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Unlocking Infrastructure in 2018

**Major "Win"
in Tax Reform**

**Assessing
Effectiveness
of U.S. Flood
Protection**

**A Buyer's
Market: 2017
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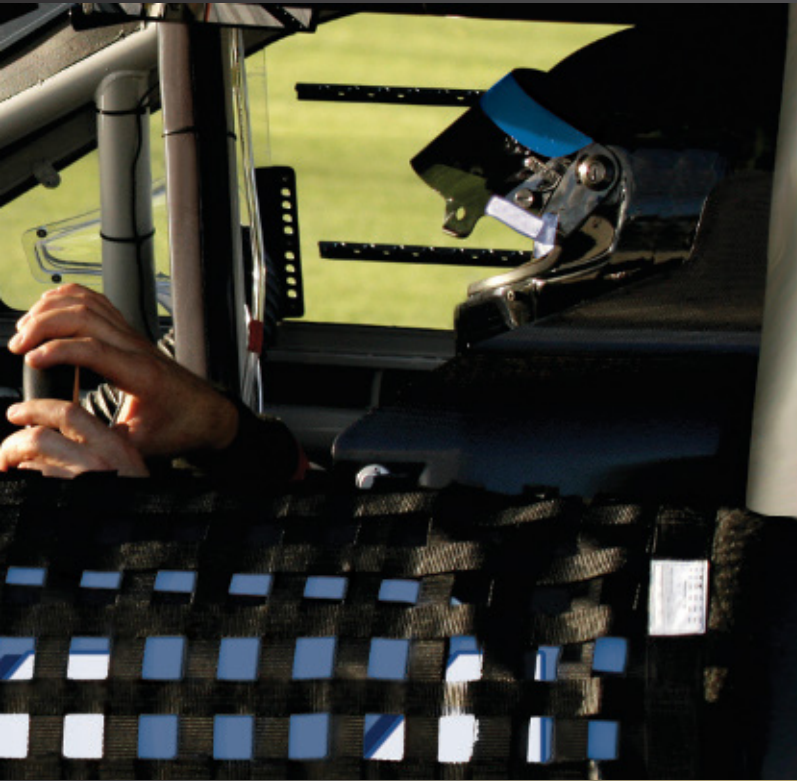
Infrastructure in the crosshairs.

"One way to accelerate, expedite and improve infrastructure and other large projects is to get rid of the red tape—without eliminating the underlying environmental protections."

Cathy Connor | WSP USA

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COVER: C.J. BURTON

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From Tax Reform to Infrastructure

The new year is a critical one for advancing ACEC's priorities, but first we can celebrate the fact that our industry was a big winner according to the *New York Times* and the *Wall Street Journal* in the tax reform bill that's about to clear Congress as we go to press.

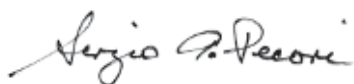
After months of hard work by ACEC's team in Washington, D.C., together with critical engagement from thousands of our members throughout the country, we succeeded in securing our core objective of ensuring that firms of all sizes and tax structures are treated fairly and equitably. The new tax law will lower the corporate tax rate from 35 percent to 21 percent and provide our Member Firms that are organized as passthroughs with a new 20 percent tax deduction. The law preserves critical incentives for retirement and employee ownership programs, such as ESOPs, as well as the cash method of accounting; other priorities identified by our industry, such as protecting private activity bonds (PABs) and tax incentives for renewable energy, were also included in the final package.

This was an exceptionally strong finish for the year, but 2017 brought other wins to the industry: killing the Department of Labor's blacklisting and overtime pay rules; making progress in reducing A/E liability in the FERC cybersecurity rule; achieving go-ahead on pipeline projects and permitting reforms; expanding QBS in pending FAA and water bills; lifting the Passenger Facility Charge cap in pending Senate legislation that will raise more money for airport projects; committee approval of legislation to encourage USAID to engage more U.S. engineering firms; state DOT FAR compliance; and keeping PVC mandates out of federal legislation.

For 2018, we now pivot to infrastructure and other related priorities. This issue of *Engineering Inc.* examines prospects for infrastructure legislation (page 8), assesses the nation's flood protection systems (page 16) and reports on how low premiums continue to define the professional liability insurance market (page 31).

Enjoy reading *Engineering Inc.*, which recently earned six international (MarCom) awards for excellence—more than any other magazine in this global competition!

And here's wishing you and your family a safe and prosperous New Year.



Sergio A. Pecori
ACEC Chairman



David A. Raymond
ACEC President & CEO



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Continued Slow but Steady Growth Projected

By Gerry Donohue

The U.S. economy is in the midst of the third longest recovery since World War II. After emerging from the Great Recession in mid-2009, the economy has been expanding for 103 months, topped only by a 106-month growth cycle in the 1960s and a 120-month period in the 1990s.

Nevertheless, many business leaders have bemoaned the sluggishness of the growth during the expansion—around 2.1 percent annually. Analysts say, however, the slow growth is the primary reason behind the recovery's longevity.

"Chances for a recession have been lessened because growth has been so slow," says Christopher Staloch, managing director of Chartwell Financial Advisory's A/E practice. "Maybe there's nothing wrong with 2 percent growth if we don't see the boom/bust cycle."

Eventually, though, the slowdown will come. Not surprisingly, economists are divided about when a slowdown may occur.

The Congressional Budget Office forecasts a flat market as soon as 2018, followed by an average annual growth rate of just 1.5 percent in 2019 and 2020.

At Moody's Analytics, Senior Director Cristian deRitis is more optimistic. "2018 will be fine. 2019 will be good," he says. But deRitis warns that a recession in 2020 is a pretty good bet given unemployment and interest rate trends.

Focusing just on the A/E/C industry, Greg Powell, managing director of investment banking at FMI Capital Advisors, Inc., is more optimistic. He is forecasting 4.0 percent average annual nominal growth in the construction market through 2021.

"We see pullback in some construction market sectors, but overall growth will continue for a few more years before leveling off," says Powell.

ECONOMIC STAYING POWER

The long recovery has been marked by the slow, but steady, decline in the nation's unemployment rate. In the closing months of 2017, the

unemployment rate stood at 4.2 percent, which deRitis says is essentially full employment.

He points to two unique characteristics of the current employment market. "We have 6.8 million unemployed and 6.1 million job openings," he says. "We've never had that many job openings. The problem is we have a substantial skills mismatch."

The second characteristic is the movement of the "quit rate," which tracks how many people are voluntarily leaving their job. "It's at record levels right now, which is a strong indication of consumer confidence," says deRitis.

Employment in the design industry has also reached record highs. In February 2008, A/E employment reached 1.45 million.

Construction Put in Place Estimated for the United States

Change from prior year—current dollar basis	2017	2018	2019	2020	2021
RESIDENTIAL BUILDINGS					
Single Family	9%	7%	5%	3%	4%
Multifamily	7%	5%	4%	3%	3%
Improvements	14%	6%	3%	1%	2%
Total Residential Buildings	1%	7%	4%	2%	3%
NONRESIDENTIAL BUILDINGS					
Lodging	5%	5%	3%	2%	5%
Office	9%	9%	6%	4%	2%
Commercial	1%	7%	4%	2%	3%
Health Care	1%	3%	4%	3%	4%
Education	-2%	3%	3%	4%	5%
Religious	-6%	1%	1%	2%	2%
Public Safety	-1%	1%	3%	3%	4%
Amusement and Recreation	4%	4%	2%	1%	3%
Transportation	1%	2%	4%	5%	6%
Communication	2%	3%	4%	3%	3%
Manufacturing	-7%	6%	8%	5%	4%
Total Nonresidential Buildings	2%	5%	4%	3%	4%
NONBUILDING STRUCTURES					
Power	-3%	4%	5%	6%	5%
Highway and Street	-1%	2%	2%	2%	2%
Sewage and Waste Disposal	-11%	-4%	1%	3%	3%
Water Supply	-8%	-3%	1%	2%	3%
Conservation and Development	-6%	3%	4%	5%	5%
Total Nonbuilding Structures	-4%	2%	3%	4%	4%
TOTAL PUT IN PLACE	4%	5%	4%	3%	4%

SOURCE: FMI



GABRIEL PASSARELLI / GETTY IMAGES

By September 2010, more than 183,000 jobs had been lost in the industry due to the recession, and A/E employment dipped to 1.27 million. Since then it has increased almost every month and currently stands at 1.46 million. Analysts estimate the unemployment rate in the design industry hovers around 1 percent.

The downside of high employment is that it causes inflationary pressures within the economy, which are typically counteracted by the Federal Reserve raising interest rates.

The Federal Reserve kept the federal funds interest rate at close to zero from 2009 to late 2015. Since then the Fed has gradually bumped up the rate, and it stood at 1.25 percent in the fourth quarter of 2017. Moody's deRitis anticipates more tightening in 2018 and beyond.

"We expect to see the federal funds rate rise to 3.0 percent over the next three years," he says. "And if the labor market gets particularly tight, we could see a 3.5 percent rate by 2020."

A/E MARKETS

According to FMI, the construction market—as measured by construction put-in-place—is forecasted to increase 5 percent in 2018, 4 percent in 2019, 3 percent in 2020 and 4 percent in 2021 on a nominal basis.

Construction put-in-place, however, isn't an ideal metric for design firms because the bulk of their contracting is done before construction starts. Analysts estimate that engineering activity tends to precede construction activity by 12 to 18 months.

"An engineering firm would cast an eye toward 2019 construction to get a sense as to how they might fare in 2018," says FMI's Powell. He cautions it's not a perfect correlation. "The length of the lag varies considerably depending on the type of firm and project," he says. Larger and public-sector projects tend to have longer lead times.

Engineering firm CEOs, responding to ACEC's third quarter *Engineering Business Index*, were optimistic about the engineering market in 2018 but were concerned about maintaining their

profitability and backlog levels in 2019 and 2020.

When trying to project which individual market sectors will outperform, Chartwell's Staloch recommends focusing on sectors that are necessities. "There may be some dips, but overall they are going to do well because they have to," he says.

Many analysts expect the roads and highways sector to be steady. "A number of states passed major bond issues in recent years, and those funds are working their way into transportation projects," says Robert Murray, chief economist for Dodge Data & Analytics.

Murray also expects the federal government to pass a modest infrastructure package in the first half of 2018, which "would provide a cushion if we do see a downturn in 2020."

The education sector will continue to grow, but the focus of the market will change. For several years, college expansion has driven the market, but those projects have been drying up because the millennial generation has graduated out of the system. The next big demographic wave is flooding the elementary level, so there will be more K-12 construction. One potential drag on the sector would be if municipalities fail to provide enough funds to meet the demand, according to Powell. And demand is rising with enrollment expected to grow by 2.5 million students over the next three years.

Uncertainty about the federal role in health care has delayed construction projects in the sector recently, but Murray expects to see a lot more activity in the next few years. "They can't wait anymore. They have to just go ahead," he says. There are several big hospital projects in planning, but the bulk of the activity will be storefront clinics and medical office buildings.

Powell says the office market can expect a couple more years of above average growth but then will likely be slowed by capacity issues. Within the sector, enterprise and co-location data centers are among the strongest performers.

Manufacturing will do well, but much of the activity will be in warehouses. "Despite strong growth in the warehouse sector, vacancy rates have ratcheted back," says Murray. "Demand continues to outpace supply." The growth in warehouses is coming at the expense of the retail sector, as online giants take market share from brick-and-mortar stores.

The energy and power sector has been boom-and-bust over the past several years, but Powell expects moderate growth over the next few years. "Owners are regaining their confidence because of pricing stability, and we project some improvement in spending, particularly on the natural gas side," says Powell. "We also expect solid investment in power that addresses transmission and distribution infrastructure demands."

Rebuilding Texas, Florida and Puerto Rico in the wake of the hurricanes will cause a spike in the environmental sector over the next two to three years.

Finally, the market sector lagging behind all the others is water. "Nobody can deny there's a need there, but there's insufficient funding," says Powell. "Because over 75 percent of our water and wastewater infrastructure is publicly owned, the sector doesn't draw enough private investment or innovation." ■

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



2018 LEGISLATIVE OUTLOOK: INFRASTRUCTURE UP NEXT

**WILL 2016 ELECTION PROMISES FOR
SIGNIFICANT INFRASTRUCTURE INVESTMENT BE KEPT?**

BY SAMUEL GREENGARD



Today's political environment can be summed up in two, frustrating words: partisan gridlock. Aside from the year-end sprint to pass tax reform, it has become next-to-impossible to enact major legislation in several areas, including transportation, water infrastructure and energy. Expectations for 2018 nonetheless, remain high.

TRANSPORTATION INFRASTRUCTURE

A 2016 report by the National Association of Manufacturers, showed the gap between current spending and what is needed to revitalize U.S. infrastructure—including highways and bridges, transit systems, aviation, ports and inland waterways—totals more than \$1 trillion.

ACEC has for years advocated for strengthening the long-term fiscal stability of the Highway Trust Fund, as the annual gap between Trust Fund revenues and annual expenditures is projected to grow to \$20 billion by 2021.

The Council will continue working aggressively to advance a bold infrastructure investment program that includes robust funding for core federal programs, innovative financing mechanisms to promote additional private investment and measures to increase utilization of private sector engineering and design capabilities.

In early 2017, President Trump released a proposal to provide \$200 billion in federal funds to leverage additional state, local and private sector investment as

part of a proposed \$1 trillion infrastructure plan to rebuild America. It focused on expanding private sector funding and promoting the use of public-private partnerships (P3s).

