MAY/JUNE 2017

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NOISE IS ONE PASSENGER TOO MANY

DRIVABILITY MATTERS

"Whether I'm training a Special Forces driver in tactical roadway maneuvers, or my son how to drive, I need to know my students can hear me. I choose to train on asphalt roads because they produce less pavement-tire noise, guaranteeing I'm heard, even when my son pretends he isn't listening. That matters."

-Guy Frank | Tactical Driving Instructor | Dad

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Engineering Inc. promotes the advocacy and business interests of ACEC by offering news, legislative analysis and business practice information to member firms, clients, opinion leaders and policy makers.

Council Poised for Sustained Success

The recent Annual Convention was a tremendous success on many levels—record attendance, insightful speakers and panels, and timely business programs. Hundreds of ACEC "citizen lobbyists" promoted infrastructure investment during Capitol Hill visits in advance of the expected release in the coming weeks of the President's infrastructure plan. We visited more than 200 Congressional offices and our message was well-received.

At our recent Board meeting, we welcomed new members of the ACEC Executive Committee—Chair-elect Manish Kothari, and Vice Chairs Charlie Gozdziewski; Mike McMeekin; Gayle Roberts, and NAECE Rep. Dave Bender—and we mapped a bold path forward to address industry contracting and technology issues including P3s, lump sum contracting, and the impact of technology on workforce requirements.

Meanwhile, ACEC/PAC fundraising banked over $278,000, bringing this year's total to more than $460,000—well-ahead of last year's record pace that had achieved over $1 million by year's end. *(See Convention wrap-up page 10).* This should stand us in good stead for upcoming political contests and engagement on critical legislative issues.

EEA's 50th anniversary was celebrated in grand style with guest host Kevin Nealon. Top EEA honors went to HDR for the world's longest floating bridge in Seattle. All EEA winners can feel justly proud of their notable achievements and the enhanced recognition accorded to them. *(See Showcase of Winners on page 16).*

This issue of *Engineering Inc.* also includes the results of an Arcadis international study, with its ranking of U.S. cities significantly lower than global counterparts based upon sustainability criteria (*See page 52).* Also piquing our interest is a report on increased private equity investment in U.S. engineering companies. *(See page 66)*

As always, we greatly appreciate the leadership and participation of ACEC members across all our state organizations on the broad range of industry issues that we care about so deeply. It is our pleasure and privilege to serve you all at the national level.

Sergio A. Pecori
ACEC Chairman

David A. Raymond
ACEC President & CEO

ENGINEERING INC.

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Investment in Wastewater Infrastructure Riddled With Uncertainty

Upgrading and expanding the nation's wastewater infrastructure could cost at least $1 trillion over the next 25 years, according to estimates.

Each year the nation's 16,000 wastewater systems discharge more than 850 billion gallons of untreated sewage into rivers, lakes and streams. Nearly 1,000 of those systems have combined sewer overflows (CSOs) that merge stormwater and raw sewage. Replacing CSO systems is expensive; the U.S. Environmental Protection Agency is currently working on 38 CSO projects and estimates that the construction costs to bring the systems into compliance will be more than $31 billion, or $840 million per system.

Unfortunately, even as the need has grown, construction spending on wastewater and sewage has fallen. According to the U.S. Census Bureau, wastewater construction spending topped out at $26 billion in 2010. Since then, it has fallen gradually, dropping to $22.1 billion in 2016, the lowest level since 2005.

Three factors magnify the impact of that decline. First, according to a recent report by the Congressional Budget Office, "prices of materials and other inputs to build infrastructure have grown much more rapidly than prices in the economy as a whole."

Second, operations and management (O&M) expenses in wastewater systems have continued to climb, even as construction spending has fallen. Currently, O&M costs are twice that of capital expenditure.

The third factor is the long list of unfunded mandates—such as CSO consent orders—that the federal government imposes on municipalities and utilities to improve water quality.

"It's very costly to address these mandates in the way the EPA wants cities to address them," says Rich Anderson, senior advisor at the U.S. Conference of Mayors. "The EPA is making all of us have first-class wastewater plants. We have no objection to that, but they're not providing the financial assistance to get there. When it comes to wastewater, it almost doesn't matter what we need," he adds. "It's a question of what we can afford."

FINDING THE FUNDING

Direct federal funding of wastewater infrastructure actually only accounts for about 2 percent of annual spending, says Anderson. Municipalities and utilities pay for the rest, primarily through rates but also through a variety of federal loan programs.

Municipalities have access to about $5 billion in low-interest loans annually through the Clean Water State Revolving Fund. Given the huge need, says Anderson, that level of funding is "anemic." Additionally, he says, many cities can't afford to take on more debt.

"The long-term debt of cities in 2014 was $1.9 trillion," says Anderson. "We can't keep forcing more long-term debt onto the cities, or we're going to have a municipal credit bubble."

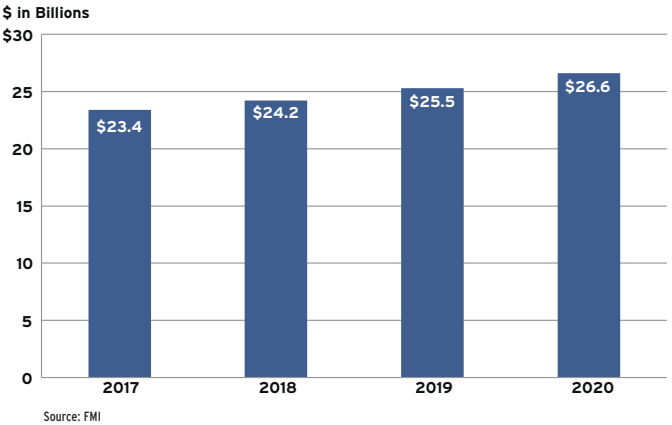
The wastewater market is projected to grow between 2 and 4 percent annually over the next four years

For cities that have pressing wastewater problems that must be solved, Anderson says the federal government should provide grants and technical assistance. For municipalities with fewer pressing needs, he sees two potential funding alternatives.

One would be to combine private funding and tax-exempt municipal bonds through public-private partnerships. "In order to do that, though," he says, "the tax code would need to be changed because private equity and tax exempt bonds cannot always or easily be in the same project."

The other option would be to change the rules for Private Activity Bonds, which are issued by local or state governments to finance projects by private entities. Currently there are caps on

Sewage and Wastewater Disposal Construction Put in Place



Source: FMI

The new UV disinfection system and facility at the Metropolitan Water Reclamation District of Chicago's O'Brien Water Reclamation Plant. This project, designed by Greeley and Hansen, is the world's largest wastewater disinfection system by flow. It is a 2017 EEA National Recognition Award winner.

the total amount of bonds that can be issued by a state. If those state volume caps were removed for water and sewer projects, Anderson says, municipalities and utilities would have access to private funding for public purposes.

He is also intrigued by the Trump administration's infrastructure funding proposal.

"Projects would have maybe a 15 percent equity stake, which would receive an 82 percent tax credit, and the 85 percent municipal stake would get tax exempt status," he says. "It's the best of both worlds. Rate growth is held down both because the tax credit means the equity partner's return on investment doesn't have to be as high and the public partner only has to borrow on 85 percent of the project."

ADDRESSING THE CHALLENGE

"Funding is a big challenge," says Andy Richardson, chairman and CEO of Greeley and Hansen, a global wastewater engineering firm headquartered in Chicago. "But this is a very dynamic market and we see a lot of opportunity, because of the reduced spending levels over the past few years, there is tremendous pent-up demand."

Richardson believes utilities will be able to meet that demand by considering new business models such as the Utility of the Future concept that is advancing within the industry.

"We have to realize we are no longer just in the wastewater business," he says. "We are in the resource recovery business. Instead of just discharging waste, we need to figure out what we can do to recover it—and not just some of it, all of it."

Richardson says utilities may be able to tap into new revenue streams that allow them to fund improvements without having to increase rates. He points to DC Water, the water and wastewater utility in Washington, D.C., which recently spun off Blue Drop, a nonprofit that markets a new line of products and services. Blue Drop sells Bloom, a biosolids soil made at the Blue Plains treatment plant, and provides consulting services for external affairs and management to other utilities.

On a bigger scale, the city of Edmonton in Alberta, Canada, spun off most of its utility functions into a private profit-making firm called EPCOR. The city is the 100 percent owner of EPCOR, which now also owns and operates utilities in Arizona, Texas and New Mexico. All of EPCOR's profits are returned to the city.

"Now is the time to seriously consider alternate funding sources," Richardson says, as the wastewater market is projected to grow between 2 and 4 percent annually over the next four years. ■

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

Council Emphasizes Need for Highway Trust Fund Fix

ACEC has acted on multiple fronts in recent weeks to advance robust infrastructure funding and a permanent Highway Trust Fund (HTF) solution.

During ACEC's 2017 Annual Convention and Legislative Summit in late April, ACEC Citizen Lobbyists urged their representatives to sign a letter to the Ways and Means Committee asking it to address the long-term financial stability of the HTF as part of comprehensive tax reform.

Led by Chairman Sam Graves, R-Mo., and Ranking Member Eleanor Holmes Norton, D-D.C., of the House Highways and Transit Subcommittee, the letter notes that all HTF revenue enhancements in the last 30 years have been included in larger tax and deficit reduction packages.

"Any HTF solution should entail a long-term, dedicated, user-based revenue stream that can sup-port the transportation infrastructure investment supported by President Trump and members of Congress from both parties," the letter states. ACEC and its stakeholder allies have secured over 150 bipartisan signatures, with the goal of finalizing the letter before the end of May.

ACEC also joined 33 other organizations, including the U.S. Chamber of Commerce, the National Association of Manufacturers and the American Association of State Highway and Transportation Officials, on another letter urging the House and Senate Budget committees to make boosting infrastructure investment and a HTF fix a key priority for the F.Y. 2018 budget.

"Failure to address HTF's revenue shortfall as part of a comprehensive measure would increase the likelihood of Congress again shifting funds from elsewhere in the budget to support another in a long string of one-time trust fund infusions," the groups wrote. "A long-term, growth-supporting revenue solution for the HTF would achieve many of the economic and fiscal objectives of both parties."

BLOOMBERG / CONTRIBUTOR / GETTYIMAGES

Rep. Sam Graves, R-Mo.

BRENDAN SMIALOWSKI / STAFF / GETTYIMAGES

Rep. Eleanor Holmes Norton, D-D.C.

PURESTOCK / THINKSTOCK

House Passes Health Care Bill, Cuts Mandates, Taxes on Firms

The House of Representatives passed legislation that would make significant changes to the Affordable Care Act, including the elimination of certain mandates and taxes on engineering firms.

The American Health Care Act of 2017 would repeal the employer mandate penalties on firms with more than 50 employees that do not offer qualified health insurance. Several taxes would also be repealed, including the tax on fully insured, traditional health plans sold to individuals and small firms, and taxes on wages and investment income paid by individuals who earn more than $200,000 and families that earn more than $250,000. In addition, the 40 percent "Cadillac tax" on high-cost health plans would be delayed until 2025.

The Senate is expected to draft its own health care reform legislation, the next step in what is likely to be a long legislative process.

DESIGN-BUILD REFORM MOVES FORWARD IN THE SENATE

ACEC's efforts to limit single-step design-build and stop the use of reverse auctions on design-build construction will take a step forward when Sens. Rob Portman, R-Ohio, and Mazie Hirono, D-Hawaii, reintroduce the Construction Consensus Procurement Improvement Act.

ACEC and industry allies have long opposed the use of single-step design-build, which puts the emphasis on teams that submit the cheapest bid. The bill would limit the use of single-step design-build in civilian construction to smaller projects (under $3 million), strongly encouraging the two-phase process, which places greater weight on the qualifications of the competing teams.

BILL CLARK / CONTRIBUTOR / GETTYIMAGES

Sen. Rob Portman R-Ohio

ALEX WONG / STAFF / GETTYIMAGES

Sen. Mazie Hirono D-Hawaii

The bill would also prohibit the use of reverse auctions in any federal design-build project. Reverse auctions require that participants submit bids in an online time-limited competition. Despite a report from the U.S. Army Corps of Engineers stating that reverse auctions did not provide "significant or marginal savings," federal agencies continue to use this process for certain construction projects.

The House version of the bill (H.R. 679) was approved by the Oversight and Government Reform Committee in February.

ISSUES ON THE MOVE	WHAT'S NEXT
Highway Trust Fund Solvency	Action on infrastructure/tax expected late summer/fall
Health Care Reform	Senate action expected in the summer
FY18 Funding for Overseas Development	Action expected in the summer

ACEC's Tax Reform Priorities

During the Annual Convention Capitol Hill visits, Member Firm executives advocated for comprehensive tax reform that provides equal treatment to C corporations and pass-through entities, including S corporations, partnerships, and sole proprietorships.

Members also underscored the importance of maintaining the cash method of accounting, the Section 199 domestic production activities deduction, provisions to encourage employee ownership, and proposals to incentivize services exports.

LUNAMARINA/THINKSTOCK

ACEC-Backed Water Trust Fund Bill Reintroduced

Reps. Earl Blumenauer, D-Ore., and John Duncan, R-Tenn., reintroduced ACEC-backed legislation to create a dedicated trust fund for water infrastructure projects around the country.

The Water Infrastructure Trust Fund Act of 2017 would create a voluntary fee for water user industries to be deposited in a trust fund and disbursed through the existing Clean Water State Revolving Fund and Drinking Water State Revolving Fund programs. Companies that participate in the program could include a special supporter logo in their advertisements.

The council has long advocated creating a dedicated trust fund for water to address the estimated $500 billion gap in water and wastewater funding over the next 20 years.

LUCHSCHEN / THINKSTOCK

ACEC Opposes Funding Cuts for Department of State and USAID

ACEC President and CEO Dave Raymond called on House and Senate appropriators to fully fund U.S. foreign aid agencies in the *2018 State and Foreign Operations Appropriations bill* in order to bolster U.S. competitiveness in foreign markets.

President Trump's preliminary budget would impose 27 percent funding cuts on the U.S. Department of State, the U.S. Agency for International Development (USAID), the U.S. Trade Adjustment Authority and the Overseas Private Investment Corp.

Raymond emphasized the critical role of these agencies in supporting U.S. foreign policy, as well as promoting U.S. exports, including engineering services.

He also urged lawmakers to adopt language to encourage USAID to hire U.S. engineering firms in international development projects.

For More News

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

HOT MARKETS, POLITICAL ENGAGEMENT

UNDERSCORES RECORD-SETTING CONVENTION

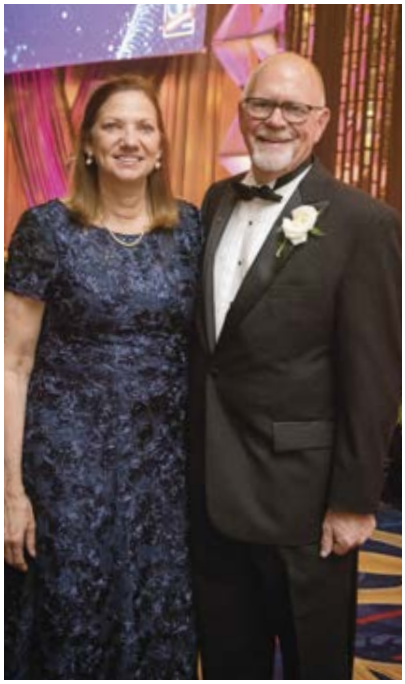
1,600 attendees at the 2017 ACEC Annual Convention in Washington, D.C.—a record number—heard business projections from national experts and behind-the-scenes insights from Capitol Hill insiders. They were also feted at a lavish Engineering Excellence Awards Gala emceed by comedian Kevin Nealon.

Gary Loesch of H2M architects + engineers, in Melville, New York, said the Convention provides him a unique opportunity for important networking. "I get a good pulse of what's going on in our industry."

"Everything was great," said Mark Harms of SCI Engineering, O' Fallon, Illinois. "Kevin Nealon was just fantastic."

Former White House Communications Director Nicolle Wallace provided Convention attendees with a behind-the-scenes look at the new Congress and administration.

ACEC President and CEO Dave Raymond welcomed some of the 1,600 attendees to the 2017 Annual Convention.



2016-2017 ACEC Chairman Peter Strub, shown with wife Denise at the 50th Anniversary EEA Gala, and 2017-2018 Chairman Sergio "Satch" Pecori, CEO of Hanson Professional Services, Inc.

KEYNOTE SPEAKER WALLACE FORECASTS PASSAGE OF INFRASTRUCTURE BILL

Former White House Communications Director Nicolle Wallace predicted that infrastructure investment will be one of the few instances of cooperation on Capitol Hill in the foreseeable future.

"The difficulty of repealing Obamacare, or passing significant tax reform, will force the president to go all in on his infrastructure pledge because it will put his base to work," she said.

Wallace added that despite a "White House swimming in isolationism" and the media "continuously creating more anxiety than it should," voters need to show patience with the administration.

"Give him time," she said. "The education of a president is still underway."

PECORI SUCCEEDS STRUB AS ACEC CHAIR

Hanson Professional Services Chairman and CEO Sergio "Satch" Pecori took the gavel as 2017–2018 ACEC chairman at the 2017 ACEC Convention, succeeding Peter Strub of TranSystems.

"I look forward to working with you to address priorities such as infrastructure funding, risk management, and the impact of automation and new forms of contracting on our businesses," said Pecori.

In addition to Pecori, new members of the Executive Committee are: Chair-elect Manish Kothari, president and CEO, Sheladia Associates; Charlie Gozdziewski, executive chairman, Hardesty & Hanover; Mike McMeekin, president, Lamp, Rynearson & Associates; and Gayle Roberts, president and CEO, Stanley Consultants.

They join current ExCom members: Mary Erchul, principal, Ghirardelli Associates; Joel Goodmonson, executive vice president, Architectural Engineers, Inc.; Thomas Mosure, president and chair, ms consultants, inc.; John Nelson, CFO, Wright-Pierce; and ACEC President and CEO Dave Raymond.

