

JULY/AUGUST 2018

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**Aviation Infrastructure
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EXPERIENCED HELP WANTED

A shortage of veteran engineers, particularly those with seven to 10 years of experience, presents a challenge for Member Firms.

"There's a tremendous shortage of engineers, and the problem appears to be growing worse. The impact on the profession is noticeable."

Mick Morrissey | Morrissey Goodale, LLC

EA Partners, PLC & Kentucky Transportation Cabinet District 2

MULTI-MODAL SUCCESS

EA Partners, PLC

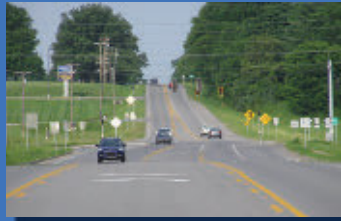


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Safety, history and the future A win for all on U.S. 60 in Henderson



Prior to construction, the five-lane highway and multi-use path ended at the intersection of U.S. 60 and the Kentucky 425 Henderson Bypass. The entrance to the college, shown at the top of the photo, was located on a substandard crest vertical curve.



Plans from EA Partners included the extension of a multi-modal path to the college to help protect pedestrians and cyclists.



The new roadway extends past the college—and an historic property on the other side—to join the existing roadway.



The finished product is an attractive, safe, five-lane roadway with a multi-modal path leading to Henderson Community College.

The one-mile stretch of U.S. 60 in Henderson, Ky., could be described as a thin line between a figurative rock and a hard place. On one side is a historical property, home to the Barrett-Keach Farm, with grounds that run approximately two-thirds of a mile along this stretch.

On the other side is Henderson Community College, a huge asset to the Henderson community, providing education to the future workforce as well as a community theater facility for the area. The entrance to the college is along this stretch of roadway, and for years, was off a substandard crest vertical curve.

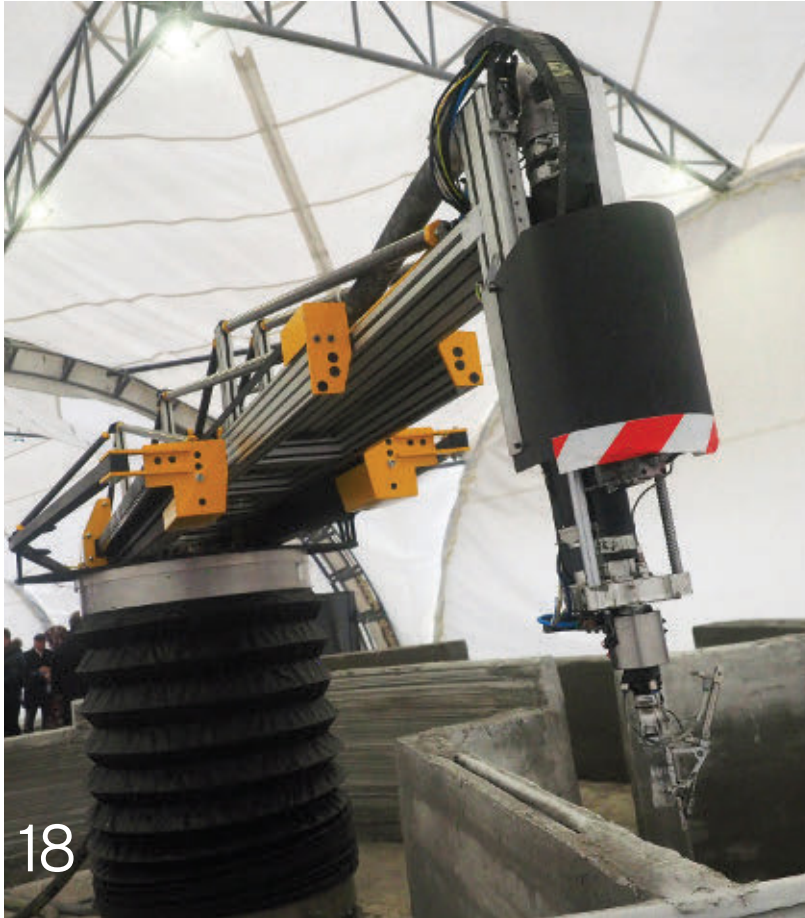
EA Partners developed a design that successfully widened a two-lane,

dangerous country road to a safe, five-lane highway—four lanes and a continuous turning lane. The design incorporated a plan for bicyclists and pedestrians to utilize a multi-modal path on the south side of the roadway to reach or leave the college.

The plan developed by EA Partners focused on safety, preserved history, and helped Henderson plan for the future by educating a workforce and opening up lanes to economic development in the area.



**Members of the EA Partners and KYTC District 2 teams:
Jerry Cottingham, Cassy Wade, John Rudd and Darin Hensley.**



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COVER: C.J. BURTON

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

New ACEC President & CEO

As the unanimous choice of the ACEC Search Committee, Executive Committee and Board of Directors, we are pleased to welcome Linda Bauer Darr as the Council's new President/CEO succeeding Dave Raymond. She will officially begin her tenure on Aug. 6.

Darr is a broadly experienced association executive who spent her last four years as CEO of the American Short Line and Regional Railroad Association. She previously held leadership positions at the American Moving & Storage Association, American Bus Association and the American Trucking Association.

She also was U.S. deputy assistant secretary of transportation for budget and programs, and she started her career working for an engineering company. Darr, who is a Washington-area native and a University of Maryland graduate, also completed the Executive Education Program at the Harvard Kennedy School. An in-depth interview with ACEC's new President/CEO will be featured in the September/October edition of *Engineering Inc.*

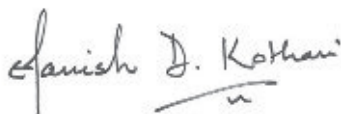
Our current issue examines the engineering industry's continued shortage of seasoned talent and its impact on Member Firms (*see page 10*). We also cover the growing use of 3D printing in engineering applications (*see page 18*) and the observations of the 2018-2019 ACEC Executive Committee members on the challenges of new technology (*see page 28*).

Looking forward to our Fall Conference Oct. 28-31 at the Bellagio in Las Vegas, we have an exciting lineup of nationally renowned speakers as well as the industry's best business education programs. You don't want to miss this one!

Because this is the last time that I (Dave Raymond) will share this space to address you, please know that it has been a great honor and pleasure.

Both of us are highly gratified with the many gains that ACEC has made over the years—and that the Council will continue to be in strong hands as we look to the future.

Enjoy the summer!



Manish D. Kothari
ACEC Chairman



David A. Raymond
ACEC President & CEO



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Engineering Inc., Volume 29, Number 4 (ISSN 1539-2694), is published bi-monthly by the American Council of Engineering Companies (ACEC), 1015 15th Street, NW, 8th Floor, Washington, D.C. 20005-2605. Periodicals postage paid at Washington, D.C., and at additional mailing offices. Annual subscriptions are \$24 for members (included in dues as a non-deductible amount); \$45 for U.S. non-members; \$65 for institutional subscriptions. Back issues are \$15.

POSTMASTER: Send address changes to *Engineering Inc.*, c/o ACEC, 1015 15th Street, NW, 8th Floor, Washington, D.C. 20005-2605.
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Aviation Infrastructure Market Booming

By Gerry Donohue

Engineering firms working in the aviation infrastructure market are flying high right now. The airlines are profitable, and many airports—especially the large hubs—are planning or in the middle of huge upgrade programs.

“It is a perfect storm,” says Burns & McDonnell Aviation Vice President Bret Pilney. “There is a lot of capital spending going on, by both airlines and airports. They are reinvesting in their terminals and facilities. It has been great.”

Some of the largest programs include Chicago O’Hare International Airport (\$15 billion), Los Angeles International Airport (\$14 billion), Hartsfield-Jackson Atlanta International Airport (\$6 billion), New York LaGuardia Airport (\$4 billion), John Glenn Columbus International Airport (\$1.3 billion) and Kansas City International Airport (\$1 billion).

“The airports face a lot of development needs,” says Greg Heaton, vice president at Crawford, Murphy & Tilly. “Facilities are old, passenger counts continue to climb, regulations and security requirements are expanding, and aircraft are changing.”

For a long time, these needs were unmet because airlines and airports had an often fractious relationship. The airlines have struggled to be consistently profitable and begrudged contributing to airport infrastructure improvements. For their part, airports have been constrained by limited federal funding.

“There has not been the kind of money and political fortitude in the past to upgrade our airports,” says Tina Millan, who directs WSP’s U.S. aviation practice. “Now everyone is getting really aggressive.”

A recent survey by the Airports Council International – North America reported that U.S. airports have plans for up to \$100 billion in infrastructure improvements through 2021, although anticipated funding only covers about half of that.

“Maybe they will get to \$50 billion,” says Millan, “but I expect the spend will be closer to \$25 or \$30 billion.”

Even at that level, though, the aviation infrastructure market will be robust for the foreseeable future.

PUBLIC FUNDING

Federal programs account for almost half of airport infrastructure funding.

The Airport Improvement Program (AIP) provides about \$3.35 billion in grants for capital improvements. That level has held steady since 2012. The grants are limited to “airside” projects, such as runways and taxiways. They may not be used for “landside” projects, such as for buildings or making improvements to attract commercial enterprises.

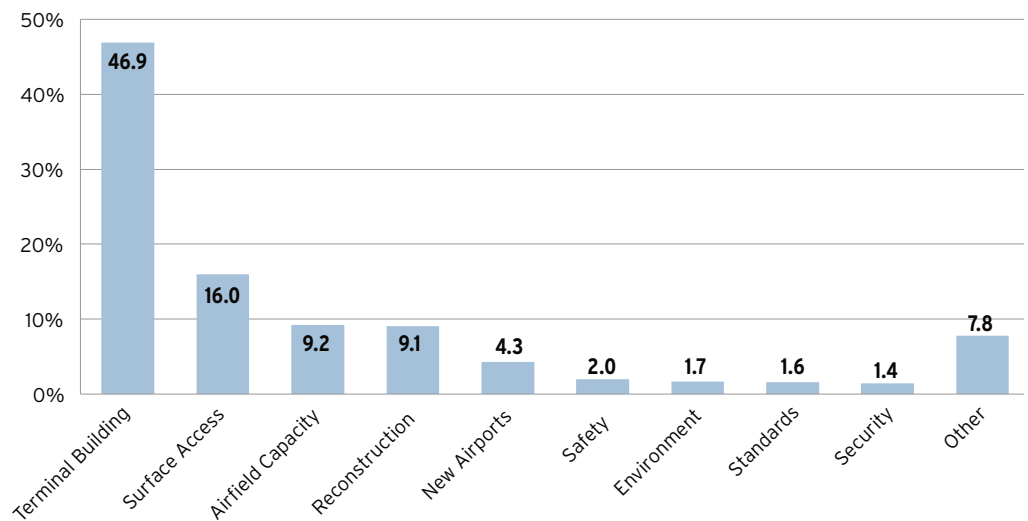
According to the Federal Aviation Administration’s (FAA) most recent National Plan of Integrated Airport Systems report, U.S. airports have about \$32.5 billion in AIP-eligible projects through 2021, but that is more than twice the current funding level.

Most airports also levy a Passenger Facility Charge (PFC) on each passenger using the airport on originating and connecting flights. The funds can only be used for FAA-approved projects aimed at reducing noise; enhancing safety, security or capacity; or increasing air carrier competition. Congress raised the PFC to \$4.50 per flight segment in 2000 but has been unwilling to increase it since then.

“The PFC is now worth about half of what it once was,” says C&S Cos. Senior Vice President Michael Hotaling. “Increasing the PFC has been a battleground between the airports, which consider it to be a user fee, and the airlines, which see it as a tax.”

ACEC and the airports have lobbied Congress to increase the AIP and raise the PFC limit, but the House passed its FAA reauthorization bill earlier this year without any increases. The legislation does include, however, \$1 billion in a new competitive grant program for small and midsize airports.

Airport Infrastructure Needs by Type of Development (2017-2021)



Source: ACI-NA SURVEY

"We are very excited to see that additional \$1 billion," says Heaton. "Maybe Congress is beginning to understand the pent-up demand for airport infrastructure investment."

PRIVATE FUNDING

With public funding flatlined, airports and airlines are relying more on private financing sources, including public-private partnerships (P3s).

"We have been doing P3s for a long time, but we did not call them P3s," says Millan. She points to car rental centers at airports, which are typically funded through the revenue from the car rentals.

There have been several attempts to create P3s for entire airports, but only one has gone through—San Juan Luis

Muñoz Marín Airport in Puerto Rico. Better, Millan says is to "get away from thinking of an airport as one major thing and break it down into a lot of different funding opportunities."

For example, Denver International Airport wanted to include solar in its power grid. The airport contracted with a solar company to install the array on its land. The airport takes its share of the power, and the company sells the rest.

This common financing arrangement, called "soft P3s," is one in which the

airport and one or more airlines collaborate on a project.

"For the past 18 years, we have worked with the city of Philadelphia and an airline on more than \$1 billion in infrastructure improvements to Philadelphia International Airport," says David Yeaman, president, aviation & federal, Burns & McDonnell. Philadelphia Area Industrial Development, or PAID, the bond authority on behalf of the city, sells the bonds. The airline executes the contract for design and construction, which it then turns over to the airport. The airline then becomes a tenant. "This method allows the projects to get done more affordably and in about half the time because the city has lengthy procurement requirements," Yeaman says.

C&S Cos. has been working with several airports to improve their land use. "We work with them to identify opportunities that help generate revenue from their land holdings," says Hotaling. "Using detailed market analytics, we determine the best uses for the land, how to market it for development and to whom."

Smaller airports are also getting in on the action. Crawford, Murphy & Tilly recently worked with Chicago Rockford International Airport and an airplane maintenance and repair company to build two large fabric structures capable of housing a 747 aircraft.

"This is the largest maintenance facility in the country that is not owned by an airline," says Heaton. "The airport is using the new facility as an economic generator, to bring traffic and new users to the field."

PASSENGER EXPERIENCE

An increasingly important focus of infrastructure investment for both the airlines and the airports is improving the passenger experience.

"Customer satisfaction numbers are driving how the airlines are investing," says Yeaman.

The FAA estimates that U.S. airport traffic will increase by 50 percent by 2036 to 1.2 billion passengers annually. Most major airports are geographically constrained, so they cannot build themselves out of the expected congestion. They need to use their space better, getting passengers from the curbside to the jetway faster and more efficiently.