Congress, however, continues to wait on the White House for details of the president's initiative. "There are fundamental questions about how we invest in ourselves," says Rich McFarland, senior vice president at Parsons Corp. While some states and localities, including the state of West Virginia and the city of Los Angeles, have recently passed transportation initiatives, federal funding and oversight remain critical. "Obviously, maintaining national standards is critical for commerce and the economy.

Interstate highways and many other projects don't stop at state lines," observes Cathy Connor, senior vice president and director of federal government affairs at WSP USA. In addition, many projects are too extensive and expensive for states or localities to tackle on their own. "You can't leave everything up to state and local funding," she says.

Greater state autonomy combined with President Trump's call for the greater use of challenge grants also has some concerned that a clear set of winners and losers might emerge. Some states have resisted increases in their gas tax, others divert gas tax revenues into a general fund and still others lack ballot propositions that might address key transportation and infrastructure issues. Further complicating matters, 12 U.S. states still haven't authorized any form of P3s—while the framework in states with P3s varies greatly.

A couple of bright spots have emerged. For example, the administration issued an executive order in August focused on facilitating more efficient environmental reviews, a long-held industry priority. The stated goal is to reach unified federal permitting decisions on major infrastructure projects within a two-year timeframe. "One way to accelerate, expedite and improve infrastructure and other large projects is to get rid of the red tape—without eliminating the underlying environmental protections. It's important to have federal agencies conduct simultaneous National Environmental Policy Act environmental reviews rather than the process taking place sequentially," Connor argues.

Even if lawmakers in Washington don't agree on the specifics, there's bipartisan agreement that it's an issue that must be addressed now. Thomas O'Grady, corporate president for HNTB

Corp., says he's optimistic that a breakthrough will occur in the not too distant future. "The importance of infrastructure to the economy and the national well-being is clear," he says.

PORTS, AIRPORTS AND FAA REAUTHORIZATION

Airport terminals, runways and other air and port infrastructure also require significant improvements. Many U.S. facilities and terminals require modernization, including the need for more advanced IT and security systems or just overall expansion to handle increased demand.

ACEC has steadfastly advocated for increased funding for the Airport Improvement Program, and the raising the cap on Passenger Facility Charges (PFC) collected by airports to finance infrastructure investments, as well as an expansion of Qualifications-Based Selection rules for airport projects. The Council last fall succeeded in lifting the Passenger Facility Charge cap in a pending Senate appropriations bill.

O'Grady says that we're approaching a critical juncture where additional funding is desperately needed to meet air travel demands. "We're not at the pinch point yet, but it's clear there will be problems soon if we don't see improvements to airport infrastructure," he says. This includes landside roadway access, people-mover systems and airfield capacity enhancements.

Today's flight control infrastructure doesn't necessarily take advantage of the latest technologies, says Jay Farrar, principal vice president and manager of the Washington D.C. office at Bechtel Corp. The FAA relies on terrestrial navigation systems—essentially radar technology introduced in the 1950s—instead of satellite systems. Some of the nation's ports have also

reached geographic constraints and have hit full capacity—or they are approaching critical levels. Many of them also cannot accommodate post-Panamax ships. "We must focus on how we can make ports and systems more efficient," he says.

FAA reauthorization—which Congress tackles every four years—has entered the spotlight. Although Congress has approved an FAA extension to temporarily fund the agency at previous budgeting levels through the end of March 2018, a long-term funding agreement hasn't been reached. The current bill, H.R. 2997 (the 21st Century AIRR Act), aims to fund improvements but also create a private nonprofit corporation to oversee air traffic

**President
Trump released
a proposal to
provide \$200
billion in
federal funds
to leverage
additional state,
local and private
sector investment
as part of a
proposed
\$1 trillion
infrastructure
plan**

"We will eventually hit the point where some type of action is taken on key issues, including infrastructure. These issues are too important to ignore. They are vital to our nation's economic well-being."

CATHY CONNOR | WSP USA





“For a variety of reasons, Congress has not addressed the market factors affecting liquefied natural gas exports, as well as gasoline and oil imports and exports, for a couple of decades.”

JAY FARRAR | BECHTEL CORP.

controllers. The latter issue has led to acrimonious debate.

WSP’s Connor says that FAA reauthorization is vital. “This is an issue that has largely been overshadowed by all the controversy with the proposal to privatize the Air Traffic Control (ATC) system. The issue being discussed relates to the ATC system, not to the controllers,” she says. All of this has made it difficult for engineering firms to plan and operate adequately. Businesses in this industry require more certainty, she explains.

ENERGY AND THE ENVIRONMENT

The energy/environment sector is another area where ACEC is advocating important changes.

ACEC seeks smart, resilient and sustainable energy and water infrastructure including more efficient, yet effective, environmental permitting to enable timely investment, design and construction. Where lack of funds is an issue, such as with stormwater, water supply and treatment facilities, ACEC advocates for more appropriations, loans and loan guarantee programs.

During his campaign, President Trump promoted energy independence, then hit the ground early in revising U.S. policy, starting with actions to greenlight major pipeline projects delayed by the previous administration. In March, President Trump then signed an executive order directing federal agencies to review their regulations to enable more efficient permitting decisions. Many agencies have since issued reports on their plans to expedite NEPA and other reviews. The administration has also repealed Obama

climate rules, including the Clean Power Plan as well as the rules defining the Waters of the United States.

Major energy legislation that passed with broad, bipartisan support in the last Congress is back this year—Energy and Natural Resources Act—which addresses a variety of issues, ranging from long-term energy supplies and modernizing power grids to conservation efforts and energy efficiency standards.

More controversial environmental bills have passed the House, such as the Ozone Standards Implementation Act. The bill would delay implementation of the Obama administration’s 2015 rule lowering the acceptable level of ozone and would require the Environmental Protection Agency to reconsider the ozone rule every 10 years, rather than on the current timetable of every five years. Ozone standards can pose a major obstacle to energy infrastructure investments in some parts of the country, including pipelines, power generation, refineries and chemical facilities.

One problem, says Farrar, is the lack of a predictable framework for energy. “There’s not as much certainty in the marketplace as companies would like. For a variety of reasons, Congress has not addressed the market factors affecting liquefied natural gas exports, as well as gasoline and oil imports and exports, for a couple of decades,” he explains. Alternative technologies such as solar, wind and wave action should be viewed as opportunities rather than just liabilities, he says. “The reality is they create different types of jobs that then create different types of opportunities.”

The issue, for now, is that alternative energy sources are not a





"We're not at the pinch point yet, but it's clear there will be problems soon if we don't see improvements to airport infrastructure."

THOMAS O'GRADY | HNTB CORP.



reliable source of energy for base load energy production. Consequently, Farrar supports the expansion of nuclear-powered electricity generation, which he describes as clean and safe. The biggest issue is spent fuel storage. "Right now, it's kept on-site, but that is not the ultimate solution," he says.

Ultimately, energy policies must focus on a balanced approach. "We need to move toward alternative energy sources in a smart and careful way," McFarland says. Other countries, as well as cities and private entities in the U.S., have demonstrated that alternative energy is viable—and it leads to economic gains.

TAXES

Tax reform is the one major agenda item expected to become law early in 2018. The final bill appears to be a major win for the engineering industry, particularly for ACEC's effort to secure tax benefits for firms of all sizes and tax structures.

The final tax plan will reduce corporate tax rates from the current 35 percent to 21 percent, which will help engineering firms organized as C corporations be more competitive in the global marketplace. The bill also preserves the ability of firms to use cash accounting versus undergoing the expensive process of switching to accrual accounting. And the final package maintains existing tax incentives for retirement and employee ownership, such as ESOPs, which were key industry priorities.

For firms organized as "passthrough" businesses—S corporations, partnerships and LLCs—where the taxes are paid through the filings of individual firm owners, the bill will create a new 20 percent deduction instead of a reduced tax rate. While the original House and Senate versions of the bill initially excluded many engineering passthrough firms from the proposed tax benefit (along with doctors, lawyers and other service industries), ACEC was successful in securing changes that will treat the industry the same as other nonservice industries in qualifying for the new deduction. Like those industries, engineering passthrough owners with incomes below \$315,000 for joint filers and \$157,500 for individuals can claim the full deduction. Owners with higher incomes will be able to claim the deduction using rules similar to those that apply to the Section 199 deduction that many A/E firms claim.

Other changes included in the final tax bill—including the elimination of the Section 199

deduction, reductions in state and local tax deductibility, and changes in the application of the alternative minimum tax—will affect individual firm owners in different ways.

Infrastructure funding and finance is an area where tax reform fell short of expectations. Federal action here is long overdue. The ongoing push for lower taxes, resistance at the national level to increasing the federal gas tax and the distaste for toll roads have made it extraordinarily difficult to fund transportation and infrastructure upgrades. Infrastructure improvements are further complicated by a growing need for cybersecurity protections—particularly as smart cities and autonomous vehicles roll into the landscape.

There's been no increase in the federal gas tax since 1993, and the introduction of hybrid and electric vehicles is making it harder to fund projects in the traditional way. While some states, such as Oregon, have studied and even tested mileage-based

transportation taxing, and Congress included funding in the FAST Act in 2015 to support additional pilot projects, there's still no consensus about how best to move forward, or when. "The question our country must answer is: How do we invest in our collective economic future to meet the needs of a population exceeding 300 million people?" McFarland says.

WSP's Connor points out that more than 24 states have raised their gas tax over the last few years, and voters have increasingly passed initiatives funding projects. "Pushing responsibility to the state and local level can be a positive thing, but it cannot become a substitute for federal action," Connor says.

BUILDING ON THE FUTURE

In the end, Connor and others are taking a tempered view of the current legislative and executive environment. They realize that while the acrimony and divisiveness in Washington aren't likely to vanish anytime soon, there's a growing consensus that political leaders will be forced to find some common ground.

"We will eventually hit the point where some type of action is taken on the key issues, especially infrastructure," Connor says. "These issues are too important to ignore. They are vital to our nation's economic well-being." ■

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

There's been no increase in the federal gas tax since 1993



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2018 Infrastructure Agenda Includes Transportation, Waterways and Disaster Recovery Bills

ACEC/California Gets Minuteman Fund Grant to Protect Transportation Funding

ACEC/California will use a Minuteman Fund grant to combat efforts to repeal The Road Repair and Accountability Act, which provides \$54 billion over the next decade to fix roads, freeways, bridges and transit across the state.

ACEC national is also working with the state organization to deter members of California's Republican congressional delegation from supporting the repeal initiative.

A ballot initiative is underway to repeal the law, which took effect on April 28, 2017, and to make passage of future infrastructure funding measures more difficult.

ACEC/California is working with the Fix Our Roads Coalition, a broad coalition of stakeholder groups that support stable and accountable funding for California's roads, to dismiss the repeal effort.

The congressional legislative agenda includes a comprehensive investment package recommended by the administration, along with a number of targeted infrastructure bills. ACEC will be promoting funding increases and regulatory reforms in aviation, water and disaster recovery legislation.

The administration is expected to roll out its long-awaited infrastructure proposal in January, which will cover a wide array of sectors including transportation, water and broadband deployment. The package will feature incentives for additional state, local and private sector investment, along with targeted funding for rural communities and measures to facilitate more efficient regulatory reviews of projects.

The current extension of funding for Federal Aviation Administration programs is set to expire at the end of March. House and Senate oversight committees have approved long-term FAA reauthorization measures, but both bills have encountered significant obstacles. In the House, the 21st Century Aviation Innovation, Reform & Reauthorization Act (H.R. 2997) would provide six years of funding for airports and aviation programs but also includes a controversial measure to remove air traffic control operations and equipment from the FAA and move it to a new, not-for-profit corporation. In the Senate, the four-year FAA Reauthorization Act (S. 1405) has stalled over objections to pilot training requirement changes.

Both House and Senate bills increase funding for the Airport Improvement Program, a top Council priority. ACEC is also seeking an increase in Passenger Facility Charges collected by airports to finance infrastructure investments, as well as an expansion of Qualifications-Based Selection rules for airport projects.

Congress is also expected to take up the next version of the biannual Water Resources Development Act in 2018. The legislation will authorize additional funds for Army Corps of Engineers projects for navigation, flood control and environmental protection and remediation, and may include measures related to drinking water and wastewater programs. ACEC is promoting an expansion of existing financing measures for water projects.

As communities in Texas, Florida, Puerto Rico and the Virgin Islands continue to recover and rebuild from the devastating hurricanes of 2017, and California and other states respond to wildfires, Congress is likely to pass another supplemental funding bill to aid in recovery. A multitude of ACEC Member Firms have been contracted to assist state and local agencies with various recovery efforts. The Council is supporting additional federal investments to repair damage to critical infrastructure while emphasizing the need to build more resilient structures that will help manage flood control and mitigate risk during future disasters.



MIKE WATSON IMAGES / THINKSTOCK

KOREY WAGGONER / THINKSTOCK

TAX REFORM EFFORT NEARS CONCLUSION

ACEC worked successfully with House and Senate leaders to improve the treatment of engineering passthrough firms in the tax bill—a vote was expected in late December.

The House and Senate passed different versions of tax reform, and the final bill follows the basic contours of the Senate bill in several respects. It lowers the corporate tax rate from 35 percent to 21 percent, which will help engineering firms organized as C corps. The bill also preserves tax incentives for retirement and employee ownership programs, such as ESOPs, as well

as the ability of engineering firms to use the cash method of accounting.

For passthrough businesses—S corporations, partnerships and LLCs—the final bill creates a new 20 percent tax deduction. An earlier version initially excluded most passthrough owners in certain professions from qualifying for the new deduction, including lawyers, doctors, accountants, financiers, entertainers, professional athletes as well as architects and engineers.

