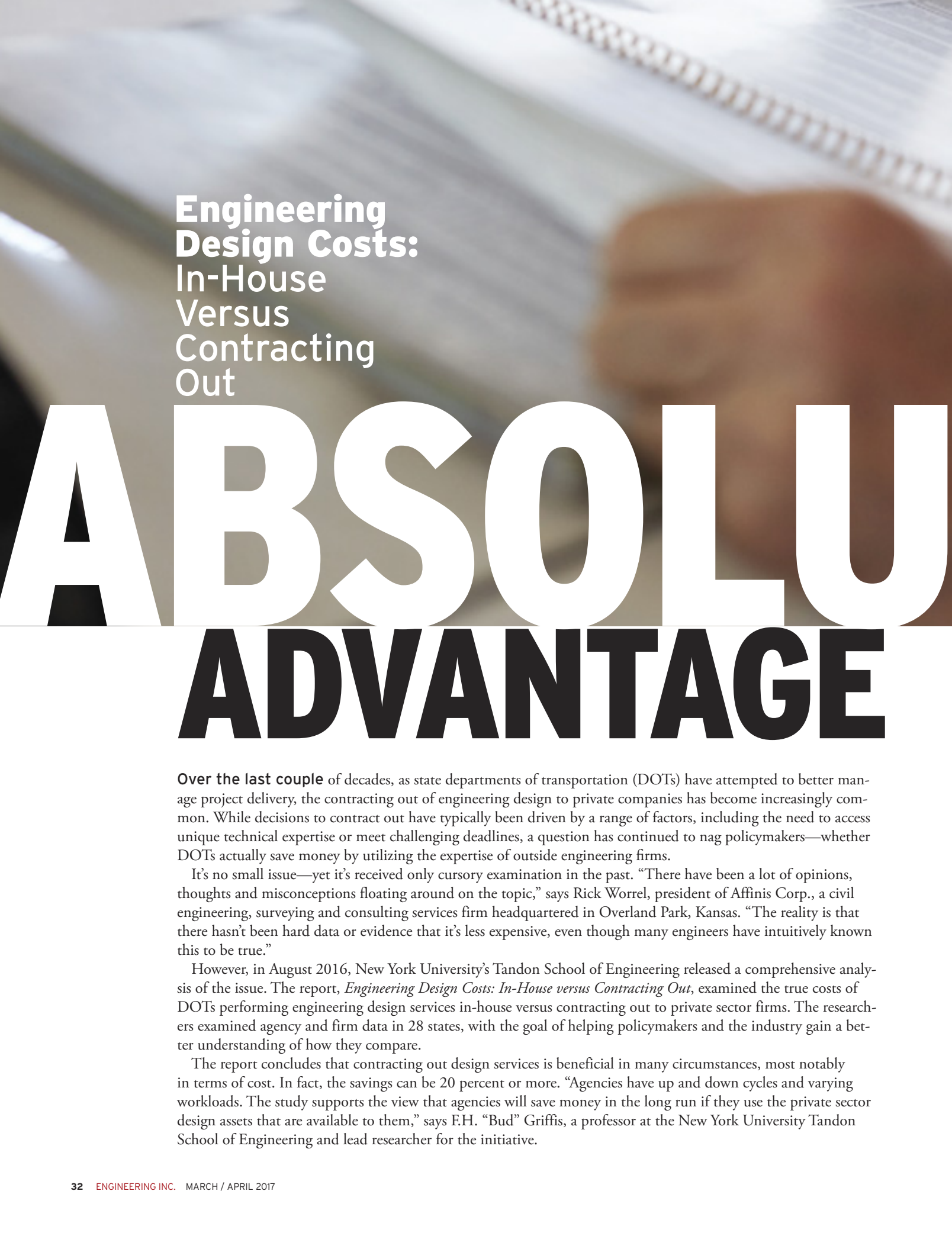
Reciprocity also carries a lot of weight. "If a legislature deregulates the practice of engineering, firms in a deregulated state cannot gain reciprocity registrations in other states because their licenses are not comparable," says Folk. "De-licensing hurts the businesses in their own state."

The campaign to defend professional licensure continues, and ACEC and the Member Organizations will continue to work in close cooperation to meet the challenges head-on. ■

Gerry Donohue is ACEC's senior communications writer. He can be reached at gdonohue@acec.org.

**A 2009 study
by Morris
Kleiner and Alan
Krueger reported
that licensed
professions enjoy
a 14 percent
wage premium in
the market**





Engineering Design Costs: In-House Versus Contracting Out

ABSOLU ADVANTAGE

Over the last couple of decades, as state departments of transportation (DOTs) have attempted to better manage project delivery, the contracting out of engineering design to private companies has become increasingly common. While decisions to contract out have typically been driven by a range of factors, including the need to access unique technical expertise or meet challenging deadlines, a question has continued to nag policymakers—whether DOTs actually save money by utilizing the expertise of outside engineering firms.

It's no small issue—yet it's received only cursory examination in the past. “There have been a lot of opinions, thoughts and misconceptions floating around on the topic,” says Rick Worrel, president of Affinis Corp., a civil engineering, surveying and consulting services firm headquartered in Overland Park, Kansas. “The reality is that there hasn't been hard data or evidence that it's less expensive, even though many engineers have intuitively known this to be true.”

However, in August 2016, New York University's Tandon School of Engineering released a comprehensive analysis of the issue. The report, *Engineering Design Costs: In-House versus Contracting Out*, examined the true costs of DOTs performing engineering design services in-house versus contracting out to private sector firms. The researchers examined agency and firm data in 28 states, with the goal of helping policymakers and the industry gain a better understanding of how they compare.

The report concludes that contracting out design services is beneficial in many circumstances, most notably in terms of cost. In fact, the savings can be 20 percent or more. “Agencies have up and down cycles and varying workloads. The study supports the view that agencies will save money in the long run if they use the private sector design assets that are available to them,” says F.H. “Bud” Griffis, a professor at the New York University Tandon School of Engineering and lead researcher for the initiative.



TE

The new ACEC-commissioned study confirms the benefits of government contracting out

BY SAMUEL GREENGARD

KLAUS VEDFELT / GETTY IMAGES

MONEY MATTERS

It's no secret that state DOTs face unparalleled budget pressures along with a growing need to upgrade and add transportation infrastructure. But underlying the real-world issues are political and social issues. State DOTs have been criticized for contracting out services, often by labor unions which promote the belief that it's cheaper to perform the work in-house. Likewise, lawmakers have debated in-sourcing versus contracting out, once again with cost savings in mind.

But studying the topic was no simple task. For example, the NYU report notes that simple cost comparisons fail because they fall short in measuring other relevant value indicators in the project delivery process, such as technical expertise, innovation, project schedule and managing risk, among others. Procurement laws at the federal level and in most states reinforce this view, as they require the use of Qualifications-Based Selection (QBS) for selecting architect and engineering service providers. "Under the QBS process, firms compete on the basis of the technical skills and experience of their respective design teams, with cost negotiations to follow, ensuring that public agencies receive design services best suited to individual project needs at a cost that meets the agency's budget," the report points out.

Still, the public debate often focuses on cost metrics and a basic presumption that, because agency personnel tend to earn less than their private sector counterparts, it must be cheaper for state DOTs to perform the design work in-house. However,

those crunching the numbers or examining projects haven't applied numbers in an equivalent way, says Griffis, former head of the Army Corps of Engineers for the New York District. This includes issues that extend beyond direct salary and into the territory of fringe benefits and overhead costs. "It can become a fairly complicated process," he explains. "As a general rule, government entities do not calculate overhead in the same way as a private firm."