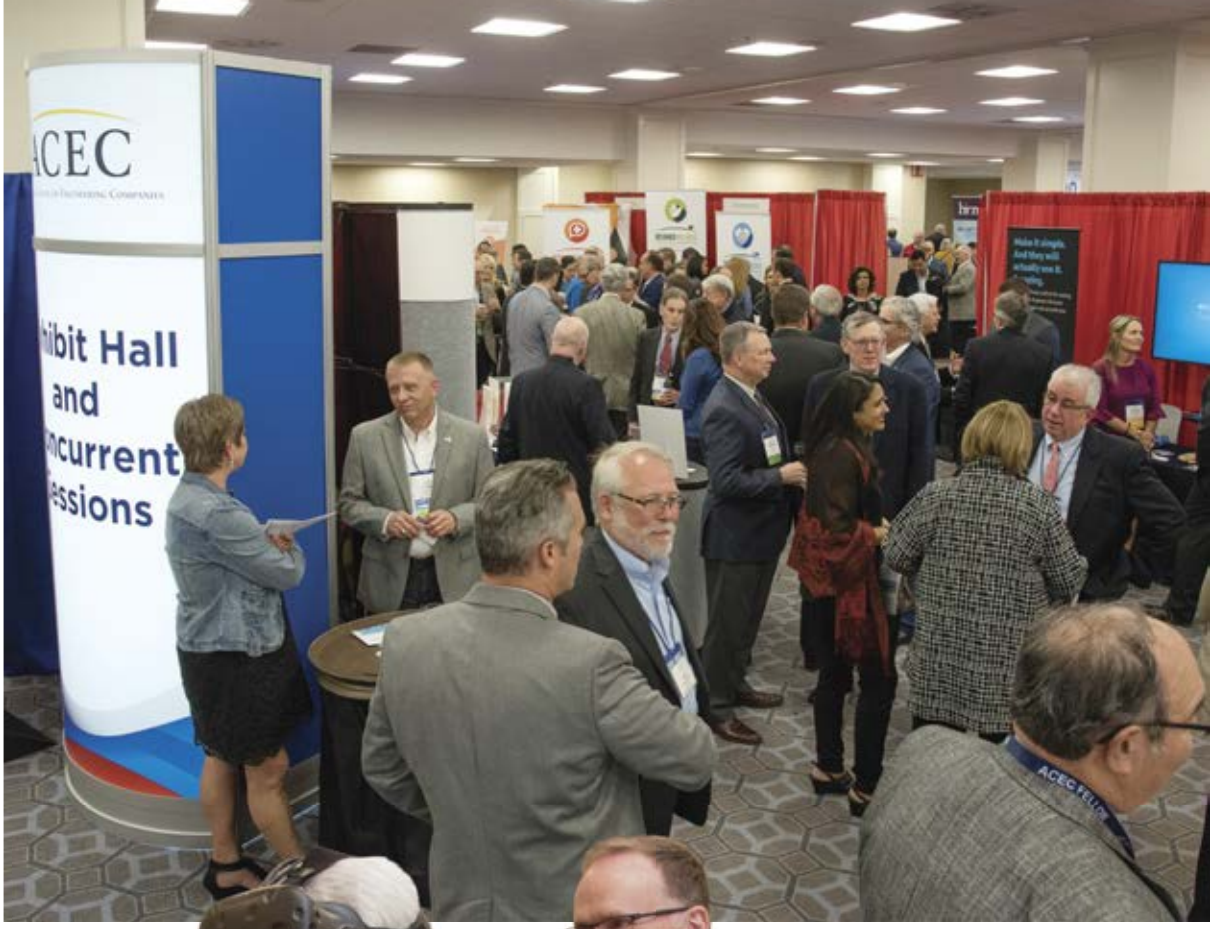
ACEC/Illinois Executive Director Dave Bender will serve as the NAECE president and representative on the Executive Committee.

ACEC PRESIDENT AND CEO RAYMOND SET TO RETIRE; SEARCH COMMITTEE FORMED

Informing the ACEC Board of Directors that he plans to retire in May 2018—after almost 20 years as president and CEO of the Council—Dave Raymond, who will be 70 next year, joked that his "sell-by date" is coming up.

"Under Dave's leadership, ACEC has gained national and international stature as the voice of our industry and achieved many important business and political goals," ACEC Chair Sergio "Satch" Pecori said.

Pecori named a search committee headed by former ACEC Chair Gregs Thomopulos, which also includes Peter Strub, Manish Kothari, Tim Psomas, Robin Greenleaf and himself.



ACEC Vice Chairman Joel Goodmonson tested a virtual reality system at the Autodesk booth, one of nearly 40 vendors on display at the Convention Exhibit Hall.

Fortune magazine Senior Editor Geoff Colvin (left) led a discussion among Member Firm leaders on industry prospects. Panel members from the left were: George Nash, Atkins North America CEO; Vahid Ownjazayeri, chief growth officer, Americas, AECOM; and Greg Kelly, President/ CEO, WSP USA.

FORTUNE MAGAZINE'S COLVIN MODERATES INDUSTRY LEADER PANEL ON FEDERAL, STATE ISSUES

Top Member Firm leaders expressed strong support for public-private partnerships (P3) but cautioned that they are a funding mechanism, not the funding solution.

"What is often lost is that the first P in P3s is for public," said Greg Kelly, president and CEO, WSP USA. "The first dollars in funding have to be public."

AECOM Chief Growth Officer, Americas, Vahid Ownjazayeri, urged the administration and Congress not to ignore proven funding vehicles. "There used to be a substantial infrastructure budget. Let's put that back first and then let's talk about the $1 trillion," Ownjazayeri said.

The states have realized that they can't rely on the federal government, Atkins North America CEO George Nash said. "We are very encouraged by what we see in state ballot initiatives on gas taxes. There has been a real ramp up in state funding," he said.

CONGRESSMEN OUTLINE TOP CAPITOL HILL CHALLENGES

Three congressmen agreed that the long-sought GOP repeal and replacement of Obamacare, along with meaningful tax reform and substantial infrastructure investment, are the top issues facing Congress today.

"We're talking now about moving some of the health care funding partnership to the states and restructuring the delivery of health care," Rep. Patrick Meehan, R-Pa., said. "But coming up with a plan that suits everyone is just very, very difficult." Meehan said the two parties will likely find more common ground on tax reform.

Rep. John Delaney, D-Md., said that while certain parts of Obamacare can be improved, "Democrats are united on the fundamental premise that the federal government should subsidize health care for those who can't afford it, and that it should be paid for through tax increases on those who can."

Infrastructure investment enjoys bipartisan agreement, Rep. Jeff Denham, R-Calif., said. "But it will be difficult to make progress while questions remain unanswered on projected savings from health care reform and tax reform."

Cook Political Report National Editor Amy Walter (right) led a discussion on current Congressional challenges with (from the left) Congressmen Jeff Denham (R-Calif.); Patrick Meehan (R-Pa.) and John Delaney (D-Md.).

Bay Area Rapid Transit General Manager Grace Crunican (left), led a discussion on transportation investment opportunities with Pennsylvania Secretary of Transportation Leslie Richards (center) and Amtrak Senior Director Rina Cutler.

TRANSPORTATION PANEL CITES P3 OPPORTUNITIES

PennDOT Secretary Leslie Richards told Convention attendees that she is assembling a multistate P3 program along the East Coast. "Several states, including Pennsylvania, New York, New Jersey, Delaware and Maryland, are looking to get together to create a P3 pipeline," she said. "We'll develop a list of projects and then hand them over to the private sector to get them done."

Amtrak Senior Director Rina Cutler said she's using P3s to monetize the assets at the legacy railway stations, starting with Chicago's Union Station. She cautioned, "In the public sector, lack of expertise is often what stops agencies from doing more P3 projects."

Firms that work with public agencies should beef up their information technology expertise, said Grace Crunican, general manager, Bay Area Rapid Transit. "The infrastructure world now fully embraces apps," she said.

A packed assembly listens to Darryl Williamson, of BST Global, describe how to ***"Harness Your Knowledge Potential"*** during one of nearly 40 Convention education sessions.

ACEC/Indiana leaders met with Indiana Senator Todd Young (center) during Convention Capitol Hill visits. From the left, Hans Peterson, Clark Dietz; Mak Knowles, HWC Engineering; Ken Fleetwood, Beam, Longest & Neff; and Pat Long, American Concrete Pavement Association-Indiana Chapter.

Actor and comedian Kevin Nealon added his special brand of humor to the EEA Gala celebration.

Scott Gombar, of Eisman & Russo, Inc., in Weston, Florida, and wife Diane enjoy the ACEC/PAC-sponsored Casino Night.

ACEC/PAC RAISES A RECORD $278,000; JANUSZKA WINS TOP SWEEPSTAKES PRIZE

ACEC/PAC raised an unprecedented $278,000 during the Annual Convention, bringing its year-to-date total to more than $440,000, well ahead of last year's record-setting pace.

In the 2017 ACEC/PAC Spring Sweepstakes, **Ted Januszka** of Pennoni Associates won the $10,000 Grand Prize. **Holly Beck** of Holly Beck Surveying & Engineering, Inc., and **Janice Burnett** of ACEC/Arizona each won $5,000. **Steve Field** of Stantec and **Mike Hinton** of Lochmueller Group won $2,500 each. **Hans Arnett** of R&M Consultants, **Lee Cammack** of J-U-B Engineers, **David Harrell** of Vaughn & Melton Consulting Engineers, **Nicole Knox** of R&M Consultants, **Jim Littlejohn** of Littlejohn (a subsidiary of S&ME), **Mark Markosky** of the Markosky Engineering Group, **Jason Matson** of Kimley-Horn and Associates, **Bill McCormick** of Erdman Anthony, **Peter Monroe** of Monroe & Newell Engineers, Inc., and **Brad Montgomery** of GRW, Inc., each won $1,000. ■

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2017 Grand Conceptor Award Winner

SR 520 Floating Bridge Replacement and HOV Program
Seattle, Washington
HDR, Seattle, Washington

This dynamic new 1.5-mile span is the world's longest and largest floating bridge. The superstructure is supported by 21 of the heaviest, widest and deepest longitudinal pontoons ever built, each weighing nearly 11,000 tons. Further stabilized by 54 supplemental pontoons and cables and anchors, the bridge can resist winds of up to 98 mph and 6.3-foot wave heights or the equivalent of a 100-year storm. The new bridge also features an innovative stormwater treatment system that utilizes specially designed catch basins located in the pontoons to collect runoff pollutants. It will also support future multimodal transportation options.

HDR's Larry Lyle (center right), along with WSDOT's Julie Meredith (center left), celebrate winning the 2017 Grand Conceptor Award with the rest of their project team.

2017 ENGINEERING EXCELLENCE AWARD WINNERS

The 2017 Engineering Excellence Awards Gala—known by ACEC members as the Academy Awards of the engineering industry—showcased 162 projects from across the country and around the world.

A panel of more than 30 judges from across the nation representing a wide spectrum of built environment disciplines selected 36 projects for top awards—including 16 finalists for the Grand Conceptor Award, presented for the year's most outstanding engineering achievement.

Comedian and actor Kevin Nealon hosted the 50th Anniversary Gala, attended by more than 700 members, guests and dignitaries.

EEA Gala attendees begin to gather in anticipation of the program's 50th Anniversary celebration.

World Trade Center Transportation Hub (Oculus) Erection Engineering

New York, New York

Buckland & Taylor International, an affiliate of COWI North America
New York, New York

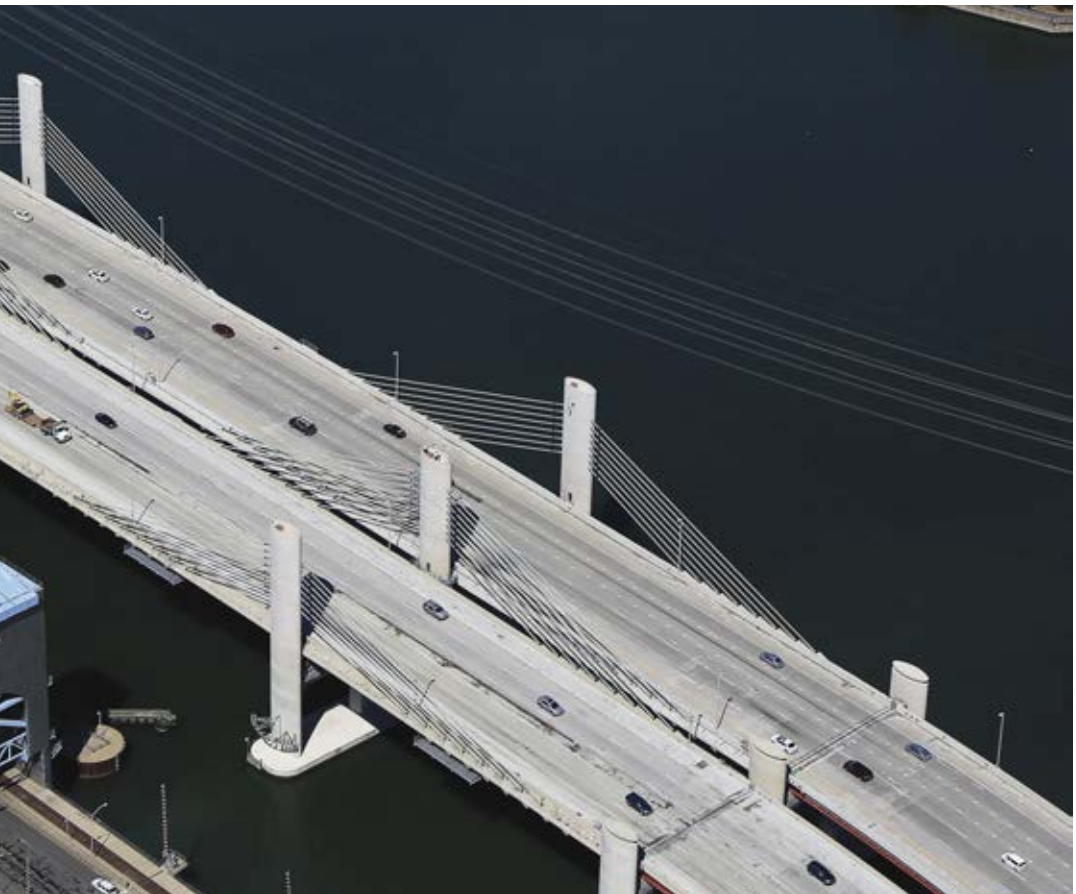
Resembling a pair of hands releasing a white dove, this eye-catching steel and glass dome structure welcomes more than 200,000 daily commuters into Manhattan. Two parallel arches span the 300-foot-long oval-shaped Transit Hall, providing a cathedral-like appearance and reaching a crown height of 100 feet. The dove "wings" consist of variable length rafters extending from the arches as long as 200 feet to form the exterior roof structure. Spaces between supporting columns are enclosed in glass to allow natural light to illuminate the main Transit Hall and create an unprecedented railway station experience.

Pearl Harbor Memorial Bridge

New Haven, Connecticut

AECOM, Rocky Hill, Connecticut

The striking new structure is the first "extradosed" cable-stayed bridge in the United States. Used extensively in Europe and the Far East, "extradosed" bridges employ much shorter stay-towers and are used when height, navigation clearance or aesthetic requirements make other options less feasible. The project team had to meet height restrictions, due to a nearby airport, and clearance restrictions over an active marine channel. A centerpiece of the $2 billion I-95 New Haven Harbor Crossing Corridor Improvement Program, the project adds a distinctive landmark in the New Haven skyline, evoking the profile of the battleships memorialized by its name.



Jerome L. Greene Science Center
New York, New York
Jaros, Baum & Bolles
New York, New York

The nine-story, 450,000-square-foot facility is the largest academic science building in New York City and a paragon for noise reduction, light and temperature control. A groundbreaking double-skin, all-glass curtain wall system diminishes noise from an adjacent elevated subway line—imperative for a neuroscience research facility. The double-skin curtain wall also features various glass compositions to meet exacting standards for light and temperature control, and connects with a unique mechanical ventilation system that repurposes exhaust air from the laboratory spaces, passing it between the layers of the glass curtain wall to keep the facility cool in summer and warm in winter.

Foundation Design for the New N.Y. Bridge (Tappan Zee Bridge Replacement)

Hudson River between South Nyack and Tarrytown, New York

GZA GeoEnvironmental
Norwood, Massachusetts

Innovative pile foundation units will support two new 3-mile-long multispan structures for the new Tappan Zee Bridge replacement across the Hudson River. The project team overcame ground conditions that slope dramatically along the bridge route, including one-third of the alignment where the bedrock is more than 700 feet below weak river bottom deposits. Extensive subsurface testing and analysis precisely defined the size, length and required capacity of the 1,100 foundation support piles for the new superstructure. The foundation system is designed to last 100 years without major structural maintenance and will safely accommodate future rail service and a pedestrian/bicycle path.

U.S. 84 Mississippi River Bridge Pin-and-Link Replacement

Natchez, Mississippi

HNTB Corp.
Baton Rouge, Louisiana

Using a process never before attempted to replace the most deteriorated structural components of a 75-year-old bridge, the project team extended the structure's life another 40 years and avoided the time and expense of building a new bridge. By developing highly detailed plans and guidance for removing damaged pins and links, as well as rivets, the margin for error was reduced to almost zero. Despite many risks and unknowns, the pin-and-link replacement was completed successfully and restored a vital connector between Natchez, Mississippi, and Vidalia, Louisiana.

Elliott Bay Seawall Habitat and Public Space

Seattle, Washington

Magnusson Klemencic Associates
Seattle, Washington

After 75 years of corrosion from tides and wind-driven waves, the 3,700-foot-long seawall—the city's largest piece of infrastructure—was replaced with a state-of-the-art seismic-resistant version designed to last at least another 75 years. The design also incorporates an integrated salmon migration corridor—a first-of-its-kind structure aimed at enhancing the tidal marine environment. Topped by a new pedestrian promenade that features a custom light-penetrating sidewalk, the project greatly benefits the city's overall quality of life—both above and below the water's surface.

Golden 1 Center

Sacramento, California

AECOM & Henderson Engineers
Orange, California

The new home of the NBA's Sacramento Kings raises the bar for environmental leadership at more than 200 events per year for more than 1.2 million visitors. It is the nation's most energy efficient sports venue and the world's first indoor sports facility to achieve LEED platinum certification for energy and resource efficiency. The complex is powered entirely by solar energy; water use by 45 percent and energy use by 30 percent. The first-of-its-kind displacement ventilation system delivers conditioned air directly beneath the seats, allowing fans to control temperature through a smartphone app. The arena's five-story aircraft hangar doors open to the city and the natural cooling breezes of the Sacramento Delta.

Croton Water Filtration Plant

New York, New York

AECOM – Hazen and Sawyer (Joint Venture)
New York, New York

Situated under one of the nation's first public golf courses is a four-story 290 million-gallon-per-day water treatment plant that provides up to 30 percent of New York City's drinking water. Using deep-rock excavation and tunneling, the project team integrated a variety of advanced treatment systems, including stacked dissolved air filtration/flotation tanks. The largest plant of its kind in the world, the massive complex includes an impressive array of sustainability measures that minimize environmental impacts. The natural processes that control and filter 40 percent of the site's stormwater help the 9-acre Moshulo Golf Course also become one of the nation's largest green roofs.

Claude "Bud" Lewis Carlsbad Desalination Plant Passage
Carlsbad, California
Arcadis and Kleinfelder
Carlsbad, California

San Diego County's new $922 million desalination plant is the largest in the Western Hemisphere, with a production average of 50 million gallons of fresh drinking water per day. An innovative design-build delivery process allowed the project team to improve drinking water and expedite completion. The plant will provide 400,000 residents with a locally controlled, drought-proof water supply that meets or exceeds state and federal drinking water standards. It helps San Diego County take a major step toward achieving its goal of supplying 8 percent of the region's water needs from seawater desalination by 2020.

SR 826 (Palmetto Expressway)/SR 836 (Dolphin Expressway) Interchange Improvements

Miami, Florida

BCC Engineering, Inc.
Miami, Florida

A reconstructed five-level interchange upgrades a vital link connecting two of the most traveled corridors in South Florida. The project team overcame constraints of a highly urbanized corridor that included three active rail lines, which limited the interchange's horizontal footprint, in addition to its proximity to Miami International Airport, which restricted project elevation. Reconstruction of the interchange included 49 new bridge structures and the relocation of a major drainage canal—all achieved with minimal disruption to traffic.