In response to concerns raised by ACEC, the bill was modified to allow engineering passthrough owners to access the deduction. Like most industries, engineering

ISSUES ON THE MOVE	WHAT'S NEXT
Tax Reform	Finished by the end of 2017
Infrastructure Agenda	White House plan expected in early 2018
CA Funding Initiative	Coalition effort to defend the funding package will continue through the year



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passthrough owners with incomes below \$315,000 for joint filers and \$157,500 for individuals can claim the full deduction. Owners with higher incomes will be subject to rules similar to those in the Section 199 deduction that many A/E firms claim.

“We made a great deal of progress, despite the complexities of the proposed changes in the tax code and the rapid pace in getting the bill done before the end of the year,” said ACEC President and CEO Dave Raymond. “We appreciate the fact that Congress listened to our arguments and agreed to put engineering firms on a level footing.”

DOE Secretary Perry Receives ACEC Recommendations to Streamline Permitting, Improve Cybersecurity Regulations

Energy Secretary Rick Perry asked ACEC President and CEO Dave Raymond and other association CEOs for recommendations on improving the DOE regulatory process.

ACEC sent three key recommendations to Perry:

1. The National Environmental Policy Act (NEPA) reviews should be limited to two years.
2. In Federal Energy Regulatory Commission (FERC) hydroelectric and natural gas infrastructure permitting processes, federal agencies with jurisdiction should undertake concurrent reviews and be held accountable for meeting deadlines.
3. Department of Energy groups working on supply chain cybersecurity technology, standards and guidance should include representatives of the engineering industry in order to avoid regulatory confusion and inefficiencies.



Energy Secretary Rick Perry

DREW ANGERER / STAFF / GETTY IMAGES

Regulatory reforms in the energy marketplace will likely be included in a larger infrastructure initiative from the White House in early 2018.

For More News

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



In the wake of catastrophic loss of life and property, industry and Member Firm leaders assess the damage.

HIGH WAT

BY BOB WOODS

In the span of three weeks, from late August to mid-September 2017, three major hurricanes hit the United States. First came Harvey, a Category 4 storm that dropped 5 feet of rain on Houston. Then Category 4 Irma ravaged several Caribbean islands and forced the evacuation of more than 3 million people from south Florida before flooding most of the state. Finally, Category 5 Maria devastated Puerto Rico, already hit hard by Irma, and left the entire island without power and dropped enough precipitation that stormwater punched through a dam designed to protect tens of thousands of people downstream.

In what has become a familiar aftermath, amid repairing the destruction and waiting for the floodwaters to recede, another practice began: evaluating the impacted flood protection systems and how well they performed, or didn't. Simultaneously, in the spirit of never letting a serious crisis go to



A segment of I-10 in Houston, Texas following Hurricane Harvey. The storm dropped nearly 50 inches of rain resulting in massive flooding.

erty from hurricanes Harvey, Irma and Maria, adequacy of U.S. flood protection systems

DEEPER BLUES

waste, the entire nation's vulnerability to flooding is being scrutinized, similar to what occurred after Hurricane Katrina in 2005 and Superstorm Sandy in 2012.

Following those cataclysms, billions were spent to repair failed infrastructure, and bold new flood protection projects were proposed. But once again, many of the same questions remain. What's the physical condition of our dams, levees and similar infrastructure? Is nonstructural floodplain management, including a slew of laws and regulations, among federal, state and local authorities adequate? What, if any, changes should be considered to better protect against future loss of life and property from flooding? And, of course, who's going to pay billions and billions of dollars for all this?

These questions were posed to a cross-section of flood protection experts, officials at various national agencies and organizations as well as executives at ACEC Member Firms with whom they collaborate. Collectively they provided an insightful compilation of assessments, statistics, suggestions and opinions. The upshot is the U.S. needs not only to upgrade infrastructure and nonstructural administration but also to address critical issues such as urban development and funding.

It's helpful to start by looking at the mind-boggling network of hard infrastructure that comprises flood protection in virtually every community throughout the country. The U.S. Army Corps of Engineers (USACE), a Department of Defense unit, maintains a comprehensive national inventory of dams and a



In February 2017, the emergency spillway in the Oroville Dam failed, causing the evacuation of almost 200,000 people from Oroville, California. Inset: Once the stormwater overflow halted, a 45-foot-deep, 300-foot-wide and 500-foot-long crater in the spillway was revealed.

FLORENCE LOW / GETTY IMAGES

partial accounting of levees, plus evaluations of their condition.

As of October 2016, USACE listed 90,580 dams, with an average age of 56 years old, though around 4,400 are more than 100 years old. Each dam is classified in one of three categories based on its hazard potential, or anticipated consequences in the case of failure, mainly fatalities and economic losses. More than 15,000 dams are deemed high-hazard potential, up from 10,213 in 2005. Another 11,882 are classified as significant-hazard and 60,705 as low-hazard, with 2,495 undetermined.

Just 16,179 dams are designed exclusively for flood control while the vast majority hold back and contain water for recreation, hydropower, navigation, drinking water, irrigation and other beneficial purposes. USACE may be the most visible entity aligned with dams, yet it owns and operates only 715. Other federal agencies own an additional 2,666 dams, state and local governments and public utilities own 28,599, and 58,148 are privately owned. USACE and 15 other federal agencies regulate about 10 percent of dams; states regulate the remaining 90 percent.

The far-flung ownership and regulatory authority of dams make their safe operation a multilayered task. "Part of the challenge is you have responsibilities laid out across many federal agencies and states, without department-level oversight of it all," says Eric Halpin, who as USACE's deputy dam and levee safety officer oversees more than 3,000 infrastructure systems.

The labyrinth of levees found in every state—usually earthen embankments or concrete floodwalls all designated for flood



KELLY M. GROW / GETTY IMAGES

risk management—demand a different type of herculean effort. Nationwide there are an estimated 100,000 miles of levees, yet only around 30,000 miles are documented, according to USACE's National Levee Database. The Army Corps owns and operates a small percentage but has regulatory authority over about 14,000 miles of levees across nearly 2,000 systems. State, local and private entities manage the rest. Unlike the hazard potential assigned to dams, the condition of the nation's levees is largely unknown.

The Association of State Dam Safety Officials (ASDSO) estimates that it will cost more than \$64 billion to rehabilitate nonfederal and federal dams—and nearly \$22 billion to bring just the high-hazard ones up to current standards. Yet only \$5.6 billion in funding has been provided. Repairing levees will cost another \$80 billion over 10 years, though only \$10 billion is in the pipeline.

The federal standard for gauging the protection level of a dam or levee is whether it can withstand a 100-year flood or a 1-in-100 chance of failure in any given year. That standard was established 1973 when the National Flood Insurance Program (NFIP) was mandated by the Federal Emergency Management Agency (FEMA) to map all the floodplains in the U.S.

Yet there's an important nuance that goes beyond the physical integrity of dams and levees and takes into account factors over the lifespan of aging structures, especially increased development downstream and improved data predicting natural disasters such as hurricanes, floods and earthquakes, as well as national security threats.

"Many dams were designed for low-hazard or significant-hazard potential," says Mark Ogden, a technical specialist for ASDSO, "but development has occurred downstream since and now they're high-hazard potential and need to be upgraded to a different standard."

The same situation exists with many levee systems, says Steve Verigin, a senior principal at GEI Consultants, Inc. "It only takes one point of weakness for a levee to fail," he says. "Many started out as low structures that protected agricultural land and, over time, have become higher structures that protect greater lives and property and have not been reassessed to structurally meet those demands."

The historic flooding in Houston from Hurricane Harvey is a poignant, and painful, example of expanding urban development. The Buffalo Bayou is a 52-mile river that flows east through the city and surrounding Harris County. The bayou's flood control system is highlighted by the Addicks and Barker dams. The reservoirs they created were cresting during Harvey, forcing USACE to release water, which inundated surrounding neighborhoods. And even though the dams held up then, a 2009 report by the *Houston Press* found that Addicks and Barker are the most dangerous dams in the U.S.

"There are 1 million people in the floodplain below the Addicks and Barker dams," Halpin says. "When we built those dams 70 years ago, there were about 10,000 people so that has to be part of the discussion moving forward."

Much of that discussion will be spearheaded by Houston's Storm Water Action Team, reports Steve Costello, an engineer who retired from Costello, Inc., in 2015 and is now the city's chief resilience officer, or "flood czar," as he's often called.

As of October 2016, the U.S. Army Corps of Engineers listed 90,580 dams, with an average age of 56 years, though around 4,400 are over 100 years old



"The city has been experiencing stress-related redevelopment," says Costello. "We advocate for densification of the city, and when you densify an existing area, you strain the infrastructure."

That infrastructure has required updating for years, and though several initiatives have addressed needs, more needs remain, raising vital questions around ongoing development. "Should developers participate in improving the existing drainage problem, over and above just the mitigating of this project?" Costello says. "Ideally, the city would have money in advance to invest in infrastructure for redevelopment, and we wouldn't have this issue." But the public funds aren't there, he says, and developers balk at footing the bill. "We hope the redevelopment task force will address some of these issues moving forward," Costello says.

A similar situation confronts communities around Sacramento, California, where a 42-mile levee system controls the confluence of the Sacramento and American rivers. New Orleans used to top the list of U.S. cities most at risk from river flooding, but it's been replaced by Sacramento, as noted in a recent news report from National Public Radio (NPR). The risk in the region is so great that in 2008, federal officials mandated a building moratorium until the city worked on its levees. "It's pretty scary when you think about it," Rick Johnson, director of the Sacramento Area Flood Control Agency, tells NPR. "We have more than 100,000 people living out there."

The cost of upgrading Sacramento's levees has been estimated at \$4.4 billion and would take nearly a decade more. Instead of waiting on federal funds, the city tapped into state coffers and raised local taxes. So far, 18 miles of the levees have been improved, and the building moratorium has been lifted.

That solution exemplifies what's become a bizarre incentive to continue urban development in flood-risk areas throughout the country. This points to a basic problem the nation faces, says Jim Murphy, a water resource project director for AECOM. "It may appear that we reduce risk, but we do not eliminate it. By allowing development, it actually increases risk. Thus, we still build where we shouldn't build," he says.

The reality, however, is that development is going to continue, so efforts must continue to mitigate the risks of inevitable future floods not only by investing to improve dams and levees but also by addressing non-structural floodplain management. For instance, FEMA has only mapped about a third of the floodplains in the country, which means that many people aren't aware they live in a flood zone and thus don't purchase policies from NFIP.

Communities and individuals need to better understand their risk and what they can do to reduce the chance of flooding, says Jeff Sparrow, senior vice president at Michael

"It only takes one point of weakness for a levee to fail."

STEVE VERIGIN | GEI CONSULTANTS

Baker International. “That’s founded in how we communicate risk awareness [to the public] but also in ensuring that FEMA maps and data are current and making that information available for people to use and make good decisions,” Sparrow says.



Steve Fitzgerald, president of the National Association of Flood and Stormwater Management Agencies (NAFSMA), agrees that public awareness is paramount. “Over the last 10 years, we’ve focused on including preparedness, resiliency, evacuation procedures and communications to ensure that constituents know their risks. It’s all part of the broader flood risk management effort.”

The Association of State Floodplain Managers (ASFPM) focuses on helping local officials manage their flood risk by advocating for stronger infrastructure and smarter floodplain management regulations. Yet Larry Larson, director emeritus and senior policy advisor at ASFPM, contends that engineers also have a key role to play, especially in mapping. “Up until now, we in the engineering community have not been real positive about this,” he says. “We’ve kind of done what the

“We need to make our voices heard and make sure people can make risk-informed decisions.”

MARIO FINIS | STANTEC

decision-makers wanted us to do, rather than saying what we should do. The engineering community needs to stand up and have a voice in these kinds of decisions.”

That sentiment is echoed by Mario Finis, senior vice president of the waterpower and dams group for Stantec. “We as engineers have the science and technology behind us,” he says. “We understand what’s happening, so it’s incumbent upon us to share that information with policymakers and politicians who don’t have that background to fully understand things. We need to make our voices heard and make sure people can make risk-informed decisions.” ■

Bob Woods is a technology and business writer based in Madison, Connecticut.

The repaired levee in New Orleans’ Lower 9th Ward. The levee was breached during Hurricane Katrina, causing massive flooding.



INNOVATIVE RESTORATIONS

WITH A NOD TOWARD HISTORICAL SIGNIFICANCE, MEMBER FIRMS ARE CREATING DYNAMIC NEW FACILITIES FROM AGED AND DILAPIDATED STRUCTURES

BY TOM KLEMENS

PROJECT: Porcelanosa, New York City

FIRM: Gilsanz Murray Steficek

PROJECT: Restoration of Historic 1878
Wicomico County Courthouse
Salisbury, Maryland

FIRM: GMB Architects and Engineers

PROJECT: Country Club of Detroit,
Grosse Pointe Farms, Michigan

FIRM: G2 Consulting Group

PROJECT: Boyce Thompson Center,
Yonkers, New York

FIRM: Thornton Tomasetti

After an extensive renovation, the historic Commodore Criterion building in midtown Manhattan now showcases Porcelanosa's tile, kitchen and bath products.

Fundamentally Preserved, Entirely Transformed

PROJECT: PORCELANOSA
NEW YORK CITY

FIRM: GILSANZ MURRAY STEFICEK
NEW YORK CITY

In autumn 2015, Porcelanosa, a Spanish manufacturer of tiles and kitchen/bath finishes, opened a new 18,000-square-foot New York showroom at 202 Fifth Ave. Occupying the former Commodore Criterion building, the store required a full gut renovation to create seven levels within a building envelope that previously had only six levels. In contrast, the terra-cotta exterior is regulated by the NYC Landmarks Preservation Commission and could not be significantly altered.