So researchers gathered data from individual state DOTs and calculated the full spectrum of in-house costs—including labor, fringe benefits and overhead costs—in the same manner that private engineering firms treat these costs under Federal Acquisition Regulation Part 31. Although the NYU researchers had to make a few assumptions and incorporate a few estimates, such as segregation of direct and indirect labor costs, they managed to develop a framework that state legislatures, DOTs and private firms can use to more accurately compare costs. "It's the most useful information to date on the topic," says Dan Purvine, president of A/E Clarity Consulting and Training and a consultant to ACEC for the study. "It provides insights that haven't been available in the past."

BY THE NUMBERS

Gaining visibility into the cost structures of DOTs and private companies presented a few challenges, including sorting through the different ways states collect, manage and post data. Nevertheless, the researchers were able to crunch data from the states,

Cost Structure at a Glance

NYU examined cost data from **28 state DOTs**, as well as corresponding data from a sample of firms in each state. Researchers calculated totals for each of the major cost categories:

DIRECT SALARY

Nationwide, the average direct salaries are approximately:

DOTs: \$69,262 with a coefficient of variation of **13 percent**

PRIVATE FIRMS: \$75,133 with a coefficient of variation of **9 percent**

FRINGE BENEFITS

Nationwide mean fringe rates (as a percentage of direct salaries) are:

DOTs: 79 percent with a coefficient of variation of **23 percent**

PRIVATE FIRMS: 36 percent with a coefficient of variation of **16 percent**

OVERHEAD RATES

The nationwide calculated mean overhead rate based on direct labor cost exclusive of fringe is:

DOTs: 215 percent with a coefficient of variation of **22 percent**

PRIVATE FIRMS: 125 percent with a coefficient of variation of **10 percent**

TOTAL AVERAGE COSTS

DOTs: \$272,684

PRIVATE FIRMS: \$217,020 (includes **10.5 percent** average profit margin)

obtained through publicly available sources. Among the key findings: Although the direct salary of DOT employees is about 8 percent less than employees at private firms, fringe benefits for DOT employees are more than double that of private firms, and overhead rates are significantly higher for DOTs when calculated on a basis consistent with firms. This leads to a total average cost that's about 26 percent higher for DOTs than for private firms [see box above].

Once again, however, the study continues to emphasize that cost savings are not the only factor agencies should consider when evaluating engineering service providers. As noted earlier, the report points to other factors that DOTs must consider for any given project, including staffing capacity, scheduling constraints, the need for specialized expertise, a desire for innovation, a desire to shift risk and responsibility away from taxpayers, overall quality considerations and the cost-effectiveness of a

specific approach. As Worrel puts it: "A project must ultimately be viewed in a broader way."

PATH TO PROGRESS

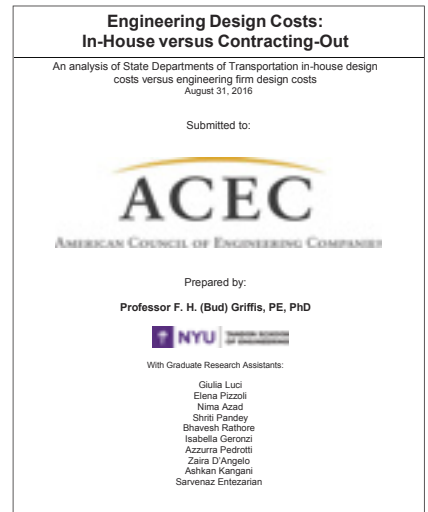
The NYU report has already made an impact. For example, in Kansas, the state legislature and KDOT have reviewed the findings and engaged in discussions with ACEC and private firms about the data, Worrel says. This has helped officials better understand cost frameworks for major transportation projects, he says. Officials have also introduced additional data and proposed revisions that would help deliver more accurate information. "It has been a very positive process," he says.

The end goal is to make the information available to other states and DOTs. Purvine says the data delivers an honest comparison of the taxpayer costs in handling the design project in-house and contracting it out to a private firm. While some states are highly receptive to partnering with the private sector, others are not. "The ability to deliver accurate and actionable information is the key to gaining acceptance when and where it is possible," he says. "This moves the conversation beyond salaries and focuses on the overall business framework. It delivers a realistic assessment."

Purvine anticipates the industry will use the report as an incentive rather than a "hammer."

"The report offers supportable data that has been developed in a consistent manner for all the states," he says. "It's a tool that will open discussions and help educate people about the real-world costs of handling design projects internally or contracting out. Nobody is advocating that DOTs should contract out all projects. It's all about using money and resources in the most efficient way possible." ■

Samuel Greengard is a business and technology writer based in West Linn, Oregon.

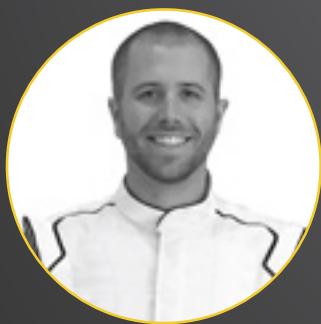


"The study supports the view that agencies will save money in the long run if they use the private sector design assets that are available to them."

F.H. "BUD" GRIFFIS
NEW YORK UNIVERSITY
TANDON SCHOOL OF
ENGINEERING

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-Brian Scott | Richard Petty Motorsports #44 | Father

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UNLEASH THE DATA

Most engineering firms have some sort of enterprise resource planning software in place, but not all are using their data management systems to their full potential

BY CALVIN HENNICK

M

ead & Hunt, a national civil engineering firm headquartered in Middleton, Wisconsin, has had one enterprise resource planning (ERP) system or another in place for around a decade and a half. But it wasn't until about four years ago that the firm really began using the system to pull together data from the company's more than 30 offices in a way that laid out all of the opportunities available to the firm.

"It was really clunky [before]," says Andy Knauf, vice president of IT for the firm.

"Things weren't working too well for us. You had to go into the ERP and look at the opportunities, and most people weren't doing it because it added five or six steps. People didn't seem engaged."

Then Mead & Hunt made a simple change. In addition to its existing Deltek Vision ERP system, the firm implemented a product called Synthesis, "a social intranet" for architects and engineers, from the San Francisco-based company Knowledge Architecture.





The newer system ties into the firm's ERP software and creates a ticker of opportunities that employees can quickly and easily scan through. "As soon as you open up Internet Explorer, it comes up, and the ticker is right there," Knauf explains. "In the last 24 hours, seven new opportunities presented themselves, and people can 'like' and comment on them."

The change may seem small—and some firms may balk at the idea of investing in a new tool when they already have an ERP system in place—but Knauf says that it transformed the way Mead & Hunt does business. The newer system makes it easier to harness information about which types of projects employees throughout the company have worked on and what sorts of skills they possess, allowing managers to identify in-house talent for projects that may have been outsourced in the past.

"This was really a renaissance for our company," Knauf says. "We've become more efficient. We have less downtime. Our profitability and our utilization have gone up. People say, 'It's such a big extra cost,' but you can't put a price tag on what that does for our community and our company."

THE NEED TO LEVEL UP

Enterprise resource planning software—typically a suite of integrated applications that organizations can use to collect, store, manage and interpret data from business activities including product planning, service delivery, marketing and finance—is so pervasive in the engineering world that Knauf likens it to Microsoft Office. "Everybody pretty much has it," he says.

Putting an ERP system in place isn't the same as establishing systems and incorporating new tools that help an organization to maximize its value.

"There's having the system, and then there's leveraging the system," says Terry D. Bennett, senior industry strategist for civil infrastructure at Autodesk. "I think that's where you find the big disparity."

Autodesk builds application programming interfaces (APIs) into its design and modeling programs, including Revit,

that allow them to integrate seamlessly with ERP systems. But Bennett says not all firms link their modeling and enterprise resource planning tools; therefore, they miss out on the opportunity to incorporate important data into their decision-making.