World Trade Center Transportation Hub

New York, New York

Downtown Design Partnership (STV/AECOM Joint Venture) New York, New York

The gleaming new transportation hub is an iconic portal to the 16-acre World Trade Center site, providing seamless access to multiple passenger rail systems and internal pathways to nearby office towers and nearly 400,000 square feet of retail space. To accommodate an active subway tunnel, which runs more than 1,000 feet across the site, the project team developed an innovative structural underpinning methodology to carry the subway line across a major pedestrian concourse and allow full subway operations throughout construction. Lateral bracing of the site's slurry walls mitigates the risk of failure of the walls that restrain the Hudson River.

Kansas City Downtown Streetcar

Kansas City, Missouri

HDR, Kansas City, Missouri

Kansas City's new 2.2-mile state-of-the-art streetcar system provides a convenient new 16-stop transportation option for more than 10 million downtown visitors and workers. The streetcar system features the nation's first fleet of low-floor vehicles and level platform-to-car boarding to accommodate disabled passengers, bicyclists and parents with strollers. The streetcar also marks the first U.S. transit project to achieve the Envision Platinum Award for sustainability. More than $400 million worth of announced developments have cited the streetcar as a factor in the decision to build within the district, confirming the new streetcar as a major economic boost for the corridor.

University Link Extension

Seattle, Washington

McMillen Jacobs Associates (on behalf of Northlink Transit Partners Joint Venture)
Seattle, Washington

Seattle's new University Link light rail extension efficiently connects the three largest urban centers in the state of Washington—downtown Seattle, Capitol Hill and the University District. The project includes 3.15 miles of twin-bored, 21-foot-diameter tunnels and new underground stations in the Capitol Hill neighborhood and adjacent to Husky Stadium. The tunnels cross under a major downtown interstate and within 13 feet of a ship canal. The project also includes the 427-foot-long Montlake Triangle Pedestrian Bridge, which is one of the first U.S. applications of highly curved post-tensioned concrete in lieu of steel.

Elizabeth River Tunnels Project

Norfolk and Portsmouth, Virginia

WSP USA

Virginia Beach, Virginia

In developing a second tube at the Midtown Tunnel connecting Norfolk and Portsmouth in Virginia, the project team also had to rehabilitate two existing tunnels, add two new interchanges to the Martin Luther King Jr. Expressway and relocate a 4,000-foot, 36-inch water main via directional drilling 170 feet beneath the Elizabeth River. The new tunnel was constructed in 11 prefabricated segments out of state and lowered into a trench excavated alongside the existing tube. The project also included 10 new bridges, two buildings, five pump stations, three noise walls and improvements to the regional Intelligent Transportation System network.

Setting a New Standard for Infrastructure Renewal

Oakland/Macomb Counties, Michigan

NTH Consultants, Ltd.

Northville, Michigan

After years of catastrophic failures, the massive Oakland-Macomb Interceptor Drain was one of Michigan's top wastewater treatment priorities. Because the sewer had no bypass capability, the project team incorporated an innovative watertight liner to prevent additional groundwater and soil infiltration as well as a chemical-resistant barrier to prevent further corrosion of the concrete pipe. Never had such a repair solution been attempted on such a large diameter pipe (up to 13 feet), at such extreme depths (up to 110 feet) and over such a long distance (more than 7 miles). The repaired system assures continuous wastewater service for more than 800,000 residents.

Lockheed Martin Technical Research Laboratory

Denver, Colorado

STV, Douglassville, Pennsylvania

This pioneering technical research laboratory features four state-of-the-art laser laboratories that meet or exceed required ultra-low concentrations of environmental and airborne pollutants. Using computational fluid dynamics modeling, the project team was able to precisely control humidity and temperature—to within one-tenth of a degree Fahrenheit—creating a consistent, precise research environment for mission-critical experiments. Facility upgrades to meet exacting technical and security requirements were completed within nine months—less than half the time for a typical project of this complexity.

National Museum of African American History and Culture

Washington, D.C.

WSP USA

Boston, Massachusetts

As the newest cultural and architectural landmark in the nation's capital, this spectacular facility is also a showcase for sustainable building design. The energy system features an innovative chilled beam heating and cooling system, perfectly controlling climate in the display areas and galleries containing sensitive artifacts, yet using nearly one-third less energy than a comparably sized structure. Additional features include a 384-solar-panel array rooftop, demand-controlled ventilation, as well as a system for the capture, storage and reuse of rainwater and groundwater.

Harry Tracy Water Treatment Plant

San Bruno, California

Kennedy/Jenks Consultants
San Francisco, California

Combining advanced civil and structural engineering innovations, the project team designed an 11-million-gallon reservoir that will help a nearby water treatment plant quickly restore operations in the wake of a major earthquake. The massive above-ground, concrete reservoir includes a "tank within a tank" design, with an outer 3-million gallon chlorine contact raceway for water treatment surrounding an internal 8 million gallon treated water storage reservoir. The structure's floor-slab and roof-slab connections are an "anchored flexible" design to resist high vertical and lateral seismic forces allowing the system to deliver a minimum of 140 million gallons per day within 24 hours after a major earthquake.

130th & Torrence Grade Separation

Chicago, Illinois

Alfred Benesch & Co., Chicago, Illinois

One of Chicago's most noted traffic bottlenecks has been transformed into a smooth-flowing multitiered interchange that is also helping spur development of the nearby Chicago Manufacturing Campus. Each day, more than 38,000 vehicles, 50 freight trains and 41 passenger trains used the intersection, creating a logjam. Further complicating the project was its proximity to an automotive assembly plant, a railroad mixing yard, a residential area and protected marsh area. The project realigned roadways and added six new bridges, including a 4.75-million-pound steel railroad truss bridge assembled in a nearby staging area then transported in just four hours to its permanent location.

U.S. Bank Stadium

Minneapolis, Minnesota

Thornton Tomasetti, Dallas, Texas

The new $1.1 billion home of the NFL's Minnesota Vikings is also a model of structural ingenuity. The 1.7-million-square-foot stadium features five 55-foot-wide steel-framed glass walls—some nine stories tall—which can pivot 90 degrees to create a large indoor/outdoor plaza with downtown views. The roof is steeply lofted for snow management and is one of the lightest steel roofs in North America. Covered by 246,000 square feet of a clear, lightweight polymer—it has the largest roof of its kind in North America and produces as much of an open-air feeling as many stadiums without roofs.

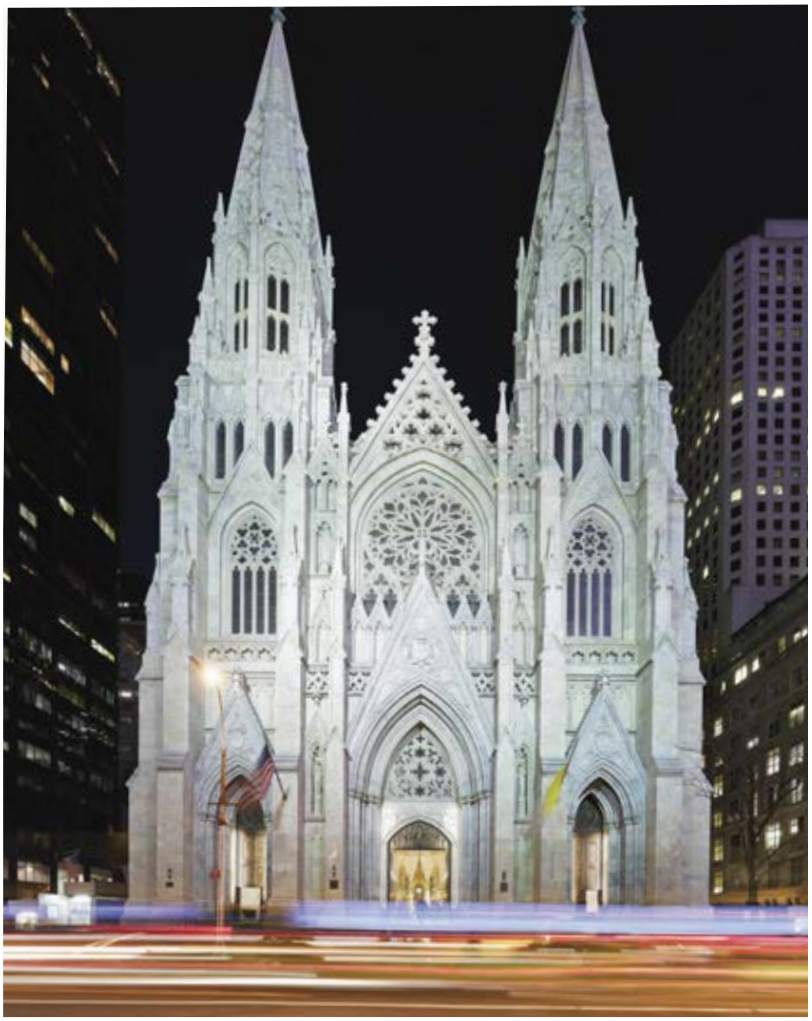
HONOR AWARDS

Sellwood Bridge Replacement

Portland, Oregon

T.Y. Lin International
Beaverton, Oregon

A picturesque, three-arch bridge replaces a deteriorating 1925-era structure that was threatened by an encroaching hillside. The project team incorporated advanced seismic-resilient bridge components and innovative landslide mitigation systems to stabilize the hillside. They also trimmed a year off the construction schedule by shifting the original steel deck truss to one side using hydraulic jacks, allowing the bridge to remain in service during construction. The new bridge carries two vehicular lanes, two bike lanes, two shared-use sidewalks and will accommodate future streetcar service.



St. Patrick's Cathedral Restoration

New York, New York

Langan Engineering and Environmental Services, New York, New York

The $177 million restoration of the historic St. Patrick's Cathedral included a pioneering scanning method to accurately assess renovation needs of the 138-year-old edifice. The first-of-its-kind method used hundreds of geo-referenced digital images to develop façade surveys. The images provided over 40 million points, more than eight gigabytes of data and were so accurate that the preservation team was able to prepare comprehensive plans of the structure's most intricate and detailed features. The remarkable survey accuracy ensures that the restored building will maintain its historical integrity for decades to come.

C.W. Bill Young Regional Reservoir
Hillsborough County, Florida
Gannett Fleming, Camp Hill, Pennsylvania

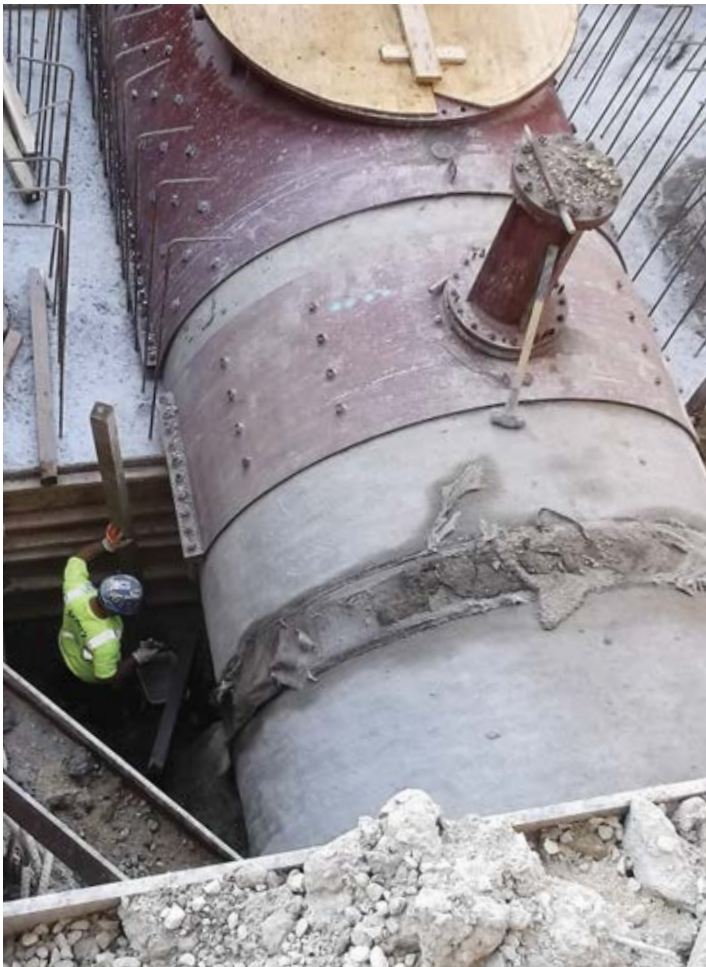
Imaginative engineering successfully restored Florida's largest off-stream potable raw water storage facility—a vital supply when available surface water withdrawals are limited. After abnormal cracks were discovered in the 1,100-acre reservoir's erosion control layer, the project team excavated the existing soil cement and soil wedge and replaced the existing geomembrane liner with a first-of-its-kind composite polyvinyl chloride layer to control seepage. A new stair-step erosion control system enhances the reservoir's stability, while a state-of-the-art re-curved sea wall prevents hurricane-driven waves from overtopping into the 15.5-billion-gallon facility that serves more than 2.4 million people.

Newtown Creek Wastewater Treatment Plant Upgrade
Brooklyn, New York
Michael Baker International; CB&I; Gannett Fleming (Joint Venture)
New York, New York

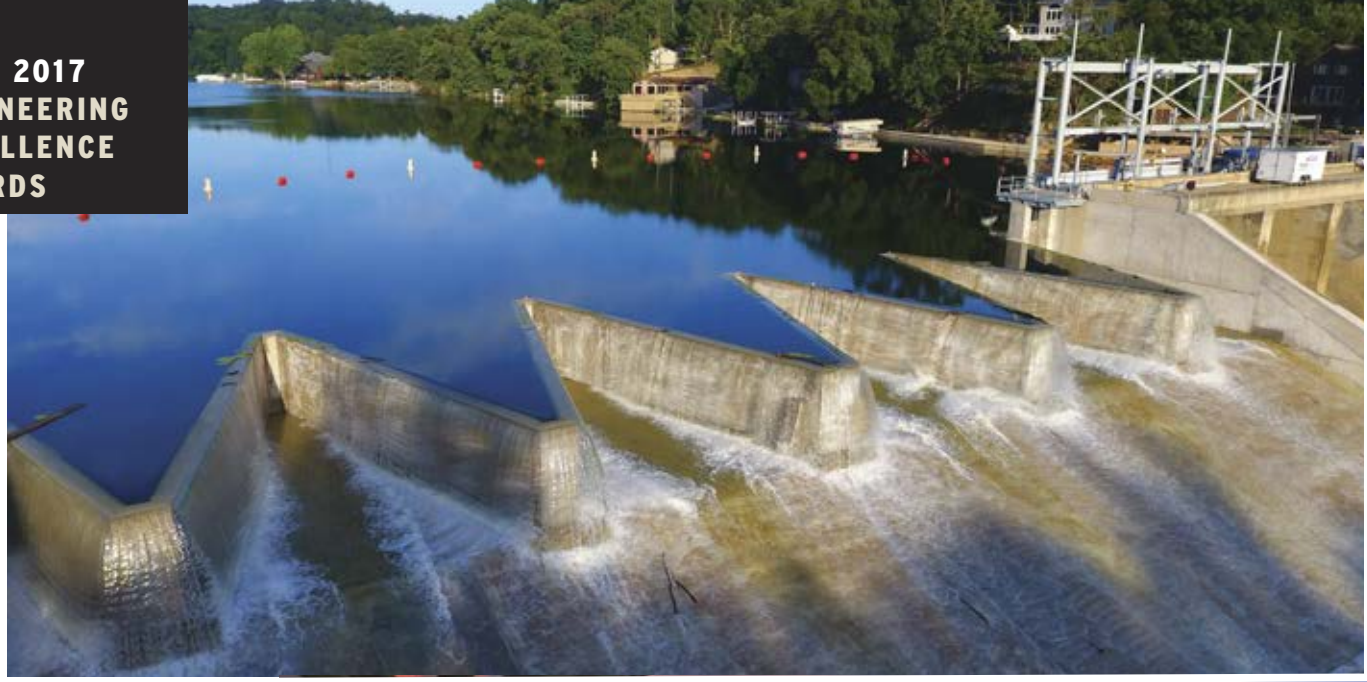
Innovative upgrades helped double this wastewater plant's wet-weather processing capacity to 720 million gallons per day, while increasing sediment and grit removal to 92 percent and reducing odor. To reduce discharges into the East River, the project team used advanced 4D modeling technology to deliver four new treatment components—totaling $1.3 billion—and inspected the interiors of eight 140-foot-high egg-shaped anaerobic digesters that sit atop the plant. They also implemented a biogas program that is expected to heat nearly 5,200 homes and reduce annual greenhouse gas emissions by more than 90,000 metric tons by the end of this year.

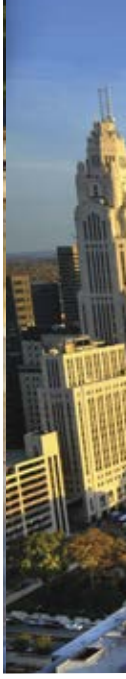
90-Inch Water Main Hot Tap & Line Plug
Des Plaines, Illinois
GRAEF-TDW Services, Inc., Chicago, Illinois

A colossal 90-inch water transmission main was relocated to accommodate the rebuilding of the Jane Addams Memorial Tollway while maintaining water service to 500,000 residents. The project team designed, tested and constructed a unique thrust restraining system to absorb the massive forces generated by the risky hot tap procedure—where two pipes are connected without emptying pipe contents. The system safely absorbed the high-pressure force when water was diverted into the bypass section. It allowed a critical water supply to be preserved, the construction schedule to be reduced by a year and renovation of the tollway to proceed.



HONOR AWARDS





Lake Delhi Dam
Delhi, Iowa
Stanley Consultants
Muscatine, Iowa

Six years after a devastating rain breached the original earthen Lake Delhi Dam, turning a popular nearby recreational attraction into 450 acres of mud, a redesigned spillway provides three times the overflow capacity of similar structures. The design team incorporated a unique accordion-shaped labyrinth spillway to pass high volumes of water across a short distance without the need for mechanical gates or electrical systems. Shortly after the completion of Iowa's first—and the Midwest's largest—labyrinth spillway, Lake Delhi had its fifth-largest recorded flood and the new dam performed flawlessly.

Arthur Ashe Stadium Retractable Roof
New York, New York
Hardesty & Hanover, New York, New York

The renowned U.S. Open Tennis stadium now has a new retractable roof to assure that championship play can continue in any weather. The project team overcame the challenge of placing a new roof on an existing stadium by employing two 1-million-pound panels mounted on 16 wheel-axle assemblies, which in just six minutes can move the panels together to enclose the 62,500-square-foot roof opening. In addition to handling the stress of panel movement, the mechanization system resists lateral winds and uplifts of as much as 50 mph. The new retractable roof saves millions of dollars in lost revenue from play stoppage and in the cost of constructing a new stadium.