The new interior consists of a three-story public showroom extending from the basement to the second floor and a materials library for designers at the upper levels. There are two floors of offices in between.

The original structure consisted of wood-

framed floors supported by a line of four cast-iron columns, which were eliminated during the demolition and floor heights were redistributed. The western portion of the new floors includes the concrete core and 8-inch flat-plate concrete slabs. The remaining floors consist of steel beams and 4-inch concrete metal deck slabs resulting in column-free open layouts.

Because the wood-framed floors braced the exterior masonry wall, demolition had to be coordinated with temporary shoring until the new floor slabs and frames were installed.

"We did a lot of work with the construction sequencing," says Ramon Gilsanz, founding partner of Gilsanz Murray Steficek, which provided structural and stability engineering for the project, as well as special inspection. "We also worked with the architect so that the new floors were not exactly at the same elevation with the old floors, which meant the demolition of the



Ramon Gilsanz

old floor and construction of the new floor could be done independently."

The new structure is heavier than the original and the anticipated live loads are also much higher. Whereas office buildings typically

assume live loads of 50 psf, the showroom is designed for live loads of 125 psf. Flat-jack testing showed that the existing exterior masonry walls were not strong enough to support the required loads.

Shotcrete was used to reinforce the original masonry perimeter walls to support the gravity loads from the steel floor beams. New pile foundations were installed to support the concrete core and new shotcrete walls. To make room for the 48-inch pile caps, portions of the existing masonry walls had to be undercut about 12 inches. The pile sections were installed one at a time, with a maximum undercut span of 6 feet.

PROJECT: COUNTRY CLUB OF DETROIT, GROSSE POINTE FARMS MICHIGAN

FIRM: G2 CONSULTING GROUP ANN ARBOR, MICHIGAN

In December 2016, the Country Club of Detroit completed a major renovation of its historic Tudor-style clubhouse, but not without some clever geotechnical and structural engineering. Located on 212 acres in Grosse Pointe Farms, Michigan, the club was founded in 1897, although the clubhouse was not built until 1927.

The renovation was part of a long-range plan to offer club members a resort-like experience. It consisted of reconfiguring what was originally the natatorium wing by moving a first-floor bowling alley down to the basement level in place of a long-unused swimming pool and providing a new first-floor fitness center.

Although club management specified the project could not alter the building's

architectural character or footprint, additional headroom was required for both the bowling alley and fitness center. That left just one way to go: down.

"So, there was the challenge: to build something underneath an existing facility, maintain its look and not damage it during the process," says project manager Mark Stapleton, associate with the geotechnical engineering firm G2 Consulting Group, Ann Arbor, Michigan.

Providing the taller ceilings and larger interior spaces in the basement and on the main level meant the bowling alley would be moved seven feet below the existing foundation. The challenge was further complicated by the variability of the soils on-site.

"Our borings confirmed that the ground conditions couldn't have been worse," Stapleton says. "It's a small footprint, but the soil conditions varied wildly. On one side of the building we had water-bearing sand, and on the other side we had clay."

G2 designed a system

of 120 steel mini piles to underpin the building. Using open cut excavation, the underpinning proceeded in 25-foot increments. Pipe piles attached to the existing foundation were hydraulically pushed down into place, essentially putting each section of the building foundation on stilts while not subjecting the historical structure to damaging vibrations of traditional pile installation.

Concrete foundation walls were then formed and poured to encapsulate the stilts, thus providing stability for the renovations in the short term and adequate bearing for the long term. Throughout the underpinning, sensors monitored foundation displacements, which amounted to only 1/100th of an inch throughout the entire construction process.

Backfilling the excavation presented another challenge because of the horizontal soil pressure it would create on the newly extended foundation walls. By using geofabrics, crews minimized active soil pressure on the foundation.



Mark Stapleton

The bowling alley was moved down to the basement level, now seven feet below the original foundation.

Deeper Foundations Support New Facilities



**PROJECT: RESTORATION OF
HISTORIC 1878 WICOMICO COUNTY
COURTHOUSE**

**FIRM: GMB ARCHITECTS
AND ENGINEERS
SALISBURY, MARYLAND**

When lightning struck the Wicomico County Courthouse clock tower in July 2016, it sent roof slates crashing to the ground and brought new urgency to plans for restoring the historic structure.

Dating from 1878, the Victorian Gothic-style courthouse is one of a small number of structures still standing after an 1886 fire destroyed much of the town, but a 2013 structure survey identified extensive deterioration of the entire building shell and general rot and breakdown of the original decorative wood cornices and trims. The clock tower already swayed

considerably in even moderate winds, and the lightning strike elevated concerns that it was in danger of toppling completely.

In 2016, the architectural and engineering design firm George, Miles and Buhr (GMB) was commissioned to perform a comprehensive physical survey of the courthouse superstructure, and develop a detailed plan and cost estimate to secure and restore the two towers and main roof.

GMB created measured drawings of the building through reconstruction of old blueprints, detailed interior and exterior field measurements and a photographic survey. To maintain historical accuracy and ensure durability for years to come, material specifications included a combination of natural slate and composite roof shingles, copper flashings, and durable African mahogany in siding and trim replacements.

The building had to remain fully operational during the construction, which complicated the overarching challenge of balancing the

need to preserve the historical integrity of the 139-year-old building with modern-day security constraints, and the technology required to perform the work.

GMB's comprehensive bid documents included defined cost alternates and work phasing as well as the design for structural repair of the clock tower.

"The louvers on the clock tower are open, and wind-driven rain was one of the reasons it had deteriorated so much," said Morgan Helfrich, vice president and senior project manager of GMB's architectural group. "Although we kept that detail when we rebuilt the louvers, we put a double layer of mesh behind them and flashed as much of it as possible."

GMB engineers used a combination of steel and timber framing to reinforce the original clock tower frame. A system of steel angle corner columns and steel angle frames above and below the intermediate floors reinforces the louver and clock levels. Diagonal steel rods on each of the four sides now laterally brace the steel reinforcing.



Morgan Helfrich

When lightning struck the Wicomico County Courthouse in July 2016, it showered the area below with roof slates and cracked one of the large timber frame members.

Restoration Starts at the Top



The renamed Boyce Thompson Center features state-of-the-art commercial, medical office and retail space while retaining the architectural style and historic fabric of the original structure.

New Life for an Old Treasure

PROJECT: BOYCE THOMPSON CENTER, YONKERS, NEW YORK

FIRM: THORNTON TOMASETTI, NEW YORK

After sitting vacant for nearly 40 years, the redeveloped Boyce Thompson Center on the northwest side of Yonkers, New York, opened earlier this year as an 85,000-square-foot, Class A mixed-use complex. Built in the 1920s as the Boyce Thompson Institute for Plant Research, the facility originally consisted of a 50,000-square-foot, three-story federal-style brick laboratory and eight interconnected greenhouses on 6.5 acres. The building fell into disrepair after it was abandoned in 1978 when the institute moved to Cornell University.

The city held out hope for a redevelopment plan that would renovate the historic structure, rather than lead to its demolition. Finally, with such a plan in hand, Simone Development acquired the crumbling, overgrown, graffiti-covered property in 2015.

Simone hired Thornton Tomasetti to perform a condition assessment for the \$35

million adaptive reuse project. The assessment included the masonry façades, roof and structures, and led to the design of structural alterations, and restoration of the existing building envelope.

“After walking the building, we determined that the actual structure was in pretty good shape, despite the external appearance,” said Michael Gerasopoulos, associate principal with Thornton Tomasetti.

With limited documentation of the existing structure, numerous probes and material testing were required to identify the building’s structural components. Engineers also investigated the existing structural framing and prepared as-built plans that were used in preparing the contract documents.

Thornton Tomasetti provided the structural design of a new 18,000-square-foot, steel-framed building and link to the existing structure, as well as a new 15,000-square-foot stand-alone, steel-framed building with a glass curtain wall façade. Developing foundations for these new structures posed another challenge.



Michael Gerasopoulos

“We had to make sure we didn’t damage the existing building,” Gerasopoulos said. “Although the new building’s foundations had to go down

to rock, the existing building’s foundations didn’t—they were supported on soil.”

Thornton Tomasetti worked closely with the geotechnical engineer, GZA GeoEnvironmental, Inc., to develop a plan using drilled-in mini piles to support the new building foundations. That approach avoided the need to underpin the existing foundation, and keeping the new mini piles at least 6.5 feet from the main building also avoided any settlement during pile installation. A series of concrete grade beams designed to cantilever past the pile caps supports the new building columns that abut the main building.

Today, the renamed and newly renovated complex features state-of-the-art commercial, medical office and retail space while retaining the architectural style and historic fabric of the original structure. ■

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

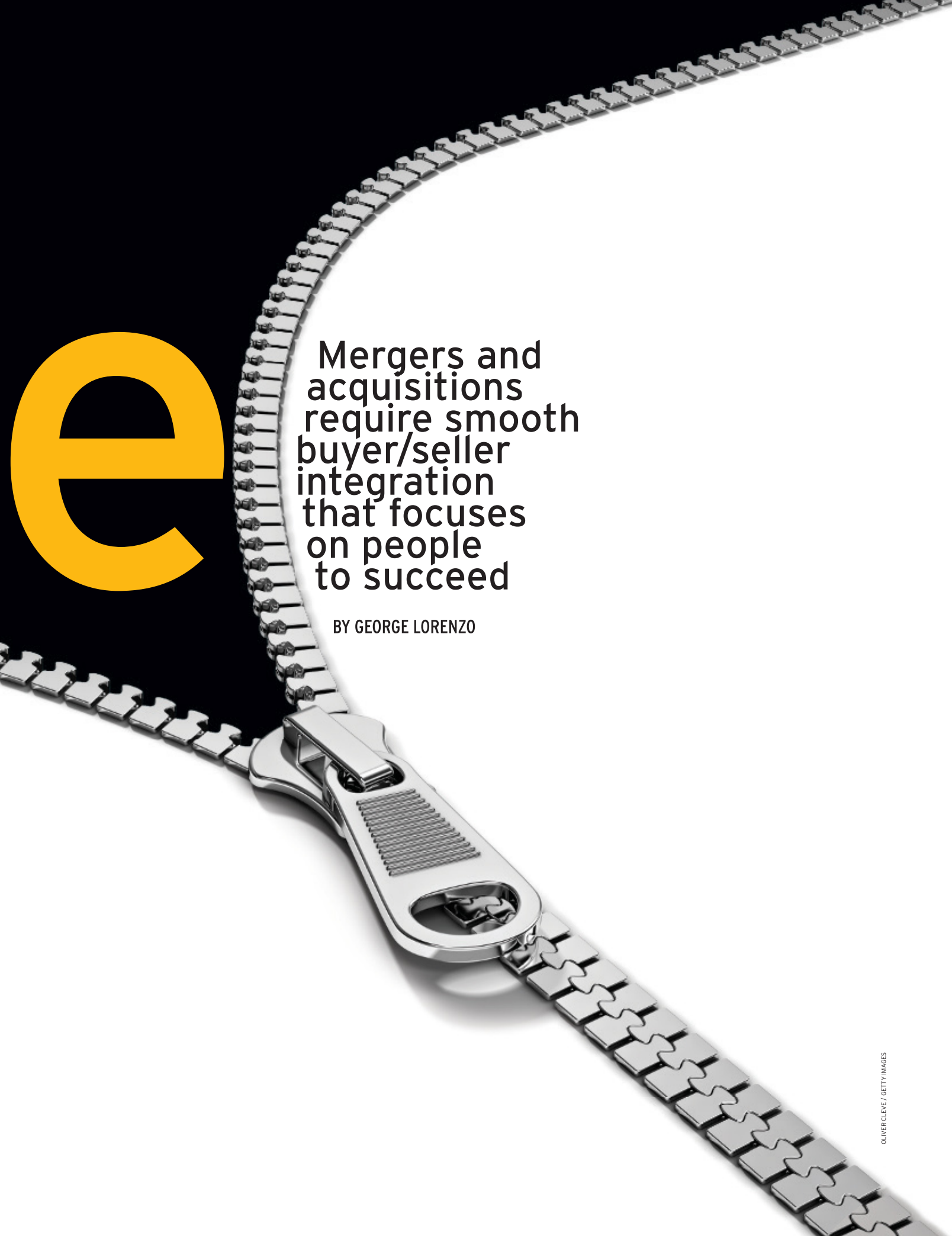
M After the Merq

Any merger and acquisition can get sidetracked when there's a poor cultural fit—regardless of how much strategic planning has gone into the deal-making process.

The inevitable differences between buyer and seller leadership and staff can derail the efficient melding of two firms into one even if there's a solid integration strategy, strong leadership engagement and a laser-like focus on people in place.

"If you try to force cultures to be exactly the same—even when everything is very similar—it is going to be very difficult," says Brad Strittmatter, CEO of Olsson Associates, which acquired 10 companies over the last 10 years. In May through July 2016, the company acquired two engineering firms, a 20-person design firm they had previously worked with during the Joplin, Missouri, 2011 tornado reconstruction project, and a 52-person North Kansas City, Missouri, firm with a strong presence in private land development projects. "You have to embrace the differences in culture," Strittmatter adds. "We try to take the benefit from that. We understand that success can come in a lot of different packages." For the two 2016 acquisitions, "the cultural integration was pretty seamless," Strittmatter says.

In his nine years as CEO of Stantec, Bob Gomes has been involved in about 50 acquisitions. He believes there's no secret for ensuring 100 percent post-transaction success.