Maximizing the value of a firm's ERP system is, essentially, a twofold challenge. First, an organization must design a system that best meets the firm's needs. This might mean swapping out existing ERP software in favor of a program that has more value to the company, adding on supplementary tools (as Mead & Hunt did with the Synthesis intranet product), or taking a piecemeal approach and integrating a number of different solutions that work together. Second, firms must take advantage of everything these tools have to offer—in particular, making use of the data they store to increase revenues and create new efficiencies.

"It's about the ability to take that information and leverage it for future projects," says Bennett. "You really have to have good insight into how your firm works, and you need to understand how to mine that information."

OPTIMIZING THE SYSTEM

Around a decade ago, managers and employees at the global engineering and architecture firm Merrick & Co. found their ERP system cumbersome. In particular, the system's invoicing and reporting capabilities were weak, and the firm had to dedicate a team of accountants every week to the manual processing of timesheets and expense reports.

"We had a team, at one time, of five people working to get our data out," says Shawn Holton, information technology services director for Merrick & Co. "It took a lot of labor to produce the reports that we needed."

So, the firm adjusted its thinking—and its ERP system.

Merrick & Co. adopted BST Global for its financial needs, including project accounting. The newer system eliminated inefficiencies, but IT administrators at the firm also recognized that no one ERP system could meet all of the organization's needs. Over time, the company has been gradually replacing its payroll and customer relationship management (CRM) systems,

as well, seeking out "best-of-breed" solutions and then integrating them to create a seamless user experience.

At Mead & Hunt, the firm added not only the Synthesis intranet tool but also a solution called Newforma, a project management tool that has been particularly helpful for organizing and creating visibility into project emails. "There are projects with literally 40,000 emails, and I can drill down and find anything that I need," says Knauf.

Often, firms opt to deploy stand-alone solutions for modules that are already covered by their ERP systems. For example, a number of leading ERP vendors provide some sort of CRM functionality, but these often don't completely meet firms' needs, and vendors producing engineering-specific CRM systems have sprung up to fill these gaps.

Atlanta-based AEC360 is one of these vendors. Whit McIsaac, president and CEO of the company, says that CRM modules within some ERP systems simply don't integrate well with companies' email and mobile devices, and some other stand-alone CRM systems don't integrate well with existing ERP systems.

"Firms end up having siloed systems," McIsaac says. "Our perspective is, if they don't have their CRM and ERP systems integrated, then they're missing a huge part of the business intelligence that their ERP systems have as it relates to sales, business development and marketing."



"We've become more efficient. We have less downtime. Our profitability and our utilization have gone up."

ANDY KNAUF
MEAD & HUNT

Engineering ERP Essentials

Enterprise resource planning (ERP) requirements vary by industry. According to ERP vendor IFS, the "must-have" features of systems for engineering firms include the following:

CRM and Estimating—For engineering, construction and infrastructure projects, customer relationship management should be centered on opportunities and subcontractor contacts, and estimating should be based on

needs including subcontracting, equipment rental, and labor and materials.

Project Cost Control—Not all ERP systems' financial modules give firms the ability to exert cost control over all activities. In engineering and construction, this ability is crucial, and an ERP system's cost control function must allow a firm to set a budget for the overall project, facilitate periodic and real-time project reporting, track

spending against the project budget and revise the project forecast.

Mobile Workforce Support—As in virtually all fields, workers in architecture and engineering are becoming more mobile, and these employees increasingly expect to be able to use mobile devices and apps to do their jobs from wherever they are. If employees are forced to batch their data and enter it when they arrive back at the office, engaging with an ERP

system can become an administrative chore that isn't seen as a top priority.

Interoperability with 3D Design and Project Management Tools—One obvious difference between the ERP requirements of engineering firms and companies in other fields is the need to connect resource planning tools to computer-aided design programs and other building design tools that store valuable company data.

SOURCE: "ERP for Engineering, Construction & Infrastructure: Industry Imperatives Force Data-Driven, Integrated Approach," IFS, June 2015.

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— **Brent Gurney**
Partner at WilmerHale



Brent Gurney,
Partner at WilmerHale



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"We had a team, at one time, of five people working to get our data out. It took a lot of labor to produce the reports that we needed."

SHAWN HOLTON
MERRICK & CO.

MINING THE DATA

There's no sense investing in the most sophisticated ERP system available if a firm only uses it to generate invoices and timesheets. The real value of these systems lies in the data they store.

CRMs are a prime example. When the construction market crashed nearly a decade ago, many architecture and engineering firms were forced to lay off their marketing and sales staffers, leaving those companies with no one—and no systems—to keep an institutional memory of various contacts, relationships and potential leads.

"The engineering business development world is all based on a foundation of relationships and experience," says McIsaac. AEC360 pulls information from employees' email and calendar tools, and allows firms to quickly search for which employees have contacts at different companies. The tool also incorporates ERP data to let managers see how successful, or not,

the firm has been at winning certain types of projects and bringing them to completion. As a result, engineering firms have valuable information to decide quickly whether they should pounce on a new opportunity, and if so, which employees to present as their experts.

"If I don't have my CRM connected to my ERP system, then all of that stuff has to be done manually," says McIsaac.

Knauf says his firm uses weekly ERP reports to help keep projects and departments on track. "You get a snapshot every week of where you are," he says. "That's a pretty valuable resource, just to know where you are, and then you can make corrections. Before, you could go a month, and you might be \$200,000 over budget because you wouldn't see where that money is going."

Holton says that some engineering companies simply don't keep track of updates to their existing ERP systems. BST Global has released new modules that Merrick & Co. use for things like electronic invoice approval, he says, but not all users know about them.

"They're not doing the integration piece that we're doing where their data is synced across all of the platforms, so they're missing out there," he says. "They're also not tapping into all of the features of the software they're paying for. They're not taking advantage of what they already own." ■

Calvin Hennick is a business, technology and travel writer based in Milton, Massachusetts.



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INNOVATIONS IN VERTICAL DESIGN

BY TOM KLEMENS

PROJECT: Liberty Fund Headquarters
Carmel, Indiana

FIRM: CE Solutions

PROJECT: Spring Street Salt Shed
New York City

FIRM: Burns Engineering, Inc.

PROJECT: Fort Carson 13th Combat
Aviation Brigade Barracks
Fort Carson, Colorado

FIRM: The RMH Group

PROJECT: O'Hare Joint Use/
Consolidated Rental Car Facility,
O'Hare International Airport, Chicago

FIRM: TranSystems

Glued Laminated Timber Columns Enable Column-Free Curtain Wall

Intermediate column bracing is used at the north and south ends of the Liberty Fund library in Carmel, Indiana.



PROJECT: LIBERTY FUND HEADQUARTERS
CARMEL, INDIANA

FIRM: CE SOLUTIONS
CARMEL, INDIANA

Since its founding as a private educational foundation in 1960, the Liberty Fund has amassed a collection of 50,000 reference works that are used principally by the organization's employees. The new home of this specialty collection is the focal point of the campus-like design for the Liberty Fund's new headquarters building in Carmel, Indiana.

Custom fabricated tree-like columns made of engineered glued laminated timber are used throughout the new headquarters and convey a sense of integration with the partially wooded site.

Seven of the largest "tree columns" are

along the centerline of the two-story library, which is approximately 100 feet by 30 feet and clearly visible to drivers on nearby U.S. 31. Supporting the steel framework of the library's mezzanine and roof, the tree columns create a column-free clerestory that extends the full height of the building.

Each tree column consists of eight timber legs arranged in pairs. The legs on the tallest tree columns are 5 inches thick and

18 inches deep at the base. The timbers tilt inward and taper at the top, where smaller timbers branch out to support the cantilevered steel channels of the roof framing.