Scioto Greenways
Columbus, Ohio
Stantec with MKSK, Messer Construction, Resource International, Korda/Nemeth and ASC Group, Columbus, Ohio

As part of a stunning new 33-acre recreational greenway in downtown Columbus, the project team revitalized a 7,000-foot section of the downtown river to its natural flow. The project included removal of an outdated dam, the installation of grade control systems and reconstruction of the riverbed. Material excavated from the riverbed was recycled to create new riverbanks.The project includes new green space for recreational activities along both banks and is a catalyst for further private downtown investment.

Franklin Avenue Bridge Rehabilitation
Minneapolis, Minnesota
HNTB Corp., Golden Valley, Minnesota

Major restoration of this historic five-span arch bridge over the Mississippi River would normally require a two-year closure, yet the span was reopened to traffic after just 116 days. With the renowned 1923-era Minneapolis landmark needing extensive structural rehabilitation, the project team designed and fabricated numerous bridge elements and systems, including deck panels, rail panels, cap beams and ornamental railing panels, before closing the bridge to traffic. The design also included polished stainless steel plates embedded in the underside of the precast deck panels to reduce the number of needed expansion joints. The project is a model for reconstructing a bridge within a short time frame.

U.S. 36 Boulder Turnpike Express Lanes
Denver, Colorado
HDR, Denver, Colorado

Colorado's first multimodal transportation facility integrates bus, vehicle and bicycle traffic. The project contains several statewide firsts: the first active traffic management system, which uses CCTV cameras to identify traffic patterns and direct drivers away from upcoming hazards; and buffer-separated lanes for express and general-purpose traffic. An innovative diverging diamond interchange—one of only 34 in the U.S.—crosses traffic to the opposite side of the road to allow for unimpeded left turns onto freeway ramps to reduce traffic conflict points. The improvements have cut average rush hour commuting times by 25 minutes.

Cincinnati Bell Connector

Cincinnati, Ohio

WSP USA and HDR Cincinnati, Ohio

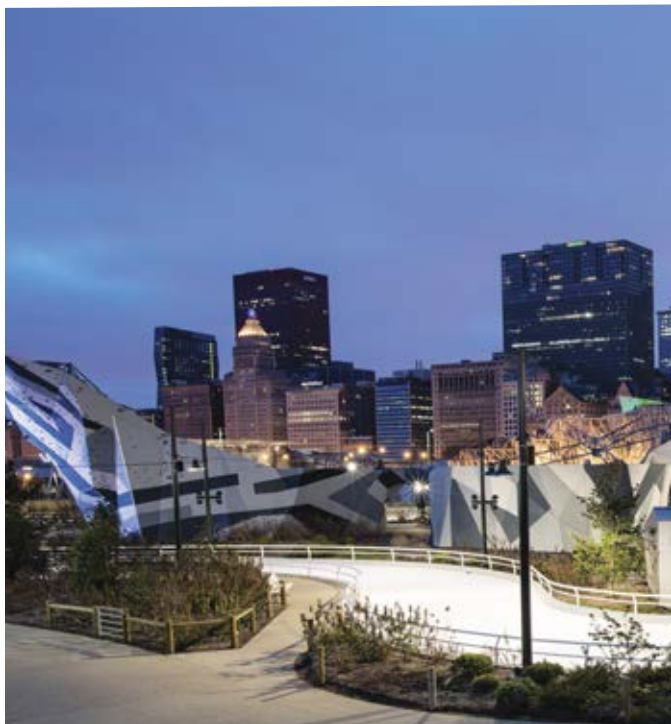
A new 3.6-mile streetcar line provides a speedy connection between Cincinnati's central riverfront, its resurgent downtown and its Over-the-Rhine neighborhoods. Powered by an overhead electrical system, the $148 million streetcar system shares the road with automobile traffic in mixed-use lanes. The design included the removal of an 8.5-foot-wide section of pavement approximately 20 inches deep to install the rail-embedded reinforced concrete. The project includes 18 raised platforms, customized shelters and aesthetics that mirror nearby historic areas while also improving infrastructure efficiency through linked transportation systems.

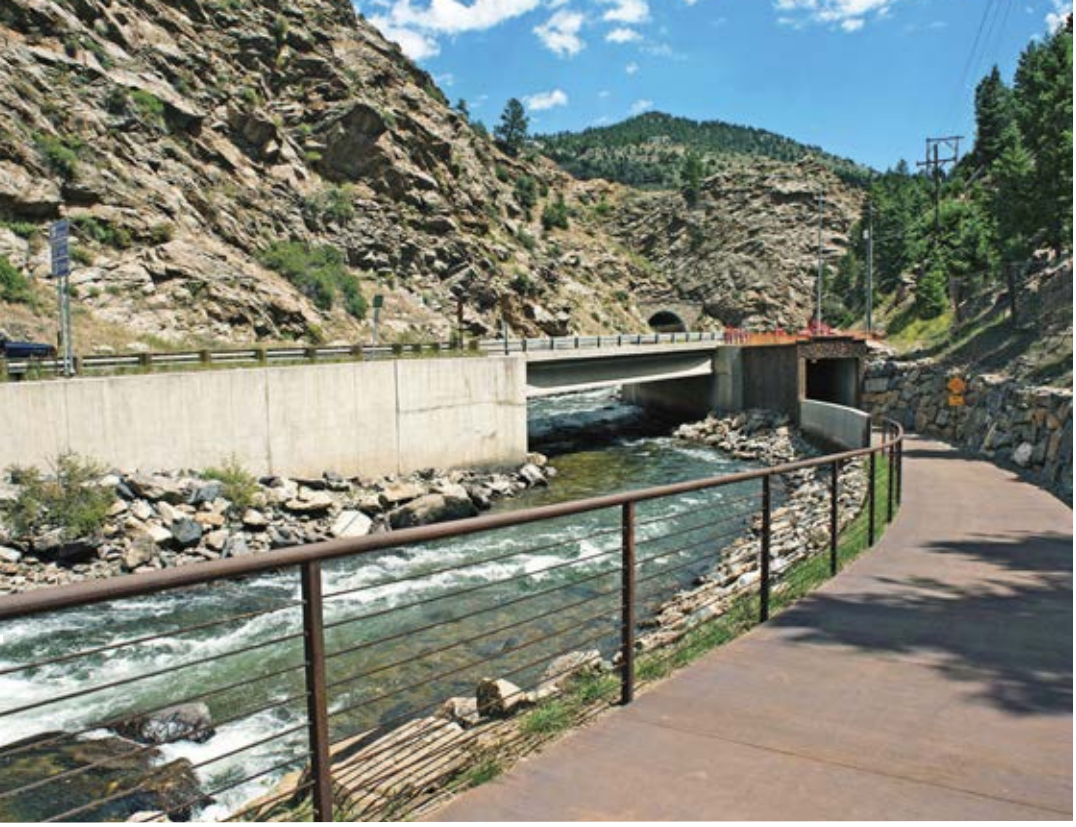
Gay Head Lighthouse Relocation

Aquinnah, Massachusetts

GEI Consultants, Woburn, Massachusetts

As the focus of national media attention including a PBS Nova documentary titled "Operation Lighthouse Rescue" a 159-year-old, 465-ton lighthouse was rescued from an eroding cliff and moved to a new elevated site to preserve the light's focal point and remain in service. The project team built a 129-foot-long precisely graded path with well-compacted aggregates and geotextile reinforcement, then raised the lighthouse onto steel beams and pushed it along steel rails along the path to its new foundation. The project team also worked with the local Wampanoag Tribe to restore the cliff site after the move.





Peaks to Plains Trail: Clear Creek Canyon Segment

Jefferson/Clear Creek Counties, Colorado

Muller Engineering Co.
Lakewood, Colorado

Outdoor enthusiasts can now enjoy unprecedented recreational access to Clear Creek Canyon with completion of a 3-mile segment of a planned 15-mile multi-use trail through the rugged terrain from Golden to Idaho Springs, Colorado. Sustainable design was a priority in creating the 10-foot-wide concrete trail, preserving existing large trees, riparian vegetation and rock outcroppings while removing debris and eroded areas from past mining operations. Artistic native rock, colored concrete and weathered steel allow the trail to blend with natural canyon colors. A major step toward the proposed 65-mile Peaks to Plains Trail, the new trail accomplishes planners' goal to "complement the Canyon terrain so well that users feel like the trail has always been there."

Maggie Daley Park Reconstruction

Chicago, Illinois

Stantec & Infrastructure Engineering
Chicago, Illinois

This world-class 20-acre park features an eye-catching quarter-mile-long "ice ribbon" for skating. The ice ribbon winds through the park, rising and falling with the landscape. It can accommodate up to 700 skaters during the winter and converts to a walking/jogging trail during warmer months. The park also includes two 40-foot-tall rock climbing structures, which also conceal the ice ribbon's refrigeration system, and a 3-acre play garden for children featuring a 125-foot-long suspension bridge. The project team overcame the challenge of locating the park atop an existing underground parking garage by incorporating eco-friendly, lightweight geofoam fill to minimize loads.

Hydrothermal Processing Pilot System

Greenwood Village, Colorado

Merrick & Co., Greenwood Village, Colorado

This pilot project proved that a hydrothermal processing system can be used to transform wet biomass waste into a valuable fuel at a useful scale. Hydrothermal processing uses water, high heat and high pressure to transform hydrocarbon-rich material—in this test case, algae—into bio-crude oil and natural gas. While the technology has been successfully tested in laboratories, this project was the first time a pilot-scale of the processing system was successfully built, tested and commissioned. Currently now in operation in India, the pilot-scale system produces approximately 1,000 liters of fuel per day—a much higher quantity than any previous demonstration of the technology and an indicator of its potential for other, larger applications.

ACEC 2017 ENGINEERING EXCELLENCE AWARDS

NATIONAL RECOGNITION AWARD WINNERS

FIRM NAME	PROJECT NAME
ACEC/ALABAMA	
Volkert, Inc.	Fairhope Water Resource Recovery Facility
ACEC/ARIZONA	
GHD	Scottsdale Booster Pump Station 71
Psomas	Paseo de las Iglesias: Santa Cruz River Bank
ACEC/ARKANSAS	
Bridgefarmer & Associates	I-430/I-630 The Big Rock Interchange
ACEC/CALIFORNIA	
AECOM/Henderson Engineers, Inc.	Golden 1 Center
Arcadis	Middle Harbor Redevelopment Program, Phase 1
Arcadis/Kleinfelder	Claude "Bud" Lewis Carlsbad Desalination Plant
Burns & McDonnell	500kV Underground Transmission Project
Holdrege & Kull Consulting Engineers & Geologists/ Innovative Construction Solutions, Inc./ Coastland Engineering, Inc.	Closed Lincoln Landfill Groundwater Corrective Action
Kennedy/Jenks Consultants	Digester Biogas to Clean Burning Vehicle Fuel
Kennedy/Jenks Consultants	Harry Tracy Water Treatment Plant - Long Term Improvements
Kimley-Horn and Associates	Blue Line Light Rail Transit Renewal
Kimley-Horn and Associates	Interstate 80 SMART Corridor Integrated Corridor Mobility Project
Kjeldsen-Sinnock & Neudeck	Regional Wastewater Facility 3D Scanning & Modeling
Kleinfelder	Auto Center Drive Grade Separation
Kleinfelder	Cross Border Xpress Terminal Building and Pedestrian Skybridge
Maintenance Design Group	L.A. County Bus Operations and Maintenance Facility
ACEC/COLORADO	
Dewberry	Rueter-Hess Water Purification Facility
HDR	South Platte Interceptor
HDR	U.S. 36 Boulder Turnpike Express Lanes
Merrick & Co.	Antarctica in HD - Master Planning at the Bottom of the Earth
Merrick & Co.	Hydrothermal Processing Pilot System
Muller Engineering Co.	Peaks to Plains Trail: Clear Creek Canyon Segment
ACEC/CONNECTICUT	
AECOM	Pearl Harbor Memorial Bridge
Lochner	I-95/I-91/Route 34 Interchange
RACE Coastal Engineering/ GeoDesign, Inc.	Steelpointe Harbor Waterfront Improvement Project
WSP USA	Rehabilitation of Route 8 Bridges
ACEC/FLORIDA	
Ayres Associates and GCI, Inc. (jointly with Kimley-Horn and Associates, Inc. and STV)	Scour Evaluation for Bridges with Unknown Foundations
BCC Engineering	SR 826 (Palmetto Expressway)/ SR 836 (Dolphin Expressway) Interchange Improvements
DRMP, Inc.	U.S. 17-92 Interchange at SR 436
Gannett Fleming	C.W. Bill Young Regional Reservoir
Hardesty & Hanover	Boca Grande Causeway Swing Bridge
Walter P Moore and Associates	DAYTONA Rising
ACEC/GEORGIA	
Amec Foster Wheeler	Porsche Cars North America Headquarters/Aerotropolis
American Engineers, Inc.	5-Points Intersection Improvement Project
CH2M	Peachtree Corners Geospatial Asset Inventory
Croy Engineering	Skip Spann Connector
Emprise Corp.	Gas Turbine Test Stand 6
ACEC/IDAHO	
Parametrix	I-84 Meridian Road Interchange
T-O Engineers, Inc.	Friedman Memorial Airport
ACEC/ILLINOIS	
Alfred Benesch & Co.	130th Street & Torrence Avenue Grade Separation
Baxter & Woodman	Wastewater Plant Combined Heat and Power Project
GRAEF - TDW Services	90-Inch Water Main Hot Tap & Line Plug
Greeley and Hansen	O'Brien Reclamation Plant Adds UV Disinfection System
Hanson Professional Services, Inc./ Maurer-Stutz, Inc.	Ahsapa Reconnects Emiquon to Illinois River
Stanley Consultants; Chastain/ Thomas Joint Venture	Fox River Bridge
Stantec/Infrastructure Engineering, Inc.	Maggie Daley Park Reconstruction
ACEC/INDIANA	
CHA	U.S. 31 Hamilton County Freeway
Greeley and Hansen	Rabbit Run Storage Tank Reduces CSO Plan Costs
Wessler Engineering	Fry Road Rain Trail
ACEC/IOWA	
CH2M	Iowa 100 Extension Project - Phase I
HDR	Iowa Premium Wastewater Treatment Plant
HDR	Railroad Relocation Project
Stanley Consultants	Lake Delhi Dam

VIA 57 West: Systems Innovations for the Courtscraper, New York, New York, by Dagher Engineering, New York, New York, is a 2017 EEA National Recognition Award winner.

FIRM NAME	PROJECT NAME
ACEC/KANSAS	
Burns & McDonnell	Riverton Unit 12 Combined Cycle Conversion Project
ACEC/KENTUCKY	
Bell Engineering	Nicholasville Road FEMA Flood Mitigation Project
EA Partners	Kingdom Come State Park Access
Stantec	Hatchery Creek Stream Restoration
ACEC/MAINE	
Amec Foster Wheeler	Fore River Seep Remediation
ACEC/MASSACHUSETTS	
GEI Consultants	Gay Head Lighthouse Relocation
GZA GeoEnvironmental	Foundation Design for Tappan Zee Bridge Replacement
Tetra Tech	Secondary National Roads Development Project
Tighe & Bond, Inc.	Biosolids Dryer Facility
VHB	Route 79/I-195 Interchange Improvements
WSP USA	Marblehead Pipeline Replacement Project
WSP USA	National Museum of African American History and Culture
ACEC/METROPOLITAN WASHINGTON	
A. Morton Thomas and Associates	Brookside Gardens Entryway and Parking Lot
Summer Consultants, Inc.	U.S. Tax Court HVAC Improvements
Walter P Moore and Associates	The Charleston Gaillard Center
Whitman Requardt and Associates	Corbalis to Fox Mill Water Main
ACEC/MICHIGAN	
Fleis & Vandenbrink Engineering	Muskegon River Survey with Drones & Boats
NTH Consultants	Oakland-Macomb Interceptor Drain Rebuild
Prein & Newhof	Gerald R. Ford International Airport Drainage Improvements
SME	Jimmy John's Field
Surveying Solutions, Inc.	Gordie Howe International Bridge Mapping
ACEC/MINNESOTA	
American Engineering Testing, Inc.	U.S. Bank Stadium
Dunham Associates, Inc.	Microgrid Technology Center
HGA Architects and Engineers	Ordway Center Concert Hall Expansion
HNTB Corp.	Franklin Avenue Bridge Rehabilitation
ACEC/MISSISSIPPI	
HNTB Corp.	U.S. 84 Mississippi River Bridge Pin-and-Link Replacement
ACEC/MISSOURI	
Burns & McDonnell	The Daniel Boone Bridge: Beyond the Basics
Crawford, Murphy & Tilly, Inc./EFK Moen	Bridging the Gateway
HDR	Kansas City Downtown Streetcar
KJWW Engineering Consultants	William H. Danforth Wing Research Laboratory
Parsons	Columbia I-70 Bridges Design-Build Project
TranSystems	Southwestern Illinois Freight Transportation Study

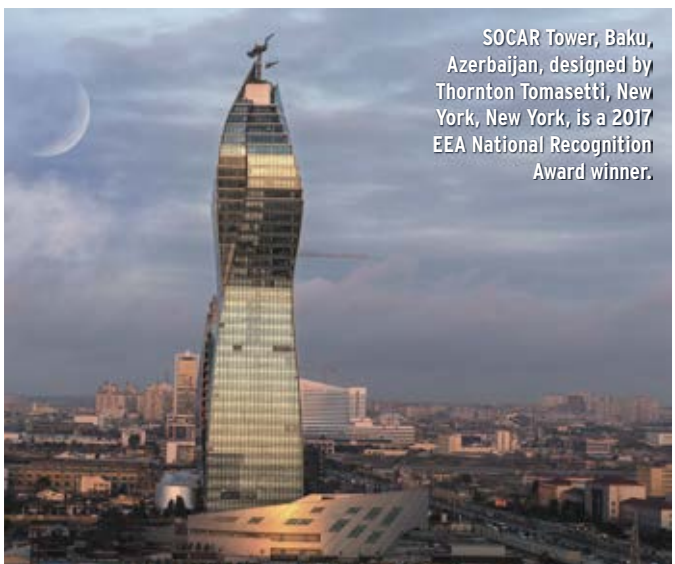
FIRM NAME	PROJECT NAME
ACEC/MONTANA	
DJ & A, P.C.	Missoula to Lolo Trail
HDR	Jackrabbit to Big Sky Transmission Line
Thomas Dean & Hoskins, Inc.	Multiuse Athletic Field & Intermittent Stormwater Detention Pond
ACEC/NEBRASKA	
EA Engineering, Science and Technology, Inc., PBC	Lincoln Park Phase 2 Sediment Clean-Up Design
Lamp, Rynearson & Associates	Henry Doorly Zoo Stormwater Management
ACEC/NEW JERSEY	
Amercom Corp., Consulting Engineers	Metro Road Bridge Replacement in 9 Days
Dewberry	NJDOT Route 46 Rockfall Protection Fence
Gannett Fleming	Centralizing for Efficiency
HNTB Corp.	Rehabilitation of Park and Watchung Avenue Bridges
HNTB Corp.	Route 18 Bridge over Route 1
Jacobs Engineering Group	NJDOT Route 72 Manahawkin Bay Bridge
WSP USA	New Route 72 Manahawkin Bay Bridge
ACEC/NEW MEXICO	
WHPacific	McCarran Int'l Air Traffic Control Tower and TRACON
ACEC/NEW YORK	
Downtown Design Partnership (STV/AECOM Joint Venture)	World Trade Center Transportation Hub
Buckland & Taylor International, Inc., an affiliate of COWI North America, Inc.	World Trade Center Transportation Hub (Oculus) Erection Engineering
CHA	Cleveland Drive over I-90 Bridge Replacement
Dagher Engineering	VIA 57 West: Systems Innovations for the Courtscraper
Gilsanz Murray Steficek	American Physical Society
Hardesty & Hanover	Arthur Ashe Stadium Retractable Roof
Hazen and Sawyer/AECOM	Croton Water Filtration Plant
HDR	Government Center Station Reconstruction
Jaros, Baum & Bolles	Jerome L. Greene Science Center
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.	365 Bond
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.	56 Leonard Street
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.	St. Patrick's Cathedral Restoration
Lilker Associates, Consulting Engineers	The Beekman Hotel and Residences Restoration

The Brooklyn Queens Connector, New York, New York, designed by Sam Schwartz Engineering DPC, New York, New York, is a 2017 National Recognition Award winner.