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Mergers and
acquisitions
require smooth
buyer/seller
integration
that focuses
on people
to succeed

BY GEORGE LORENZO

"Every company has different personalities," Gomes says, adding there is no definitive playbook for completely smoothing out an acquisition during the post-deal integration process. "Architectural companies are different than engineering companies, and engineering companies are different than project management companies. You've got to take all that into account."

FOCUS ON PEOPLE AND COMMUNICATION

At Merrick & Co., which has acquired four firms with 12 to 15 employees since 2011 and is currently in the due diligence phase with another, the post-merger integration plan includes a people focus.

"When you are acquiring a firm with 15 people, they view us as this enormous blob that is scary because we are taking them out of their comfort zone and making them part of what they perceive as a big company," President and COO Christopher Sherry says. "You are dealing with their medical benefits, their PTO, their pay. We are messing with that, so we want to make sure we communicate very clearly, post-closing, with all the folks who are going to come across from their current firm to Merrick."

Merrick's post-closing communication process includes an acquisition ambassador program where a Merrick employee who's not part of the acquisition team serves as an integration communication specialist with the seller firm. "That person is the go-to person for anybody in the acquired company to reach out for any issues they may have," Sherry says.

IT CHALLENGES

In addition to honoring differences and ensuring effective staff communication between buyer and seller, information technology integration between two companies can become challenging after a merger has been finalized.

Joe Rapier, CEO of Parkhill, Smith & Cooper, says the pressure on IT departments can be very high during a merger. "We have found that IT is a real pressure point, and everybody reacts to that," he explains. "You want everybody working on the same platforms. You can go for a while with the acquired entity stay-

ing on their own, but eventually they must come into the fold, not just for the financial platforms but also for productivity. Obtaining the net productivity efficiencies can put a great deal of pressure on IT."

IT TAKES TIME

All these important transitional elements, as well as the incoming firm's integrated business plan, can take anywhere from one to two years to fully set in within both the buyer and seller firms, says Michael J. Carragher, president and CEO of VHB. Since 2005, Carragher has been involved in 15 acquisitions, ranging in size from six to 75 employees.

"Of the 15, all but two have been successful to very successful for us," Carragher admits, putting the blame for the unsuccessful deals mostly on VHB. "The two were kind of shame-on-us," he explains. In one case, during the planning process, VHB was perhaps overly enamored with the services and skills of the seller company. "We went forward because we were in love with the services they were bringing in, and, unfortunately, the culture and leadership of that firm did not work with ours," Carragher says.

In the second case, the acquired seller was a company VHB had previously worked with that was experiencing a number of financial challenges. The deal was executed without enough pre-planning, mostly related to cultural integration, Carragher says. "There were some positive things that came forward, but shortly after coming into VHB, we did not see eye-to-eye with the leadership of that firm. They were not comfortable with being consistent with what we expect of our leaders, and we agreed to part ways."

"Having a very clearly established executive team and a set of leaders in which the lines of authority are clearly drawn, and where both company employees and cultures feel they are being represented within the leadership group ultimately top the list for a successful merger transaction," says Tim Szniewajs,

M&A Attorneys Weigh In

Because of their wide-ranging responsibilities during the negotiation and final stages of a merger and acquisition, attorneys bring helpful and unique perspectives relative to the overall process.

Two veteran attorneys who specialize in mergers and acquisitions within the A/E industry, Laura Howard, Fox Rothschild, LLP and George Christodoulo, Lawson & Weitzen, LLP, provide insight into

the merger and acquisition process. Howard has been practicing law for 30 years, the past 15 of which have been devoted to architecture, engineering and environmental consulting services companies, and she has been involved in about 30 mergers and acquisitions. Christodoulo has more than 35 years of private practice experience and has been involved with more than 180 merger and acquisition transactions over a period of 20 to 25 years.



"We have found that IT is a real pressure point, and everybody reacts to that."

JOE RAPIER
PARKHILL, SMITH & COOPER

managing director within D.A. Davidson & Co.'s investment banking practice, who has been involved with more than 30 mergers and acquisitions in the A/E industry over the past 15 years.

Of course it's most important that leadership is completely on board with the transaction and must exhibit excitement after the deal has closed, according to Gomes. "They can't just embrace it. They have to do it enthusiastically because their staff are watching them every minute of the day after the transaction," he says.

PROGNOSTICATING FAILURE

Predicting how any company leader will ultimately react over time, post-closing, is not an exact science but vitally important to consider in as much depth as possible, Carragher says.

"It is not just a financial deal," he says. "It is a major emotional transition, particularly for the leaders who were founders or second generation into a company. It is a big change for them, and you need to work with them individually to help get them into a position where they feel most comfortable."

That could mean having a company executive focus on building and developing client relationships, or team management and development, or developing business strategies for the larger buyer company. "You have to really look hard for that desire or interest in the beginning," Carragher adds.

But possible deal killers are pretty easy to identify, Strittmatter explains. They include staying away from firms selling solely for financial reasons, and firms whose leaders are purely seeking a retirement-oriented transaction. Additionally, steer clear of any company whose leaders tend to limit conversations to how the acquisition is going to mostly benefit themselves, he advises.

"We tend to see that as a major red flag versus when a seller starts talking about how their employees are going to thrive in their organization going forward," says Strittmatter.



"It is a major emotional transition, particularly for the leaders who were founders or second generation into a company."

MICHAEL CARRAGHER
VHB

THE BOTTOM LINE

After all is said and done, Mick Morrissey, co-founder and managing principal of Morrissey Goodale, says there really is only one reason to make any kind of acquisition. "Increased stock value. A good deal, priced correctly and integrated properly, should increase stock value over the long term for the buyer," he says.

Morrissey adds that the factors for catalyzing increased stock value through any acquisition include higher profits; faster growth; expanded geographic reach; better client service; and increased diversification of the business, which decreases risk and therefore increases value.

Throw all those factors in with the biggest factor of them all, the human factor, and the model for ensuring post-acquisition success entails a great deal of hard work, determination and pointed focus on guaranteeing all parties, leadership and staff on both sides of the transaction, are happy and ready to move forward together as one unified organization. ■

George Lorenzo is a freelance business writer based in Ann Arbor, Michigan.

Howard recommends firms begin with the end in mind because buyers have become more aware of the need to have a solid integration plan at the earliest stages of the merger and acquisition process. "Who is going to be the senior management? What is the reporting structure? What are the benefits for the employees? How are we going to get this group of people excited about joining us?" Howard asks.

It's often important to have

a confidentiality agreement in place before a deal closes, Christodoulo says. "You don't want competitors trying to poach or headhunters calling. You don't want people to leave," says Christodoulo.

That same theme remains during the post-deal phases of any merger and acquisition. "How many are still there when they do not have to be there?" Christodoulo asks, referring to a common practice whereby seller executives are typically required

to stay on board for a minimum of two to three years as part of a legal employment agreement. Staying beyond that agreement is a good indication of how well the deal actually turned out overall.

"On the flip side, buyers are totally petrified that people will leave because they have spent all this money, and they want to build this organization," says Christodoulo. "It is not even monetary. They want the benefit of the expertise, the client list, and

everything else."

Two factors come into play here, Christodoulo explains: How disparate are the two cultures (differences between buyer and seller), and how willing buyers are to adjusting their own policies so that the seller's concerns, including taking good care of their entire staff of employees, are adequately met.

"You need to really understand what the post-deal integration is going to look like," Howard says.

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PLI Inching Toward A Transition

**2017
PROFESSIONAL
LIABILITY
INSURANCE
SURVEY OF
CARRIERS**

CHRIS CLOR / GETTY IMAGES

BY MAUREEN CONLEY

Despite hints of change in the air, consistently low rates mean it's still a buyer's market for professional liability insurance (PLI), according to ACEC's Fall 2017 PLI survey.

"A surplus of capital is keeping rates artificially low," says John Farrar, vice president of Clark Dietz, Inc., and a member of the ACEC Risk Management Committee.

Though the total market was slightly smaller 20 years ago when roughly a dozen firms were writing PLI, supply and demand were constant. This resulted in fluctuating rates every five to seven years.

"It's been a consistently soft market for the past 15 years," says Jeff Connelly, senior vice president, Greyling Insurance Brokerage and Risk Consulting, a division of EPIC, and program manager for the ACEC Business Insurance Trust.

Regardless of the consistently low rates, some of the survey's 17 carriers, which together insure about 95 percent of ACEC Member Firms, do expect rate increases on policies that were underpriced. The 2017 PLI Survey of Carriers, conducted jointly by the ACEC Risk Management Committee with the National Society of Professional Engineers Professional Liability Committee, the American Institute of Architects Risk Management Committee, and the AIA Trust, found that 11 responding carriers foresee rate increases for certain disciplines and project types.



DON MASON / GETTY IMAGES

“Residential is on the increase, and structural and geotech seem to be targets more often,” says Dan Cecchi, president of Collins Engineers, Inc., and a member of the ACEC Risk Management Committee.

Additionally, while 2016 losses from hurricanes and fires may not directly impact the A/E segment of the PLI market, they could lead to some general belt-tightening among carriers, according to Kevin Collins, senior vice president at Victor O. Schinnerer & Co., Inc. “While there is still a wealth of capacity, the market may be transitioning,” says Collins.

Al Rabasca, director of industry relations, XL Catlin, says catastrophic losses could affect the re-insurance market, which in turn could flow down to primary carriers and possibly have some ripple effect on PLI for design firms.

Even with a record 60-plus carriers competing for design professionals’ business and nearly all aiming to gain market share, in the past year two carriers—Arrowhead General Insurance Agency, Inc., and OneBeacon Insurance Group—have left the market while another carrier decided not to renew its coverage of smaller design firms. Looking ahead, Tim Corbett, founder and president of SmartRisk LLC, anticipates consolidation among carriers that have not implemented underwriting discipline and set aside enough reserves to handle the claims that are developing in the industry.

RISKIER PROJECTS

Some carriers won’t write insurance for condos and other residential projects, or structural and geotechnical projects.

“A firm that specializes in condos may still encounter difficulty with finding carriers willing to compete for their business on competitive pricing and coverage terms,” says Connelly.

The 2017 PLI Survey of Carriers showed that nearly half of the responding carriers avoid or place restrictions on residential, condo and geotechnical projects. “Structural engineers have improved their business practices because they have been forced to pay attention to how they run their business,” says Larry Moonan, executive vice president and COO for Berkley Design

Professional, an operating unit of W.R. Berkley Corp. “But carriers can’t collect enough premium to cover losses on condo projects, and may limit offering coverage to firms with more than 5 to 10 percent of their business coming from these projects.”

Corbett urges firms doing apartment work to consider contract protections against a change of use to condos, which can happen years later. This condition should survive the sale of the property to future owners.

Larger firms tend to have higher claims, often on water, wastewater, highway and bridge projects, according to Farrar, while smaller firms see more claims for condo and residential work.

“The carriers remain concerned about owners seeking higher project limits, creating even deeper pockets to go after on lawsuits,” says Farrar. “Most carriers accommodate these limits; if the market were to harden, this coverage

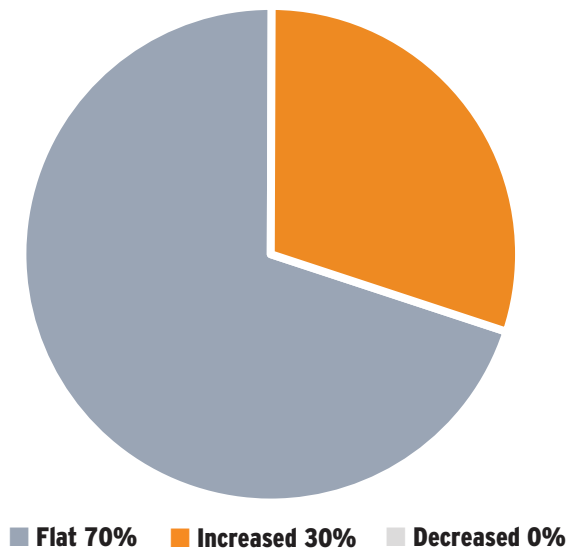
wouldn’t be available or would cost much more.”

Berkley DP is seeing more claims resulting from design-build projects, though Moonan suspects that may be due in part to their rising prevalence. Jim Messmore, senior vice president at Hanson Professional Services, Inc., and chair of the ACEC Risk Management Committee, says the design-build claims tend to arise out of contractual requirements, when designers are working for contractors rather than traditional owners.

CLAIMS TRENDS

Communication and documentation issues may be the most common source of claims, but technical errors and omissions have risen in recent years.

Have Your Rates Increased, Decreased or Remained Flat Over the Past Three Years?



Source: 2017 ACEC/NSPE/AIA/AIA Trust Professional Liability Insurance Survey of Carriers (10 of 17 firms responding).



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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
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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	TRI Professional Group
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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	TRI 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
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Characteristics in the Premium Determination Process

(1 is the highest level of influence; 8 is the lowest)

	Allied World Insurance	Aspen Insurance	AXIS Insurance	Beazley	Berkley Design Professional	Chubb	Hanover Insurance Group	Lexington Insurance Company/AIG	Liberty International Underwriters	Navigators Management Company	PUA	RLI	Terra Insurance Company	TMHCC	Travelers	Victor O. Schinnerer & Company, Inc.	XL Catlin
Location of firm	8	7	4	6	4	3	4	7	8	4	7	5	6	7	4	3	7
Location of projects	7	8	8	5	6	5	8	6	7	7	6	7	5	4	7	7	8
Type of practice	4	2	2	2	3	7	2	4	3	3	2	1	4	2	3	2	2
Type of projects	3	4	6	4	5	4	5	5	4	5	3	3	3	1	5	5	3
Annual billings	1	1	1	1	1	1	1	1	1	1	4	2	2	5	1	1	1
Claims history	2	3	3	3	2	2	3	2	2	2	1	4	1	3	2	4	4
Firm experience	5	5	7	7	7	6	7	3	6	6	5	6	7	6	6	6	6
Other	6	6	5	8	*	*	6	*	5	8	*	*	8	*	*	*	5

* Did not answer

Source: 2017 ACEC/NSPE/AIA/AIA Trust Professional Liability Insurance Survey of Carriers

Corbett attributes that increase to effects of the recession. As firms let go of more experienced technical management staff, they see a rise in claims caused by inadequacies in staffing, quality assurance, quality control and design peer reviews of design documents. That lack of quality control is a concern within firms, according to Farrar.