Relatively simple tube steel collar connections on the center five tree columns support the mezzanine's cantilevered structural

system. Lateral forces are resolved by braced frames located adjacent to the library space. As a result, the tree-columns are not required to act as lateral

load resisting elements.

"Probably the hardest thing was making the connection work at the top of the columns," says John "JD" Taylor, vice president and principal at CE Solutions, which provided structural engineering for the project. "We found that as we got toward the top, rather than cut every piece that went up there, we could maintain the integrity of one of the pieces in each pair while the other pieces got carved to almost nothing."

By making a 3D model including all the timbers that come together at the top of the column trees, engineers were able to facilitate fabrication of the required connections. At the heart of the connection is a vertical steel pipe, attached at the top to a cap plate that rests atop the tree column. Multiple plates welded to that pipe at various angles provide the bolted connections for the numerous timbers to be attached at that point.



John "JD" Taylor

Unique Design Wins Neighborhood Support for Utility Structure

PROJECT: SPRING STREET SALT SHED
NEW YORK CITY

FIRM: BURNS ENGINEERING, INC.
PHILADELPHIA

Even with the promise of better snow removal, no one wants to see a new salt storage shed built in the neighborhood. That's especially true for New York City's trendy Tribeca neighborhood in lower Manhattan, where the structure originally planned sparked protests from residents. But Burns Engineering, the structural engineer, helped create a unique, iconic structure resembling a salt crystal that has been embraced as a community landmark and honored with multiple awards.

The 6,300-square-foot, irregularly shaped structure is located along the Hudson River on a triangular half-acre site at Canal and West streets, in proximity to the Holland Tunnel. Designed to house 5,000 tons of salt, its exterior wall surfaces feature crystalline, faceted planes of architectural concrete that taper toward the bottom and rise to a height of nearly 70 feet.

The design team, led by Dattner Architects, defined the multifaceted exterior profile of the cast-in-place concrete walls using a 3D coordinate system in lieu of standard linear dimensions.

"The contractor, Oliveira Contracting, provided a lot of the real ingenuity on this

project," says Anthony LoCicero, Burns Engineering's lead structural engineer. "One thing that helped was that all the interior faces of the walls are vertical and plumb, which gave them a basis for setting their formwork."

To achieve the faceted shape of the exterior surfaces, Oliveira used custom-manufactured, high-density polystyrene sections, up to 6 feet thick, each numbered and placed against the shoring frame

formwork system. All reinforcing steel was field bent to follow the intricate alignment of the faceted formwork.

The difference between the faceted exterior wall profile and the plumb interior face resulted in the wall thickness varying from 3 feet at the base to 1 foot at the parapet. Due to color requirements of the exposed architectural concrete, the concrete mix contained a high percentage of pale gray colored cement, which intensified the mass concrete heat of hydration and cracking potential. Extensive crack-control measures included limiting the size of concrete placements, extending curing periods and installing continuous U-shaped stainless steel crack control devices at control joints in vertical architectural reveals, creating an 8-foot by 8-foot grid.



Anthony LoCicero

Uplighting accentuates the resemblance of the Spring Street Salt Shed to a salt crystal.

PHOTO (RIGHT) COURTESY OF FIELD CONDITION; (BOTTOM) ANTHONY LOCICERO



Barracks Complex Raises the Energy Efficiency Bar for Military Housing

The 370,156 gross square-foot barracks consists of three pairs of four-story buildings and a one-story pavilion linking each pair of buildings.

PROJECT: FORT CARSON 13TH COMBAT AVIATION BRIGADE BARRACKS
FORT CARSON, COLORADO

FIRM: THE RMH GROUP, INC.
LAKEWOOD, COLORADO

Located at the base of the Rocky Mountains about an hour's drive south of Pikes Peak and Colorado Springs, Fort Carson is one of two U.S. Army bases working to attain "net zero" energy, water, and waste by 2020. As one key step in that direction, The RMH Group, Inc., in 2015 helped lead completion of a \$94.9 million net zero energy barracks complex using a combination of innovative integrated mechanical systems and highly insulated, tight construction. That complex is now home to the 13th Combat Aviation Brigade and has set new standards for world-class energy efficiency, functionality and comfort in military personnel housing.

"The RFP set out guidelines to really press the envelope in energy efficiency,"

says William Green, president of The RMH Group, which provided design and engineering for the complex's mechanical systems. "The innovation here really started at the building envelope by reducing loads, getting it as tight as possible, and having features such as high-mass walls and very tight construction. Then we put in a very efficient

mechanical system that took full advantage of that tight envelope."

The highly aggressive energy performance requirements led the team to select one of the most innovative mechanical systems ever employed in a military barracks. The low-maintenance system

uses radiant floor heating and cooling combined with chilled beams to produce an exceptionally comfortable living space. Heat recovery chillers used to cool the buildings redirect heat to underground thermal storage tanks providing domestic hot water preheating and building heat



William Green



AERIAL PHOTO COURTESY OF JOHN OFFEN

in the winter, eliminating the need for a cooling tower and the associated water use. Solar hot water panels provide 30 percent of the domestic hot water heating and gravity thin-film exchangers capture heat from shower drains to provide shower water preheat.

"That is really one of the more significant energy saving features," Green says. "It's amazing how much you can raise the temperature of the cold water going to the shower by wrapping the drain pipe with the cold water line. Depending on how cold the water is going in, you can pick up 50 percent of the waste heat going down the drain and reduce your energy consumption for hot water."

PROJECT: O'HARE JOINT USE/
CONSOLIDATED RENTAL CAR FACILITY,
O'HARE INTERNATIONAL AIRPORT
CHICAGO

FIRM: TRANSYSTEMS
CHICAGO

The Joint Use/Consolidated Rental Car Facility currently being built by the Chicago Department of Aviation on the northeastern corner of O'Hare International Airport will change the way millions of people use the airport. Following a national trend toward such consolidated facilities, the O'Hare project's multiple components include three notable innovations.

The most visible is in the project scope. "This will relocate any number of activities from the central terminal area to this facility," says Michael Lev, vice president and senior project manager

with TranSystems, which developed the design criteria, facilities programming concept design and construction documents for the project. "It's not just the rental cars but also regional buses, hotel shuttles and so on. Redirecting those vehicles will eliminate a large amount of traffic on the terminal roadway."

To provide access to the new facility, the project includes an extension of O'Hare's automated train system (ATS) and a new station. That cast-in-place concrete structure used 8,000 psi self-consolidating white cement concrete to achieve the slender columns while providing the strength and rigidity necessary to support the ATS trains.

A five-story garage adjacent to the ATS terminal will serve 11 rental car

companies on its first three floors and provide 2,624 remote public parking spaces on the two upper floors. Although the garage originally was designed with moment frames to maximize use of the floor plates by the rental car companies, the precast engineer revised the lateral support system to use extra-stiff full-height columns instead. In addition to further enhancing floor plate flexibility, this shortened

erection time avoided the difficulties inherent in transporting and erecting moment frames.