Engineering firms are working with airports and airlines to improve the operational logistics, such as designing security screening to take up less space and move faster and speeding up baggage handling.

"Airports are competing for travelers," says Pilney. "And the passenger experience has become a huge differentiator." ■

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

The FAA estimates that U.S. airport traffic will increase by 50 percent by 2036 to 1.2 billion passengers annually

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ACEC Requests Tax Fix for P3 Projects

ACEC and a coalition of infrastructure groups have asked the Treasury Department to address an unintended consequence of the tax reform law that imposes higher costs on public-private partnership (P3) projects.

Before passage of tax reform, businesses could fully deduct interest expense. The new law limits such deductibility to 30 percent of adjusted taxable income. P3 project companies, however, are generally structured to not have significant income, but they tend to have high borrowing costs. As a result, these companies face significantly higher effective tax rates and costs.

The coalition has asked Treasury for guidance that includes P3 projects in the real estate exception to the limits on interest deductibility. If regulations do not adequately address the problem, ACEC will approach Congress for a legislative solution.

ROGER CAVE/GETTY IMAGES

Senate Committee Approves ACEC-Supported QBS Expansion in Water Bill

The Senate Environment and Public Works Committee passed legislation in May that would expand the application of Qualifications-Based Selection (QBS) in federally funded water projects.

The ACEC-backed provision was included in the Water Resources Development Act (WRDA), which was approved with strong bipartisan support. In addition, the bill authorizes several new Corps of Engineers water projects and expands the Water Infrastructure Finance Investment Act, which provides financing to state water

authorities for water and wastewater projects.

Passage of WRDA was among the top priorities for ACEC's "citizen lobbyists" during the Annual Convention in Washington, D.C., this past April.

The House already passed its version of WRDA, and the full Senate is expected to act in July.





JORDAN LEE/THINISTOCK

Appropriations Committees Boost 2019 Funding for Transportation Programs

The House and Senate Appropriations committees have approved increases for several infrastructure programs in their respective spending bills for the departments of Transportation and Housing and Urban Development for fiscal year 2019.

The House version of the legislation funds highway programs at \$50.3 billion, which is \$4.25 billion above the FAST Act. The Senate bill would add \$3.3 billion to current levels. Transit programs receive more than \$13 billion in both bills, including \$2.6 billion for capital investment grants, sufficient to fund projects with existing grant agreements and several new starts in the FTA project pipeline.

BUILD (previously known as TIGER) multimodal grants are funded at \$750 million in the House bill, with \$250 million designated for projects in rural areas, \$250 million for urbanized areas with a population over 200,000 and \$250 million for ports. The Senate bill allocates \$1 billion to the program. Rail programs receive more than \$3 billion in both bills, including rail infrastructure and safety

improvements and state of good repair grants.

For aviation, the bills preserve Airport Improvement Program funding from the Airport & Airways Trust Fund at \$3.35 billion and add \$500 to \$750 million in competitive airport grant funding from the General Fund. FAA Facilities & Equipment programs receive \$3.25 billion.

The bills also provide \$3.3 billion for the Community Development Block Grant program, the same as the 2018 level and 10 percent above 2017.

Lawmakers are expected to debate and vote on their respective bills this summer.

ISSUES ON THE MOVE

Water Resources Development Act

Transportation Appropriations

Tax Law P3 Fix

WHAT'S NEXT

Senate passage in July

House, Senate passage by August

Possible action before the end of the year

ACEC Co-sponsors TV Commercials and Digital Ads Calling for Increased Infrastructure Funding

ACEC teamed with major business and labor organizations to air targeted commercials and digital ads in support of infrastructure investment.

The campaign, which featured commercials running on the Fox and MSNBC networks and digital ads appearing in key Capitol Hill publications, highlights the economic costs of congestion and urges lawmakers and the administration to pass robust infrastructure investment and a permanent solution for the Highway Trust Fund.

"These ads are targeted on programs and publications that lawmakers and executive branch officials see every day," says ACEC President/CEO Dave Raymond.



The New York Times Highlights ACEC Advocacy Role for Section 179D

ACEC's advocacy for the Section 179D energy-efficient commercial buildings tax deduction was highlighted in a recent *New York Times* article.

Section 179D provides a tax deduction to building owners for certain costs incurred to increase energy efficiency in new and remodeled buildings. When the owner is a public entity (which are tax-exempt), the law allows the deduction to be allocated to the primary designer.

However, the law does not specify whether a public owner should receive anything in exchange for transferring the deduction, and some entities have begun requiring that designers provide a rebate in exchange. In a statement to the House Ways and Means Committee, ACEC argued that these rebates—particularly if they are required by the owner after the contract is signed—create financial and ethical problems for engineering firms.

ACEC is working with Congress on this issue, as well as to extend Section 179D, which expired at the end of 2017.

For More News

For weekly legislative news, visit ACEC's *Last Word* online at www.acec.org.

Missing in

Assembling the prowess to tackle projects has always been at the center of engineering. Yet, with the growing complexity of projects and new technology permeating every aspect of engineering practices, a simple but painful problem has remained: There simply aren't enough veteran engineers—with at least seven to 10 years of experience—to handle all the work that engineering firms hold in their portfolios.

“There's a tremendous shortage of engineers, and the problem appears to be growing worse,” states Mick Morrissey, managing principal at Morrissey Goodale, LLC. “The impact on the profession is noticeable.” He says the root of the current problem extends back to the Great Recession of 2008. Many firms did not hire over the following few years—some downsized—and now the shortage is being felt.



Action

BY SAMUEL GREENGARD

**A GROWING
TALENT GAP
INDUSTRYWIDE
IS CREATING
NEW CHALLENGES
FOR ENGINEERING
FIRMS**

Engineering firms aren't ignoring the problem. Most are finding ways to make do with the talent they already have—and many are looking for ways to boost retention, accelerate training and introduce programs for mentoring and leadership. At the same time, industry organizations are promoting STEM tracks and encouraging young people to pursue engineering as a profession. "Everyone is competing for the same talent. The firms that are the most innovative and creative are likely to win out," says Jeremy Brown, a senior consultant at industry research group FMI.



"The labor pool is shrinking, the number of STEM graduates entering the engineering profession isn't [increasing], and demand for expertise is growing."

SUE OUELLETTE
KLEINSCHMIDT ASSOCIATES

LABOR PAINS

The evidence of a labor and skill shortage is more than anecdotal. What's more, engineering firms have recognized a problem for years. A 2015 survey of engineering firm C-suite and human resources directors found that 52 percent of engineering firms face difficulties filling salaried professional positions. The biggest gap, according to the survey, was among those with seven to 10 years of experience. At the same time, industry reports indicate that up to 50 percent of the current engineering workforce will likely retire by 2020 or soon thereafter.

Simply put: Engineering firms have a serious problem. "The situation is unsustainable over the long-run," Morrissey says.

Although the Great Recession may have triggered the current shortage, the roots of the problem are deeper and more systemic. One problem is a dearth of female engineers and professionals. "Women make up about 50 percent of the population, but only 20 percent of engineering degrees are granted to women," Morrissey points out. This contributes to a male dominated culture—and it perpetuates the status quo—which, in turn, dissuades some women from entering or staying in the engineering profession. "Too often, there are limited opportunities for advancement or growth," he says. Adding to the challenge: Many women start families and drop out of the field—or take on a diminished role at firms.

Another problem is that those in the seven- to 10-year work range—typically millennials—have different ideas and expectations about work and their careers. "They are more open to changing professions or switching companies than baby boomers and Gen-Xers," says Ken Vogel, senior vice president, managing director of

corporate services at Jones Edmunds & Associates. Brown adds that many desire special perks and prefer to work in more collaborative environments and have greater contact with customers. "They want to be excited and engaged," he says.

The U.S. Department of Labor reported that engineering industry employment has rebounded from the 2008 recession. It now exceeds pre-recession highs with employment of about 1.453 million—about 800 full-time employees more than the pre-recession high. But the uptick in projects and work is actually putting even greater pressure on firms at a crucial time. Those who would have

gained engineering experience and begun to move into more senior positions or middle management simply aren't available in enough numbers, compared to the boomers who are retiring.

And while most engineering firms don't rely heavily on foreign talent, changes to H-1B visas will make yet another source of expertise unavailable.

"The labor pool is shrinking, the number of STEM graduates entering the engineering profession isn't [increasing], and demand for expertise is growing," says Sue Ouellette, director of human resources at Kleinschmidt Associates. In the end, this is creating a perfect storm for companies in engineering and related fields. "It's necessary to be creative and flexible when managing the workload. It's critical to take steps to address the issues," says Dawn Moore, associate and director of human

resources at Parkhill, Smith & Cooper.

A NEW DEAL

Navigating today's labor and skill shortage is fraught with obstacles. Yet, many engineering firms are taking steps to adapt and adjust—while hoping to address the longer-term challenge. At Jones Edmunds & Associates, management has been forced to slot senior engineers, project managers and others into positions and tasks that would normally be handled by midlevel engineers and employees.

Vogel says that doing so hasn't affected the company's ability to meet deadlines and maintain high standards, but it has put greater time pressures on these employees—especially in pursuing new projects.

The story is much the same at Parkhill, Smith & Cooper. Moore says that leadership and senior engineers must fill in so the firm can address skill gaps. "We provide greater latitude to experienced, high per-

Up to 50 percent of the current engineering workforce will likely retire by 2020 or soon thereafter



"We want to retain our talent so we listen to understand their concerns, interests and what makes their work more meaningful and fulfilling."

DAWN MOORE
PARKHILL, SMITH & COOPER



NICHOLAS PRIOR/GETTY IMAGES

formers by providing flexible schedules, part-time schedules, working on a per project basis or telecommuting.” This is effective in retaining those professionals that might otherwise exit the field such as retirees and women with children. “We work really hard to create an environment where people want to stay rather than choosing another industry or firm,” Moore explains.

Engineering firms feeling the talent pinch are also focusing on leadership development. For example, Parkhill, Smith & Cooper introduced a Leadership Academy in 2011. It works with young professionals—particularly top performers—to develop client skills, communication proficiencies, presentation skills and management prowess. “This helps them become more valuable within the organization, and our people appreciate how much we invest in them,” says Moore. “We want to retain our talent so we listen to understand their concerns, interests and what makes their work more meaningful and fulfilling.”

Jones Edmunds & Associates has taken a similar tack. It launched a talent development program six years ago and placed it at the center of employee development. “We identify four to six individuals each year that are on a leadership track within the company,” Vogel says. “Two to four senior executives—including the CEO—work with them to build their skills in areas such as servant leadership, emotional intelligence and communication.” For instance, discussions might revolve around how baby boomers, Gen-Xers and millennials work in different ways and what motivates a particular group or person. A combination of structured learning and mentoring leads to discussions and formal presentations. “Participants complete the 12-month program with a deeper understanding of the business,” says Vogel.

At Kleinschmidt Associates, mentoring is also a valuable tool. “We work hard to groom talented and promising engineers so they can advance their careers and deliver the knowledge and expertise we require,” Ouellette says. “One of the problems in this field is that talent is sometimes being lured away by other professions. We have to do everything in our power to be a desirable place to work—and create an environment that makes people want to stay and grow their career with us.” This ultimately encompasses everything from offering attractive compensation and benefits to creating a frame-

work where engineers and others create specific development plans that guide them toward their goals and objectives.

FUTURE FORWARD

The industry is also taking steps to attract young people to the profession. Vogel says that Jones Edmunds & Associates is involved with programs that promote STEM and engineering among middle school students. “We have to get young people interested and involved at an earlier age,” says Vogel.

Moore adds that executives at engineering firms must also do a better job communicating what engineers actually do to high school and college students. “Many people do not understand the importance of engineering in our society. The reality is the work they do is challenging, exciting and vital to the communities we serve.”

The task certainly won’t get any easier in the months and years ahead. As the engineering field becomes more digital, the internet of things takes shape and hardware and software emerge at the center of projects, attracting and retaining talent will become even more critical.

“Engineering firms are going to have to think more broadly and creatively about talent,” Brown says. This includes focusing more heavily on women and minorities.

“Organizations are going to have to invest in training, technology and other systems that encourage younger professionals stay on and develop,” says Morrissey. ■

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

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ESOPs Rife With Advantages,

Just Not for Everyone

Higher productivity, increased economic flexibility and employee longevity are a few of the benefits

BY GERRY DONOHUE



WESTEND66/GETTY IMAGES

A lot of engineering firm owners today are looking to sell. The baby boomer generation dominates firm ownership, and its members are hitting retirement age at an astonishing rate. According to the AARP, a baby boomer turns 65 years of age every eight seconds.

The sellers, however, are competing for a limited pool of buyers. There are only so many investors or other firms looking to make a strategic acquisition.

If a firm owner is looking to sell, what options are available? For an increasing number of owners, the solution is to sell the firm to the firm's employees in the form of an Employee Stock Ownership Plan (ESOP).

"The use of an ESOP as a potential buyer seems to be accelerating," says Bob Grossman, a partner at Lathrop Gage, LLP in Kansas City, Missouri. "In our practice, we have certainly seen more new ESOP formations and more expansion of existing ESOPs than we have seen in years."

ESOPS AND THE ENGINEERING INDUSTRY

ESOPs are tax-qualified retirement plans that invest primarily in the sponsoring company's stock. Because it buys anywhere from 1 to 100 percent of the firm's stock, an ESOP creates a market for the shares of departing owners. In certain circumstances, the sellers can defer or even avoid capital gains taxes from the sale. ESOPs are also the only type of retirement plan that can borrow money to finance purchases of company stock for the benefit of employees. Finally, ESOPs provide retirement benefits to employees and an ownership stake in the company where they work.

The engineering industry has a long tradition of employee ownership.

"The industry has a highly educated employee base who understand the benefits of ownership," says Chris Staloch, managing director of Chartwell Financial Advisory in Minneapolis. "A lot of engineering firms are already owned 20 to 30 percent by their employees."

According to Robert Massengill, managing director of Pilot Hill Advisors in Summit, New Jersey, approximately 300 A/E firms have partial or 100 percent ESOPs. Additionally, Massengill says, many of the largest employee-owned companies are A/E firms, including Jacobs, Parsons, HDR, Black & Veatch, Burns & McDonnell, CDM Smith and STV.

"The ESOP model works very well for HDR because our employees know their work impacts their personal success as well as that of the firm," says Rex Fisher, HDR senior vice president and director of corporate relations. "Our employee-owners are truly working for themselves and for each other. Employee-ownership is also very attractive to recruits."