"We're seeing an increased number of technical errors including sizing issues, computational errors, mistakenly approved shop drawings and undersized support elements," says Rabasca.

Documentation and communication issues, often involving emails and text messages, continue to be problematic.

"People don't really give a lot of thought to what they're sending out in texts and emails, and it may be used against them in litigation," says Farrar.

While miscommunication, documentation issues and quality control are driving up claims, there is a new reason firms should be concerned. Multiple claims against the designer on the same project are becoming more commonplace, as attorneys for plaintiffs file to access either per-claim and aggregate limits or against multiple disciplines on the same project, according to Messmore. They are also casting wider nets on road projects in cases involving auto accidents, as the design engineer's PLI is another potential source of funds beyond the auto policy, Messmore adds.

Jim Schwartz, U.S. A/E focus group leader at Beazley, is seeing more copyright claims arising from photos posted on a firm's website without obtaining explicit rights, which are typically settled for relatively low money because actual damages

cannot be proven. "Don't use a photo unless you know who took it and whether you have the right to use it," he says.

Deciding whether to settle a claim involves many considerations, including the cost of proceeding to litigation and the client's interests.

"Evaluating whether to settle a claim begins with a realistic evaluation of liability and exposure issues," Schwartz says.

SELECTING A CARRIER

When it comes to choosing a carrier, Kathy Blanchard, president of the Professional Liability Agents Network (PLAN) and senior vice president with BB&T Insurance Services, urges engineering firms to actively discuss risks and liabilities on their individual projects, consider whether the right people and processes are in place, and select a carrier that can be a partner over the long term. Corbett adds that firms

should consider financial stability, underwriting experience, discipline, the experience of the claims-handling staff and risk management service offerings.

"When choosing PLI, firms should look at what the carrier is

**The 2017
PLI Survey
of Carriers
found that
11 responding
carriers foresee rate
increases for certain
disciplines and
project types**



"When choosing PLI, firms should look at what the carrier is doing for you, how well they're working with you and understand your business and how you operate so you are protected."

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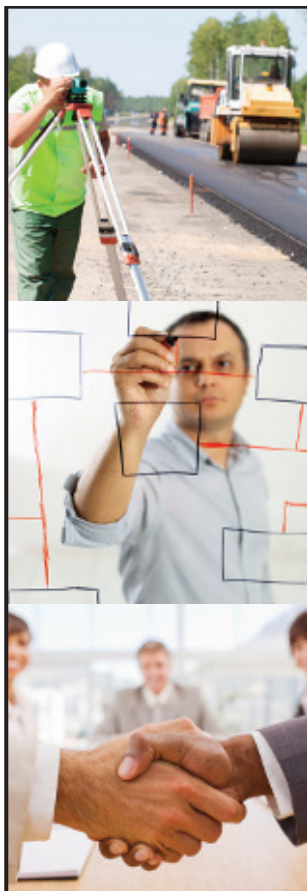
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doing for you, how well they're working with you and understand your business and how you operate so you are protected," says Cecchi.

Firms whose carriers have left the marketplace could face challenges with claims that may arise. "Carriers that still have the capital and a claims department will continue to honor claims, but they may no longer have specialists working on design-related claims," says Mike Welbel, vice president at Risk Strategies Co. and president of a/e ProNet. For that and other reasons, Welbel recommends against carriers that are not in it for the long term. "Staying with the same carrier over the years allows a designer to build relationships with claims people and underwriters, as well as 'a cache of premium,' so when there's a loss, any rate increase may be moderated," says Welbel.

"Firms should have a good reason to leave their existing carrier," Blanchard says, noting price tends to be a significant factor followed by the need to go elsewhere for coverage enhancements. "Firms that switch based on price may only find they are unhappy with the service they receive or the resources available to them. In most cases, newer carriers cannot offer the same program benefits as established carriers for education programs, contract reviews or pre-claims assistance," Blanchard says.

RISK MANAGEMENT

Selecting a carrier and a contract is only part of risk management.

"Engineering firms need to learn about where liability exists and should rely on their insurance agent and carrier to help identify those risks," says Blanchard. She says annual education programs are helpful, regardless of whether the firm earns a premium credit. Because every firm and every insurance company is different, Blanchard recommends firms that firms work with an agent that specializes in the A/E industry and that can provide guidance on maintaining a solid risk management program.



"Staying with the same carrier over the years allows a designer to build relationships with claims people and underwriters, as well as 'a cache of premium,' so when there's a loss, any rate increase may be moderated."

MIKE WELBEL | A/E PRONET



DON MASON / GETTY IMAGES

The 2017 PLI Survey of Carriers showed that nearly half of the responding carriers avoid or place restrictions on residential, condo and geotechnical projects

"Carriers are finding better ways to package the services they offer as a way to help young engineers access their education materials and understand the risks involved in design consulting," says Cecchi.

For example, Victor O. Schinnerer & Co., Inc., recently launched a new risk management resource for policyholders, the Schinnerer School of Risk Management. Schinnerer's web-based School gives policyholders 24-7 access to continuing education courses, tracks continuing education credits and even files certification with states for licensing or accreditation. "The School of Risk Management also allows firms to manage access and has course recommendations for engineers with all levels of experience," says Collins.

"Today, carriers across the board provide contract reviews, risk management seminars and pre-claims assistance, though some do it much better than others," says Connelly.

LOOKING AHEAD

Moonan sees a few challenges and potential risks ahead, including the impact of technology and how it blurs lines between the engineering and construction side, and changes the dynamics in delivering projects. "The challenge is to continue to leverage technology without it creating more liability," says Moonan. Noting that the younger generation works differently from more seasoned engineers, he sees firms focusing on how to attract that talent and manage those people—incorporating them into the firm's process or changing the firm's process to play to their strengths. ■

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

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FROM THE HELP DESK TO THE BOARD ROOM

**CIOs and IT departments have
become major factors for engineering
firm success**

BY BOB VIOLINO

Information technology, or IT, has come a long way from its days of mainly “keeping the lights on” and managing the desktop help desk. The CIO and IT department have increasingly significant roles in the day-to-day business operations and long-term strategy at engineering firms.

The change reflects the growing importance of technology in society and business as a whole over the past several decades.

The increased reliance on technology has created a workplace where engineers have a greater awareness and preference about end-user device choices as well as an opportunity and skill set to solve many IT support problems on their own. Engineers are more knowledgeable than ever about the applications they use to do their jobs.

IT'S TRANSFORMATION

IT leaders and professionals are finding that their skills and services are actually more in demand, and their expertise is becoming more of a factor in the overall bottom-line success of their firms.

"When I sit back and think about it, I'd say that the role of IT in our firm has probably changed more than any other one," says Kenneth Smith, CEO at Houma, Louisiana-based T. Baker Smith.

The IT manager has transformed to the chief information officer at T. Baker Smith, and IT has gone from a backroom support service to a C-level position that actually drives strategies and their implementation, Smith says.

One of the biggest areas of concern is protecting systems and data against a growing array of cybersecurity threats

"Technology is a lot more dynamic than it used to be, and it reaches deeper into the company," notes Andres Repetto, director of IT at Nitsch Engineering.

In the past, companies had a few pieces of software that were updated every couple of years, Repetto says. But now, software constantly evolves as do companies, so IT's role is to make sure those changes work in tandem. "We need to pick the right tools and partnerships to help companies achieve their goals—and do it as efficiently as possible," he says.

This evolution in IT has brought great benefits to the engineering industry, according to Repetto, and IT has become an essential part of the industry.

"IT used to be considered an administrative support function, but now it is absolutely a strategic position," says Lisa A. Brothers, chairman and CEO of Nitsch Engineering. "IT hardware and software costs, the smooth functioning of IT and the constant threat of a security breach is a lot more intense than it was years ago. IT management now requires a highly qualified, senior person who is involved at the strategic level."

From mobile access and collaboration to drones and laser scanners, IT has become deeply integrated into firm operations. "As tools evolve and people become more tech savvy, the line between technology and engineering begins to blur," Repetto says.

On an annual basis, Repetto presents to the firm's board of directors what he sees as critical IT needs for Nitsch Engineering in the short-term and three to five years out.

"We see the increasing role of IT in our company as something our board needs to be kept aware of so that we can make important strategic decisions," Brothers says.

Understanding the goals and challenges of the company as a whole, as well as the individual departments, allows Repetto to be more efficient when procuring solutions that can help people achieve their objectives. "It's not about keeping the lights on, but about bringing light to where it's needed," he says.

A SEAT AT THE STRATEGY TABLE

Smith agrees that IT is changing how engineering firms operate, and the top IT executive is considered a trusted adviser on various aspects of firm business.

"Not too many years back, the saying was 'never make a decision without your attorney and your CPA on your side,'" Smith says. "Today, you never make a strategic decision in your firm without your CIO on your side."

At T. Baker Smith, the CIO is responsible for IT operations as well as systems and software management, data management, digital records management, device management, cloud services, interoffice collaboration, intranet systems, and most important, the Innovation Solutions Division.

CIOs in engineering firms play a critical role in not only supplying the tools to users but also working with project team leaders to own the solution, says Dave Wagner, senior director of product marketing at software company Newforma. "Only when the team owns the solutions will it achieve a level of usage and adoption necessary to make it a success," he says.

The emergence of cloud computing has also impacted the role of IT, says Eric Quinn, director of IT at C&S Cos. In the past it was relatively simple, he says, with the main decisions involving which core software products to use.

"It was a rather narrow field, so you could look at things and say, 'This is what we're going to buy.' Now every manufacturer has some sort of online presence and tools available in the cloud, so being able to help coordinate the different cloud-based tools is extremely important," Quinn says.

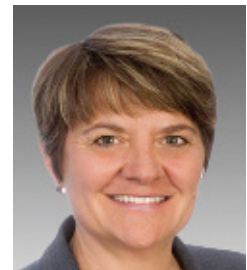
"There are a lot of niche services for different industries, and we want to be sure we're connecting with those," he says.

Now, IT must leverage those new cloud, mobile and social technologies tools to capture information and communicate it to the entire team—both young and old, Wagner says. "Through IT's effort, we are seeing a revolution in how engineers do their job," he says.

Looking ahead, IT will likely play an even bigger strategic role as firms increasingly use emerging technologies such as machine learning, artificial intelligence and augmented and virtual reality.

"It will make us better 'trusted advisers' to our clients," Smith says. "Machine learning and the automation of manual tasks will force the engineering firm to do more than just good design work. We will truly need to step it up and provide innovative solutions."

IT's role in the industry's future will also grow as "smart cities" continue to evolve, which will impact infrastructure design, from sensors collecting all kinds of big data to paperless 3D-model deliverables, according to Brothers. "These



"We see the increasing role of IT in our company as something our board needs to be kept aware of so that we can make important strategic decisions."

LISA A. BROTHERS
NITSCH ENGINEERING



"Data, business automation and improved efficiencies are critically important for clients, and integrating applied technologies into our core services is integral."

GREGORY BOSWORTH
VHB

"We need to adapt so that we can continue to solve clients' challenges," Bosworth says. "Data, business automation and improved efficiencies are critically important for clients, and integrating applied technologies into our core services is integral."

FACING CHALLENGES

With increased responsibility and reliance on IT have come a number of challenges for firms.

"IT has made all of us more connected, which has created a situation where everyone expects an instant response," Brothers says.

"This connectivity and expectation of response challenges how we manage our workforce and our clients. We can't be on all the time; it is not healthy, and we don't expect it of our staff at Nitsch Engineering. The challenge is how to provide the IT solutions that connect our employees to the company and our clients while articulating our expectations for communication."

Another challenge is the need to hire more people with various data-related skills.

"You would think that due to all the automation we would actually need less people," Smith says. "I have not seen this. Just the opposite; we need more folks. However, we need much different types of people."

Take professional surveyors as an example. "Due to technology we can gather a tremendous amount of data in a very short time period," Smith says. "However, people conducting the surveying

new challenges will affect how we approach our services, and how we quantify and minimize the risks that come with them," she says.

It's clear technology will play an increasingly larger role in solving the challenges of urbanization, says Gregory Bosworth, vice president of IT at engineering firm VHB. "To make sure we are ahead of the curve in addressing this, we are devoting significant resources to keep us current with technology in terms of the tools we use," he says.

Over the past year and a half, VHB's applied technology services has evolved into a core service for the firm with executive-level representation, Bosworth says. The firm's focus on technology includes providing employees with the technology they need, building revenue through new technology-related services and helping to mitigate business risk.

VHB also plans to continue increasing its investment in technology over the next several years.

need a much higher level of technical skills. Additionally, the level of support in the office has increased due to the pure volume of data being brought in."

One of the most pressing areas of concern is protecting systems and data against a growing array of cybersecurity threats.

"Cybersecurity used to be a discussion that didn't take very long," Quinn says. "We had anti-virus software and basic firewalls. These days it's about educating the end-user and letting them know what today's threats are. Threats change every day, and the security discussion is a lot more prevalent."