ACEC 2017 ENGINEERING EXCELLENCE AWARDS

NATIONAL RECOGNITION

FIRM NAME	PROJECT NAME
ME Engineers	Billie Jean King National Tennis Center
Michael Baker International/CB&I/ Gannett Fleming, Joint Venture	Interim Upgrade of Newtown Creek Wastewater Treatment Plan
Sam Schwartz Engineering	Brooklyn Queens Connector
STV/URS	Reconstruction of Route 9A and Lower Manhattan Streets
Thornton Tomasetti	SOCAR Tower
Thornton Tomasetti	U.S. Bank Stadium
WSP USA/STV/AECOM	Gateway System Level Design
ACEC/NORTH CAROLINA	
CDM Smith	Incinerator System Rehabilitation and Air Emissions Upgrades Project
McKim & Creed	UAS Proof of Concept for Beach Monitoring
ACEC/OHIO	
Stantec	Fourth and Summit Complete Streets
Stantec with MKSK, Messer Construction, Resource International, Korda/Nemeth, ASC Group	Scioto Greenways
Wade Trim Associates, Inc.	CSO Advanced Facilities Plan
WSP USA/HDR	Cincinnati Streetcar: Cincinnati Bell Connector
ACEC/OKLAHOMA	
Guernsey	Boeing Office and Laboratory
Olsson Associates	Emergency Repair of May Avenue Bridge
Olsson Associates	Western Road Widening
ACEC/OREGON	
HDR	Bridge Creek Water Supply and Treatment Plant
T.Y. Lin International	Sellwood Bridge Replacement
ACEC/PENNSYLVANIA	
Gannett Fleming	Hulton Bridge Replacement
Gannett Fleming	Maintenance-IQ: GIS Application
Johnson, Mirmiran & Thompson	Guaranteed Pavement Information System Application
STV	Lockheed Martin Technical Research Laboratory



SOCAR Tower, Baku, Azerbaijan, designed by Thornton Tomasetti, New York, New York, is a 2017 EEA National Recognition Award winner.

AWARD WINNERS

FIRM NAME	PROJECT NAME
Urban Engineers	Environmental Services for the Extension of Delaware Avenue
Whitman Requardt and Associates	Manayunk Bridge Trail
ACEC/SOUTH CAROLINA	
HDR | ICA	Bluffton Parkway Phase 5A
Stantec	U.S. 17 Median Improvements
TranSystems	Charleston County Bees Ferry Road Widening
Vaughn & Melton Consulting Engineers	Wastewater Treatment Plant Expansion
ACEC/TENNESSEE	
Gresham, Smith and Partners	TDOT Fast Fix 8 Project
ACEC/TEXAS	
Dannenbaum Engineering Corp.	Upper Texas Coast Hurricane Storm Surge Suppression Study
Garver	Fort Hood Belton Lake Recreation Area WWTP Energy Reduction Project
HDR	U.S. 190 Copperas Cove Reliever
Huitt-Zollars	Love Field Modernization Program
Kimley-Horn and Associates	The Star in Frisco
Parkhill, Smith & Cooper	Borger Northwest Wellfield Project
Parkhill, Smith & Cooper	Texas School for the Deaf 3D Survey
Walter P Moore and Associates	City of El Paso Traffic Management Center Relocation
Walter P Moore and Associates	Texas Center for Proton Therapy
ACEC/UTAH	
Reaveley Engineers and Associates	Provo City Center Utah LDS Temple
ACEC/VIRGINIA	
Dunbar Milby Williams Pittman & Vaughan, PLLC/Schnabel Engineering, LLC	Children's Hospital of Richmond Pavilion
WSP USA	Elizabeth River Tunnels Project
ACEC/WASHINGTON	
Brown and Caldwell	Chambers Creek Wastewater Plant Expansion
HDR	SR 520 Floating Bridge Replacement and HOV Program
Magnusson Klemencic Associates	Elliott Bay Seawall Habitat and Public Space
McMillen Jacobs Associates (on behalf of Northlink Transit Partners Joint Venture)	University Link Extension
Shannon & Wilson	Fir Island Farms Estuary Restoration
WSP USA	Sound Transit Regional HCT System Plan
ACEC/WISCONSIN	
Donohue & Associates	Energy Optimized Resource Recovery
GRAEF	Wisconsin Ave. Transmission Main and Temporary Booster Station
Short Elliott Hendrickson	2016 Water Main Rehabilitation Project

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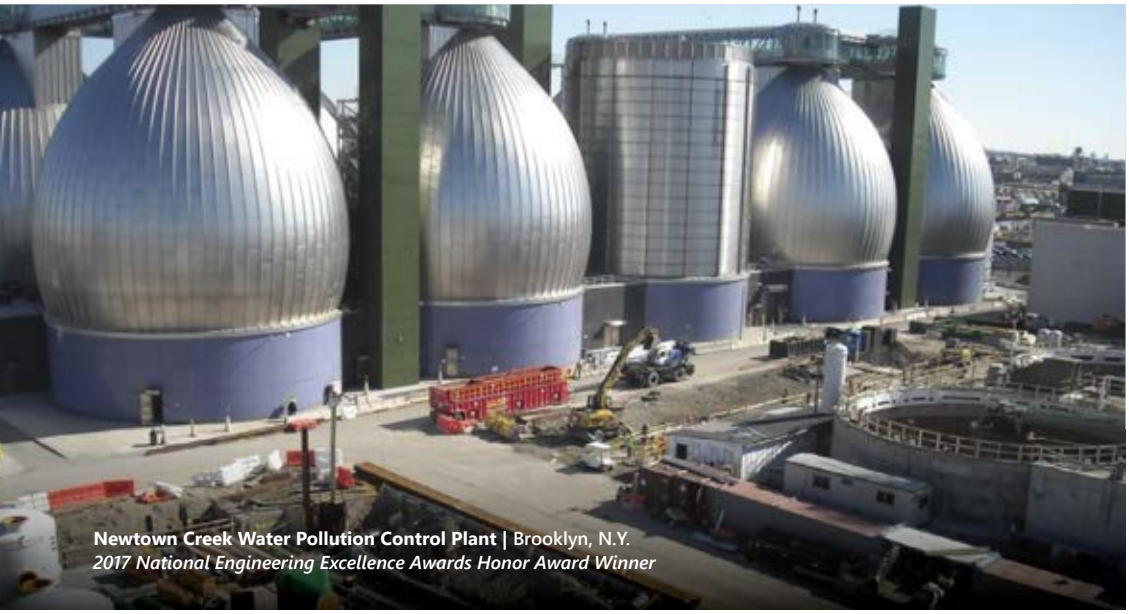

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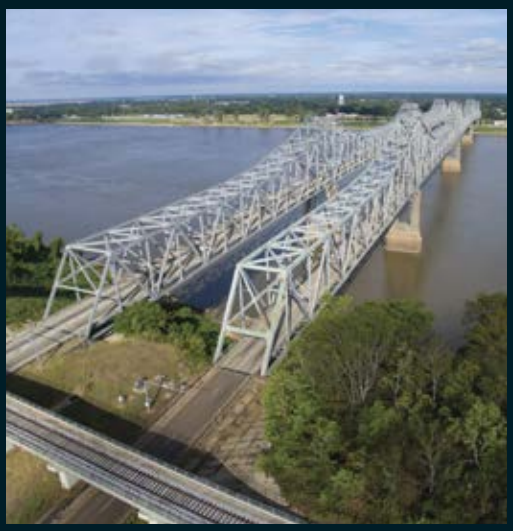
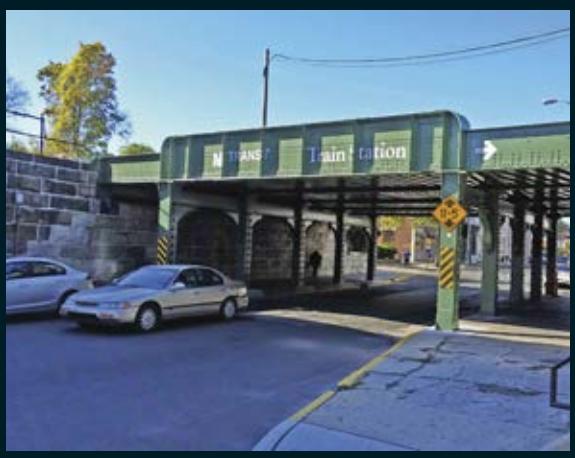


AWARD-WINNING INFRASTRUCTURE SOLUTIONS



TOP LEFT: Franklin Avenue Bridge Rehabilitation, *Minneapolis* | RIGHT: US 84 Mississippi River Bridge Pin and Link Replacement, *Mississippi*
BOTTOM LEFT: Park and Watchung Bridge Rehabilitation Project, *New Jersey* | RIGHT: Route 18 Bridge over Route 1, *New Jersey*

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100 years later, innovation remains at the heart of HDR

A lot can change in 100 years. Technologies improve, communities evolve, people come and go. But to withstand a century of disruptions, you must be built on a solid foundation. At HDR, that foundation has always been helping our clients and communities adapt to change.

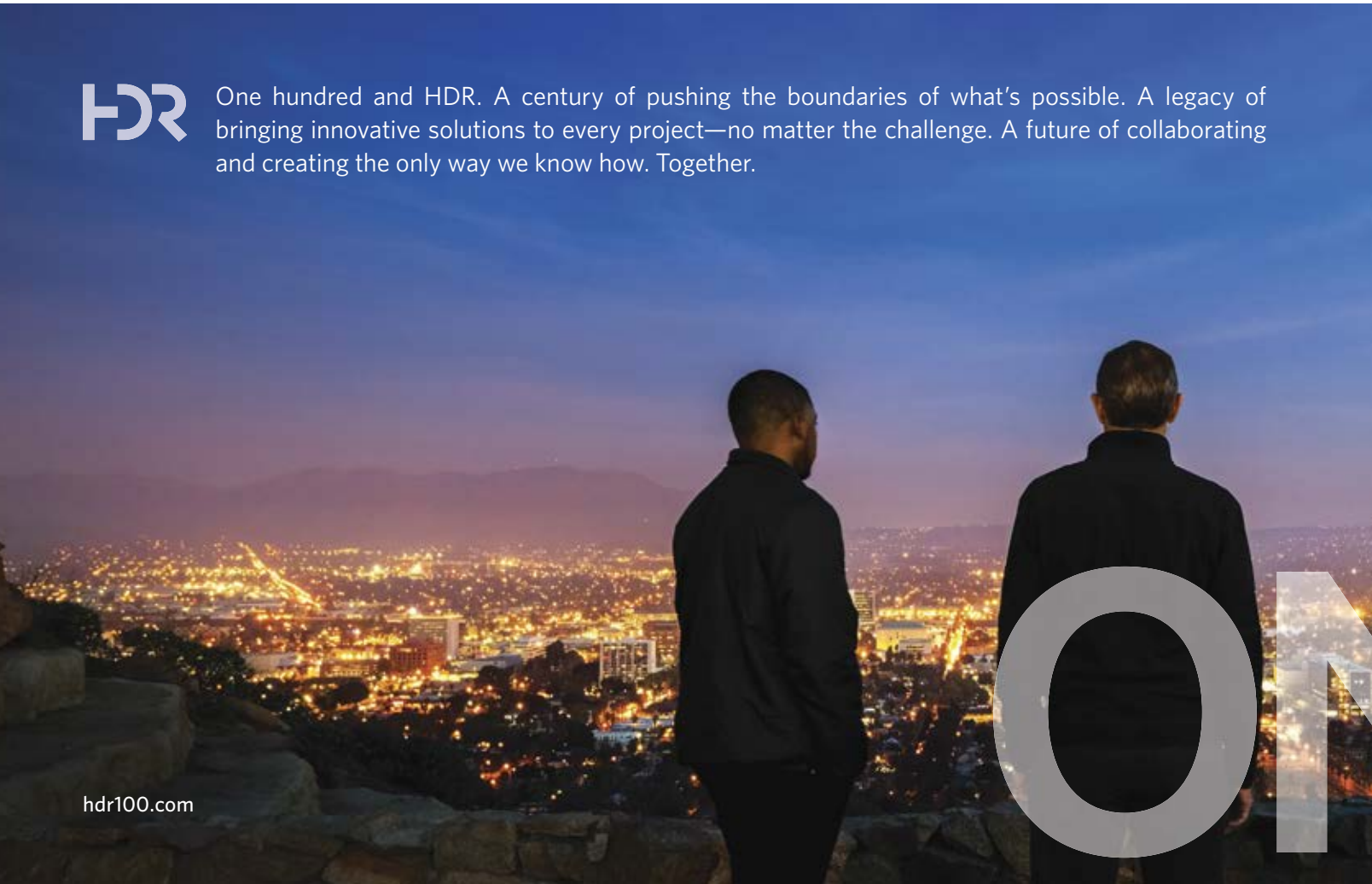
When H.H. Henningson founded the Henningson Engineering Company in Omaha, Nebraska, in 1917, his focus wasn't on mega projects or global expansion. It was on helping rural Midwest towns adapt to a changing world. He brought power, sewer, street and water treatment systems where they were needed most. President Franklin Roosevelt's New Deal turned things around by creating the Public Works Administration, and rural electrification became one of Henningson's most significant contributions.

Beyond the nuts and bolts of civil engineering, Henningson's innovative approach stood out. He envisioned a "middleman" who worked between municipalities and their contractors and vendors. This middleman would design a project to fit a client's need and protect the owner's interests during construction. Henningson's philosophy not only contributed to the company's early success; it continues to guide HDR's approach today.

HDR founder H.H. Henningson started the Henningson Engineering Company in 1917 in Omaha, Nebraska, where it remains headquartered today.

By 1940, Charles "Chuck" Durham and Willard Richardson, the "D" and "R" in HDR, had joined the firm. In 1950, the firm was renamed Henningson, Durham & Richardson, Inc., later shortened to HDR. Among the firm's many innovations was becoming the first architecture-engineering firm to use aircraft as a key component in its operations. Some HDR employees were former military pilots, and both Durham and Richardson learned to fly to better serve clients.

The best testaments to the firm's innovative approach are three American Council of Engineering Companies Grand Conceptor Awards, given annually to the most outstanding engineering achievement in the United States. HDR projects received back to back Grand Conceptor Awards in 2010 and 2011. The 2010 winner was the Gills Onions Advanced Energy Recovery



system, which converts onion waste into renewable energy. The 2011 winner was the Hoover Dam Bypass, which eliminated severe traffic congestion while enhancing security for the iconic dam.

The third Grand Conceptor Award winner in HDR's 100-year history is the recently announced 2017 winner, the SR 520 floating bridge. Part modern marvel and part practical mobility solution, the new bridge enables multiple modes of land-based transportation to simultaneously cross the state's second-largest natural lake. The project included replacing the existing, 52-year-old floating bridge and re-constructing the rest of the SR 520 corridor, from Interstate 5 on the west side of the lake to Interstate 405 on the east side.

The result is a bridge that, at 7,708 feet (about 1.5 miles), has earned a place in the Guinness World Records as the world's longest floating bridge.

Although HDR has grown to 10,000 employees in 225 locations around the world over the last 100 years, some things have not changed. We still measure our client relationships in decades. And we still develop innovative solutions for their ever-changing infrastructure needs.

The SR 520 floating bridge in Seattle is the world's longest floating bridge and HDR's latest Grand Conceptor Award winner.

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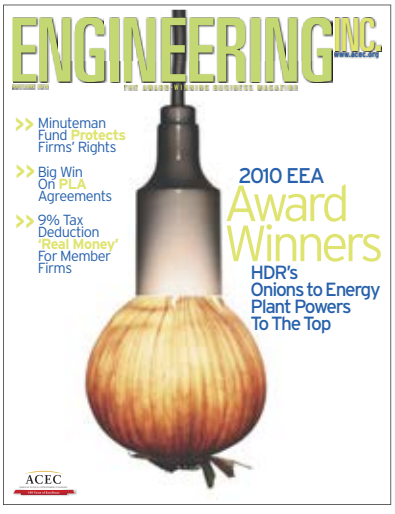

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RANKING SUSTAINABILITY

What U.S. Cities Can Learn From European Peers

Annual Arcadis study reveals how U.S. cities stack up against global counterparts and the pivotal role engineers play in boosting U.S. competitiveness

BY ALAN JOCH

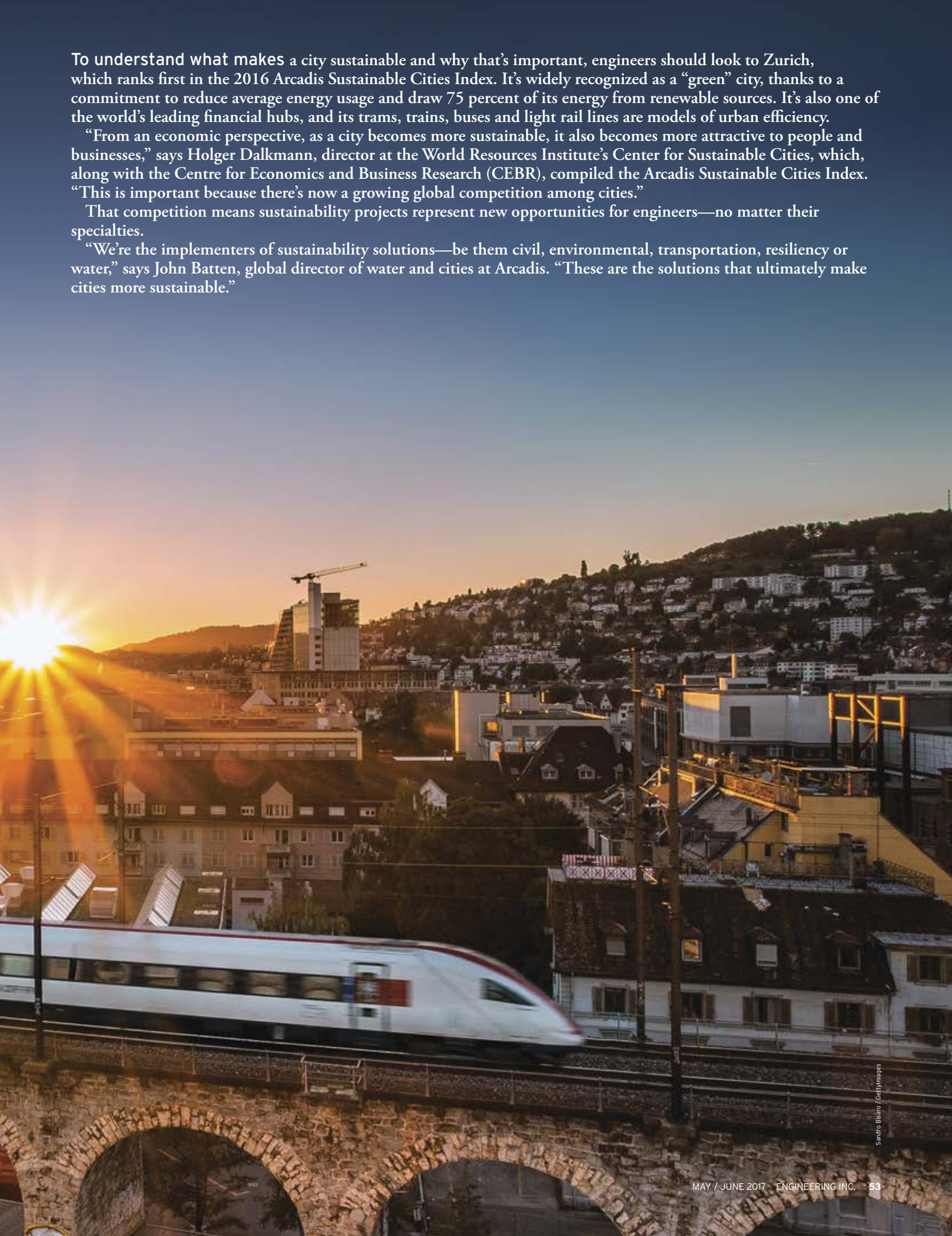
Based on three sustainability dimensions—quality of life, green factors and economic health—Zurich ranked No. 1 in the 2016 Arcadis Sustainable Cities Index.