About 80 percent of ESOP firms have fewer than 500 employees, and 39 percent have fewer than 100 employees.

In a typical ESOP transaction, the firm sets up an ESOP trust, which is a defined contribution plan regulated under the Employee Retirement Income Security Act of 1974 (ERISA). The firm borrows money from a bank, investors and/or the selling shareholder(s) and then lends it to the ESOP on a long-term loan that is typically 10-30 years in length. The ESOP uses the funds to pay the shareholders for some or all of their equity.

Initially, the shares are held in suspense. Each year, the company makes a contribution to the ESOP, which uses those

funds to pay down the loan. As the loan is paid back, the ESOP releases a portion of the suspense shares, allocating them to employees' retirement accounts, generally in proportion to their annual compensation.

When employees leave the firm, the company or ESOP buys back their shares on a predetermined schedule.

SIGNIFICANT TAX ADVANTAGES

ESOPs enjoy substantial tax benefits, both for the sellers and the buyers, because Congress has been determined over the years to promote and expand employee ownership.

"There is a lot of bipartisan support for ESOPs," says Staloch. "In fact, there have been a number of bills introduced in Congress in recent years that would provide additional incentives for companies and shareholders to adopt an ESOP as part of the ownership structure."

The primary tax advantage for the seller to an ESOP is the ability to utilize Section 1042 of the Internal Revenue Code, which allows for the rollover of proceeds from the sale of stock to an ESOP on a tax-deferred basis.

Under Section 1042, the firm must be a C corporation at the time of the sale to the ESOP and the ESOP must own at least 30 percent of the voting shares immediately after the sale. Additionally, the seller cannot receive stock as compensation and must reinvest the proceeds from the sale in a qualified replacement property (QRP), such as corporate bonds or blue-chip equities.

If those requirements are met, the seller can defer the tax on the capital gain realized from the sale until they sell the QRP. The tax deferral on any QRP that has not been sold becomes permanent upon the death of the shareholder, given the step up in basis that would occur at that time.

For the buyers, combining a 100 percent ESOP with an S corporation can create a tax-free entity. As an S corporation, the firm pays no federal and, in most cases, no state income taxes at the corporate level, passing the income tax liability through to the shareholders. Furthermore the ESOP, as the sole shareholder, does not pay income tax.

Contributions made by the firm to the ESOP are tax deductible as long as they do not exceed the statutory limits. This includes contributions made to the ESOP to repay the loan between the ESOP and the firm—which means both the interest and principal payment are tax deductible—as well as

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"The most successful ESOPs are very transparent. The leadership communicates constantly about the ESOP, what it is and how it benefits the employees."

CHRIS STALOCH
CHARTWELL FINANCIAL ADVISORY



cash contributions made to the plan to buy out participant accounts.

ESOP CHALLENGES

Despite the significant tax advantages, ESOPs are not for everyone. Creating and maintaining an employee-owned firm can bring unfamiliar pressures to bear on both the owners and employees.

“Owners choosing ESOPs need to have a broader set of objectives rather than just looking for the highest dollar from the sale of their company,” says Massengill. “Many owners are looking to benefit the employees who have helped them grow their business.”

While selling your firm to private equity might get a better price, you have to meet its investment goals, and selling to a strategic partner can be problematic because a strategic partner often has its own management team, Grossman says. “ESOPs give you the ability to sell your shares at fair market value, reward, motivate and incentivize your employee workforce and maybe even preserve a family or community legacy,” he says.

Additionally, Grossman says owners who sell to the ESOP tend to remain in the firm for several years. “They maintain their level of involvement, nurturing the ownership culture within the company,” he says.

Building that culture takes a lot of work by leadership. “This can be a pretty big mind shift,” says Staloch. “The most successful ESOPs are very transparent. The leadership communicates constantly about the ESOP, what it is and how it benefits the employees.”

“We use a combination of channels to communicate our ESOP news to employees,” says HDR’s Fisher. “Our internal

portal has a section devoted to ESOP information that employees can access at any time. We present it visually using tools such as infographics in addition to more detailed information. We also use the portal and email to communicate specifics such as buy/sell information.”

Firms that adopt employee ownership also must be consistently profitable because they need to make annual contributions to the ESOP.

“High turnover companies do not work very well as ESOPs,” says Staloch. Employees leaving at a steady clip can put a strain on the firm’s cash flow, as it must buy back their shares.

Finally, ESOPs can be a challenge to set up and to manage. Because they are protected by ERISA, they are regulated by the Department of Labor, which has taken an aggressive stance in recent years to ensure employees are treated fairly in the transactions.

“There was a time when only one financial adviser was needed to model an ESOP,” says Staloch. “Today, the Department of Labor wants to see a highly negotiated transaction, which almost always requires that both the sellers and the ESOP trustee have financial advisers to represent them. That adds a lot more complexity.”

All the extra effort, however, appears to be worth it. According to a variety of researchers, ESOP companies are outperforming other firms and enjoying higher productivity, increased economic resilience and longer employee tenure.

“I can always tell when I walk into an ESOP firm,” says Grossman. “They make for really happy, successful companies.” ■

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



DIMENSIONAL

BY GERRY DONOHUE

MAGNITUDES

While still considered a new wave in technology, **3D printing** is growing as an innovative backbone for a variety of industries, including engineering

A large industrial 3D printer is shown in operation, extruding a thick layer of concrete into a mold. The printer's arm is black with a red and white striped safety band. The background is a large, white, curved structure, possibly a tent or a large container. The printer is positioned over a concrete mold, and the extruded concrete is visible as a thick, grey layer.

A Chinese construction firm recently demonstrated how a 3D printer can construct a small house. The house can be completed in 24 hours.

ALTREND IMAGES/GETTY IMAGES

At the Consumer Electronics Show in Las Vegas in January 2018, 3D printers were a common attraction, but manufacturer Aleph Objects, Inc., caught participants' attention by using 150 3D printers at its booth to build new 3D printers.

As futuristic as that may sound, Aleph Objects has been using 3D printers to manufacture 3D printers since 2011.

While frequently touted as the "next big thing," in reality 3D printing has been around for quite a while. The first 3D printer was created in 1984, and the technology has gone mainstream in a variety of industries, from food processing to fashion to jet engine manufacturing. The process is also being incorporated into the health care industry for its potential in human tissue repair and cancer research. By definition, 3D printing refers to processes in which material is joined or solidified under computer control to create a 3D object, with material being added together, such as liquid molecules or powder grains being fused. Potential applications, however, are endless.

Engineering is fertile ground for 3D printing. Firms are already using 3D printers to create scale models, design unorthodox components, combine materials, test tolerances and build structures.

"I see almost endless potential for 3D-printed building components," says Enrico Dini, an Italian engineer and pioneer in large-scale 3D printing. "There are huge opportunities in building components. Traditional processes can't match the levels of complexity and accuracy that you can get with 3D printing."

BIGGER AND BETTER

Three-dimensional printing is also known as additive manufacturing, in that the printer works off a digital design to add successive material layers in a sequential manner to create a desired object. For engineers, the technology has developed in two key ways. First, the types of materials that can be printed are constantly expanding and include thermoplastic, metal, powder, ceramic, paper, photopolymer, liquid and concrete.

Not only that, says Thornton Tomasetti Principal Rob Otani, "We can use 3D printers to change material properties. We can make composites that we would not be able to make manually."

Printers have also gotten bigger. Most printers are as big as an office printer, but companies are testing the limits of size. Dini has designed a 3D printer that is 40 feet by 40 feet by 32 feet.

While there are numerous types of 3D printers, the two that have had the biggest impact on the A/E/C industry are extrusion printers and inkjet head and powder bed printers.

Extrusion printers dispense the material through a nozzle. Several companies are marketing large extrusion printers that use gantry systems to lay down a concrete bead that builds up to form the walls of a structure. A Chinese construction firm 3D printed a

Thornton Tomasetti 3D printed *Flotsam* and *Jetsam*, two 30-foot by 30-foot by 10-foot structures printed out of biodegradable bamboo, for the Design Miami Festival in 2016.



small house in 24 hours using one of these printers, and a developer announced plans to build a community of 1,000 3D-printed homes in Russia.

With an inkjet head and powder bed printer, fine binder droplets are sprinkled onto a thin layer of a powdered material, a roller compacts and binds the layer, more powder is applied and the process repeats until the bound-together powder layers form the desired object. Follow-up treatments can be applied to improve the material strength.

"We have scaled up this process," says Dini. "Instead of using powder, we use sand or aggregates or gravel, and instead of using binder, we use cement."

In 2005, Dini used one of these printers to manufacture the components for a small house in Italy. More recently, he printed the components to build a concrete pedestrian bridge in Spain.

In the U.S., Thornton Tomasetti has been a pioneer in 3D-printing technology within the engineering industry. In 2016, the firm engineered two 30-foot by 30-foot by 10-foot structures for the Design Miami Festival. "We're working on one now in Nashville that would have a 35- to 38-foot span," says Otani.

Other 3D-printing processes have made their way into construction for specialized applications. MX3D, a technology startup in



"Once the regulatory bodies come up with a way to qualify and certify 3D-printed structures, there's no limit to what we could see."

HEATHER REED
THORNTON TOMASETTI



A 3D-printing process was used to build a metal pedestrian bridge, which will span over a canal in Amsterdam.

COURTESY OF MK3D

Holland, recently built a metal pedestrian bridge to span over a canal in Amsterdam using an additive welding process. Two robots, one on each side of the canal, created layer upon layer of spot welds, gradually building the structure from each end until they met in the middle. Arup performed several load tests to confirm the structural integrity of the bridge.

REGULATORY LIMITATIONS

The 3D printing of structures has largely been an overseas phenomenon, and that will likely continue because of U.S. building codes.

“One of the challenges that we face the most is the qualification and certification aspect of 3D printing,” says Heather Reed, associate in Thornton Tomasetti’s Weidlinger Applied Science practice. “It takes a long time to build up the necessary statistical confidence.”

To that end, Reed says Thornton Tomasetti is developing predictive models to analyze the material and mechanical properties of various 3D-printed components.

“Once the regulatory bodies come up with a way to qualify and certify 3D-printed structures, there’s no limit to what we could see,” says Reed.

INFINITE POTENTIAL

As bright as the future is, the technology offers a lot of options for engineering firms today.

At the most basic level, engineering firms are using 3D printers to build scale prototypes of their designs to impress a potential client. “We can demonstrate to the client the possibilities and show them the advantages that 3D printing has to offer,” says Reed.

The technology also allows firms to create designs and use materials they would never have considered. “It’s changed the way we work,” Reed says. “Previously, there was a finite list of materials that we could use, and the design had to conform to the limitations of those materials. With 3D printing, we no longer have those limits.”

3D printing also streamlines the production process. “It allows us to go directly into fabrication,” says Otani. “There’s no misinterpretation of design documentation. For the Miami Design Festival project, we went from digital models straight to the printer.

“There’s almost no limitation with this technology, especially when 3D printing is combined with full-scale robotics,” he adds. “It will significantly change how buildings are designed and how they are built.” ■

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

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Growth, Stability and Change

Practicing good risk
management now
will position firms
for success

BY MAUREEN CONLEY

JUSTIN LEWIS/GETTY IMAGES

The professional liability insurance market has been remarkably stable for years, and last year was no different, according to ACEC's 2018 PLI survey of Member Firms. Insurance rates and claims are largely flat, in spite of significant increases in revenue reported by ACEC Member Firms.

Of the 442 Member Firms that responded to ACEC's survey, 87 percent renewed with their existing carrier last year. Premiums were flat for 37 percent of firms, and nearly equal percentages were subject to decreases versus increases—27 percent versus 29 percent.

While all signs point to a continuing steady market, the nature of risk in the A/E sector is always changing, and that can bring a change in the carriers' appetites and change in the business profiles of ACEC members, according to Al Rabasca, director of industry relations for XL Catlin. He urges design firms to seek value and continuity in their PLI carrier. "If their carrier did not collect enough to offset losses, some insureds may see higher premiums or the premiums they should have had in the first place" says Rabasca.

Some carriers have recently stopped writing PLI for small firms. Those carriers exiting the market remain responsible for claims filed under their policies, but may not be able to give the same level of service, according to James Schwartz, U.S. A&E focus group leader for Beazley.

RECOMMENDATIONS

ACEC's 2018 PLI survey reflects stiff competition among the PLI carriers; however, Jeff Connelly, program manager for the ACEC Business Insurance Trust and a broker at Greyling Insurance Brokerage, a division of EPIC Insurance Brokers & Consultants, counsels his clients not to shop every year. "You need a strong, long-term relationship with your carrier so they will continue to insure you even after a claim or two," he says.

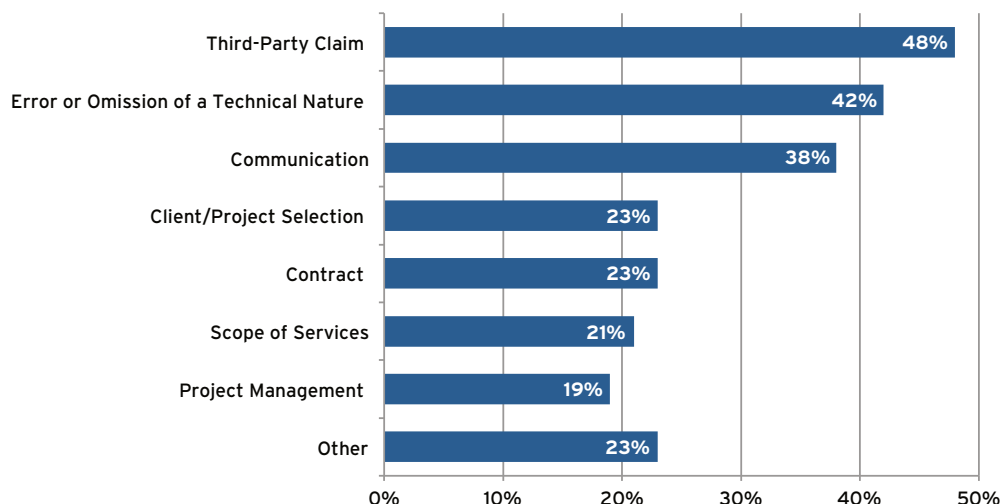
"Financial stability and history in the marketplace are important, as is finding a carrier that can be a business partner with a risk management program that will make them be better businesspeople, and better insureds, by lowering their risk profile," says Rabasca.