Information security and business continuity top the list of challenges, Repetto says. "Finding the balance between security and convenience is never an easy task, and IT departments need to constantly look at how to find this balance," he says.

Software diversity can be a challenge when people collaborate with different companies and need to find a common platform, according to Repetto.

"Another challenge is storage management," he says. "With more and more terabytes of data that need to be available to everyone in every office, we keep pushing technology to be where we need it to be."

Defining, measuring and maximizing the value of IT remains difficult for many engineering firms. IT is undoubtedly central to creating value and therefore continues to account for a rising share of total investment.

In some cases, the economic value expected from the IT department can be measured through improvement in the overall cost-to-revenue ratio while the strategic value can translate into a competitive edge in terms of investment or acquisition capacity.

T. Baker Smith uses percentage increase in revenue per full-time equivalent—the hours worked by one employee on a full-time basis—to measure the value of technology spending.

But IT has become so integral to the operations of engineering firms today that its value should be assumed.

IT will likely play an even bigger strategic role as firms increasingly use emerging technologies such as machine learning, artificial intelligence and augmented and virtual reality

"In some cases, technology is a requirement to get the job. In others, technology is saving the company resources or providing a better value on the work done," Repetto says. "Different pieces of technology provide different benefits, and we can't always measure it the same way. The investment must be in tune with the overall strategy for the company."

At C&S, any discussion in the firm these days about how to improve almost always involves technology, according to Quinn. "If we need better communications, that's a technology issue. If we need faster development of our products, that's technology. If we need improved collaboration between companies, that's technology," he says. "IT is what's driving innovation." ■

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



Brown and Caldwell
engineer Jaclyn
Lauer assists with
stream and wetlands
restoration in Forsyth
County, Georgia.

Team Gree

**Brown and Caldwell employees give back in
that create more sustainable communities**



n ways

BY CALVIN HENNICK



Brown and Caldwell's corporate sustainability report highlights the firm's passion for making a difference.

Brown and Caldwell, a 1,500-person, Walnut Creek, California-based environmental engineering and construction firm bills itself as “100 percent environmental.” Founded in 1947, the company a year later designed one of North America’s first wastewater cogeneration systems and subsequently began promoting the benefits of recycling treated wastewater in the 1960s—years before sustainability issues were even on most companies’ radar.

So, it’s no surprise that many of Brown and Caldwell’s volunteering and giving programs focus on making the planet not just a better, but also a more sustainable, place to live.

“Our business is all water-related,” says Cindy Paulson, the company’s chief technical officer. “It’s the full water cycle, whether it’s getting clean water to people, or cleaning water up. The people who are here are really passionate about that.” Paulson observes that more and more, employees—especially millennials—are energized to make an impact globally. “We really believe in these sustainability-focused nonprofit organizations. When people join us, they see that.”

The firm’s charitable and volunteer efforts extend beyond environmental initiatives, to include hunger, education and other issues. In 2016, Brown and Caldwell employees logged 20,000 volunteer hours. Across the company’s 45 offices, employees have worked to support organizations and causes including food banks, natural disaster relief, fundraising bike rides that benefit medical research and a charity golf tournament to help schools in underserved neighborhoods. At the core of these activities is a passion for making communities healthier, safer and happier places to be.

“It’s a big part of what we do,” Paulson says. “That’s who our people are.”

INTERNATIONAL EFFORTS

For more than 10 years, Brown and Caldwell has been a big supporter of Water For People, a nonprofit organization that promotes the development of high-quality drinking water and sanitation services in developing countries. The company also supports Engineers Without Borders.

Paulson is a member of the board of directors of Water For People, and she says that the firm is drawn to the nonprofit in



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Brown and Caldwell Charlotte employees, George Anipsitakis (left) and Jordan Chandler (right), joined TreesCharlotte to help maintain and expand the natural tree canopy in Charlotte, North Carolina.

part because of its “Everyone Forever” model, which emphasizes strong communities, businesses and governments to help ensure the sustained impact of water and sanitation projects.

Brown and Caldwell provides employees the option to donate to both Water For People and Engineers Without Borders through payroll deductions, and one in three employees have opted in. In the 2017 fiscal year, employees gave an average of \$100 per person to the two organizations, after factoring in the corporate match. Over time, the firm and its employees have contributed more than \$900,000 to Water For People.

“Brown and Caldwell is a great partner of ours,” says Julie Kauffman, business development manager for Water For People. “They really support and understand our mission of ‘Everyone Forever.’”

In addition to the fundraising, Kauffman notes, Brown and Caldwell sponsors events for the nonprofit, with a number of company managers and employees serving on the group’s leadership council and volunteer committees.

“They personally believe in the mission,” Kauffman says. “It’s not just a check box for them. They support us and are always looking for ways to make the partnership better, to help us with our mission. It’s not just, ‘We’re going to give money and walk away.’ It’s, ‘How do we help?’ That’s a really great thing to have.”

Before she was a member of the Water For People board, Paulson visited Rwanda—at the invitation of a government official she met in California—to see the group’s work firsthand. “It was just amazing to me,” Paulson says. “The thing that was most striking was the level of pride in their infrastructure. These were the most beautiful pieces of infrastructure I’ve ever seen.”

Prior to Water For People’s work in the area, Paulson says, people had to spend hours each day traversing hilly terrain to bring water to homes, schools and

health clinics. “The visit was enough for me to really want to commit even more time,” she says. “It’s become a really big part of who I am.”

Paulson’s not alone in her commitment.

Bhargavi Golluru, an engineer at Brown and Caldwell, volunteered with Water For People before joining the firm, and the company recently paid for her to travel from her office in New Jersey to a training workshop at the nonprofit’s headquarters in Denver. “It’s something I am very passionate about,” she says. “One of the biggest reasons I picked Brown and Caldwell is because I knew they were a big Water For People supporter.”

PUSHING FOR THE PLANET

Individual Brown and Caldwell offices try to minimize their environmental footprint using such efforts as eliminating bottled water, reducing printing and eating from reusable plates. Several years ago, Kelly Rogers, the firm’s mid-Atlantic area marketing manager, was brainstorming ways to make operations even more sustainable. She came up with the idea for something called the Earth Day Challenge. Rogers describes it as a “throw down” challenge with the company’s other offices to see who could come up with the best sustainability-focused programming.

“We had already accomplished a lot in our office, and we were looking for ways to do more,” Rogers recalls. “We issued contest guidelines companywide. We said we wanted to promote environmental education, as well as more sustainable practices in each office and at home.”

The Earth Day Challenge started in 2015, with Rogers’ Charlotte, North Carolina, office taking the lead. Employees visited a local elementary school to give presentations about clean water and engineering, planted a tree in a local park and developed sustainable gardens at their homes using compost and rain barrels. “We felt if we were putting the challenge out there, we needed to participate and really lead the pack,” Rogers says.

Other offices propagated milkweed plants to support monarch butterfly migration, adopted street planters, performed rehabilitation work on streams and wetlands and organized recycling drives for old electronic devices. Although the initiative is centered on Earth Day, Rogers notes the impact of many of

these programs extends throughout the year.

At first, Rogers wasn’t sure whether the challenge would catch on, but it’s become one of the company’s core programs with more than half of offices participating. “I was really surprised,” she says. “I thought it might dissolve after the first year. But a month or two before Earth Day the next year, people were asking me, ‘When’s the Earth Day Challenge?’ Now people look forward to it.”

“One of the biggest reasons I picked Brown and Caldwell is because I knew they were a big Water For People supporter.”

BHARGAVI GOLLURU
BROWN AND CALDWELL
UPPER SADDLE RIVER
NEW JERSEY



GETTING LOCAL

Spread as they are across 45 offices, Brown and Caldwell employees tend to infuse local flavor into even national efforts. In Denver, where craft brewing is a common hobby, Brown and Caldwell invites employees and clients to bring their creations into the office once each year for a “BrewHaHa.” Everyone samples each other’s beer and then votes for the best brew with their dollars, with all the money going to charity.

The event generally features around 30 different beers and raises more than \$1,000. The last couple of years, the office has sent the money to Water For People.

“That’s a fun thing that raises awareness,” says Sarah Reeves, operations manager for the company’s Rocky Mountains region. “It brings in our clients and our staff, and it focuses on the fact that people in Colorado like their beer.”

Offices also participate in local efforts to clean up the environment and encourage sustainability. In New Jersey, for example, employees compete in “Marsh Madness”—paying to fill out NCAA basketball tournament brackets and then donating the money toward local wetlands protection.

New York City employees have volunteered with the Gowanus Canal Conservancy, weeding and building a garden wall. Employees at the firm’s headquarters volunteer with their families to perform cleanup work at three different locations. And staff in Honolulu work to clear away invasive algae in a local bay.

In Boise, Idaho, employees participate in a community-wide effort to rake up leaves for seniors and disabled people who need

PROMOTING DIVERSITY THROUGH SCHOLARSHIPS

Nationally, Brown and Caldwell awards up to \$35,000 each year to students in environmental science and engineering. Several annual awards go to support groups that have traditionally been underrepresented in the field.

Minority Scholarship: This \$5,000 award supports students who identify as a member of a minority group, including students who are African-American, Hispanic, Asian-American, Pacific American or Alaska Native.

GLBTQ Scholarship: An annual \$5,000 award goes to an environmental studies student who identifies as gay, lesbian, bisexual, transgender or questioning.

Women in Leadership Scholarship: This \$5,000 award goes to female students who demonstrate leadership within the community.

Navajo Nation Scholarship: An annual \$1,000 award, renewable for four years of schooling, supports an enrolled member of the Navajo Nation.

assistance maintaining their properties, and they also travel to a neighboring community to clean up trash from gutters and waterways and mark storm drains.

“We’re making a difference every day working on these long-term environmental projects,” says Andy Weigel, a project manager in the Boise office. “But it’s also really satisfying to go out and volunteer—to really see the impact we’re having firsthand.” ■

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

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“We’re making a difference every day on these environmental projects, but it’s also really satisfying to go out and volunteer—to really see the impact we’re having first-hand.”

ANDY WEIGEL
BROWN AND CALDWELL
BOISE, IDAHO



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M&A Activity Turning Green

BY NICK BELITZ

Domestic deal-making activity began to pick up in the latter half of 2017. While merger and acquisition data through the first half of the year suggested a slight contraction in the number of industry transactions—both globally and domestically—the most recent data shows the industry is on pace to slightly eclipse the 215 deals made with U.S. sellers in 2016.

We predicted an uptick in completed transactions for full-year 2017 in the November/December 2017 issue of *Engineering Inc.*, and as of this writing, we have every indication that 2018 will begin with positive momentum for buyers and sellers in all segments of the A/E industry as opportunities in numerous markets align with acquirers' strategic goals and sellers' need to transition ownership.

Judging by the most recent spate of announcements, ACEC member deal-makers targeted a handful of critical sectors in the third quarter of 2017. While acquisitions focusing on data-driven technology and design and construction management for public infrastructure contribute to the list, ACEC members announced a string of acquisitions with at least a portion of firm services dedicated to providing environmental and/or geotechnical expertise.

Notably, while ACEC members Terracon Consultants and Stan-tec, both experienced acquirers, made buys in coastal markets to build each firm's presence in the mid-Atlantic region and California, respectively, less frequent industry buyers, such as ACEC members GEI Consultants and LaBella Associates, also made plays to build staff resources, client contacts and greater penetration in environmental and environmental-related markets.

For engineering firm leaders looking to build or diversify their businesses, the environmental market in the current economy makes a compelling strategic case. First, the sector enjoys above-average growth expectations. The U.S. environmental consulting and engineering market has been growing by an average of 2.3 percent annually from 2014 to 2016, according to Environmental Business International (EBI). However, the near-term outlook is much brighter as this year the market is expected to follow the 3.4 percent growth in 2017, which is greater than the expected U.S.

GDP growth rate of 2.2 percent over the same timeframe.

Secondly, in addition to rising growth expectations, this segment is also uniquely positioned to benefit from spending in both the public and private sector. EBI reports that U.S. environmental consulting and engineering market measured \$29.79 billion in 2016 and of that, expenditures of the environmental market were almost evenly split between the public and private sectors. Public sector agencies accounted for \$15.82 billion, or 52 percent in spending, with the private sector accounting for 48 percent, or \$13.97 billion.

This bifurcation of spending sources offers a measure of diversification to engineering consulting firms as the current economic expansion continues and buyers look to balance their client portfolios. For added context on sources of funding, the top buyers in the U.S. environmental consulting and engineering market last year were federal and local government, energy and manufacturing. The federal government accounted for about one-third of the market while the local government accounted for 17 percent, the energy sector (largely driven by oil and gas companies) accounted for 16 percent, and the manufacturing sector accounted for 11 percent.

As the A/E industry finishes a successful 2017 and firm leaders look to expand in 2018 and beyond, we fully expect firms to continue going green with further plays and acquisitions in environmental consulting and engineering.

NOVEMBER 2017

H2M architects + engineers (Melville, N.Y.) acquired **Schommer Engineering, Inc.** (Morristown, N.J.), a civil engineering, planning, environmental studies and landscape architecture firm. Both firms involved are ACEC members.