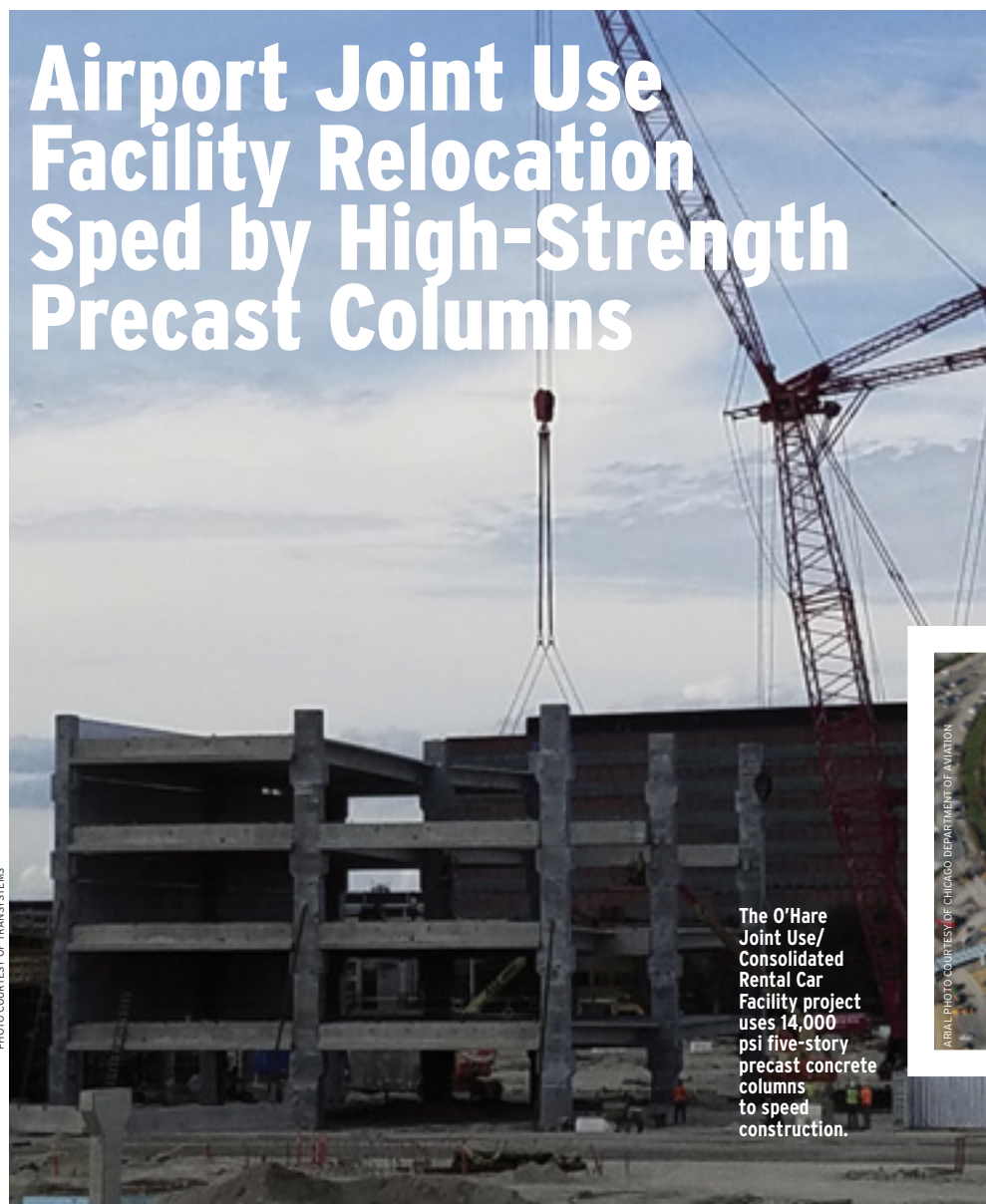
Another innovative portion of the project is the Quick Turn Around facility, where the rental car companies can service cars after their return before putting them back into service. Each of the facility's three floors has five car wash bays, 24 fueling positions and eight maintenance bays. TranSystems and the Chicago Department of Aviation worked closely with the Chicago Building Department and the Chicago Fire Department to develop a life safety plan for the unique multistory fueling. One key component to this system is an aqueous film-forming foam fire suppression system with storage tanks to collect discharged foam and water used to fight a fire. ■

Tom Klemens is a freelance writer near Chicago and is a registered Professional Engineer in Illinois.



Michael Lev

Airport Joint Use Facility Relocation Sped by High-Strength Precast Columns



The O'Hare Joint Use/Consolidated Rental Car Facility project uses 14,000 psi five-story precast concrete columns to speed construction.



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CFO Roundtable

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Sustainable Ownership Models

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\$331 in donations more than 25 years ago kick-started American Structurepoint's charitable giving program that continues to grow today

STRUCTURING DREAMS

BY CALVIN HENNICK



Residents from the village of Sibovu in Swaziland refresh themselves with water from a well funded by American Structurepoint.

The first time Indianapolis-based engineering and architecture firm American Structurepoint employees took up a collection during the holidays was in 1989, 28 years ago, when they collected \$331 to buy food, clothing and gifts for an elderly woman in need.

After the firm's chief executive heard about their effort, he matched the donations on the spot, and the employees were able to make the Christmas season special for someone else.

Little did they know that first act of charity would snowball into a year-round employee giving program that raises around \$35,000 each year—and that's before the company's matching donation, which pushes the fundraising total to \$70,000.

"It just grew every year," says Michele Collins, an executive assistant at the firm, who organized that first giving drive.

The chief executive matched the donations again the next year,

and gradually, more and more people began to participate in the giving program. Now, around 30 percent of company employees contribute to the fund via payroll deductions. Collins hopes to increase that number to 50 percent in honor of the firm's golden anniversary.

The fund, which employees still manage, now donates to a wide range of causes all year, including international relief efforts, educational programs and aid for ailing staff members and their families.

"It always feels good to help somebody," Collins says, explaining the popularity of the program. "There's just nothing like it."

In addition to being generous with their money, employees have also been generous with their time, as the interest in giving back to communities through volunteer efforts has blossomed.

"It's in our core values, giving back to the communities in which we work," says Ben Braun, vice president of human resources.

**Since 2011,
American
Structurepoint
and its
employees
have given
\$73,000 to
The Thirst
Project**

DAY OF SERVICE

For the last two years, several of American Structurepoint's offices also have participated in an annual Day of Service, designed to get employees working together on a project that makes a difference in the community. Employees from the firm's Indianapolis headquarters volunteer in two-hour shifts at Gleaners Food Bank of Indiana, sorting donations to separate out unusable items and preparing weekend food bags for needy schoolchildren.

Employees carpool to the food bank, alternating between two shifts and often engage in a friendly competition over which shift can process the most food. The event draws about 50 volunteers from the company per year, and last year, employees sorted more than 18,000 pounds of donations. The firm also makes a financial donation to the food bank on the Day of Service.

"It's one of the more concentrated, more visible things that we do," says Margaret Kantz, a contracts manager who coordinates the Indianapolis office's Day of Service. "You can really accomplish something as a group."

The company's Columbus, Ohio, office also helps out at a local food bank for its Day of Service project. The smaller Terre Haute office has completed work on a local bike park dedicated to veterans killed in combat.

**"It's in our core values,
giving back to the
communities
in which we work."**

**BEN BRAUN
AMERICAN STRUCTUREPOINT**



Kantz recommends that all companies find a way to get their employees working together on a service project because it helps to strengthen the communities where a firm operates. It can also build camaraderie among colleagues who work in different areas of the company and may not regularly interact with one another, she says. Plus it allows volunteers to get out of the office and get a little more hands-on.

"Nobody needs special talents or training. It gets a lot of employee buy-in, so it's an easy call," says Kantz.

THE THIRST PROJECT

In recent years, the company's charitable giving has extended to the global community.

Since 2011, American Structurepoint and its employees have given \$73,000 to The Thirst Project. The nonprofit, started by Indianapolis native Seth Maxwell, builds wells in impoverished African countries, with the aim of bringing safe and clean water to communities. According to the organization, the introduction of clean water can cause an 88 percent drop in water-related illnesses, along with a 90 percent reduction in child mortality.

The firm's partnership with The Thirst Project began when it donated \$10,000 for the construction of a well in Swaziland, a small, landlocked country near the southern tip of Africa.

The Thirst Project has raised \$8 million globally and has completed nearly 2,000 water well projects in 13 different countries.