To understand what makes a city sustainable and why that's important, engineers should look to Zurich, which ranks first in the 2016 Arcadis Sustainable Cities Index. It's widely recognized as a "green" city, thanks to a commitment to reduce average energy usage and draw 75 percent of its energy from renewable sources. It's also one of the world's leading financial hubs, and its trams, trains, buses and light rail lines are models of urban efficiency.

"From an economic perspective, as a city becomes more sustainable, it also becomes more attractive to people and businesses," says Holger Dalkmann, director at the World Resources Institute's Center for Sustainable Cities, which, along with the Centre for Economics and Business Research (CEBR), compiled the Arcadis Sustainable Cities Index. "This is important because there's now a growing global competition among cities."

That competition means sustainability projects represent new opportunities for engineers—no matter their specialties.

"We're the implementers of sustainability solutions—be them civil, environmental, transportation, resiliency or water," says John Batten, global director of water and cities at Arcadis. "These are the solutions that ultimately make cities more sustainable."



Sandro Bisaro / Getty Images

But what exactly is a sustainable city? Various research organizations weigh individual factors differently, but there's consensus around key characteristics.

"Sustainable cities have people at their hearts," says Caroline Assaf, president of Sustainable Cities International in Burnaby, British Columbia. "They balance physical, social and economic assets to provide people with healthy and resilient communities that are less vulnerable to risks and promote collaboration and inclusiveness among people. Factors like these, in turn, attract businesses, investments, talent and tourism."

CITIES ASCENDANT

Cities are home to more of the world's population than ever. The World Health Organization (WHO) says urban areas accounted for 54 percent of global population in 2014 versus 34 percent in 1960. As people gravitate to cities, they're expecting a better quality of life. To sustain and support this growth, which WHO estimates will be nearly 2 percent every year until 2020, cities must invest in the future. In addition to an infrastructure that promotes economic growth, that means affordable housing, fresh air and drinking water, easy access to public transportation, and education and health care resources.

The World Health Organization says urban areas accounted for 54 percent of global population in 2014 versus 34 percent in 1960

With these multifaceted aspects of livability in mind, Arcadis and CEBR evaluated 100 cities throughout the world using three sustainability dimensions:

Quality of Life: The people subindex rates health (life expectancy and obesity), education (literacy and universities), income inequality, work-life balance, the dependency ratio, crime, and housing and living costs.

Green Factors: The planet subindex ranks cities on energy consumption and renewable energy share, green space within cities, recycling and composting rates, greenhouse gas emissions, natural catastrophe risk, drinking water, sanitation and air pollution.

Economic Health: The profit subindex examines performance from a business perspective, combining measures of transportation infrastructure (rail, air and traffic congestion), ease of doing business, tourism, gross domestic product per capita, the city's importance in global economic networks, access to mobile and broadband services and employment rates.

(None of the cities, even those in the top of the composite index, effectively balance all three subindexes, the researchers say. For example, although Zurich posted the best overall score and ranked at or near the top for planet and profit, it came in 27th place for people.)

Zurich wasn't the only European city that ranked highly in the composite index. In fact, European cities dominated the overall rankings, taking 13 of the top 15 places. This includes the global hubs of London (No. 5), Frankfurt (No. 6) and Paris (No. 15).

What about North American cities? The index found they have a lot to learn from their international peers. Vancouver was the continent's leader at 23rd in the overall ratings, while U.S. cities failed to enter the top quartile. The closest contender was New York City at 26th place.

Infrastructure differences help explain why European cities outpaced U.S. and Canadian counterparts. Many European urban centers were settled before the automobile age and, as a result, are densely settled and supported by well-established public transportation systems. However, many American cities outside the Northeast grew with automobiles in mind. "Car-centric designs can lead to urban sprawl and a large carbon footprint, with enormous costs," Dalkmann says. "Those are fundamental challenges for U.S. cities in terms of sustainability."

His organization is part of The New Climate Economy (NCE), a global commission that studies links between economies and climate change, and its research bolsters the Sustainable Cities Index results. For example, a NCE study compares Spain's Barcelona (No. 24 in the Sustainable Cities Index) with Atlanta (No. 63), two cities with approximately 2.5 million residents. "Atlanta has five times more total area than Barcelona, and its carbon footprint is six times higher," he points out. "Where there's urban sprawl, research shows there are more challenges in terms of access to jobs and schools and in environmental quality."

But density and transportation aren't the only differentiating factors. "Europeans recycle and recover resources from municipal solid waste much more than American cities do on a whole," Batten says. He adds that better work-life balance, access to public health care and lower homicide rates also gave the top 20 municipalities an edge in the composite Sustainable Cities Index.

SIGNS OF PROGRESS

Although North American cities lagged many in Europe, the latest index results offers signs of progress, particularly in the various subindexes in the Arcadis research. Experts say much of the improvement is linked to the direct involvement of engineers during all phases of the project development life cycle. For example, New York ranked 26th place overall, but for profit it holds an impressive 8th place. Its 33rd ranking for planet is the best in the

"Europeans recycle and recover resources from municipal solid waste much more than American cities do on a whole."

JOHN BATTEN | ARCADIS

2016 Arcadis Sustainable Cities Index

Top 100 Sustainable Cities

1	Zurich 74.6%	26	New York 62.9%	51	Philadelphia 55.9%	76	Riyadh 45.9%
2	Singapore 74.1%	27	Wellington 62.8%	52	Dubai 55.9%	77	Istanbul 45.9%
3	Stockholm 73.9%	28	Montreal 62.7%	53	Baltimore 55.5%	78	Guangzhou 45.9%
4	Vienna 73.4%	29	Antwerp 62.4%	54	Miami 55.4%	79	Sao Paulo 45.3%
5	London 73.2%	30	Brisbane 62.4%	55	Kuala Lumpur 55.2%	80	Buenos Aires 44.9%
6	Frankfurt 70.6%	31	Birmingham 62.4%	56	Dallas 55%	81	Jeddah 44.7%
7	Seoul 69.6%	32	Melbourne 62%	57	Moscow 53.9%	82	Rio de Janeiro 43.2%
8	Hamburg 69.2%	33	Toronto 61.7%	58	Abu Dhabi 53.7%	83	Lima 43.1%
9	Prague 69.1%	34	Boston 61.7%	59	Houston 53.5%	84	Mexico City 42.8%
10	Munich 68.6%	35	Dublin 60.6%	60	Chicago 53.4%	85	Tianjin 42.5%
11	Amsterdam 68.2%	36	Glasgow 60.5%	61	New Orleans 52.6%	86	Amman 42.4%
12	Geneva 68.1%	37	Warsaw 60.3%	62	Pittsburgh 52.5%	87	Hanoi 42.3%
13	Edinburgh 68.1%	38	Leeds 60.2%	63	Atlanta 52.3%	88	Jakarta 41.3%
14	Copenhagen 68%	39	San Francisco 60.1%	64	Shenzhen 52.1%	89	Chennai 40.9%
15	Paris 67.6%	40	Brussels 60%	65	Indianapolis 52.1%	90	Johannesburg 40.8%
16	Hong Kong 66.8%	41	Macau 59.6%	66	Athens 51.8%	91	Bengaluru 40.7%
17	Berlin 66.7%	42	Milan 59.5%	67	Bangkok 51.2%	92	Mumbai 39.9%
18	Canberra 66.6%	43	Seattle 59.4%	68	Tampa 51.1%	93	Chengdu 39.4%
19	Rotterdam 66.6%	44	Washington, D.C. 59.3%	69	Detroit 51.1%	94	Wuhan 37.7%
20	Madrid 66.3%	45	Tokyo 59.1%	70	Kuwait City 50.5%	95	Cape Town 37.4%
21	Sydney 66.3%	46	Lisbon 58.6%	71	Santiago 48.5%	96	Manila 36.8%
22	Rome 65.2%	47	Lyon 58.3%	72	Doha 48.1%	97	New Delhi 36.5%
23	Vancouver 65%	48	Taipei 57.8%	73	Beijing 47.1%	98	Nairobi 34.8%
24	Barcelona 64.1%	49	Denver 57.5%	74	Shanghai 46.7%	99	Cairo 34.4%
25	Manchester 63.4%	50	Los Angeles 55.9%	75	Muscat 46.3%	100	Kolkata 30.8%

U.S., and initiatives are underway that may boost its green profile even more. PlaNYC, an engineering-intensive initiative, is evolving the city's image of grit and grime into a more people-friendly destination thanks to targets for reducing carbon emissions, networks of bike paths and a pedestrian mall in the formerly car-congested Times Square. "Projects like these are propelling New York into a strong urban brand in terms of sustainability," Batten says.

The city recently expanded PlaNYC's objectives with targets for more housing that's affordable for a broad range of incomes to keep police and fire professionals, nurses, teachers and others in the city. "The more diverse a city is, the more vibrant it is," Batten explains.

Resiliency in the age of climate change has also become a priority. The city upgraded building codes to prepare for extreme floods and winds in the wake of 2012's destructive Superstorm Sandy. Arcadis and other engineering firms are actively involved in fortifying vulnerable areas of Manhattan and other boroughs. One of the most prominent initiatives is the East Side Coastal Resiliency Project, which will create levees, flood gates and other storm defenses in lower Manhattan. "Sitting on top of them is expected to be parkland and recreational facilities for the downtown community," Batten says.

On the West Coast, Los Angeles (No. 50 in the overall Sustainable Cities Index and No. 60 for planet) has set goals for improving business, environmental and lifestyle characteristics with its Sustainable City pLAn. A year into the initiative, the mayor's office says the plan helped reduce water use by 19 percent. The city's efforts got a boost in the last election when voters approved Measure R, a multidecade infrastructure project for expanding metro and regional rail service, adding to the rapid transit system, earthquake-proofing bridges and other improvements.

In the Midwest, Chicago (No. 60 overall and No. 67 for planet) is continuing its Sustainable Chicago program, which is developing more than 225 miles of bike lanes and expanding a bike-sharing program. The Department of Water Management is replacing 100 miles of water and sewer lines a year, while the Metropolitan Water Reclamation District is investigating more energy-efficient technologies for the city's water infrastructure.

TAKEAWAYS FOR ENGINEERS

Whether sustainability starts with resiliency efforts, greenways or expanded mass transit resources, the projects create positive ripple effects for communities and the engineering industry in particular.

Following Superstorm Sandy, New York is fortifying vulnerable areas. One initiative is the East Side Coastal Resiliency Project, which will create levees, flood gates and other storm defenses.

Arcadis' Vision:
Create a Big Picture View of Sustainability

When Arcadis executives designed the Sustainable Cities Index, they knew their rankings would join a slew of others from numerous studies. But they saw an opportunity to offer a new perspective.

"We wanted to present a broader view of urban sustainability," says John Batten, global director of water and cities at the engineering company. "So we looked at three dimensions of sustainability: people, planet and profit. We need to analyze all of these dimensions to fully understand urban sustainability."

The target audience for the index includes public-sector policymakers, nongovernmental organizations, academics and anyone else with an interest in making cities more sustainable and livable. But the results are particularly meaningful for engineers.

"Whether it's updating or replacing aging infrastructure, expanding transportation resources or making cities more resilient to climate change, sustainability projects translate into opportunities for the engineering sector," Batten says.

"We're seeing that everywhere you add a new rail line, for example, you create a redevelopment corridor that renews the housing stock and expands transportation networks along that route," Batten says. "This creates a great uplift for the engineering and architectural businesses that serve those areas."

For its part, Arcadis is involved in a number of resiliency projects. One is a new rail station in the centuries-old Dutch city of Rotterdam. When complete, the station will handle three times more passengers than the old facility. The project is part of an ambitious modernization effort that is using engineering expertise to redevelop city waterfronts and revitalize an abandoned port area.

"The waterfront opportunities are clearly a place where engineers can practice their art by designing dikes, berms and bridges that make the areas more resilient to severe weather and accessible to citizens," Batten says.

Engineering companies are active participants in sustainability projects such as these, providing input during the early development, as well as the designs that bring these complex initiatives to life.

One of Arcadis' resiliency projects, Rotterdam's new rail station, will handle three times more passengers than the old facility.

"Having more engineers thinking about the bigger picture and understanding the goals of cities directly impacts the overall success of sustainability efforts," Dalkmann says. "For example, we have worked on the bus rapid transit systems in many countries, and our research shows that with high-quality designs that promote ridership, cities can reduce traffic fatalities by as much as 30 percent."

Research shows that with high-quality designs that promote ridership, cities can reduce traffic fatalities by as much as 30 percent

Considering the declining reserves of nonrenewable energy resources and the growing competition among cities to attract people and businesses, engineers will become even more pivotal for progressive cities.

"Sustainable development is quickly becoming the only option," Assaf says. "The question is, what cities will be willing to make this transition to sustainability on their own terms, and which ones will wait until they're forced to make an even more rapid transition when they no longer have a choice?" ■

__Alan Joch__ is a business and technology writer based in Francestown, New Hampshire.

"What cities will be willing to make this transition to sustainability on their own terms, and which ones will wait until they're forced to make an even more rapid transition when they no longer have a choice?"

CAROLINE ASSAF | SUSTAINABLE CITIES INTERNATIONAL

ADVERTORIAL

A&E Mergers

Best Practices: Driving Joint Success

by Eddie Shasek

Here you are: the documents have all been signed, and ownership has officially shifted. The challenge of joint success just got real.

Once ownership shifts following an acquisition, the mission should become this: success of the joint entity. Regardless of how smooth or rocky the negotiation, due diligence, and closure process was, it is incumbent on both firms to quickly stabilize, and start to grow in the "new normal" of joint operations.

But, how? After years of experience helping architecture and engineering firms around the world streamline operations, I have identified four steps that are critical to driving joint success post-merger. Let's walk through each.

PLAN: WHAT IS THE GAME PLAN?

Following a merger, it might seem easiest to dive right in to a straight data conversion project to get your firms to one business system. But with this approach, one of the two entities will likely end up suffering major gaps in understanding, and possibly even capabilities.

Planning a program to address overall success vs. just systems consolidation makes all the difference. It is better to first focus on a plan for the alignment of the corporate structure, processes, and people. Then, let the system integration tasks follow that lead.

COMMUNICATE: TALK TO ME.

Every good integration plan must also contain a solid communication plan. Your people must be on board for the organization to reach its full joint potential. Ensure there is clear ownership of the communication plan for each company. Plans should address:

- What will happen when
- Participation of each entity and key roles
- Internal marketing for a positive change

Remember: this is about getting the word out with no surprises. Be sure to leverage many forms of communication beyond email to align with what is typical and effective in your firm.

EXECUTE: WHAT IS IT THAT YOU DO HERE?

As previously mentioned, your systems consolidation process should follow the lead of a process integration (or at least follow a detailed analysis of overlaps and gaps in how the separate entities were run). In this process analysis, be sure to:

1. Identify overlaps and gaps early
2. Identify adjustments by role and process
3. Clearly define what the recommended process is going forward
4. Identify how the systems integration project needs to enable the intended new process in the near and long-term

To build an integration plan that joins not only systems, but also process, the fulcrum should be a business process catalog. This can be leveraged when identifying the general approach to each process area for each entity that will be integrated. Focus on elements of the process that are most likely to be disconnected. You must define:

- What roles are involved and the level of detail that is managed at each level?
- Is the process manual/paper based vs. automated workflow, or even an email based process?
- Who has what access to data and decision-making authority to execute the process efficiently?
- Is there a material difference in volume or other factor in one entity driving the process differences that cannot be adjusted?

REFINE: YOU ARE NEVER REALLY DONE.

After go-live on your joint system with commingled data, the focus should shift to finding the inevitable data issues in the details of individual projects, billings, or other records. Plan to have some project core team members transition into a temporary support group accessible to the new users.

Resist the urge to add more functionality and customizations or to kick off a Phase Two of implementation for at least a few months. This allows for operational stabilization.

Be sure to reserve some ad hoc time from your software vendor's consulting or technical staff to be available on-call or even on-site to address any technical business interruptions quickly. Leverage the experience of your vendor at this time, who should be your partner during this process.

Understand your cost of down time and recovery plan should larger issues surface in the weeks following your go-live date. And finally, continue to ensure daily tasks are done prior to starting a second phase of implementation.

In taking these steps, you can help better ensure joint success post M&A activity.

Eddie Shasek is a Project Director at BST Global, *the leading global provider of enterprise business management software and service solutions for engineering, architectural, and environmental consultancies. For more information, visit bstglobal.com.*

Valued Interactions

Participants in ACEC Joint Coalitions Roundtable discover commonality in best practices

BY SAMUEL GREENGARD

In an era of technological advances and accelerated globalization, many executives recognize the path to success and business growth is paved with old-fashioned networking and peer interaction.

The first Joint Coalitions Roundtable, held February 17-18, 2017 in San Diego, brought together more than 75 executive committee members from five coalitions:

- Council of American Mechanical and Electrical Engineers (CAMEE)
- Council of Professional Surveyors (COPS)
- Land Development Coalition (LDC)
- Council of American Structural Engineers (CASE)
- Small Firm Council (SFC)

"It was an opportunity to gain insights that otherwise wouldn't be possible."