Michael Welbel, president of a/e ProNet and vice president of Risk Strategies Co., notes that "Purchasing a PLI policy is really buying claims handling, and you do not know until you have a claim how good that service may be."

Additionally, the PLI marketplace has been flooded by insurance carriers, and they are not all equal, according to Kathy Blanchard, president of PLAN and senior vice president with BB&T Insurance Services. She advises firms to focus on pollution protection, cyber risk and technology liability coverage. "All firms have network security and cyber exposures related to the data they work with, control or create," she says. Carriers may also vary in

Of the 442 Member Firms that responded to ACEC's survey, 87 percent renewed with their existing carrier last year

Causes of Claims



how they define professional services and claims.

Schwartz believes that if there is a claim, a firm will be well protected. "Designers want to be with a carrier that will live up to that promise and can understand the intricacies of A/E claims."

Jim Messmore, senior vice president at Hanson Professional Services and former chair of the ACEC Risk Management Committee, agrees. "Carriers consistently receive high marks for their pre-claims and claims handling services," he says.

Access to legal help and resolving issues early is good for everybody—the insurer, the engineering project and the client relationship, according to Matt Richards, executive vice president and corporate secretary of Strand Associates, Inc., and former vice chair of the ACEC Risk Management Committee.

"Handling issues as they occur and before they morph into claims is a key to our 99.5 percent client satisfaction rate," says Tim Haener, president of J-U-B Engineers and a member of the ACEC Risk Management Committee. "Our insurance carrier's loss prevention program plays an important role in that process."

INDUSTRY GROWTH

Firms employing good risk management practices may be much better positioned for growth, particularly if Congress succeeds in enacting an infrastructure bill, according to Kevin Collins, underwriting manager and senior vice president for Victor O. Schinnerer & Co.

Collins, who is seeing both steady frequency and steady severity in claims, advises maintaining the focus on good risk



"You need a strong, long-term relationship with your carrier so they will continue to insure you even after a claim or two."

JEFF CONNELLY
GREYLING INSURANCE BROKERAGE/PROGRAM MANAGER,
ACEC BUSINESS INSURANCE TRUST

management before firms start to feel the strain of double-digit growth. Risk management is especially important in the large majority of firms without in-house counsel or full-time risk managers—94 percent and 95 percent of the survey respondents, respectively.

“As the construction market continues to grow, we are going to see increased claims frequency just because there are more projects going up,” he says.

Of those surveyed, 68 percent of firms report increased revenue in 2017, and more than 40 percent grew by 10 percent or more. Electrical and mechanical/HVAC firms had the largest increases but there is evidence of growth across all disciplines, project types and geographical regions.

In order to take advantage of growth opportunities in new geographic regions or technical disciplines, firms must have the talent behind them to do so. Difficulties in finding that talent, which, according to Schwartz, is the biggest challenge for the industry, can stress project staffing and have a cascading effect on the end product—adding more liability to your project and more risk for claims.

Aside from managing risk when it comes to staffing and expertise, there is the PLI contract itself. Negotiating with your carrier or finding a new carrier to better balance the liability and your costs can be an effective tool in an overall risk management plan.

Kurt Fischer, president of Kurt Fischer Structural Engineering, changed carriers last year, opting for lower cost PLI that came with access to contract reviews, dispute resolution services such as legal advice and education on business practices. For example, Fischer finds value in the monthly seminars his new carrier offers on how to avoid claims and prevent losses.

But negotiations should not stop there. Haener believes the current economic climate makes contract negotiations of all kinds easier—including with clients. “When times are tight, it is tough to get anything changed. Now, clients seem much more amenable to contract terms for insurability,” he says.

Sixty-eight percent of firms report increased revenue in 2017, and more than 40 percent grew by 10 percent or more

However, a desire for growth and a good climate for negotiation does not mean taking on any job and any client. Strategic growth should include making sure the firm’s liability is covered when choosing each job. That is even more important considering, for example, that Beazley is seeing severity increases beyond simple claims inflation that is likely fueled by projects becoming more complex and expensive.

If a contract is potentially uninsurable, J-U-B will turn down a project. “We may consider a potentially risky project but only if the risk is manageable, or if it is mitigated by our contract, scope of services and insurance,” says Haener.

“The economy is good, and there is work out there. It is just a matter of thinking strategically about how firms want to grow,” Richards says.

DEFENDING CLAIMS

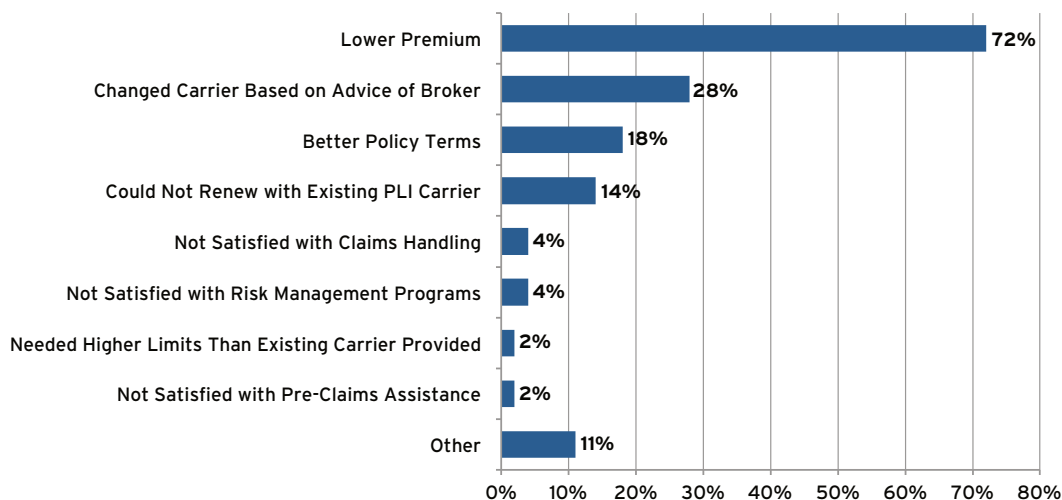
For 52 percent of firms, claims are flat. However, 30 percent of firms reported higher claims while 17 percent reported a lower number of claims. Overall, the number of claims is trending upward. According to Messmore, errors of a technical nature are still a concern, affecting 42 percent of firms with claims last year. This is possibly due to challenges in quality assurance or the loss of experienced staff.

“It is never pleasant to defend a claim,” says Collins. “In most cases, some combination of factors comes into play, and every firm is going to react differently.” Collins adds that a decision to settle should be made jointly, and may require the informed consent of the insured.

Fischer had one eye-opening pre-claim experience that, while it never became a claim, required time, work and money to prepare for a deposition. A lesson having been learned, he is now much more thoughtful during the review process and more aware that what is done now can have an impact 10 years from now.

“Engineers are often viewed as people with deep pockets,” says Chris Anderson, president of DJ&A. Anderson’s firm has had three frivolous claims thrown out in the past 10 years. “If we can

Reasons Firms Changed PLI Carriers



mitigate a problem before it becomes a claim, that is our first priority. Some insurers do that well, others not so well."

THE ROLE OF BROKERS

Cost generally drives decisions to change carriers, according to Welbel. Of the 13 percent of firms that changed PLI carriers last year, 72 percent switched for lower premiums while 18 percent sought better policy terms, and 14 percent could not renew with their existing carrier. Broker advice prompted 28 percent of the switches.

"These numbers have held steady over the years, reflecting a low turnover rate for the industry, despite the large number of carriers in the marketplace," says Messmore. The number of firms changing brokers was even smaller at 8 percent.

"What sets brokers apart is what happens after the policy has been issued, and the services they provide," says Blanchard.



"The economy is good, and there is work out there. It is just a matter of thinking strategically about how firms want to grow."

MATT RICHARDS
STRAND ASSOCIATES, INC.

"Understanding hot buttons, risk appetite and future business plans allows us to work together on helping to minimize risk and liability to the firm."

"Brokers can go to bat for our clients, leveraging a staff of risk managers, including attorneys who have experience working at large engineering firms and have been through many of the situations our clients find themselves in," says Connelly.

NEW COVERAGE AND RISK

Carriers may need to innovate and find ways to fill gaps in existing policies, according to Welbel. To that end, a/e ProNet and Risk Strategies, Inc., worked with Founders Specialty and Aspen Insurance to launch stand-alone contractual defense protection that insures duty-to-defend clauses. Following a 2010 court decision that found the design engineer liable for the client's cost of defending a claim, project owners have increasingly required duty-to-defend clauses, something carriers consider outside the PLI policy. According to Welbel, this left designers with a binary choice: take on that uninsured exposure or pass on the work. The new policy has no deductible, but requires the designer to pay 20 percent co-insurance up to a cap.

Beazley has seen a few claims, usually

in connection with growing facilities that have not met the expected yields.

"It is a very speculative business, like real estate development, so expectations may be unrealistic," says Schwartz.

It is not unlike real estate development or biofuel projects; the claims are large and involve lost revenue and profits. "While it can be difficult for plaintiffs to prove those claims, they have been expensive to defend," says Schwartz.

MANAGING CLIENT EXPECTATIONS

Anderson says DJ&A has a unique approach to managing risk. "About 85 percent of our work last year was with the federal government," he says. "This reflects the company's strategic goal to work for public entities where the likelihood of lawsuits is very low." Anderson adds that he would like to see this practice make more of an impact on the cost of his PLI.

Fischer does not like to turn down a project, but sometimes clients ask for things that may be uninsurable or unfair in a contract's terms and conditions. He finds it frustrating that contracts are getting longer, more complicated, and are rife with uninsurable and unfair provisions.

Nontraditional delivery methods, such as integrated project design, public-private partnerships or design-build, can raise a red flag, according to Richards. "I think there is a perception that people can get things done more quickly to save some money, but there is some downside and risk for the design community," he says. Richards believes the solution may lie in educating project owners and finding skilled contract reviewers to help designers manage their risk on complex projects.

Haener occasionally has clients interested in reusing existing facilities or components to save on the cost of new construction, but who may have unclear expectations about risk balance.

"We have a discussion during scoping about who has the risk, who can mitigate it and who should be responsible for a cost overrun if it does not pan out," says Haener. "This allows for clarity if there is an issue later on, with each party contributing to the fix in proportion to their responsibility."

Anderson believes the need for PLI will only become greater. "It is a matter of growing importance for us," he says. "We look at it every year, and make sure we weigh the benefits of a good insurer with the total cost of insurance and make sure we mitigate risks where we can." ■

Maureen Conley has more than 25 years' experience writing about science, engineering and government policy in Washington, D.C.



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CO	USI Colorado LLC
CT	Smith Brothers USA
DE	KT & D Inc.
FL	USI Insurance Services / Suncoast Insurance
GA	Crow Friedman Group LLC
HI	Finance Insurance Ltd.
ID	The Hartwell Corporation
IL North/Central	Holmes Murphy & Associates
IL South	Crane Agency
IN	ONI Risk Partners
IA	Holmes Murphy & Associates
KS	Holmes Murphy & Associates
KY	The Underwriters Group
LA	Alexander & Sanders Insurance Agency Inc.
ME	Clark Insurance
MD/DC	CBIZ/Ebersberger
MA	Poole Professional Ltd.
MI	Professional Concepts Insurance Agency Inc.
MN	H. Robert Anderson Associates Inc.
MS	HUB Gulf South
MO	Crane Agency
MT	The Hartwell Corporation
NE	The Harry A. Koch Co.
NV	American Insurance & Investment Corporation
NH	Poole Professional Ltd.
NJ North	Risk Strategies Company
NJ South	Wortley/Poole Professional Ltd.
NM	R.J. Dean & Associates
NY North	Poole Professional Ltd.
NY South	Risk Strategies Company
NC	BB&T Insurance
ND	TRJ Professional Group
OH	Oswald Companies
OK	McLaughlin Brunson Insurance Agency
OR	USI Northwest/Kibble & Prentice
PA East	Wortley/Poole Professional Ltd.
PA West	Oswald Companies
RI	Smith Brothers USA
SC	BB&T Insurance
SD	TRJ Professional Group
TN	Crow Friedman Group LLC
TX North	McLaughlin Brunson Insurance Agency
TX South	USI Southwest
UT	Benchmark Insurance
VT	American Insurance & Investment Corporation
VA	Poole Professional Ltd.
	CBIZ/Ebersberger
	BB&T Insurance Services
WA	USI Northwest/Kibble & Prentice
WV	Oswald Companies
WI	Holmes Murphy & Associates
WY	USI Colorado LLC

PUERTO RICO

Fulcro Insurance

CANADA

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BC	Metrix Professional Insurance Brokers Inc.
MB	Oldfield Kirby Esau
NB	HUB International Atlantic
NT	Lloyd Sadd Insurance Brokers
NS	HUB International Atlantic NS
NU	Lloyd Sadd Insurance Brokers
ON	Pro-Form Sinclair Professional / HUB International Ontario Limited
QC	Vestas Inc.
SK	Lloyd Sadd Insurance Brokers



2018-2019
EXECUTIVE
COMMITTEE

ADDRESSES THE CHALLENGE OF NEW TECHN



BLACKJACK3DGETTYIMAGES

BY STACY COLLETT

The future for the engineering industry looks brighter than it has in years.

Capital spending in the United States is at an all-time high. The state of New York, for example, which invested \$48 billion on capital projects last year, is expected to spend an additional \$50 billion this year, according to New York-based Executive Committee members.

The Trump administration still has plans to invest trillions in the nation's infrastructure, though the initiative is stagnant for the time being. New hires who joined engineering firms after 2011 have little recollection of the recession's crippling effect on the industry and have primarily experienced only growth and prosperity at their firms.

Members of the 2018-2019 ACEC Executive Committee offer their views on technology and trends that are expected to impact the industry.

"We are living in a great time in our industry where markets are expanding," says ACEC Chairman **Manish Kothari**, president and CEO of Sheladia Associates, Rockville, Maryland. "There is also unprecedented opportunity for innovation and the use of new technology."



Manish Kothari

LOGY

FOLLOW THE MONEY

With no clear commitment on long-term federal funds for public sector projects, Chair-elect **Mitchel Simpler** sees firms migrating more and more from public sector work into the private sector. “The private sector is where the money is,” says Simpler.

“In New York, \$2 out of every \$3 spent in construction is in the private sector,” says Simpler, a managing partner at Jaros, Baum & Bolles, New York City. The private sector offers not only new opportunities for firms that traditionally rely on public sector projects, but it also drives them to become more innovative and creative. “Overall, diversification is going to help the industry tremendously,” he says.