DREAM ALIVE

The company's charitable efforts also focus on the future of the engineering and architecture industry.

American Structurepoint works with students from DREAM Alive, an Indianapolis organization that provides mentoring, character development and learning opportunities to students in seventh to 12th grade with the aim of helping them become civic-minded leaders. In half-day sessions, the kids learn about the engineering world and participate in hands-on projects.

"We try to get them excited about not only pursuing a job in the architecture and engineering industry but about pursuing college in general," says Brandon Hoopingarner, an American Structurepoint architectural design director active in the firm's partnership with DREAM Alive.

"Our volunteers are passionate about letting DREAM Alive scholars know that there's opportunity out there for them, and we're just one small piece of that."

"DREAM Alive scholars know that there's opportunity out there for them, and we're just one small piece of that."

BRANDON HOOPINGARNER
AMERICAN STRUCTUREPOINT



(Top): Marketing Communications Group Leader Julie Kost, Staff Engineer Derrek Day and Design Engineer Tommy Polster join with coworkers and friends to pack meals for hungry families during the Million Meals Marathon event in Indianapolis.

(Bottom): Indianapolis employees work to rehab homes for lower-income families receiving assistance from The Fuller Center for Housing of Central Indiana.

During one of the visits, American Structurepoint volunteers coached students as they designed and built bus stop shelters to certain specifications out of LEGOs. At another visit, students competed in the Marshmallow Challenge, in which teams are given materials such as tape, string and sticks of spaghetti to build a free-standing structure that will support a single marshmallow.

"It's an exercise in communication and teamwork," says Brandon Farley, a senior project manager at the firm. "And even though they don't know it at the time, it's an exercise in iteration and failure. We talk about how failure isn't necessarily bad, how it's something you learn from. They get a big kick out of it."

Hoopingarner says he sees the program as a way to talk with students about the ways the architecture and engineering fields are beneficial to society. "A lot of young people feel disconnected from their communities and maybe think there's not a promising future out there for them," he says. "This is a good opportunity to get kids thinking about being a positive influence."

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Brandon Bart, a project planner in Indianapolis, is one of a number of American Structurepoint employees who participate in the Million Meal Marathon, an annual event held at Lucas Oil Stadium, where participants work to pack as many nutritious meals as possible during a single day.

Donning hairnets, volunteers work in teams to combine rice, soy protein, dried vegetables and vitamins and minerals into meal packs that get distributed to families around Indiana.

"There's one person that handles the bags, there's one person that vacuum seals them up and packs them. There's one person that does the scoop of the protein, vitamins and rice," says Bart, who has put in a two-hour shift as a rice scooper each of the past two years. "It's an assembly line, and they expect you to be very, very quick."

The two hours fly by pretty fast, he says, and event officials try to make it as energetic as possible when they pick up the box they do a cheer, or ring a bell. "There's definitely a good, positive energy there," Bart says. "Everybody who's there wants to be there."

Each month, American Structurepoint allows employees to bill half of their volunteering time to the company, up to two paid hours.

"You're still partly on the clock, but you're getting to participate in something a little more fun," Bart says.

"It feels like you're part of something bigger," Bart adds. ■

Calvin Hennick is a business, technology and travel writer based in Milton, Massachusetts.

Focus on STEM

Last March, American Structurepoint donated \$250,000 to the Indianapolis Public Schools (IPS)—enough to allow any district school that opts-in to participate in Project Lead the Way, an organization that focuses on science, technology, engineering and math (STEM) education.

Before the grant, only five schools in the district were participating in Project Lead the Way (PLTW), which gives K-12 students access to hands-on projects that help them gain skills in problem solving, critical thinking and communication.

"This remarkable partnership with American Structurepoint and PLTW will allow us to expand our STEM offerings to benefit students across the district and inspire the next generation of engineers, scientists and leaders in the field of technology," IPS Superintendent Lewis Ferebee said in a statement when the grant was announced.

The large, one-time donation came during the year of American Structurepoint's 50th anniversary and was in addition to the firm's regular giving. "We wanted to give back in a bigger way this year," says Ben Braun, vice president of corporate affairs. "We were trying to look for something that was big for our community."

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Has Industry M&A Reached its Peak?

BY MICK MORRISSEY

U.S. design firm deals fell 15 percent last year to levels not seen since 2013. This is the first meaningful decline in the pace of industry consolidation since the Great Recession. It puts decision makers in uncharted territory because M&A typically rises or falls in synch with the economy. This is the first time in over 20 years the industry has seen declining consolidation in a growing economy.

The slowdown mirrors that seen in the larger economy with FactSet reporting an overall decrease in M&A activity of almost 10 percent last year. Theories for the slowdown range from uncertainty in a presidential election year (which was not the case in the prior two presidential election years) to the idea that all the good firms have been sold. Regardless, it would appear the industry is now a buyer's market and sellers may start to see downward pressure on valuations.

Have we reached "peak M&A"? It's too early to tell. Morrissey Goodale continues to see strong demand on the part of buyers, with many first time buyers entering the market. However, buyers are, for the most part, much more strategic and selective than they were in prior years. Similarly, we see no slowdown in sellers looking to find buyers, largely due to continuing mega industry trends of ownership and leadership transition breakdowns and a hyper competitive market. However, we do see a fault line in the seller universe. Those sellers that have some combination of a unique market offering, hot geography or strong performance and backlog tend to find it easier to find a buyer. Those sellers that have none of these attributes are more frequently getting passed over.

A deeper dive into the 2016 M&A stats yields the following nuggets for decision-makers:

- Less than 10 percent of all deals in the U.S. last year involved a publicly traded buyer. This is down from 17 percent the prior year. This undoubtedly correlates with less M&A activity and downward pressure on pricing last year.
- In 2016, inter-state deal activity (a firm headquartered in one state acquiring a firm headquartered in another) reached 61.4 percent, its highest level prior to the Great Recession. Last year the majority of buyers used acquisitions as a tool to grow their geographic reach.
- Texas confirmed its status as the hottest state for acquisitions with 24 deals during the year. Deal activity in the Lone Star state was driven by a combination of its business-friendly environment, its robust and diverse economy and outlook for

demographic growth. Beyond Texas, the West saw considerable consolidation—with a combined total of 30 deals in California and Washington.

- Global deals also declined during 2016, falling to levels not seen since 2012. For the first time since 2012, the number of U.S. firms acquiring internationally outpaced the activity of overseas acquirers entering the U.S. market.
- The median acquiring firm last year generated \$65 million in revenue, up from \$59 million in 2015. The median selling firm last year was \$4 million, up from \$3 million the prior year. In other words, M&A activity involved larger firms in 2016. Smaller firms may find that a firm sale is no longer viable for them.

RECENT ACEC DEAL-MAKERS

JANUARY 2017

ACEC member **KCI Technologies** (Sparks, Md.) acquired ACEC member **RPM Transportation Consultants** (Nashville, Tenn.), a firm specializing in traffic engineering, transportation planning, roundabout and bikeway design and traffic data collection. The addition of RPM's 21 employees and retention of RPM President Bob Murphy strengthens KCI's position in the transportation market in the southeast U.S.

DECEMBER 2016

Hurt and Proffitt (Lynchburg, Va.) acquired ACEC member **Anderson & Associates** (Blacksburg, Va.), a civil engineering and surveying firm. With the addition of A&A's services and employees, H&P will now offer full-service capabilities.

ACEC member **Thornton Tomasetti** (New York, N.Y.) agreed to acquire **Swallow Acoustic Consultants Limited** (Mississauga, Canada), a specialist in acoustics, noise, and vibration control engineering.