ANDREW RAUCH | COALITIONS STEERING COMMITTEE CHAIRMAN

"It was interesting and valuable to hear how different organizations are dealing with major business issues and the dynamics surrounding them."

GARY VEENSTRA | COPS COMMITTEE MEMBER

SUEDHANG / GETTY IMAGES

FORWARD THINKING

As Andrew Rauch, a principal at BKBM Engineers in Minneapolis, Minnesota, and ACEC's Coalitions Steering Committee chair put it, "It was an opportunity to gain insights that otherwise wouldn't be possible."

"It was interesting and valuable to hear how different organizations are dealing with major business issues and the dynamics surrounding them," said Gary Veenstra, formerly with Langan Engineering & Environmental Services in Parsippany, New Jersey, and a member of the COPS committee.

The focal point for the roundtable was project management, including:

- What will be the top three challenges facing project management within your firm over the next two to three years?
- How are you working to overcome these challenges?
- What coalition education, publications or other resources would help you overcome the challenges?

The value of the event, says Jeffery McBride, principal fire protection engineer at EBL Engineers, LLC, in Parkville, Maryland, and chair-elect of the CAMEE group, was the opportunity to get candid feedback from colleagues. "They generously offer insight into how they approach challenges and solve problems that we all encounter. The setting is informal and dialogue is always free flowing," he says, adding that he learned more about both internal and external survey methods.

Gaining outside perspective is extremely valuable, says Michael Unger, a vice president at WSP USA in Denver and a board member of the LDC group. Over time, he says, many business leaders and engineers become accustomed to the same language, thinking and perspective, so they wind up with a somewhat myopic view.

By combining different engineering groups as well as different types of professionals—from areas as diverse as mechanical engineering, structural engineering and land development—we gain deeper and broader insights. "It's possible to hear about best practices that extend beyond your organization's walls."

IMMEDIATE BENEFITS

The group roundtable has already prompted several joint initiatives to enhance publications, products and ultimately member services.

CASE and COPS are already identifying publications they each separately produce that instead can be combined into a new, enhanced and jointly produced suite of tools focusing on project management.

"Today, project management intersects with almost every aspect of the business in some way," Unger says. "These are the people on the front lines of delivering on projects, working with clients and providing excellent service. But they also must focus on labor issues and budgeting."

Land Development and CAMEE are similarly exploring respective resources that would be more beneficial for members through a joint collaboration.

BEYOND THE ROUNDTABLE

In the end, the Joint Coalitions Roundtable, like other professional gatherings, delivered benefits and gains that extend beyond the actual event. Not only do participants go back to their firms with a renewed sense of purpose and new knowledge, but they make new connections—and reinforce existing bonds—that complement their professional lives.

Organizers say the roundtable could serve as a template for future gatherings, including regional and national conferences. ■

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

"They [attendees] generously offer insight into how they approach challenges and solve problems that we all encounter."

JEFFERY McBRIDE | CAMEE CHAIR-ELECT

"Today, project management intersects with almost every aspect of the business in some way."

MICHAEL UNGER | LDC BOARD MEMBER

FROM THE GROUN

Employees and managers at Chicago-based Primera Engineers inspire new generations of engineering professionals

For almost 20 years, Primera has hosted eighth-grade students from Chicago's Francisco Madero Middle School. The students spend the day learning about careers in engineering and architecture.

BY CALVIN HENNICK

D UP

More than 20 years ago, Primera Engineers began working with Francisco Madero Middle School in Chicago's Little Village neighborhood. That was the beginning of a special connection between the school and the firm, as Madero was the first school client for which Primera completed "ground-up" architecture and engineering work. Primera's then-owners were also impressed by the level of community involvement in the project.

Though the architecture and engineering work was completed in 1996, the firm still finds ways to stay involved with the school.

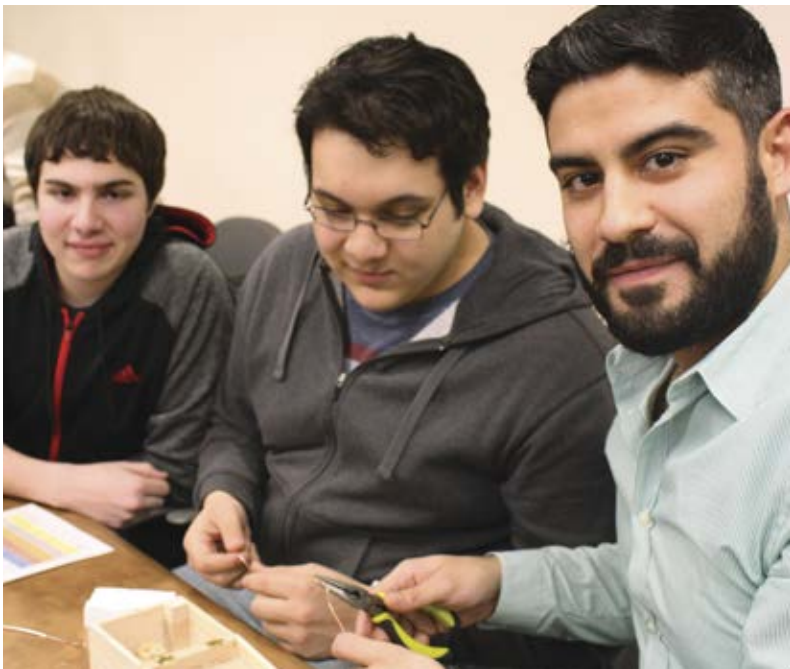
And it's just one of the Chicago-based firm's wide-ranging efforts—many of which revolve around education and getting kids excited about STEM fields—to give back in the communities in which it works and beyond.

"We became very involved with the neighborhood as part of the design and construction process," says Lourdes Gonzalez, a senior vice president for Primera. "They had public meetings before we designed the building, and the community was very invested in the success of this school."

Since then, the firm has hosted a group of Madero eighth-graders four times each year, talking to the kids about the importance of education, leading them through hands-on activities and introducing them to architecture and engineering as potential future career fields. Additionally, Primera employees have visited the school to judge science fairs.

Even though Primera's ownership has changed, the Madero partnership continues.

"We're constantly trying to recruit engineers," says Erin Inman, Primera's CEO, who purchased the firm from its co-founders in 2016. "We're finding that you go to colleges, and there are 30 or 40 firms fighting over new graduates. We're trying to get kids interested in engineering, architecture and construction management. As the baby boomers retire, it's going to be even more of a crunch."



Primera electrical designer Louis DeAlba, (right) instructs students from the ACE Program through the ceiling in a box activity, which shows the complications and coordination that go into above ceiling space in an MEP project.

Primera electrical engineer Jason DeRosa talks to visiting students about different careers in the AEC industry.

In addition to the partnership with Madero, Primera helps to support schools in Haiti, and is active with the ACE Mentor Program of America.

"I really think it's a part of our culture," Gonzalez says of the push to give back. "The founders were really community-focused, and that has been a self-perpetuating trait that has continued."

AN ONGOING RELATIONSHIP

Louis DeAlba, an electrical designer for Primera, has coordinated the partnership with Madero for the past five years. DeAlba grew up in the Little Village neighborhood, only a few blocks from where Madero now stands, and he says that it's meaningful for students to see someone with a similar background succeeding in engineering.

"I thought it was a good opportunity for me to teach and talk to the youth about engineering and career paths that they could have…" DeAlba says. "Letting them know they have options is a big goal of mine for the program."

Four times a year, a different group of eighth-graders come to visit the firm. In the morning, Primera employees talk to kids about renewable energy, and then the students build their own model wind turbines. Their goal is to develop designs that are both sturdy and cost-effective. The firm also buys the kids lunch, and later in the day, students present their models and explain their engineering decisions.

Four times a year, a different group of eighth-graders come to visit the firm

Primera raised between $5,000 and $6,000 for the classroom in Haiti

Each year, Primera employees collect and pack school supplies for New Life for Haiti, an organization that helps build schools along the Grande Anse River Valley in Haiti.

"Just getting in front of each other and speaking in a presentation setting is really good for them, getting them out of the their shell and making them feel more comfortable speaking in front of a crowd," DeAlba says. "I get a lot of good feedback from the kids. We'll get letters after every visit talking about how much they learned, how they never experienced anything like that and how now they want to start looking into becoming engineers and architects."

"Seeing students gain interest in what we're talking about, that's been the most important part," DeAlba adds.

Erin Lowery, a senior project manager for Primera, is also involved in the Madero partnership. Just as DeAlba serves as a role model for the kids from his old neighborhood, Lowery says it's important for the girls who visit the firm to see women succeeding in engineering.

"People can talk to young girls over and over, but I think it's important for them to see that engineering is a reality," Lowery says.

Cesar Batres, a seventh-grade math teacher at Madero, has taught at the school since it opened. He says that students enjoy their trips to Primera, and that building models and giving presentations help them to be more confident.

"We're finding that you go to colleges, and there are 30 or 40 firms fighting over new graduates."

ERIN INMAN
PRIMERA

"What I like about this program is the encouragement they give to the students to continue their education," says Batres. "It is very important for our kids, especially the lower-income kids. They need all this support, and they need all these opportunities."

LEARNING BEYOND BORDERS

Primera's efforts to give back stretch far beyond Chicago's borders.

Inman sits on the board for New Life for Haiti, a nonprofit organization that has built six schools and operates one of them in Haiti's Grande Anse River Valley. For the last five years, Primera employees have organized supply drives to help support the schools. In the past year, employees raised money to fund one

OUTSIDE THE CLASSROOM

Along with its service efforts around education, Primera and its employees actively support these programs through activities including volunteering, fundraising as well as food and clothing drives:

- Canstruction Chicago
- Cystic Fibrosis Foundation
- DuPage County Adopt-a-Trail
- DuPage Pads
- DuPage Regional Office of Education STEM Program
- Feed My Starving Children
- Greater Chicago Food Depository
- J.P. Morgan Corporate Challenge
- Juvenile Diabetes Research Foundation
- Naperville Area Humane Society
- North Aurora Mothers Club
- Rebuilding Together Metro Chicago
- Ronald McDonald House Charities

of three classrooms for a new school in the region.

This new school is a model-teaching site where teachers can learn new methods of instruction. "Most of the schools in Haiti teach by rote memorization," Inman says. "The kids don't have books, and there's no interactive hands-on learning. The school that was built last year has a lot of manipulatives and a lot of interaction. The kids sit at little tables, rather than lined up on benches."

Primera raised between $5,000 and $6,000 for the classroom, Inman says, with employees raising half of the money and the firm providing a match. Additionally, Inman has traveled annually to Haiti to work at the schools for the past 10 years, and she has begun bringing Primera employees with her on trips. This year, the manager of the firm's consulting division is making the journey.

"Seeing students gain interest in what we're talking about, that's been the most important part."

LOUIS DeALBA
PRIMERA

Inman says she's "slowly getting people" from the firm to make the trip, which can be a challenge for people unaccustomed to traveling in places with little in the way of basic infrastructure, including running water and reliable electricity.

For the ones who make the trip, there's plenty of work to do. "It's a bit of an adventure to get all the kids together and make sure you know who's who [for the sponsorship program]," Inman says. "It usually takes a group of five or six people to do that."

INSPIRING FUTURE ENGINEERS

While Primera engineers give the Madero Middle School students a glimpse into the engineering world, the ACE Mentor Program of America allows the firm's employees to go deeper, by working closely with a group of high school students over the course of several months.

Typically, four to five Primera employees team up with other firms to work with two- and three-dozen students from around Chicago and the surrounding area on a hypothetical project. This year, students are working on designs to turn abandoned grain silos in the city's industrial areas into residential, commercial and retail spaces. Adult leaders guide students through various aspects of the planning process, down to how construction equipment would be transported to the worksite and where cranes would sit.

"It can get pretty detailed," says DeAlba. "We even have structural engineers talking to students about trusses and beams. We cover all of the disciplines, and give the students an idea of what each discipline does, so they can gauge what they're most interested in."

Amanda Beck Larkin, a Primera fire protection engineer who is active with the ACE Mentor Program, says the volunteer opportunity originally seemed like a fun thing to do once a week after work. But she kept with the program because it allows her to introduce her field to a new generation.

"I don't think there's enough exposure to engineering," Beck Larkin says. "I remember when I was 17, and I wanted to do something with math and science. My dad said, 'Why don't you be an engineer?' I was thinking of the guy who drives the train. I had no exposure to engineering. I think it's such a rewarding career, I want students to know what their options are."

"Sometimes it's tough with all your deadlines, and you think, 'Can I really fit this into my schedule?'" Beck Larkin adds. "But then one of the students will go to college for engineering and ultimately graduate. It really keeps you going." ■

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

To Expand Private Infrastructure Investment, Simplify the Federal Permitting Process

BY ERIC B. BEIGHTEL

To fully realize the promise of President Donald Trump's plan to make America's infrastructure "second to none," we need more than a designation as a "high-priority" project to advance critical infrastructure investments. We need a greatly simplified federal permitting and review process, and it should be easier for the private sector to participate in funding and planning infrastructure development.

The president and Congress must work together to advance substantive reform while maintaining protections of our most valuable natural resources. It is absolutely possible to expedite the approval of needed infrastructure while retaining important environmental safeguards.

First, the federal review and approval process under the National Environmental Policy Act (NEPA) should be modified to account for the influx of private capital in public infrastructure projects. There is no longer any practical infrastructure rebuilding scenario in which public works projects are funded solely through public sources, and the president's $1 trillion infrastructure plan relies on substantial private sector investment.

Eric B. Beightel

To promote public-private partnerships, we need a better way to include potential investors in the environmental review process to ensure a project both meets approval and is an attractive investment opportunity. Currently, the NEPA process maintains a firewall between those performing the analysis and those with interest in the outcome in order to preserve objectivity. However, this firewall can prevent critical input from potential investors and can lead to approving projects that must then be modified, triggering additional analysis, increased costs and further delays.

Instead of keeping potential funders at arm's length during the NEPA process, federal agencies should invite their participation in scoping and preliminary design, which would limit the need to revisit issues already considered.

Second, federal agencies must have the resources and expertise necessary to handle projects using design-build and other nontraditional procurement methods. Project delivery mechanisms such as design-build often require conditional approvals based on limited design early in development. Too often, lack of familiarity with the design-build process by agency staff results in unnecessary delays and escalating costs. Design-build will become more prevalent as we continue to seek efficiencies in contracting and construction practices, so our federal partners must be able to support this growth—and not be an obstacle to progress.

Next, we need better collaboration among federal agencies in facilitating project planning, siting and permitting. Confusion among private-sector sponsors about the regulatory process and competing federal approving agencies result in too much delay. Identifying critical resources early in development helps eliminate unnecessary delays due to avoidable conflict or resource impacts. The Fixing America's Surface Transportation (FAST) Act of 2015 took important steps in this regard, but more can be done to strengthen the role of the lead federal agency to define the project and the alternatives considered. Establishing a strong federal lead agency empowered to set parameters will help avoid unnecessary study and review.

Additionally, federal agencies should be able to share their standardized approvals for specific project types ("categorical exclusions" in NEPA parlance) to avoid unnecessary analysis of otherwise routine actions.

A more radical idea: Consolidate certain oversight and permitting responsibilities such as reducing the number of agencies charged with approvals and centralizing the federal government's oversight of planning, reviewing, approving and funding projects. For example, both the Pipeline and Hazardous Materials Safety Administration (PHMSA) and the Federal Energy Regulatory Commission (FERC) have jurisdiction over pipelines, but neither has "ownership." Is it possible to combine the safety and rate oversight functions of PHMSA and FERC in one department? It's an option worth exploring.

These strategies are not a panacea, nor are they exhaustive, but they are a good place to start. They also avoid some pitfalls of other proposed approaches such as establishing hard deadlines or delegating all authority to the states.

The environmental review process takes time because there are hard decisions to make. We cannot rush those decisions, but we can make it easier to avoid situations where *every* decision is difficult. Ultimately, we can strengthen the role the private sector plays in environmental planning while ensuring positive outcomes for communities and the environment. ■

Eric B. Beightel *is associate director of the federal environmental policy practice at WSP USA. He advises the firm's clients regarding the federal environmental review and approval processes related to the development of large infrastructure projects. He was previously a senior environmental policy advisor in the Office of the Secretary, U.S. Department of Transportation.*

Private Equity: Steadily Transforming the Industry

BY MICK MORRISSEY

It's no surprise we are seeing more and more interest in this industry from private equity (PE).

At the end of 2016, the PE industry had a record $2.49 trillion in assets, and 319 new firms launched in 2016 alone. According to The Boston Consulting Group, innovators of the Growth-Share Matrix, Experience Curve and Advantage Matrix, PE now has nearly $900 billion in dry powder; and global savings from pension, mutual and sovereign funds. Additionally, capital from other financial institutions and insurance firms will likely continue to flow in. PE firms are outperforming public equities, fixed income and real estate.

The PE investments that tend to get all of the attention and turn the most heads are those that involve the brand names in *Engineering News Record's Top 500* such as:

- In March 2017, publicly traded industry leader and ACEC member **TRC Cos.** (Lowell, Mass.) entered into a definitive agreement with **New Mountain Capital** (New York) to become a private firm.
- In 2015, employee-owned global engineering and infrastructure player and ACEC member **CH2M** (Englewood, Colo.) secured a $300 million investment from **Apollo Global Management, LLC** (New York).
- Also in 2015, **Bernhard Capital Partners** (Baton Rouge, La.) led the group that acquired 1,350-employee environmental consulting, industrial hygiene and geotechnical engineering firm **ATC Associates** (Lafayette, La.) from Australia's publicly traded **Cardno**, an ACEC member. Bernhard Capital Partners has since gone on to make many more investments in environmental, energy and engineering firms.
- In 2013, **DC Capital Partners** (Alexandria, Va.) acquired publicly traded and ACEC member **Michael Baker Corp.** (Pittsburgh) through its affiliate **Integrated Mission Solutions** and rebranded the firm as **Michael Baker International**.

But PE is also busy playing an increased role in recapitalizing smaller engineering firms, with some recent examples including:

- Earlier this year, **Bow River Capital Partners** (Denver) along with co-investors, acquired controlling ownership interests in the 300-person engineering, project, program and construction management firm **RailPros** (Irvine, Calif.).
- In January 2016, **Keystone Capital** (Chicago) announced its investment in and partnership with a 140-employee, construction management, professional engineering and construction inspection firm **Target Engineering Group** (Coral Gables, Fla.). Keystone Capital is also active in the architectural space with its 2015 investment in and partnership with designer **MorrisSwitzer Environments for Health** (Williston, Vt.) and its rebranding of subsequent acquisitions as **Environments for Health Architecture (E4H)**.
- Also in 2016, **Yenni Capital** (New York) acquired MEP design firm **Steven Feller P.E., LLC** (Fort Lauderdale, Fla.).

We see more and more PE firms looking to either enter our industry for the first time or grow their current position in the industry. There are two primary drivers:

- First, PE recognizes that many firms in our industry are underperforming brands. Their existing employee ownership capital models and management teams are unable to generate sustainable high performance. PE is able to step into those situations and align capitalization, leadership and management to generate greater returns.
- Second, in an industry where employees are increasingly either unwilling or unable to make the capital investments required to internally transition ownership from one generation to the next, PE provides a viable alternative to continuity of the firm.