Kothari says that “we are also going into international markets for infrastructure work.”

He adds that the government sector does have bright spots. “An increase in military spending will offer opportunities in the defense sector,” he says.

TECHNOLOGY TRENDS

Executive Committee members say innovation is critical to advancing the industry.

“As we are providing services, we are not just blindly doing the same thing over and over again,” says **W. Arthur Barrett**, ACEC vice chair and senior vice president at Gannett Fleming, Baltimore. “Putting innovation into our projects makes sure we are keeping up with technology, and that we are embracing technology such as artificial intelligence (AI).”

Vice Chair **Jerry (Jay) Wolverton, Jr.** points to the increased speed of engineering projects. “It is so much faster, and the expectation from clients is there for it to be fast,” says Wolverton, president and CEO of Wolverton & Associates, Duluth, Georgia. “I have colleagues who are fearful the profession of engineering may go away because of technology. But firms that embrace technology are going to thrive.”

“What would have previously taken 10 hours now takes an hour to generate that same work product,” says **Michael “Sully” Sullivan**, executive director of ACEC/Georgia and NAECE president on ExCom.

It’s not just client expectations that are being upended.

Mitchel Simpler



The convergence of groundbreaking industry technology will change both the way engineering work is done and the products generated.

“We are going from 2D drawings to 3D BIM models that someone can put on a virtual reality headset and walk through their building or piece of infrastructure that is being designed,” Sullivan says. “That is



W. Arthur Barrett

toward selling our value and getting away from selling hours. Consider developing technologies and software suites, leveraging analytics using sensors and project data together with our engineering know-how to offer new services,” she says. “Partnering with companies beyond our traditional thinking such as Google and others could lead us to new areas. We are moving toward technology solution providers rather than engineering design companies.”

In the meantime, firms have to be careful about who is building the design software they incorporate on projects. “The people developing design software are not usually traditional design engineers, but software programmers,” says Vice Chair **Stephanie Hachem**, senior vice president at Kimley-Horn and Associates, Raleigh, North Carolina. “Design decision making is shifting more to the programmer and away from the design. But if we are not proactive, we are going to find ourselves reacting to someone else’s programming. We need to step in and

going to radically change the way engineering work is done and what clients are going to expect.”

Technology also brings opportunities for firms to transition from billing time into selling value, says Vice Chair **Gayle Roberts**, former chair at Stanley Consultants, Centennial, Colorado. “We need to work



Jerry (Jay) Wolverton, Jr.

Michael “Sully” Sullivan



have an active role in the development of design programs, their use and implementation.”

Some deceptively simple new technology could also pose a threat to the industry, Sullivan adds. “An untrained, unqualified person could try to leverage these new technologies to deliver an engineering product. How do we protect against unqualified companies or individuals using these tools without the expertise or the knowledge?” he says.

It’s not enough to rely on others for expertise. For example, AI, which garners both excitement and concern in the industry, has the potential to revolutionize project design. If firms outsource all of their AI know-how, they could lose their competitive edge and their market share. It comes down to integration and utilization.

“Where are we going to be when AI can design a bridge better than we can?” says Barrett. Engineers will have to learn what a community wants and use AI to design a product that addresses those wants and needs while at the same time maximizing the savings that AI will bring to a project, Barrett says.

INFRASTRUCTURE NEEDS

In some areas, it’s not the latest technology but the everyday needs that face the biggest hurdles. U.S. infrastructure remains in dire straits, with about \$150 billion annually needed to repair highways and bridges, \$100 billion for airports, \$25 billion for public transit and \$25 billion for water and wastewater, according to Kothari.

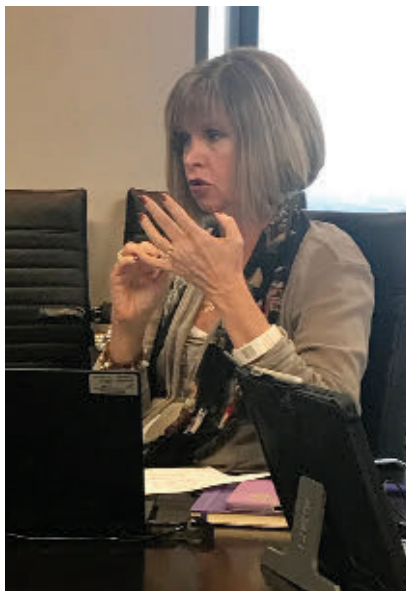
Vice Chair **Keith Jackson** believes water will be a particular area of opportunity, both in the need to repair infrastructure related to water and wastewater, but also getting water to where it is needed.

“In Texas, for instance, we have lots of water. It is just in the wrong part of the state, and others do not want to share it,”



Gayle Roberts

Stephanie Hachem



says Jackson, who is also a senior vice president at HNTB Corp., Austin, Texas. “You also have Flint, Michigan, and their water problems. Puerto Rico is suffering still without water, and California just signed an \$11-billion plan for a new pipeline system to get water to Los Angeles.”

In California and other parts of the West, Vice Chair **Keith London**, president and CEO of Kennedy/Jenks Consultants, Murrieta, California, also sees parched communities working on ways to treat all types of water as one water resource. “Planned potable reuse projects, where wastewater undergoes advance purification before being reintroduced to the environment to indirectly supplement drinking water supplies, are being explored in parts of the U.S. where water is scarce,” says London.

“We are currently leading the planning, design and implementation of what will be the next wave of indirect potable reuse projects in California; supplementing groundwater and surface water supplies to meet increasingly stringent discharge compliance requirements, or to offset expensive imported water supplies,” he says. “This is an exciting time, where the regulations, public acceptance and technology are all aligning to allow cities and water agencies to develop local, sustainable supplies.”

But funding remains a thorny issue, with the federal government proposing that more money come from states and private partnerships. “There have been states passing infrastructure bonds, which is a good thing, but as far as federal funds, unless they really have a new revenue source it is going to be very difficult to fund any added increases,” says Vice Chair **Charles Gozdziwski**, executive chairman at Hardesty & Hanover, New York City.

Despite the Trump administration’s talk of infrastructure funding, there is still no clear funding source for these projects. “However, it does feel like the pulse is stronger than it has been in a long time for infrastructure funding,” Hachem says. “The focus is shifting a bit from just a case for helping move goods and people to an issue of economic health, especially when giant online retailers increasingly look to infrastructure to build massive distribution centers and need healthy roads and bridges to deliver goods to customers.”

DOSE OF REALITY

There is no shortage of other threats to the industry, according to Kothari. Fear of over-regulation, looming trade wars, the perpetual shortage of qualified engineers and China’s plan to invest \$4 trillion in global infrastructure are just a few of the “what ifs” that keep some engineering firm leaders up at night. And that doesn’t include the major impact that a sudden economic downturn



Keith London

could have on the industry despite its current strength.

Relative to the current strong economic conditions, “we know it does not last forever,” London says. “You have to be prepared for the fact that one day, the national economy is going to start to slow down, and we are going to have to adapt. In fact, adaptation will be key for our industry going forward.”

Despite all of the new projects, firm growth and expansion in the industry today, those who endured the recession cannot forget what it felt like when the bottom dropped out.

“Although the economy is robust at this time, we have the highest levels of debt ever in the country—both from the political and private side. We do not know how that is going to play into it,”



Keith Jackson

Gozdziewski says. “It is cyclical. We just have to be ready for something bad when it happens.”

But what does that readiness look like? What business strategies should firms implement to capitalize on the good times and prepare for an industry shift or downturn?

“ACEC has been at the table for more than 100 years protecting our industry and advancing its interests in all kinds of conditions,” says outgoing President and CEO Dave Raymond. “Today in many fundamental respects we are operating no differently than the past—in that we seek infrastructure funding, regulatory and procurement reforms and tax relief. But these concerns are played out against changing politics, technologies and market trends. The better we understand these trends, the better we will advance our interests.”

“You have got to be a player, and you cannot sit on the sidelines,” Wolverton says. “ACEC gives us the opportunity to get in there and shape the vision of our industry by being the person sitting at the table talking about issues such as funding and technology to make sure our industry is protected.”



Dave Raymond



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"Firms need to develop high-level relationships at the board and CEO levels of their clients," Jackson says. He points to global consulting firms like Accenture, Deloitte and PwC that arose out of accounting firms and have higher-level access to executives. Now they are starting to encroach on engineering consulting, he says. "They already have these relationships at the CEO and the board levels because they help with strategic planning and business practices, which can give them an edge," Jackson says.

And it's not just relationships with the C-suite that firms need to nurture. "Business strategies also have to include investments in our staff to make sure they are being innovative and creative. That is going to save our industry," Barrett says.

DIVERSITY AND INCLUSION

Investing in professional staff also means investing in diversity and inclusion, Kothari says. "I strongly believe that our industry and profession will be strongest when we embrace diversity to its fullest. By that I mean diversity not only across gender and race, but diversity across regions and our vast country—diversity in types of services, diversity in type and size of firms and diversity of clientele. This would not only benefit our individual member firms but their respective member organizations and our council and industry as a whole."

Inclusion also means creating a culture where everybody feels that they belong and that their ideas are valued, Roberts says. "Data has shown that you are going to have better

financial success, your teamwork will be better, you will be a more creative and innovative company as you move along the continuum of diversity and inclusion, which will also help firms find talent and attract the best and brightest."

Simpler says that firms should also diversify their portfolios in terms of types of projects, clients and geographies where they work to protect themselves from uncertainty. "We needed to change our mentality—the way we look at projects and the business—and be more flexible and adaptive," he says.

In the end, each firm will have to choose the path that is right for them, Kothari says. "If you make sure your colleagues, partners or clients succeed, then we would all succeed together. All boats rise together in a rising tide." ■

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



Charles Gozdziwski





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MANAGING

Conflicts are possible in any type of business transaction, and engineering firms are not exempt. The key to overcoming conflict is knowing how best to resolve changes, claims and disputes—or, even better, how to avoid them in the first place.

For many projects, differences in perspectives between what a client expected compared to what an engineering firm can actually deliver through design has resulted in costly change issues that too often evolve into claims and ultimately disputes. Experiencing an issue through these processes can be challenging and stressful for firms large and small.

“Any disagreement between parties to a contract can become a claim, which in turn can lead to a dispute,” says Kevin O’Beirne, manager of standard construction documents at Arcadis U.S.

In a professional services agreement between a project owner and an engineering consultant, common sources of disagreement brought by the owner are allegations of deficient services by the engineer, such as an



**EFFECTIVE
PRACTICES
FOR RESOLVING
CHANGES,
CLAIMS AND
DISPUTES**

ING **ONFLICT**

BY BOB VIOLINO

MARTIN BARBAUDGETTYIMAGES

accusation that the engineer did not comply with the standard of care, O'Beirne says.

"Perhaps the most common cause of the rare claim of an engineer against the owner is nonpayment of the engineer's invoices, particularly when the engineer is seeking compensation for additional services," O'Beirne says. "When either the owner or engineer files a claim against the other, it's a serious rupture in their relationship."

In construction contracts, a disagreement between the parties to the contract—such as the owner and contractor, or owner and design-builder—typically emerges first as a change proposal, which can escalate into a claim, which can subsequently become a dispute, O'Beirne says.

Resolution of construction change proposals and claims often involves the engineer, O'Beirne says. Among the most

common types of construction claims are those arising from alleged delays and their associated costs, and from differing site conditions.

CLEAR UP COMMUNICATION

Contract issues can more readily turn into claims and disputes when there is poor communication between the parties.

"The biggest problem is when there's not an understanding of expectations that each party has for the other, and that goes back to the actual contract negotiations," says Gary Bates, a partner at Roenker Bates Group and an expert on conflict resolution and negotiation strategies. "They do not have clear communications about what the expectations are."

Sometimes the way contracts are worded leads to problems.

"A person reading the scope of services should be able to

easily understand when the work is fully performed,” says Erin Austin, general counsel at David Evans and Associates, Inc. “Terms like ‘coordinate’ or ‘as needed’ or ‘as necessary’ are unclear and do not identify which activities are sufficient and therefore complete.”

Another key problem area is when the client does not understand the impact on engineering costs and therefore on the fee when the client wants to make changes or add work to what was agreed to within the scope of work.

“That’s especially true if the project is quite far along,” Bates says. “Oftentimes by the time it gets to 60 to 70 percent complete the owners still think they have the right to go in and make changes. They think they can change their minds almost right up to the end, not realizing how that changing of mind requires engineering firms to undo what has already been done.”

Naturally, it would be ideal for firms to prevent such disputes from happening in the first place.

A good practice is to do thorough preparation before the contract negotiations. “Conflict resolution starts at the time a firm makes a go or no-go decision on the project,” Bates says. “As soon as you accept the project, you’re putting the firm at risk. Spend the appropriate amount of time on preparation, and always have the project manager and marketing and salespeople involved in the contract negotiations so everyone is on the same page.”

Again, during negotiations good communications is a key. “You have to go beyond the written word and talk openly and candidly about the expectations, especially as related to quality and the scope of work,” Bates says.

It’s important to remember to leave emotions out of any discussions. “Don’t ignore the issue but treat the matter professionally, not emotionally,” Austin says. “Schedule a face-to-face meeting to listen and understand the concern before you respond. Consider the practical and appropriate options for addressing the underlying issue and providing a proposed solution.”

PREPARATION IS VITAL

Preparing for discussions that involve conflict is also important. “I will sometimes



“Any disagreement between parties to a contract can become a claim, which in turn can lead to a dispute.”

KEVIN O’BEIRNE
ARCADIS U.S.

draft talking points to help clarify key messages, starting with the most important yet simple message first,” Austin says. “Details may be important but details shouldn’t overwhelm the message you are trying to make.”

Firms could also ask the project owners for a set of plans for a similar, previous project that they perceive as being an appropriate level of quality, to provide guidelines, Bates says.

Ongoing feedback is also important. “Ask for early feedback from the owners so there’s an understanding of the scope of work and you can catch issues early as opposed to when you’re further along or almost done,” Bates says.

With an owner-engineer professional services agreement, often the best means of reducing the potential for an owner claim of deficient design is for the engineer to have appropriate, experienced personnel in charge of the project and its design; and to expressly advise the client of risks and uncertainties in the design, O’Beirne says.

“It’s very important for the engineering firm to ensure that its professional services agreements include the typical standard of care, [and] to ensure the profes-



MARTIN BARRAUD/GETTY IMAGES



"Having an open dialogue with the client is beneficial for aligning the expectations of the client and engineer."