ACEC member **WSP | Parsons Brinckerhoff** (Montreal, Canada) acquired structural design and technical consulting firm **Hoyer Finseth** (Oslo, Norway). Hoyer Finseth will become part of the WSP brand, but will continue under its current management. The acquisition strengthens WSP's structural design expertise and brings the firm's staff count in Nordic countries to 4,400.

ACEC member **Northern Technologies** (Fargo, N.D.) acquired **American Technical Services** (Sioux Falls, S.D.). The acquisition adds similar services to Northern's existing offerings, but expands the firm's footprint in the Dakotas as well as several surrounding states.

2016 AEC M&A Year in Review

U.S. Deals

**U.S. DEALS
DOWN 15%
2016 vs 2015**



**U.S. DEALS
61.4%
INTERSTATE**

**NO. OF DEALS
BY STATE**

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+



TOP STATES FOR FIRM SALES



Global Deals

**GLOBAL DEALS
DOWN 5.7%
2016 vs 2015**



**15 U.S. FIRMS SOLD TO
INTERNATIONAL BUYERS**



**U.S. BUYERS ACQUIRE
20 INTERNATIONAL FIRMS**



ACEC member **Burns & McDonnell** (Kansas City, Mo.) acquired **AZCO** (Appleton, Wis.). The addition of the industrial contractor bolster's Burns & McDonnell's construction sector and adds significant fabrication capabilities to the firm's service offerings.

ACEC member **Terracon** (Olathe, Kan.) acquired ACEC

member **CHJ Consultants** (Colton, Calif.), a geotechnical and materials testing firm. Terracon has been aggressively pursuing growth in geotechnical services in coastal regions of the U.S. This acquisition follows Terracon's November 2016 purchase of Virginia-based firm Geotechnical Consulting & Testing.

ACEC member **NV5** (Hollywood, Fla.), acquired infrastructure engineering firm **CivilSource** (Irvine, Calif.). CivilSource's large public client base offers NV5 the opportunity to engage municipalities as federal and state infrastructure support continues to build.

In a separate acquisition, NV5 acquired ACEC member **The Hanna Group** (Rancho Cordova, Calif.), a bridge and transportation program management firm with approximately \$11 million in annual revenue. The acquisition adds significant bridge expertise to NV5's northern California operations.

NOVEMBER 2016

ACEC member **Bolton & Menk** (Mankato, Minn.), announced that **Survey Services, Inc.** (Mankato, Minn.) has joined the firm. The local acquisition brings additional land surveying capabilities and clients under the Bolton & Menk umbrella.

ACEC member **Barge, Waggoner, Sumner, and Cannon** (Nashville, Tenn.) acquired **jB+a** (Atlanta, Ga.), a planning and landscape architecture design firm. The deal expands BWSC's footprint in the southeast U.S., as jB+a will continue to operate out of its offices in Atlanta and Savannah.

ACEC member **Woodard & Curran** (Portland, Maine) acquired **RMC Water and Environment** (Walnut Creek, Calif.), an environmental engineering firm focused on water resource use and protection. Woodard adds its fourth office in Northern California with the acquisition.

ACEC member **MSA Professional Services** (Baraboo, Wis.) acquired the staff members of the former **Ourston Roundabout Engineering** (Madison, Wis.). The new employees will provide intersection analysis and roundabout design expertise. ■

Mick Morrissey is managing principal of **Morrissey Goodale, LLC**, a strategy, M&A and human capital solutions firm serving the architecture, engineering and construction industry. He can be reached at: mmorrissey@morrisseygoodale.com.

- To view the most up-to-date and "live" versions of the M&A heat maps, and to see who are the buyers and sellers in each state, go to www.morrisseygoodale.com.
- Watch the M&A Takeaway video that accompanies this article, presented by Mick Morrissey, at www.morrisseygoodale.com/ACECMergers/MarchApril2017.



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On the Move

Robert J. Slimp has been named chairman, president and CEO of **HNTB Holdings Ltd.**, the parent company of Kansas City, Missouri-based **HNTB Corp.** Slimp will continue to serve as CEO of **HNTB**, a post he has held since 2013. He is based in Atlanta.

Harrisburg, Pennsylvania-based **Gannett Fleming** appointed **Robert M. Scaer** chairman and CEO, and **Paul D. Nowicki**, president and COO, succeeding Scaer. Nowicki previously served as Southeast region director. **Luis Casado** joined the firm as senior vice president and Southeast region director, where he will manage eight offices in Florida, Louisiana and Tennessee.

Brian A. Lutes has been named president and CEO of Pittsburgh-based **Michael Baker International**, succeeding **Kurt C. Bergman**, who had been CEO since 2013. **Dale R. Spaulding** was appointed executive vice president and COO. **Penny Mercadante** was named executive vice president and chief human resources officer, and **Darcie Zeliesko** vice president of talent management.

Charles Russo was appointed CEO of Waltham, Massachusetts-based **Simpson Gumpertz & Heger**. **Glenn Bell**, CEO since 1995, will remain chairman and senior principal.

Bismarck, North Dakota-based **Kadrmars, Lee & Jackson, Inc. (KLJ)**, appointed **Dean Anagnost** CEO, succeeding former CEO **Niles Hushka**, who retired at the end of 2016 after 35 years with the firm. Anagnost, who joined KLJ in 1991, was appointed CFO in 2007. **Barry Schuchard**, KLJ's current chief production officer, will also serve as president of the board.

Lincoln, Nebraska-based **Olsson Associates** appointed President **Brad Strittmatter** the firm's new CEO. **Ryan Beckman**, senior vice president of sales and new business, was named president.

Pietro "Pete" Giovenco was named president of Rochester, New York-based **Bergmann Associates, DPC**. Giovenco previously served as the firm's COO.

Christopher M. Solomon, president of Austin, Texas-based **Surveying And Mapping, LLC**, has been appointed to oversee daily operations of the company, following the retirement of **Samir "Sam" G. Hanna**, founder and CEO. Hanna will remain chairman and serve as an advisor. Solomon, who will retain the title of president, was appointed to that role in December 2015.

Williamsport, Pennsylvania-based **Larson Design Group** has hired **David Martin** as COO. Martin most recently served as senior vice president for Michael Baker, Inc.

Louis Saulino has joined Mineola, New York-based **Sidney B. Bowne & Son, LLP** as COO. He formerly served as COO and executive vice president at Hirani Engineering and Land Surveying.

Bloomfield Hills, Michigan-based **Hubbell, Roth & Clark, Inc.**, announced the following appointments: **Daniel W. Mitchell** was named



Robert J. Slimp



Robert M. Scaer



Paul D. Nowicki



Luis Casado



Brian A. Lutes



Dale R. Spaulding



Penny Mercadante



Darcie Zeliesko



Charles Russo



Dean Anagnost



Barry Schuchard



Brad Strittmatter

president. **Nancy Faught** was named executive vice president and **Charles E. Hart** was named vice president. These appointments follow the retirement of former President **George E. Hubbell** and former Executive Vice President **Thomas E. Biehl**.

Tampa, Florida-based **Walker Parking Consultants** named **Casey Wagner** executive vice president and COO. Wagner formerly served as a senior vice president in the Houston office. In addition, **Jim (Hakam) Dib** was promoted to vice president of the United Arab Emirates offices and will be based in Dubai. **Rick Klein** was promoted to vice president of the Michigan offices and will be based in Ann Arbor.

Markus Weidner has rejoined Philadelphia-based **Pennoni** as the firm's first chief innovation officer. Weidner most recently served as director of technology at NELSON. He previously served as associate vice president and IT director at Pennoni several years ago. He will be based in the company's headquarters.

Stephanie Kelly was appointed chief human resources officer at New York City-based **Thornton Tomasetti**, where she will be based.