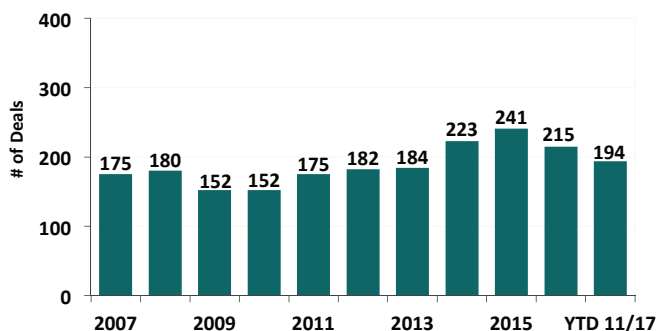
Architecture, engineering and environmental consulting firm **LaBella Associates** (Rochester, N.Y.) acquired **Joyce Engineering** (Richmond, Va.), a firm serving the solid waste industry for public and private clients. Both firms are ACEC members.

ACEC member **S.W. Cole Engineering, Inc.** (Bangor, Maine), a geotechnical engineering and geo-environmental consulting firm, acquired **Tibbetts Engineering Corp.** (Taunton, Mass.), which provides construction materials testing, construction administration, construction inspection and geotechnical services and will consolidate operations to the firm's Taunton headquarters.

ACEC member **WSP** (Montreal, Canada) acquired multidisciplinary consulting firm **ConCol** (Bogota, Colombia) in pursuit of WSP's Latin American expansion. ConCol is recognized for its expertise in power, transportation, oil and gas, environmental and project management services.

Terracon Consultants (Olathe, Kan.) an ACEC member, acquired two Washington, D.C.-area firms: **GeoConcepts Engineering, Inc.** (Ashburn, Va.), and **GeoCapitol Engineering LLC** (Washington, D.C.). Both acquired firms provide geotechnical engineering, environmental and construction materials services.

Reported Annual U.S. A/E M&A Activity



OCTOBER 2017

SNC-Lavalin (Montreal, Canada) acquired ACEC member **Data Transfer Solutions** (Orlando, Fla.), a North America leader in asset management and geographic information systems.

Global design firm and ACEC member **Stantec** (Edmonton, Canada) acquired **North State Resources, Inc. (NSR)** (Redding, Calif.), a 60-person environmental consulting firm. NSR serves a variety of both public and private clients in Northern California.

ACEC member **GEI Consultants** (Woburn, Mass.), a provider of geotechnical, environmental, water resources and ecological science services, acquired fellow ACEC member **Inland Seas Engineering** (Traverse City, Mich.), an environmental, land surveying, geotechnical and civil engineering firm.

Psomas (Los Angeles) merged with **Andregg Geomatics** (Auburn, Calif.), a Northern California surveying and mapping firm specializing in water, transportation, energy, public works, land use and land conservation projects. Both firms are ACEC members.

ACEC member **Golder Associates** (Palm Beach Gardens, Fla.) entered into a definitive agreement to purchase the assets and ongoing operations of **Alan Auld Group of Companies** (Doncaster, U.K.), a global provider of specialized engineering design and construction services for underground structures.

CHA Consulting, Inc. (Albany, N.Y.), acquired **PDT Architects** (Portland, Maine), a regional firm specializing in sustainable, high-performance design for K-12 schools, health care facilities, corporations, municipalities and higher education facilities. CHA is an ACEC member.

Garver (North Little Rock, Ark.) acquired engineering and design services firm **Ruggles & Bohm** (Wichita, Kan.). Garver provides services for transportation, aviation, water, energy, industrial development, survey and construction management projects. Both firms involved in the deal are ACEC members.

ACEC member **Parsons** (Pasadena, Calif.) acquired **Williams Electric Co.** (Fort Walton Beach, Fla.), a privately held firm specializing in control systems integration, electrical and general contracting and energy infrastructure solutions. Williams Electric Co. serves a wide range of federal government organizations including numerous agencies within the Department of Defense.

Full-service design firm and ACEC member **Clark Patterson Lee** (Rochester, N.Y.) acquired **Moser Mayer Phoenix Associates (MMPA)** (Greensboro, N.C.), an architecture, engineering and interior design firm. MMPA is Greensboro's largest A/E firm and primarily serves clients in North Carolina and Virginia.

Global design firm **WorleyParsons** (North Sydney, Australia) acquired the upstream oil and gas division of **AMEC Foster Wheeler** (London) an ACEC member.

Hatch (Mississauga, Canada) merged with ACEC member **Shrader Engineering** (Houston) to establish **Hatch Shrader**. The merger marks the 17th A/E deal in Texas this year and creates Hatch's U.S. operations center for digital technologies in power, automation, controls, communication, physical and cybersecurity and smart city solutions.

In the 18th Texas deal in 2017, ACEC member **Braun Intertec** (Minneapolis) acquired engineering and testing firm **GME Con-**

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.



sulting Services, Inc. (Austin, Texas). Braun Intertec is a geotechnical engineering, testing and environmental consulting firm.

Consulting and engineering services firm **Tetra Tech** (Pasadena, Calif.), an ACEC member, acquired **Glumac** (Portland, Ore.), a provider of sustainable infrastructure design services. Glumac employs more than 300 professionals and incorporates sustainable technologies and solutions into its LEED and net-zero designs.

Engineering, construction management, land surveying and materials testing provider **Goldsmith Heck Engineers, Inc.** (Sioux Falls, S.D.), joined ACEC member **KLJ** (Bismarck, N.D.), a multidiscipline engineering firm.

SEPTEMBER 2017

Full-service structural engineering firm **Hope-Amundson** (San Diego) has agreed to merge with ACEC member **Coffman Engineers** (Seattle), a multidisciplinary design firm.

ACEC member **HDR** (Omaha, Neb.) acquired ACEC member **Maintenance Design Group (MDG)** (Denver), a firm specializing in the planning and design of fleet vehicle operations and maintenance facilities. MDG will now conduct business as HDR's Maintenance Design Group.

Burgess & Niple (Columbus, Ohio) sold its Geotechnical Division to **CTL Engineering** (Columbus, Ohio). The purchased division operates out of Chantilly, Va. and provides drilling and testing services to government, private and industrial clients. Both firms are ACEC members.

ACEC member **Fisher Arnold** (Memphis, Tenn.) acquired **MidSouth Utility Consultants** (Memphis, Tenn.), adding 27 employees to Fisher Arnold's staff. MidSouth is primarily an electrical engineering firm and provides a broad range of engineering experience and technical competence to the electric utility community throughout the Southeast and Midwest. ■

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.

On the Move

Roseann Schmid has been named CEO of Rochester, New York-based **Fisher Associates**. She succeeds **Robert Goossen**, who announced his retirement. Goossen will remain with the company for three years and serve as CFO. Schmid formerly served as vice president and director of transportation. **Christopher Smith** was named COO and formerly served as vice president and client service manager for the firm's renewable energy market sector. All three are ACEC SEI graduates and are based in the headquarters office.

Gary Torosian has been appointed CEO of Acton, Massachusetts-based **Geocomp Corp.** Torosian has been with the company since 1992 and was appointed to the executive committee in 2015. He is based in the headquarters office.

Kevin Switala has been promoted to chief technology officer at Harrisburg, Pennsylvania-based **Gannett Fleming**, where he will provide strategic technical leadership and oversight of Information Technology Services, a division of Gannett Fleming. He previously served as vice president of GeoDecisions, the

company's geospatial technology division. He is based in the headquarters office.

Jim Riley has joined Boston-based **CDM Smith** as senior vice president and national transportation director in the firm's North America Unit. Riley formerly served as national transportation market sector leader and chief sales officer at HNTB. He is based in the Cleveland office.

Pittsburgh-based **Michael Baker International** announced the following appointments: **Scott Roux** has joined the company as senior vice president and national bridge practice lead. Roux most recently served as vice president of U.S. operations for COWI North America. He is based in the Seattle office. **Frank Terak** was promoted to senior vice president, federal markets. He formerly served as national market lead for the company's U.S. Army and Army Corps of Engineers segment. He is based in the Moon Township, Pennsylvania, office. **Anna Lantin** has been appointed senior vice president of business development. She formerly served as regional director for the West Region. She is based in the Santa Ana, California office.

Else (Lisa) Adele Roger recently joined Fairfax, Virginia-based **Dewberry** as executive director, IT and technology. She most recently served as executive vice president-CIO at Michael Baker International. Roger is based in the headquarters office.

Joe Viola has been named vice president and complex bridge manager for the Northeast and Southeast regions of New York City-based **WSP USA**. Before joining WSP, he was a vice president and project director for COWI North America. Viola is based in the New York City office.

Fargo, North Dakota-based **Ulteig** announced the following appointments: **Hossein Tabrizi** has been promoted to chief engineering and technical officer. Tabrizi formerly served as senior market director-power and technical director-substation and is based in the Denver office. **Jason Hoskins** has been named vice president, innovation, development and quality and will focus on emerging industry technologies and strategic alliances. Hoskins is based in the St. Paul, Minnesota, office.



Roseann Schmid



Christopher Smith



Gary Torosian



Kevin Switala



Jim Riley



Scott Roux



Frank Terak



Anna Lantin



Else (Lisa) Adele Roger



Joe Viola



Hossein Tabrizi



Jason Hoskins

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REDD, Inc.
Scottsdale
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ACEC/California

Advent Engineering Services, Inc.
San Ramon
Axiom Engineers, Inc.
Monterey
Capital Engineering Consultants, Inc.
Rancho Cordova
Domenichelli & Associates
El Dorado Hills
Dufoe Consulting Engineers, Inc.
San Diego
Lawrence Engineering Group
Fresno
MWE Engineering, Inc. d/b/a
Michael Wall Engineering
San Diego
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Lakeport

ACEC/Colorado

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Lakewood
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Fort Collins

ACEC/Florida

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Orlando

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CriTek Engineering Group
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NC Design Solutions
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Irving
WGI, Inc.
Houston
Yaggi Engineering, Inc.
Arlington

ACEC/Washington

C. W. Felice, LLC
Woodinville
J. Keiser & Associates, LLC
Poulsbo

ACEC/West Virginia

Civil & Environmental Consultants, Inc.
Bridgeport
Monaloh Basin Engineers
Morgantown

JANUARY

- 16** Working Effectively on Multidisciplinary Projects as a Civil Engineer (online class)
- 24** The PM's Survival Guide to Managing Multiple Projects (online class)
- 25** Use Your Engineering Talents to Grow Your Business Network and Attract New Opportunities (online class)
- 31** Equipment Leasing Considerations and Strategies (online class)

FEBRUARY

- 1** Coming Up Short: The Top 10 Reasons Why Companies Fall Short of Achieving Strategic Goals (online class)
- 7** Your Marketing Toolbox 2020 (online class)
- 14** Communicating Technical Information to Decision Makers (online class)
- 22** Communicate with Presence (online class)
- 27** Impact of Automated & Connected Vehicles on Transportation, Site/Land and Parking Design (online class)

MARCH

- 13** The Do's and Don'ts of Landing Your Next Strategic Hire (online class)
- 14** The 3 Most Important Agendas for Leaders (online class)
- 14-17** Business of Design Consulting - Chicago 2018
- 21** Engineer-Led Design-Build: Simple, Safe & Profitable (online class)
- 27** Simple Incentive Compensation That Works! (online class)

APRIL

- 3** Before Signing the Design Services Contract (online class)
- 15-18** ACEC Annual Convention and Legislative Summit, Washington, D.C.

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

SEI Program Accepting Applications; *Construction Management at Risk* Second Edition

LEADERSHIP IN THE MODERN WORLD

ACEC's flagship leadership program, the Senior Executives Institute (SEI), has prepared more than 500 engineering professionals for top executive positions in the A/E industry. SEI's mission: turn effective A/E managers into successful executives and forward-thinking industry leaders. The program works on multiple levels to help executives identify and explore their unique brand of leadership styles with the goal of developing stronger, more effective corporate leaders. Over 18 months, participants work to build core knowledge, skills and overall business acumen—and that is just the beginning. SEI's program is designed to encourage creative thinking beyond the day-to-day or even year-to-year approach of A/E business management to a greater awareness of the ebbs and flows of the industry environment.

In today's rapidly changing workplace, staying ahead of the technology and innovation curve can be a challenge, and effective leadership means creating an adaptable environment. As *Harvard Business Review* points out, good leaders are good learners, so effective leadership means adopting an observational, learning mindset. By strengthening their leadership and effectiveness, executives can better clarify what matters for themselves and their businesses, thus creating an environment where compelling vision, goals and strategies develop and take root.

ACEC is currently accepting applications for SEI Class 24 starting in September 2018, in Washington, D.C. To learn more or to register, visit <https://sei.acec.org/>.

BIG DEAL INTELLIGENCE: LEVERAGING ECONOMIC DEVELOPMENT COUNCILS FOR NEW WORK

A commonly underdeveloped relationship for engineering firms is one with their local Economic Development (ED) Council. When *Fortune 500* companies and large industrial entities are looking at possible locations for their next facility—such as with the recent Amazon HQ2 search—it is ED Councils and public stakeholders that make the pitch, often presenting deep analysis of various sites and the infrastructure that surrounds them.

How can engineering firms be the go-to for these councils in attracting big deals and getting on teams for the next big project? Upcoming ACEC online programs and education sessions with speakers ranging from firm leaders to ED directors will explore these opportunities and provide useful advice. For more information, visit <http://www.acec.org/education/>.

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ACEC's new second edition of *Construction Management at Risk* explains how to use CMAR, with emphasis on the roles and relationships among the architect, engineer and the project owner. Written by Elliott Gappinger, along with three contributors, the manual describes the types of projects best suited to CMAR, the A/E and contractor selection processes, and methods of managing the project team for best results. Examples of real projects are given to illustrate potential pitfalls for architects and engineers and how they can use the CMAR process to better serve their clients' needs. Updates to the original edition reflect current CMAR usage and conditions.

To learn more and purchase this publication, go to <http://bit.do/acec-cmar2>. ■



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