ERIN AUSTIN
DAVID EVANS AND ASSOCIATES, INC.

sional services agreement does not otherwise bind the engineer to an elevated standard of care," O'Beirne says.

When a disagreement turns into a claim or a dispute, firms can use effective conflict resolution strategies to try to solve the problem.

Regarding disagreements between an engineer and its client, most standard professional services agreements, such as those by the Engineers Joint Contract Documents Committee (EJCDC) do not establish a formal, defined process for the submittal of claims, although EJCDC's owner-design professional agreements have optional provisions for dispute resolution, O'Beirne says. "Often, the process will eventually be resolved via a formal or informal mediation process," O'Beirne added.

"Thus, claims against the engineer are left to negotiation in good faith," O'Beirne says. "Relationships with the client

are key to successfully resolving these types of disagreements. It's useful in such situations to know your counterpart's viewpoint, drivers and limitations of authority, and to understand what motivates their superiors concerning the claim."

Sometimes just talking it out provides a solution. "One thing the parties need to do before something becomes a dispute or a claim is brainstorm possible solutions," Bates says. "Keep going until you've reached a consensus."

In some cases this will require the use of mediators who can help firms and clients reach agreements before the issue ends in disputes and claims. "Mediation is cheaper than arbitration or a claim," Bates says.

PREVENT ESCALATION

Firms can take other steps to prevent disagreements from becoming claims.

"Insurers like to see that the firm uses pre-claim assistance," says Nancy Rigassio, executive claims counsel at XL Catlin, a company providing professional liability insurance. "Most professional liability insurers provide this service as a loss prevention feature."

The use of loss prevention will not involve payment out of the insured's deductible, and expenses authorized by the insurer are not allocated against the policy, Rigassio says.

"Firms that invest in educating their engineers on risk management practices have good procedures in place so that its project managers can identify warning signs early on and effectively resolve the issues before they develop into a claim," Rigassio says.

Firms that put in place decision-making procedures for client selection, contract negotiations and authority to bind the firm in a contract find that they can effectively mitigate disputes before they become claims, Rigassio says.

"And there are also lessons learned after the firm experienced a claim," Rigassio says. "The

firms that evaluate internal practices that may have contributed to a claim, the nontechnical factors that we call risk drivers, in addition to the technical factors, are the ones who learn from the experience and minimize the risk of another claim."

Engineering firms are also likely to experience a professional negligence claim at some point, Rigassio says. "It is not a reflection of the quality of your services, but the way we resolve disputes," she says. "Notify your professional liability insurer of the claim. Claims are going to happen, but how you interact with your professional liability insurer can reflect positively on your firm."

There's much at stake. Disputes and claims can affect not only a firm's bottom-line profit on a project, but its reputation as well.

"Most design professional teams serve clients in a relatively limited geographic area and they serve a certain type of client,"



"Firms that invest in educating their engineers on risk management practices have good procedures in place so that its project managers can identify warning signs early on and effectively resolve the issues before they develop into a claim."

NANCY RIGASSIO
XL CATLIN

O'Beirne says. "Clients speak to each other, particularly via professional associations." When one owner has a problem with a given firm, the firm should assume that the client's personnel will discuss it with their peers.

"The bigger the claim or more troubling the problem, the more likely it will be for people to talk about it, particularly when there are significant allegations of negligence against the design firm," O'Beirne says. "Word gets around fast, and that can harm an engineering firm's reputation, regardless of whether the allegations are true or baseless."

As with many other types of business and personal disputes, resolution often comes down to the parties reaching out to each other in a civil manner.

"Having an open dialogue with the client is beneficial for aligning the expectations of the client and engineer,"

Austin says. ■

Bob Violino is a business and technology writer based in Massapequa Park, New York.

Avoiding Conflicts Starts With Standard Contract Documents

Looking to avoid conflicts with clients during professional services and construction projects?

Using standard contract documents provided by the Engineers Joint Contract Documents Committee (EJCDC) is a smart starting point.

EJCDC develops and updates fair and objective standard documents that represent the latest and best thinking in contractual relations between all parties involved in engineering design and construction projects.

The committee is made up of the American Council of Engineering Companies, the National Society of Professional Engineers and the American Society of Civil Engineers. The committee also involves the participation of more than 15 other professional engineering design, construction, owner, legal and risk management organizations.

"It's advisable to use standard contracts such as those by EJCDC and to avoid using or accepting open-ended scope language," says Kevin O'Beirne, manager of standard construction documents at Arcadis U.S.

"Clearly defined scopes of services, with defined limits, help both parties understand the basis of the engineer's professional services from the outset, and thus can reduce the potential for claims and disputes," he says.



MARTIN BARRAUD/GETTY IMAGES

URBAN

Member Firms enhance communities by revitalizing previously blighted industrial, environmental and hazardous waste sites

Restoration Projects

BY TOM KLEMENS

WGM GROUP

GEI CONSULTANTS, INC.

CREIGHTON MANNING ENGINEERING

STRAND ASSOCIATES



The mixed-use redevelopment of Missoula's Old Sawmill District is adding new residential units and commercial office and retail space.

Brownfield Offers New Vitality

PROJECT: OLD SAWMILL DISTRICT
MISSOULA, MONTANA

FIRM: WGM GROUP
MISSOULA, MONTANA

A once-blighted 46-acre area near the heart of Missoula, Montana, is being transformed into a vibrant mixed-use neighborhood, thanks to local determination, private investment and city of Missoula and Brownfield redevelopment funds.

Now known as the Old Sawmill District, the area was home to a lumber mill complex for more than 80 years. A central player in Montana's wood products industry, the mill used the nearby Blackfoot and Clark Fork rivers to transport and process logs on-site.

The mill closed in the late 1980s, but industrial manufacturing continued for a decade before the site was abandoned in

the early 1990s. After the mill's closure, the property was left unattended, becoming an eyesore to the surrounding neighborhoods. However, its prime riverfront location—just half a dozen blocks from the downtown business area—made it a desirable candidate for redevelopment.

One challenge of this multiphase project was the extent of environmental remediation required prior to redevelopment. Several decades of heavy industrial use left environmental contamination that required mitigation. The site underwent 15 years of assessment and cleanup under a Voluntary Cleanup Plan, which was completed in the spring of 2014.

"There were other significant site issues just because of the land use," says Brent Campbell, president and CEO of WGM Group, Missoula, which has been instrumental throughout the cleanup and redevelopment. "For example, there was an accumulation of 30 feet of sawdust under a third of the site. Because everything was so overgrown, the site was drilled to figure out where the sawdust was located."



Brent Campbell

Now covered with topsoil and grass, those areas have been turned into parkland within the development.

WGM Group developed conceptual plans for the Old Sawmill District redevelopment and was central in the land use planning, the complete street section component of the project, including landscape architecture, the creation of bike lanes and utilities development. The firm's other responsibilities included coordination with the environmental cleanup, a riverfront park and trail system, and planning the urban mixed-use development.

Today, the Old Sawmill District is on its way to becoming an exemplary brownfield and infill redevelopment, combining single- and multifamily residences and mixed-use commercial office space. A new 14-acre city park along the river extends the Clark Fork trail system and brings the community together in an area that would have been avoided altogether a few years ago.

A Park With a View

PROJECT: SENATOR JOSEPH FINNEGAN PARK AT PORT NORFOLK BOSTON, MASSACHUSETTS

FIRM: GEI CONSULTANTS, INC. WOBURN, MASSACHUSETTS

More than 30 years after locking arms and chaining themselves to the gate of the Shaffer Paper factory to block toxic dumping, residents of Boston's Port Norfolk section of Dorchester finally are enjoying the results of their efforts. The Massachusetts Department of Conservation and Recreation (DCR) in May 2017 opened the Senator Joseph Finnegan Park at Port Norfolk on the site of the old factory, making good on a promise to the neighborhood from decades ago.

The 12-acre waterfront park is the last link of the 5-mile Neponset River Green-

way, which provides a variety of scenery from urban wilderness through a mill village to a salt marsh at the mouth of the Neponset River. The park was formerly a lumberyard, a commercial fishing pier and an industrial area, which led to hazardous waste contamination. The DCR acquired the site in 1986 and began initial cleanup activities. Financial constraints impeded final site cleanup, and it remained a vacant eyesore until 2014 when funds again became available.

DCR hired GEI Consultants, Inc., as lead designer, environmental consultant and Licensed Site Professional (LSP) of record to plan and build the park.

Over the years, residents expressed a strong desire for a simple walking path in the natural area. "With another open space very close that accommodates active recreation, the community wanted a neighborhood park that was just for passive use and more naturalistic," says Ileen Gladstone, senior vice president at GEI Consultants.

One key step was reviving the natural edge of the shore,

which included demolishing a dilapidated sheet pile seawall and replacing it with a shoreline that consists largely of preserved and expanded native salt marshes capable of absorbing floodwaters and rising water levels. "We stabilized the shoreline with an ecological community as opposed to rip-rap," Gladstone says.

The new park blends seamlessly with the coastal environment. "Everything was designed with native plants," says Anne Leifer, GEI's project manager and LSP of record. "The park was designed to be low maintenance, not just for the usual issues but also to use less fertilizer, less water and to need less mowing."

After waiting decades for the contaminated site to be rehabilitated, residents now have a park where they can enjoy the view of the Boston skyline, walk with their pets and relax with family and friends.



Ileen Gladstone



Anne Leifer



Senator Joseph Finnegan Park includes footpaths, lawns and green spaces, salvaged granite seat stones and new trees and shrubs.

HALVERSON DESIGN

Bridge to Development

PROJECT: CP RAIL BRIDGES OVER NOTT STREET AND JAY STREET SCHENECTADY, NEW YORK

**FIRM: CREIGHTON MANNING ENGINEERING
ALBANY, NEW YORK**

Carefully coordinating the planning and construction of a railroad bridge replacement over a busy street in downtown Schenectady, New York, turned a potential nightmare into a win-win situation for all involved. In a multipart arrangement, Canadian Pacific (CP) agreed to replace its aging 60-foot two-span bridge over Nott Street with a single span bridge nearly twice as long. The increased clearance would enable the city to upgrade and enlarge a roundabout east of the underpass, providing a gateway to a casino and resort at Mohawk Harbor. In exchange, the city agreed to close the Jay Street and Pine

Street underpasses, allowing CP to eliminate those bridges altogether.

Mohawk Harbor, a \$500 million commercial and residential redevelopment project that includes the Rivers Casino & Resort, is transforming one of the oldest brownfield sites in the country into a mixed-use development along the Mohawk River. The 60-acre site was a manufacturing plant from the early 1900s through the 1960s. Remediation and redevelopment of the brownfield site has been widely cited as a key part of Schenectady's revitalization efforts.

Replacing the Nott Street bridge posed a significant challenge because of the heavy rail traffic on the CP line—more than a dozen Amtrak and freight trains daily.

“Despite the complexity of the project, we replaced this bridge with a new bridge without ever interrupting rail traffic,” says Charles Tutunjian, project manager for Creighton Manning Engineering.

To overcome the significant site constraints and accelerated schedule, Creighton Manning worked closely with contractor ING Civil, Inc., to develop an innovative construc-

tion method that allowed dismantling the existing Nott Street bridge while simultaneously constructing the new bridge in the same location. This minimized project cost, the impact to railroad operations and the amount of time the traveling public would have to use a detour.

“To facilitate construction, the city of Schenectady agreed to a three-week closure of Nott Street, which is a busy road and that leads to a hospital,” says Tutunjian. “We designed our replacement and construction sequencing based on that three-week closure window.”

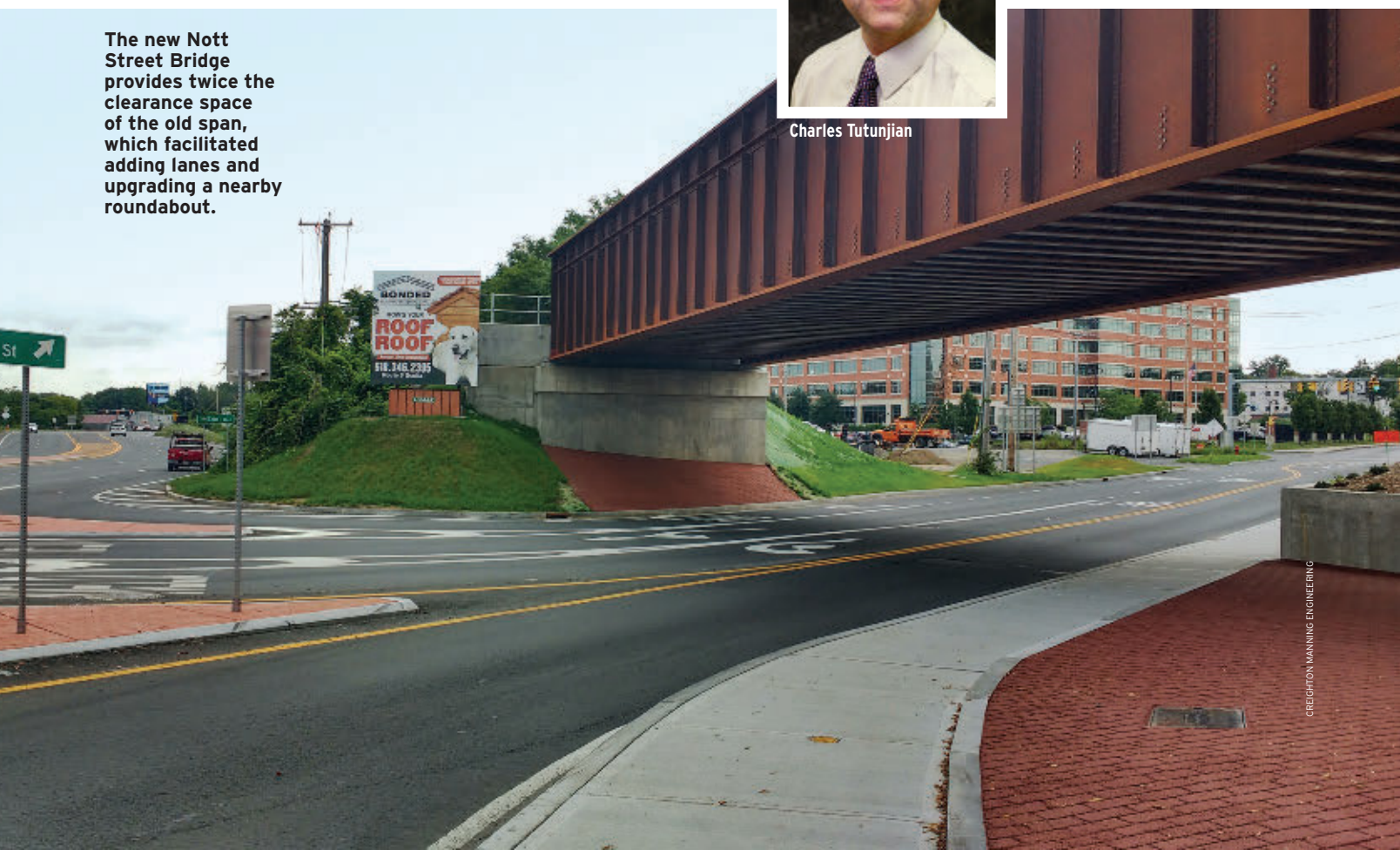
During the closure, a trestle-like support underneath the bridge enabled the contractor to remove pieces of the old bridge and replace them with new pieces while maintaining rail traffic. In addition, work was scheduled within the six-hour blocks of downtime provided throughout the project by CP.