Los Angeles-based **AECOM** named **Andy Sallis** president of global oil and gas for the firm's construction services division. Sallis formerly served at AMEC Foster Wheeler and will be based in Houston. **Robert Leonetti** has been promoted to president and general manager of the firm's civil construction & mining business unit. He formerly served as senior vice president of alternative delivery services. Leonetti will be based in New York, N.Y. and Denver, Colo.

WSP | Parsons Brinckerhoff appointed **Kurt W. Krauss** chief projects officer for the firm's U.S. Advisory Services group. He is based in Washington, D.C. **Christopher Peters** was named a senior vice president and transportation and infrastructure business manager of the West region and will be based in the Orange, Calif., office. **Emily Freund** was appointed a vice president and will

serve as regional director of design-build for the firm's West region. She is based in the Los Angeles office. **Tanya Adams** was promoted to vice president and is based in the Chicago office. Vice President **Edwin E. Tatem** has also been named construction services manager, transportation and infrastructure for the Central region and is based in the Detroit office.

John "JD" Taylor has been promoted to vice president and principal of Carmel, Indiana-based **CE Solutions**.

Edward R. Kennedy has joined Seattle-based **Shannon & Wilson** as a vice president and senior project manager for tunnels and systems.

Alan Thomas has joined Pasadena, California-based **Parsons** as senior vice president and Eastern regional manager of its Industrial Division. **Richard Reis** joined the company as vice president and Northwest regional manager of its Infrastructure Division. Thomas is based in Philadelphia, and Reis is based in Seattle.



Ryan Beckman



Pietro "Pete" Giovenco



Christopher Solomon



David Martin



Louis Saulino



Daniel W. Mitchell



Nancy Faught



Casey Wagner



Markus Weidner



Stephanie Kelly



Andy Sallis



Robert Leonetti

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Siloam Springs

ACEC/California

Bogh Engineering, Inc.

Beaumont

Gordon Prill, Inc.

Sunnyvale

Green Dinosaur, Inc.

Culver City

Inertia Engineers

Valencia

Kurt Fischer Structural Engineering

Encino

MacKay & Soms Civil Engineers, Inc.

Pleasanton

Maintenance Design Group, LLC (MDG)

Pasadena

Verde Design, Inc.

Santa Clara

Western Allied Mechanical, Inc.

Menlo Park

ACEC/Colorado

Albright & Associates, Inc.

Basalt

Anderson Consulting Engineers, Inc.

Fort Collins

Inter-Mountain Engineering

Avon

JDS-Hydro Consultants, Inc.

Colorado Springs

NEI Electric Power Engineering, Inc.

Wheat Ridge

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ACEC/Kansas

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Mission

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Jefferson

ACEC/Nevada

Nova Geotechnical and Inspection Services

Las Vegas

ACEC/New York

Donald J. Winston, P.E., P.C.

Port Washington

EnTech Engineering, P.C.

New York

ACEC/North Carolina
Concord Engineering & Surveying Inc., DBA CESI

Concord

Orsborn Engineering Group, PA

Charlotte

ACEC/Ohio

Adaptive Engineering Group, LLC

Vermilion

BSI Engineering

Cincinnati

Dynotec, Inc.

Columbus

ACEC/Oregon

Cascade Earth Sciences

Albany

Hood River Consulting Engineers, Inc.

Hood River

Rieke Consulting Services, LLC

Tigard

ACEC/South Carolina

NOVA Engineering and Environmental

Greenville

ACEC/Texas

ABCO Subsea

Houston

Bannister Engineering, LLC

Mansfield

Bosworth Steel Erectors, Inc.

Dallas

Capital Technologies, Inc.

Houston

Data Transfer Solutions, LLC

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The Dimension Group

Dallas

T&D Engineers, LLC

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ACEC/Utah

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Logan

Cartwright Engineers, PC

Logan

ACEC/Virginia

Paciulli, Simmons & Associates, Ltd.

Leesburg

ACEC/Washington

Ludwig Structural Consulting

Seattle

MARCH

- 9** Understanding Firm Value: Looking Beyond the Numbers (online class)
- 14** Managing Multiple Projects (online class)
- 16** Connecting Client/Prospect Feedback to Organizational Improvement (online class)
- 15-18** Business of Design Consulting, Orlando, Florida
- 22** Brand Now: Refocus Your Brand and Help Your Firm Grow (online class)
- 28** Strategic Crisis Planning to Protect Your Company's Assets and Profit (online class)
- 29** Find the Lost Dollars in Your A&E Firm (online class)

APRIL

- 5** Battle of the Paper (Bulge): Document Retention Issues and Best Practices for Design Professionals (online class)
- 13** Strategies to Develop Winning Award Submissions (online class)
- 18** Secrets to Successfully Communicating Technical Topics (online class)
- 19** Sharpen Your Communication Skills! (online class)
- 23-26** ACEC Annual Convention and Legislative Summit, Washington, D.C.
- 25** Take Control of Your Email: Outlook and Email Management Best Practices (online class)
- 26** Rules for Good Teaming! (online class)

MAY

- 2** How to Create the Next Generation of Seller-Doers: Without Throwing Them to the Wolves (online class)
- 3** Best Practices for Highly Effective Boards (online class)
- 9** The Life Cycle of Going Global (online class)

To sign up for ACEC online seminars, go to www.acec.org/education.

Additional information on all ACEC activities is available at www.acec.org.

Updated P3s Publication Released; Webinar 10-Packs Offer Discounted PDH Option

INSIGHTS ON LEVERAGING P3S AND DB FOR INFRASTRUCTURE INVESTMENT

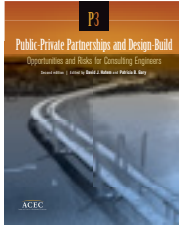
With a renewed national spotlight on infrastructure investment, public-private partnerships (P3s) remain a flexible and innovative solution to the gap between scarce financial resources and infrastructure investment needs.

When designed and implemented correctly, P3s leverage private sector expertise, technology and innovation to provide better quality public services, operational efficiencies and sustainability.

For critical infrastructure projects that lack a revenue stream, the use of more traditional design-build project delivery offers the benefits of innovation and efficiency while relying on traditional funding mechanisms.

ACEC's updated publication, *Public-Private Partnerships and Design-Build: Opportunities and Risks for Consulting Engineers, Second Edition*, helps engineers leverage new opportunities for P3 and design-build projects and further explore the rewards, challenges and risk exposures for consulting engineers in their consideration of those projects.

Order from the ACEC Bookstore at: <http://bit.do/P3DB>.



TOOLS AND PUBLICATIONS FOR LAND DEVELOPMENT FIRMS

Land Development Coalition (LDC) business practices and procedures products are member-developed checklists, best practice guidelines and marketing tools that help land development and site/civil firms increase business revenues and profitability.



LDC publications focus primarily on these essential business topics: (1) marketing and business development; (2) project management; (3) financial management; (4) risk management; and (5) business management. Publications include practical worksheets, templates and practice guidelines covering critical processes and procedures for a successful project.

Several documents are now revamped with new technology to make them easier to use in the field, and several more have been revised to reflect current best practice standards. The following publications were revised in 2016: *Marketing Your Land Development Firm with Greater Success*; *Project Management Tools: Go/No-Go Process*; *Project Start-Up*; *Cost to Complete*; *Contract Negotiations*; *Quality Assurance/Quality Control Tools* and *Project Schedule Review*.

All LDC-developed publications are available for immediate download at www.acec.org/bookstore.

ON-DEMAND WEBINAR 10-PACKS FOR CONVENIENT AND AFFORDABLE PROFESSIONAL DEVELOPMENT

Most states require licensed engineers and surveyors to earn professional development hours (PDHs) each year and file the credits with their state licensing boards. But for many A/E and surveying professionals, the time and expense of a multiday training program is a challenge, especially when renewal deadlines approach.

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