Once the Nott Street bridge replacement was completed, the Jay Street underpass—which was part of the detour—was closed and the embankment filled in. The Pine Street bridge closure was also completed in early 2018.



Charles Tutunjian

The new Nott Street Bridge provides twice the clearance space of the old span, which facilitated adding lanes and upgrading a nearby roundabout.





Dubuque's Upper Bee Branch flood mitigation project is recognized as a natural resource recovery effort.

GENERAL BOB PHOTOGRAPHY



Eric Vieth

Flood Mitigation Enhances Community

**PROJECT: UPPER BEE BRANCH CREEK RESTORATION
DUBUQUE, IOWA**

**FIRM: STRAND ASSOCIATES
MADISON, WISCONSIN**

Despite decades of devastating flash flooding, the residents and businesses in Dubuque's Bee Branch Watershed no longer fear the next deluge of rain. Stormwater that frequently overwhelmed the old sewer system in this 6.5-square-mile area in the heart of the city now drains into an open stormwater conveyance channel instead after the 2017 completion of the Upper Bee Branch Creek Restoration project. Daylighting of the buried Bee Branch Creek, which in the early 1900s was enclosed within a large-diameter storm sewer to accom-

modate rapid urbanization, allows stormwater from flash floods to move freely through the area. In addition, the open parkland developed along the restored Bee Branch Creek provides welcome green space to the community.

"This was a flood mitigation project from the start," says Eric Vieth, project manager with Strand Associates. "But what made this project unique is how the city made it a community asset. Part of that is improvement in water quality and the sustainable concepts that were used, including the green infrastructure and green stormwater conveyance rather than gray infrastructure or underground storm sewer pipe conveyance."

The Lower Bee Branch Creek Restoration, completed in 2011, opened up a portion of the creek that flows through commercial and industrial properties just before it enters a stilling basin and the Mississippi River. That project served as a model for restoring the Upper Bee Branch Creek, which runs through a residential neighborhood where recreational aspects of the project had added importance.

A multipurpose structure built where the creek emerges from an upstream culvert serves as both an outfall structure and an overlook. The creek then meanders by a community orchard, an amphitheater, a creek aeration feature, a playground and three stormwater biofields until it flows into the Lower Bee Branch Creek.

Combined with other measures in the ongoing 12-phase Bee Branch Watershed Flood Mitigation Project—which include enlarging upstream detention basins and installing pervious pavement to replace more than 200 paved alleys—the open system can now safely collect, store and channel five times more stormwater than the old storm sewer system could handle.

"The collaboration among the city, citizens and engineering teams led to a multifaceted solution that addressed the core issue but also provided value in other areas including recreational amenities, habitat restoration and an enhanced quality of life," Vieth says. ■

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

38-Minute Missile Threat Provides an Emotional Lesson

BY KEVIN NAKAMOTO

It was a clear, sunny Hawaiian morning on Saturday, Jan. 13, and I had just finished warming up my daughter's soccer team, which was preparing to take the field when a message flashed on my cellphone: **"BALLISTIC MISSILE THREAT INBOUND TO HAWAII. SEEK IMMEDIATE SHELTER. THIS IS NOT A DRILL."**

Naturally, I did what any quick-thinking engineer would do. I moved the team to a shelter inside the park's hollow tile restroom. It would be 38 minutes before state officials broadcast another message declaring: **"THERE IS NO MISSILE THREAT OR DANGER TO THE STATE OF HAWAII. REPEAT. FALSE ALARM."**

Too late. This was the scariest 38 minutes of my life—not to mention the lives of 11 frightened 10-year-old girls.

Meanwhile, Honolulu resident Noah Tom had just dropped off his oldest daughter at the airport and was picking up breakfast for a meeting when he heard the alert. His two younger children were at home, and his wife was already at work. "I literally sent out 'I love you' texts to as many family members as I could. It was kind of surreal at that point," he told *The Washington Post*.

When he heard the alert was a mistake, Tom had not yet made it home. Instead, he pulled over to the side of the road and cried. "I just broke down at that point. It all kind of hit me in a wave, what I had just gone through. I was unable to drive for 20 or 30 minutes," he said.

I now know that scientists estimate a ballistic missile originating from North Korea would take approximately 20 minutes to reach the state of Hawaii—only 20 minutes until life as you know it changes forever.

So, it is not hard to imagine the anger and uproar from my fellow Aloha State citizens criticizing state officials for taking 38 minutes to send out a message retracting the original alert.

The emergency management agency did not understand the expectation of the public and the consequences of the time it took to rescind the alert. In the public's eye, it did not act with enough urgency to inform them of the mistake. In the era of social media, smartphones and instant gratification, an immediate update was expected.

The emergency management agency obviously misunderstood the needs of the people it serves or its clients—whether it was terrified little girls or a father crying on the side of the road—who really needed to know an important fact sooner rather than later.

The same theory works for engineering. You need to know your client's expectations on a project and answer these important questions:

- Do you really know what is important to them? Is it the schedule, cost control, quality, responsiveness or something else?
- What do they worry about going wrong on the project? Is it loss of funding, exposure to public criticism, exposure to lawsuits or something else?

Once you understand the answers to those questions, you can tailor your project management style to meet the client's needs and provide strategies to mitigate those concerns.

Of paramount importance is being able to communicate this understanding to your client, which means identifying an effective communication plan. At a minimum, the plan should contain how, what and when you will communicate with your client. Larger and more complicated projects will need more frequent communication to ensure a smooth delivery.

This is especially true if you seek to manage your client's expectations. While a client expecting perfection might not be realistic, urgent responses and constant communication in response to errors are logical expectations. It is the project manager's responsibility to ensure the client's expectations are in sync with reality. Regular and effective communication is a great tool to make this happen.

Finally, inquire of your clients about how they treat their own clients. This should give you a feel of how they in turn appreciate being treated.

Not long ago, I asked a successful architectural client who recently retired about his firm's approach to client service. His response: "You need to be in front of the client, showing them that you are absorbed in the success of their project. Show enthusiasm and urgency."

In other words, to maximize your opportunity for positive project outcomes, never leave a client confused at any stage about what is clearly going on. ■



Kevin Nakamoto

Kevin Nakamoto is an associate and senior structural engineer at SSFM International, Inc. in Honolulu. He can be reached at knakamoto@ssfm.com.

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Nontraditional Services Fuel 2018 Deal-Making Surge

BY NICK BELITZ

To date in 2018, engineering firms large and small, domestic and international, have contributed to a surge in deal-making across the industry. The volume of transactions as measured by the number of deals consummated globally over the last 12 months increased 7 percent while the number of deals made just in the United States rose an astounding 21 percent.

Not surprisingly, individual deals represent a broad cross-section of all the industry has to offer. Buyers snapped up firms providing a range of services, including firms focused on civil infrastructure, geospatial technologies, power transmission, structural engineering, mechanical, electrical and plumbing services and environmental consulting.

Recently, ACEC Member Firms also ventured further afield from traditional engineering disciplines and made acquisitions of planning firms, architecture firms and landscape architecture firms.

ACEC Member Firms have increasingly chosen nontraditional services as a centerpiece of the deals.

Consider the following from ACEC Member Firms just in the last several months:

- **Thornton Tomasetti** (New York) acquired **MFD** (Romsey, U.K.), a security consultancy specializing in physical, operational and technical security analysis and design.
- **Treadwell Franklin Infrastructure Capital** (New York) acquired ACEC member **James W. Sewall Co.** (Old Town, Maine), a provider of engineering, surveying, geospatial and natural resource services. As part of the deal, Treadwell Franklin also acquired control of **E4Research.org**, a nonprofit research and development corporation.
- **Intertek** (London) acquired **Proasem** (Bogota, Colombia), a provider of laboratory testing, inspection, metrology and training services.

This, combined with other recent deals from big-name firms, indicates industry decision-makers are pursuing nontraditional offerings when expanding via acquisition. Other examples include **IBI Group's** acquisition of **GreenOwl Mobile** (Ontario, Canada), a firm that deploys technology solutions for transportation authorities, cities, municipalities and private media corporations. Also, **Parsons** (Pasadena, Calif.) acquired **Polaris Alpha** (Colorado Springs, Colo.), a technology-focused provider of mission solutions for complex defense, intelligence and security

customers, including the U.S. government. Finally last year, **SNC-Lavalin** (Montreal) expanded into digital asset management with the acquisition of **Data Transfer Solutions** (Orlando, Fla.).

All together, these deals point to a trend that increasingly puts engineering firms in businesses that are at best loosely related to traditional engineering services. The reasons for this trend vary, of course, but based on Morrissey Goodale's experience as consultants and advisers to the industry, we can pick out two main drivers at work globally right now:

1. New technologies are threatening traditional ways of doing business. Any job that can be broken down into discrete, repeatable tasks can and will be automated as computers identify patterns in data and use algorithms to build predictive models. That includes engineering design. Forward-thinking firms are looking for ways to add value for clients beyond the traditional design process and that includes investing in niche technology service providers.

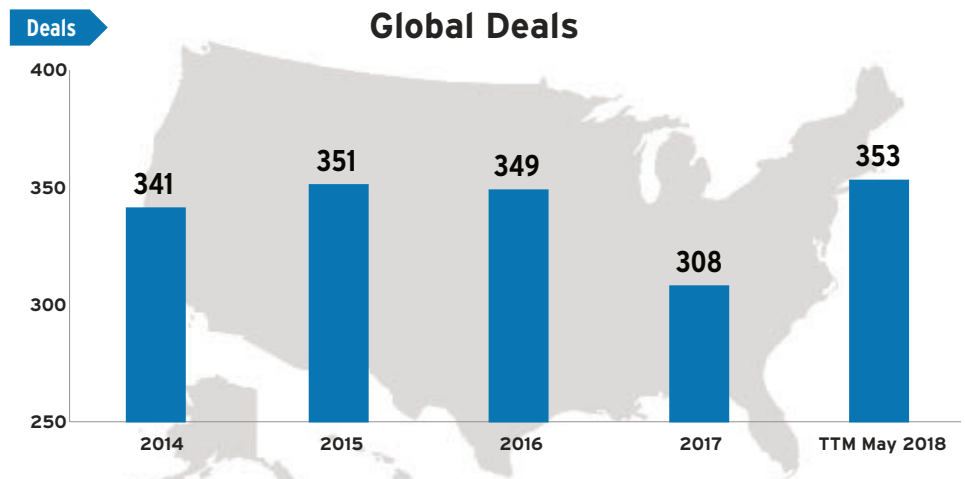
2. Decision-makers are responding to market trends. We've heard many conversations (and even a few loud complaints) about the commoditization of the engineering profession and services over the years. Engineering firm clients expect rock bottom pricing for projects they view as routine and seem to demand more for less each day. Firm leaders have two basic options in this environment: adapt, diversify and respond to the market; or whine and complain.

Recent data would suggest an increasing number of ACEC members are choosing the former over the latter.

RECENT ACEC DEAL-MAKERS

MAY 2018

Partner Engineering and Science (Torrance, Calif.), an ACEC member, acquired construction risk management firm



Nevada Construction Services (Las Vegas), a national engineering, environmental and energy consulting and design firm.

ACEC member **COWI** (Lyngby, Denmark) acquired the U.S. tunnel resources of **ILF Consulting Engineers** (Innsbruck, Austria), bringing COWI's tunnel engineering group to over 500 professionals.

TKDA (St. Paul, Minn.), an ACEC member, acquired structural engineering firm **Mazda Consultants** (St. Paul, Minn.). All Mazda staff joined the structural group in TKDA's Facilities Engineering Division.

ACEC member **EnSafe** (Memphis, Tenn.), a global provider of environmental, engineering, health and safety and technology services, acquired **Cirrus Associates, LLC** (Richardson, Texas), which provides engineering, environmental and hydrogeological consulting services.

ACEC member **Golder Associates** (Palm Beach, Fla.) entered into a definitive purchase agreement to acquire **Pastor, Behling & Wheeler, LLC** (Round Rock, Texas), an environmental consulting firm with five offices throughout Texas.

Civil engineering firm and ACEC member **CT Consultants** (Mentor, Ohio) acquired landscape architecture and planning firm **Cawrse & Associates** (Chagrin Falls, Ohio). Cawrse and CT have partnered on several projects over the last 10 years before the deal.

APRIL 2018

ACEC member **Ghafari Associates** (Dearborn, Mich.) acquired **Concept Design Group** (Grand Rapids, Mich.), an architectural and interior design firm serving the commercial, office, multifamily, hospitality, retail and mixed-use markets.

Global design firm and ACEC member **Stantec** (Edmonton, Alberta, Canada) acquired engineering and project management firm **Cegertec** (Saguenay, Quebec, Canada). The acquisition adds over 250 employees to Stantec's Quebec operations.

ACEC member **Barton & Loguidice (B&L)** (Liverpool, N.Y.) acquired landscape architecture and planning firm **Eberlin & Eberlin, P.C.** (Brewster, N.Y.), is a 250-person engineering, planning, environmental and landscape architecture firm with nine offices in the state of New York.

ACEC member **Malone Finkle Eckhardt & Collins, Inc. (MFEC)** (Springfield, Mo.), merged with **RTM Engineering Consultants** (Schaumburg, Ill.). MFEC is a full-service mechanical, electrical and plumbing firm serving the office, health care, education and hospitality markets.

First Reserve (Stamford, Conn.), a global private equity firm focused on energy, acquired ACEC member **CHA Consulting, Inc.** (Albany, N.Y.), from **Long Point Capital** (New York). CHA is a diversified, full-service engineering firm with over 1,000 employees across the U.S. and Canada.

AKF Group, LLC (New York), acquired **Bold Rock Engineering Group** (Henrico, Va.), a mechanical, electrical, plumbing, fire protection and commissioning firm. Both firms are ACEC members.

Landscape architecture and planning firm **Remenschneider Associates, Inc.** (Indianapolis), joined forces with ACEC member **Kimley-Horn and Associates, Inc.** (Raleigh, N.C.).

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.



The acquisition marks a continuation of Kimley-Horn's Midwest expansion.

ACEC member **McClure Engineering Co.** (Clive, Iowa) acquired fellow ACEC member **Shafer, Kline & Warren, Inc.** (Lenexa, Kan.), a surveying, engineering and construction services firm. McClure specializes in public infrastructure and capital improvement projects.

ACEC member **POWER Engineers, Inc.** (Hailey, Idaho), acquired **MITKOR Consulting, Ltd.** (Edmonton, Alberta, Canada), a 30-person firm offering distribution engineering and supplementary transmission design services. The acquisition follows POWER's effort to expand its service offerings in Canada.

ACEC member **Farnsworth Group** (Bloomington, Ill.) acquired 11-person architecture firm **EWR Architects, Inc.** (Fairview Heights, Ill.). Farnsworth Group is a full-service engineering and architecture firm with 450 employees nationwide.

ACEC member **Cardno, Ltd.** (Brisbane, Australia), an infrastructure and environmental services firm, acquired utility location and management company **SureSearch** (South Wentworthville, Australia). SureSearch was founded in 2006 and employs 52 staff in offices across Australia.

ACEC member **COWI** (Lyngby, Denmark) acquired **PB Teknik AB** (Solna, Sweden), a heating, ventilation and sanitation consulting firm. The acquisition adds 25 employees to COWI's Stockholm operations.

Multidisciplinary forensic consulting firm **The LiRo Group** (Syosset, N.Y.), purchased the assets of ACEC member **Sidney B. Bowne & Son** (Mineola, N.Y.), an engineering consultancy specializing in the GIS and IT industries.

ACEC member **Engineering Consulting Services (ECS)** (Chantilly, Va.) acquired **GEM Engineering, Inc.** (Louisville, Ky.), a geotechnical engineering, construction materials testing and environmental engineering firm. GEM's office will become part of ECS Southeast and a member of the ECS Group of Companies. ■

Nick Belitz is a principal with Morrissey Goodale, LLC, a management consulting firm that specializes in the A/E industry and provides strategic business planning, merger and acquisition, valuation, executive coaching, leadership development and executive search services. He can be reached at nbelitz@morrisseygoodale.com.



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On the Move

Pasadena, California-based **Parsons** announced the following appointments: **Patrick Cassity** was promoted to construction group executive vice president of business development and design-build delivery. He formerly served as executive vice president of the corporation's infrastructure business unit. He is based in the company's Chicago office. **Linda Murray** was appointed chief audit executive. She recently served as the federal business unit's strategic planning and marketing manager. Murray is based in the Columbia, Maryland, office. **Brent Harvey** was promoted to chief risk officer, succeeding Tom Roell, who will retire later this year. Harvey recently served as corporate chief audit executive and is based in the Charlotte, North Carolina, office. **Adam W. Taylor** joined the company as chief transformation and operations officer. This new position encompasses the corporate operations

duties managed by Mike Loose, who is retiring, and supports technology implementation and acquisition. Taylor is also based in the Charlotte, North Carolina, office.

Greg Clum joined Bismarck, North Dakota-based **KLJ** as chief commercial officer. Clum previously served as president, special projects, at Black & Veatch. He is based in the Denver area.

Anthony Ferruccio joined Harrisburg, Pennsylvania-based **Gannett Fleming** as a senior vice president and Construction Services Business Line director. He will lead strategic growth of program and construction management, risk management of alternative delivery and construction engineering inspection services.

Kimberly Slaughter, transit/rail market sector leader at Kansas City, Missouri-based **HNTB Corp.**, was appointed

senior vice president. She is based in the Chicago office.

Walnut Creek, California-based **Brown and Caldwell** announced the expansion of the firm's water reuse practice with several key hires: **Dr. Kati Bell** joined the firm as managing director of water strategy. She recently served as global water reuse practice leader at Stantec and is based in Nashville, Tennessee.

Melanie Holmer joined the company as national water reuse leader. She formerly served as Stantec's water reuse leader for California and is based in Sacramento. **Dr. Allegra da Silva** was named regional water reuse leader. Previously, she served as water reuse practice leader for the Rocky Mountain region for Stantec. Da Silva is based in Denver. **Melissa Meeker** was named Rocky Mountain area leader and is also based in Denver. **Wendy Broley** has been promoted to vice president and One Water leader



Patrick Cassity



Linda Murray



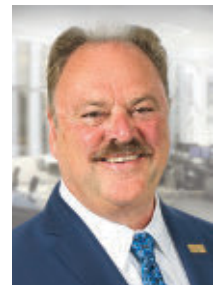
Brent Harvey



Adam W. Taylor



Greg Clum



Anthony Ferruccio



Kimberly Slaughter



Kati Bell



Melanie Holmer



Allegra da Silva



Melissa Meeker



Wendy Broley

responsible for setting the strategy and managing the firm's growing One Water team, to help municipal and industrial clients optimize existing water resources and to create new supplies to meet 21st-century water challenges. She is based in the San Diego office.

Julie D'Orazio has been named national market leader for transit and rail at New York City-based **WSP USA**. D'Orazio, who is also a senior vice president, formerly worked at AECOM where she served as senior vice president, deputy transportation leader and transit rail market segment leader for the New York metropolitan area. She is based in the New York office.

Denver, Colorado-based **CTL|Thompson** announced the following appointments: **Shawn Fitzhugh** was named vice president and manager of the firm's Denver division. **Wyatt Knutson** was named vice president and manager of the firm's Wyoming division. **Damon Thomas** was named president of CTL|Thompson

Materials Engineers, Inc., an affiliate company that manages CTL's materials testing division. Thomas is based in the Denver office.

Philadelphia-based **Urban Engineers** announced that **William "Bill" Petit** will succeed George H. Willis as vice president and office manager of the firm's Erie, Pennsylvania, office. Willis, who is retiring after 43 years, currently serves as senior vice president and office manager.

Gail Farber joined New York City-based **Arup** to lead the company's infrastructure practice in Southern California. Farber, who was director of the Los Angeles County Department of Public Works, is a principal and serves on the infrastructure executive leadership team for the Americas region. Farber is based in the Los Angeles office.

Michael A. Salvato joined Iselin, New Jersey-based **Mott MacDonald** as vice president of infrastructure advisory

practices. Salvato previously served as the director and program executive for enterprise information and asset management at the New York State Metropolitan Transportation Authority. He is based in the company's North American headquarters office.

Tracy Adamski was promoted to vice president of Westfield, Massachusetts-based **Tighe & Bond**. Adamski, a principal planner at the firm, is based at the headquarters office.

Philadelphia-based **Pennoni** promoted **Michael R. Cromer** to regional vice president of the company's new Energy and Design-Build region and to associate vice president for the firm. He is based in the West Chester, Pennsylvania, office.

Jeremy P. Martelle was promoted to associate vice president and Northeast aviation market leader at Albany, New York-based **CHA Consulting**. He is based at the headquarters office.



Julie D'Orazio



Shawn Fitzhugh



Wyatt Knutson



Damon Thomas



William "Bill" Petit



Gail Farber



Michael A. Salvato



Tracy Adamski



Michael R. Cromer



Jeremy P. Martelle

Welcome New Member Firms

ACEC/Arkansas

New Water Systems
Little Rock

ACEC/Colorado

Advanced Engineering, LLC
Loveland

Shrewsbury & Associates, LLC
Denver

Summit Engineering Services, Inc.
Englewood

ACEC/Illinois

**George L. Crawford & Associates,
dba CBB**
Glen Carbon

ACEC/Maine

Olver Associates, Inc.
Winterport

ACEC/Massachusetts

Meridian Associates, Inc.
Beverly

ACEC/Michigan

Geotech, Inc.
Grand Rapids

ACEC/Missouri

Arch Rail Group
St. Louis

CJW Transportation Consultants, LLC
Springfield

Cribb Philbeck Weaver Group, Inc.
Branson

ACEC/New Mexico

**Luchini Trujillo Structural Engineers,
Inc.**
Santa Fe

North GeoEngineering Services, LLC
Albuquerque

ACEC/Oregon

Kleinschmidt Associates
Portland

Parsons Water Consulting, LLC
Medford

ACEC/Pennsylvania

First Capital Engineering, Inc.
York

Gibson-Thomas Engineering Co., Inc.
Camp Hill

ACEC/South Carolina

Carper Civil Consulting
Daniel Island

IPW Construction Group, LLC
North Charleston

John Davenport Engineering, Inc.
Mount Pleasant

Sims Group Engineers, Inc.
Irmo

ACEC/Texas

ALJ Lindsey, LLC
Houston

**Ecology and Environment
Engineering, P.C.**
Houston

Garcia Infrastructure Consultants, LLC
San Antonio

R. Gutierrez Engineering Corp.
Pharr

**Siegfried Engineering & Construction,
LLC**
Houston

Simon Engineering & Consulting, Inc.
Dallas

Souder, Miller & Associates
El Paso

Stevens Technical Services, Inc.
Houston

T. Baker Smith, LLC
Stafford

TSC Engineering
Houston

Veristic Technologies, Inc.
Houston

ACEC/Virginia

Applegate Consulting Engineers
Midlothian

Bold Rock Engineering Group, Inc.
Henrico

ACEC/West Virginia

Dawood Engineering, Inc.
Bridgeport

ACEC/Wisconsin

CORE 4 Engineering
Mequon

AUGUST 2018

- 21** Making Money—Scope and Design Budget Management (online class)
- 30** Working Effectively on Multidisciplinary Projects as a Civil Engineer (online class)

SEPTEMBER

- 5** Your Marketing Toolbox 2020 (online class)
- 6** The Realities of Client Behavior (online class)
- 11** Business Development for Introverts (online class)
- 12** Grow Up! Things You Need to Know as Your Firm Grows (online class)
- 18** Function-Based Resiliency: Improving Performance Through Adaptive Management (online class)
- 19** Essential Elements of Effective Leadership (online class)
- 20** Fast Future Rx: A Seven Step Prescription for Breakthrough, 21st Century Business Success (online class)
- 24-25** Human Resources Forum—2018, Minneapolis
- 24-25** Information Technology Forum—2018, Minneapolis
- 24-25** Finance Forum—2018, Minneapolis
- 26** Coming Up Short: The Top 10 Reasons Why Companies Fall Short of Achieving Strategic Goals (online class)
- 27** Leveraging Project Accounting and Marketing Systems to Increase Profits (online class)

OCTOBER

- 2** Simple Incentive Compensation That Works (online class)
- 4** Preventing and Responding to Sexually Harassing Conduct (online class)
- 16** Addressing New Technological Threats/Opportunities for the Practice of Engineering (online class)
- 28-31** ACEC Fall Conference, Bellagio, Las Vegas

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.

HR, IT and Finance Forums Set to Meet Sept. 24-25 in Minneapolis

REVISED NEW EDITION OF QBS BEST-SELLER

The newly revised ACEC publication *Owner's Guide to QBS: Qualifications-Based Selection of Design Professionals, Second Edition* is a "ready reference" for selecting qualified design professionals and establishing the framework for a successful project.

Updated to meet the challenges of today's engineering firms, the guide offers recommended procedures for conducting a QBS process, defines the scope of services, explains how to negotiate fair and appropriate compensation commensurate with the services provided as well as prepare a legal agreement.

Readers with and without experience in selecting design professionals and procuring professional services will find information to help streamline the selection and negotiation process. The publication is available in print and digital versions. Visit: <http://bit.do/acec-QBS-owners-guide>.

HR, IT AND FINANCE FORUMS TO MEET SEPT. 24-25 IN MINNEAPOLIS

Providing two days of peer-to-peer information sharing, problem solving and networking, ACEC forum workshops help members make sense of current concerns and emerging trends impacting the A/E workplace.

HR, IT and finance firm leaders and directors will discuss common problems, benchmark processes, share experiences and network with their peers in an informal roundtable format, all of which continues post-forum via active online communities.

The in-person forum meetings will be held Sept. 24-25, at the Marquette Hotel, Curio Collection by Hilton, in Minneapolis. For more information on each and to register, visit:

- HR Forum: <http://bit.do/acec-2018-hr-forum>
- IT Forum: <http://bit.do/acec-2018-it-forum>
- Finance Forum: <http://bit.do/acec-2018-finance-forum>

NEW PRIVATE INDUSTRY BRIEFS

ACEC's just-released *Private Industry Briefs* focuses on the dynamic commercial and residential real estate market. Within a concise format, the brief informs readers of the top development firms working within different real estate market sectors; the five most significant market trends—including historic changes in the retail and industrial markets; the hottest geographic markets nationwide; and how current legislation and policy—such as the 179D tax deduction—influence the market.

The briefs are produced bimonthly, focusing on different market sectors. The August/September issue focuses on intermodal and logistics, followed by energy and utilities in

October/November, and health care and science+technology in December/January.

Each issue provides an overview of current market trends, descriptions of clients and information about what makes that market unique. To access the briefs, please visit: <https://programs.acec.org/industrybrief/>.

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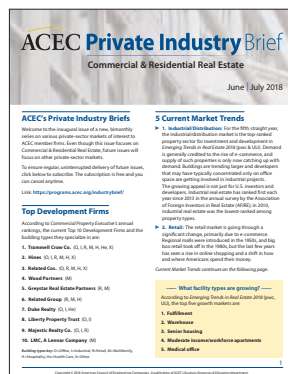
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More than 87,000 design professionals use RCEP online to manage their continuing education. Originally developed in 2008 by NCEES and ACEC, RCEP is now administered by ACEC with the support of the American Society of Civil Engineers.

RCEP is a resource for firms to manage and track their staffs' continuing education programs. Firms can create customized reports to track continuing education credits earned toward renewing licenses, identify specific courses and seminars for staff improvement and use RCEP to recognize and award merit increases to employees for their continuing education achievements. Unique to RCEP is the provider network and master calendar.

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