RECENT ACEC DEAL-MAKERS

MARCH

ACEC member **COWI** (Lyngby, Denmark) acquired **Projektbryan** (Stockholm), a company specializing in project management services. The acquisition strengthens COWI's competencies in management of large, complex urbanization projects and adds 100 employees to COWI's growing presence in Stockholm.

ACEC member **EnSafe, Inc.** (Memphis, Tenn.), a global provider of environmental, engineering, health and safety and technology services, acquired the **Environmental Services Practice** of **E2 ManageTech** (Long Beach, Calif.). The acquisition allows EnSafe to provide localized expertise in Southern California and South Texas.

Structural and civil engineering firm **JQ** (Dallas) acquired ACEC member **Baldauf Herrin & Associates, Inc. (BHA)** (Dallas), a structural engineering firm. The acquisition of BHA, whose clients are concentrated in federal and corporate markets, supports JQ's strategic growth efforts in those markets.

International engineering, architecture, planning and construction firm **Pond & Co.** (Norcross, Ga.) acquired **Landmark Engineering** (Jacksonville, Fla.), a firm specializing in highway

and structure design. Landmark Engineering's founder and president, Nina Sickler, will lead Pond's Florida operations. Both firms involved in the deal are ACEC members.

Wood Group (Aberdeen, U.K.), an international energy services firm, acquired ACEC member **Amec Foster Wheeler** (London) in an all-stock takeover deal worth approximately $2.7 billion. The combined firms have enhanced capabilities diversified across oil and gas, chemicals, renewables, environment and infrastructure and mining sectors.

ACEC member **IMEG Corp.** (Rock Island, Ill.) merged with **Taylor RyMar Corp. (TRC)** (Tempe, Ariz.), a provider of vertical engineering and energy services. IMEG Corp. adds 50 professionals to its staff in the Southwest region, as TRC will now operate under the IMEG Corp. name.

ACEC member **Arcadis** (Amsterdam) acquired planning and development practice **Brooke Smith Planning** (Birmingham, U.K.). Founder Louise Brooke-Smith will lead Arcadis' planning capabilities across the U.K.

FEBRUARY

CB&I (The Woodlands, Texas), an ACEC member, entered into a definitive agreement to sell its Capital Services business to an affiliate of private equity firm **Veritas Capital** (New York) for $755 million in cash. The strategic move is part of CB&I's efforts to optimize its balance sheet.

ACEC member **POWER Engineers, Inc.**, (Hailey, Idaho) and **Sega, Inc.**, (Overland Park, Kan.) have entered into a letter of intent for POWER to acquire Sega. The acquisition adds Sega's focus on power plant and electrical distribution engineering services as well as the firm's 130 employees to POWER's profile.

DLR Group (Minneapolis), an ACEC member, acquired **Studio Hive** (Minneapolis), an interior design firm. The deal will bring Studio Hive's 14 employees into DLR's Minneapolis office.

ACEC member **christopher consultants, ltd.** (Fairfax, Va.), a civil engineering, land planning, surveying and landscape architecture firm, acquired civil engineering, surveying and land planning firm **Paciulli, Simmons & Associates, Ltd. (PSA)** (Leesburg, Va.). PSA's leadership team will remain in place for what will become a wholly owned subsidiary of christopher consultants.

Global design firm **Mott MacDonald** (Croydon, U.K.), an ACEC member, acquired Genoa, Italy-based engineering and design consultancy **Wideurope Engineering Italy**. The acquisition of the 50-person firm offers Mott MacDonald new scope, allowing the firm to work closely with the global energy sector.

ACEC member **GHD** (Sydney), an engineering, environmental, and construction services company, merged with **Omni-Means, Ltd.** (Roseville, Calif.), a transportation-focused engineering firm. The addition of Omni-Means' 60-person staff adds to GHD's capacity in the Western U.S.

JANUARY

ACEC member **Jacobs Engineering Group** (Dallas) acquired **Aquenta Consulting** (Brisbane, Australia), a leading provider of integrated project services to public and private sector clients. Jacobs acquired the 220-person business from ACEC member **Amec Foster Wheeler**; the terms of the deal were not disclosed.

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.

A group of investors including **Bow River Capital Partners** (Denver), Aberdeen Asset Management (Aberdeen, U.K.), Brooke Private Equity Associates (Boston) and an undisclosed family office acquired a controlling interest in ACEC member **RailPros** (Irvine, Calif.). RailPros is a comprehensive provider of outsourced services to the freight, transit and commuter rail industries.

ACEC member **Harley Ellis Devereaux** (Southfield, Mich.) acquired **Deems Lewis McKinley** (San Francisco), a provider of architecture and engineering services for educational facilities. The acquisition gives HED further service diversification and expands the firm geographically.

ACEC member **O'Brien & Gere (OBG)** (Syracuse, N.Y.) acquired **Natural Resource Technology** (Milwaukee), an environmental engineering and consulting firm with offices in Wisconsin, Illinois and Michigan. The acquisition supports OBG's focus on the remediation of complex sites for the energy utilities, industrial and federal markets.

ACEC member **Gannett Fleming** (Camp Hill, Pa.) acquired **LDP Group** (Chicago), an electrical engineering design consulting firm. The addition of LDP's nearly 40 employees expands Gannett Fleming's power delivery services in the Midwest.

ACEC member **CHA Consulting, Inc.**, (Albany, N.Y.) acquired an interest in **American Fire Protection, Inc.** (Birmingham, Ala.), a leader in custom design, engineering, installation and maintenance of fire protection systems. CHA is anticipating growth in the fire protection systems market.

DECEMBER 2016

ACEC member **Westwood Professional Services** (Eden Prairie, Minn.), an engineering and surveying firm, acquired civil engineering firm **Coursen-Koehler Engineering & Associates** (San Antonio). The acquisition expands Westwood's land development operations in Texas as the acquired firm will now operate as Coursen-Koehler Engineering & Associates, a division of Westwood. ■

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

On the Move

Amsterdam, Netherlands-based **Arcadis** named **Peter Oosterveer** global CEO. Oosterveer previously served as COO of the Fluor Corp. He will be based in The Netherlands. Highlands Ranch, Colorado-based Arcadis appointed **Alex Rothchild** president of the company's environmental sector in North America. He is based at the firm's Braintree, Massachusetts office.

Swaminathan (Vasan) Srinivasan has been named president of Olathe, Kansas-based **Terracon Consultants, Inc. David Gaboury**, who has served as president since 1997, will continue as chairman and CEO. Srinivasan, who previously served as COO, is based at the firm's headquarters.

Alberto Villaman was appointed president of New York City-based **HAKS**. Villaman joined the company in 2000 and recently served as executive vice president and head of its construction inspection department.

Christopher J. Griffith has been promoted to COO of Sparks, Maryland-based **KCI Technologies Inc.** He formerly served as executive vice president. He is a past director of ACEC/Maryland and is based at the firm's headquarters.

Los Angeles, California-based **AECOM** announced the following appointments: **Paul Praylo** has been named COO of its construction services business division. He previously led the division's finance and administration. He is based in the firm's New York City office. **Carolyn Flowers** has been appointed senior vice president and head of the company's transit practice in North America. Flowers, who formerly served as acting administrator in the U.S. Department of Transportation's Federal Transit Administration, is based at the firm's Los Angeles office.

Elese Roger has joined Pittsburgh, Pennsylvania-based **Michael Baker International** as executive vice president and chief information officer. She previously served as vice president of technology services for SC3. **Leanna Anderson** has joined the company as executive vice president and chief communications officer. She formerly served as vice president of marketing, corporate communications and sales for ServiceLink. Roger and Anderson are based at the firm's headquarters. **Bonnie D. Shepherd** has been promoted to executive vice president and chief practice officer. She is based in the firm's Baltimore office. **Alfred Murillo** joined the company as vice president and office executive, and will manage the San Antonio, Texas office and support various transportation infrastructure projects. Murillo is a board member and president-elect of the San Antonio Chapter of ACEC/Texas.

Louis Armstrong has been named executive vice president and west division director at San Diego, California-based **Kleinfelder**. Armstrong will oversee all firm operations throughout the Western United States and be based at the firm's headquarters.

New York-based **WSP USA** named **Andres Ruiz** CFO of its Latin America region. He is based in Bogota, Colombia and formerly served as an investor relations officer for Avianca Holdings S.A. **Elia Nunez** has been named an assistant vice president in the firm's Miami office and will be responsible for managing capital improvement planning for transit agencies and public works departments.


Peter Oosterveer


Alex Rothchild


Swaminathan (Vasan) Srinivasan


Alberto Villaman


Christopher J. Griffith


Paul Praylo


Carolyn Flowers


Elese Roger


Leanna Anderson


Bonnie D. Shepard


Alfred Murillo


Louis Armstrong

Ed Pasewicz has joined Hollywood, Florida-based **NV5 Global, Inc.** as chief information officer. From 2006 to 2013, he served as director of information systems and database and development leader of Bureau Veritas. He is based at the firm's headquarters.

Glenn W. Suitor has joined Concord, California-based **Harris & Associates** as division president of program + construction management. Suitor formerly served as senior vice president at WSP USA's construction services west. He is based at the firm's headquarters.

Watertown, Massachusetts-based **VHB** announced the appointment of **Mike McArdle** to chief development officer and **Bill Ashworth** to COO. McArdle, who will be responsible for overseeing the strategic growth of VHB's markets and services, is based in the firm's New York City office. Ashworth will be responsible for executing and implementing VHB's regional and office operations, and is based in the firm's headquarters.

Morristown, New Jersey-based **Louis Berger** named **Adelle Elia** chief integrity officer, succeeding **Tom Nicastro**, who is stepping down as chief compliance and ethics officer after 15 years with the company; he will remain a senior advisor. Elia is based in the Washington, D.C. office. **Sofia Berger** was promoted to senior vice president for U.S. transportation. She formerly served as the managing director for Latin America and the Caribbean and is based in the firm's New York City office.

Kansas City, Missouri-based **HNTB Corp.** announced that **Peter Gertler** rejoined the company as a senior vice president in a corporate and national strategic business development role. Gertler previously worked at HNTB from 2004 to 2014 as senior vice president of rail and transit services. Prior to re-joining HNTB, he served as vice president, strategic consulting for HDR. He is based in Oakland, California. **Liam Dalton** joined the company as vice president of the Northeast division and as design-build project director. He is based in the New York City office. **Gordon Clark** joined the company as vice president and technical director - tunnels and complex underground structures. He is based at the firm's Bellevue, Washington office.

Sam Tinsley has joined New York, New York-based **Thornton Tomasetti** as a senior vice president in the structural engineering practice. He will be based in the firm's Boston office. Tinsley formerly served as a staff consultant at Simpson, Gumpertz and Heger. **Richard J. Vivenzio** has rejoined the firm as a senior vice president, and will support the property loss consulting and forensics practices in the U.S. East Region. Vivenzio, who previously served as a vice president with the firm from 2011 to 2014, will be based in the New York City office.

New York-based **STV** appointed **Thomas F. Prendergast** executive vice president and chief strategic officer, who will also serve as principal on major transportation projects. Prendergast recently served as the chairman and CEO of the Metropolitan Transportation Authority in New York City and will be based in the headquarters office. **Randall Hallman** has been promoted to vice president, and will manage the firm's Douglassville, Pennsylvania and Philadelphia offices. He also is the lead electrical engineer for STV's buildings and facilities division's Central Region. **Tyler Bonstead** was named vice president, and currently serves as STV's West Coast deputy regional manager in the transportation and infrastructure division in Los Angeles. **David C. Shearer** has been promoted to vice president. Shearer is the head of the firm's Florida offices and will be based in Jacksonville. He will lead business development and operations of the firm's transportation and infrastructure division throughout the state.


Andres Ruiz


Ed Pasewicz


Glenn W. Suitor


Mike McArdle


Bill Ashworth


Adelle Elia


Sofia Berger


Peter Gertler


Liam Dalton


Gordon Clark


Sam Tinsley


Richard J. Vivenzio

On the Move

Roseann B. Schmid and **Christopher R. Smith** have been promoted to the role of executive vice president at Rochester, New York-based **Fisher Associates**. Schmid is director of transportation and will assume corporate responsibility for the human resources, IT and finance departments. Smith will oversee all marketing and business development initiatives, in addition to his role in the renewable energy sector. They are both based in the Rochester office.

Pasadena, California-based **Parsons** appointed **Doug Dreyer** as executive vice president of business development for its federal business unit. **Wendy Van Wickle** joined the company as executive vice president for the logistics and training division in its federal business unit. Dryer and Van Wickle are based in the Centreville, Virginia office. **Joseph J. Cudney** has been appointed senior vice president, international, for its federal business unit. He will be responsible for international business development activities, including United States government international efforts, foreign military sales and direct commercial sales. **Sunnie House** has joined the company as vice president and western regional transit and rail manager for the United States. She is based in the firm's San Diego office. **David Strong** has joined the company as vice president and rail systems lead for the New York and New Jersey region. **Rajendra Navalurkar** has joined the firm as vice president and program director for complex bridge and tunnel design. Both Strong and Navalurkar are based in the New York City office.

Tallahassee, Florida-based **Genesis** promoted **Kyle Thornton** to senior vice president and **David Fleeman** to associate vice president. Both are based in the firm's Tampa office.

Steven R. Kramer has been named senior vice president–tunnels of Seattle-based **COWI North America**. Prior to joining COWI, Kramer was vice president and director of tunneling for the Americas at AECOM. He is based in the firm's Springfield, New Jersey office.

John Pfisterer has been named a senior vice president at New Hyde Park, New York-based **M&J Engineering, P.C.** Pfisterer formerly served as deputy director of electrical, mechanical and commissioning groups at the MTA Bridges and Tunnels. He is based in the firm's headquarters.


Thomas F. Prendergast


Randall Hallman


Tyler Bonstead


David C. Shearer


Roseann B. Schmid


Christopher R. Smith


Doug Dreyer


Wendy Van Wickle


Joseph J. Cudney


Sunnie House


David Strong


Rajendra Navalurkar


Kyle Thornton


David Fleeman


Steven R. Kramer


John Pfisterer

Welcome New Member Firms

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Amark Engineering & Manufacturing, Inc.
Gravette

ACEC/California
ADVANTEC Consulting Engineers, Inc.
Irvine
Alternative Energy Systems Consulting, Inc.
Carlsbad
Diakont Advanced Technologies, Inc.
San Diego
Hargis + Associates, Inc.
San Diego
John R. Byerly, Inc.
Bloomington
LG2WB Engineers, Inc.
Irvine
Mark Thomas & Co., Inc.
San Jose
Mikhail Ogawa Engineering, Inc.
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Radfall Co.
Saugus
SB&O, Inc.
San Diego
Taylor & Syfan Consulting Engineers, Inc.
San Luis Obispo

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Element Water Consulting, Inc.
Denver
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Carbondale
Illingworth & Rodkin, Inc.
Denver
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Colorado Springs
Roaring Fork Engineering
Carbondale

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Marietta
IDS Global
Powder Springs
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Dallas

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East Peoria
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Brownsburg
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Indianapolis

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Cornerstone Engineering, LLC
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Cross Discipline Engineering, LLC
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Engineering Surveys & Services
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Townsend

ACEC/North Carolina
American Engineering Associates-Southeast, P.A.
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Hughes Engineering, PLLC
Raleigh

ACEC/Ohio
Hull & Associates Inc.
Dublin
Melink Corp.
Milford

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Benchmark Construction Services, LLC
Norman
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Edmond

ACEC/Texas
Adams Surveying Co., LLC
Richardson
TSG Industries
Houston

ACEC/Washington
Transportation Solutions, Inc.
Redmond

ACEC/Wisconsin
TranSmart Technologies, Inc.
Madison

JUNE

6 Retaining Great Marketing Talent in 10 Easy Steps (online class)

13 Emerging Technologies for Engineers (online class)

14 Conversation and Collaboration Win Sales (online class)

20 PowerPoint Simplified! Tools and Tips for Presentations That Bring Results (online class)

21 How to Become a Project Manager (online class)

27 Increase Shareholder Liquidity without an ESOP: The Better Alternative (online class)

28 Taking Stock of the Engineering Industry in 2017—Economic and Market Trends Shaping the Industry (online class)

29 How to Avoid Organizational Amnesia: Transferring Employee Knowledge and Skills Before They Walk Out the Door (online class)

JULY

11 Working Effectively on Multidisciplinary Projects as a Civil Engineer (online class)

12 Negotiating Engineering Contracts for Better Results (online class)

25 Communicating for Decisions: Why Only 20 Percent of Your Company May Understand You (online class)

26 Strategies to Fight Broad Form Indemnification and "Duty to Defend" (online class)

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Leadership Program Class 2 Launched

ACEC LAUNCHES 2017–2018 LEADERSHIP SKILLS PROGRAM

ACEC's newest leadership development program, *Pathways to Executive Leadership*, will launch Class #2 at the ACEC 2017 Fall Conference in Orlando, Florida, Oct. 15–18, 2017.

Designed for promising, up-and-coming, mid-career professionals who are just beginning to lead and think strategically about their practices and careers, this innovative and intensive six-month program focuses on the core skills necessary to think strategically about markets, build effective teams and deliver great service for their clients.

For additional information, visit: **www.programs.acec.org/2017-pathways/**.

HOW ENGINEERS CAN BECOME AN EXCEPTIONAL EXPERT WITNESS

Launched in 2009, the ACEC Expert Witness Program, *Applying Expertise as an Engineering Expert Witness*, has trained hundreds of professional engineers to serve as unbiased expert witnesses in courtroom settings.

The program covers appropriate courtroom behavior, including conduct on the stand when being cross-examined by the opposing attorney, as well as what an expert witness needs to know about tasks and actions outside the courtroom during discovery, depositions and writing reports.

Applying Expertise as an Engineering Expert Witness is for engineers, architects and surveyors interested in taking engagements as experts or as an added client service. The day-and-a-half course is scheduled for June 15–16, 2017 in Boston.

Program and registration information can be found at: **http://bit.do/acec-expert-witness**.

CASE SEMINAR: LESSONS LEARNED IN MANAGING RISK

A proper risk management program can reduce your chances of being sued and allow you to take on more risky projects—which, when handled correctly, can generate substantial profits for your firm.

Developed by the Council of American Structural Engineers, *Lessons Learned in Managing Risk* can help reduce your rate of claims against structural engineering projects, as well as raise the level of quality services provided by all project participants. Firm principals, owners, project managers and risk managers are encouraged to attend.

Register now to help your firm balance risk management and profitability with greater confidence. The seminar is scheduled for Aug. 3–4, 2017, at the DoubleTree by Hilton Hotel Chicago-Magnificent Mile.

To register, go to: **http://bit.do/case-risk-management**. ■

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Clearview Land Design
Georgia Water Services
Gredell Eng Resources (Missouri)
Hayden Consultants
JLB Traffic Engineering (CA)
NEI Electric Power Engineering
Stubbs Engineering
The Ratliff Group (TX)
Zumwalt-Hansen, Inc.

609 Consulting, LLC
68 West Engineering, Inc.
A&R Engineering, Inc.
A. Morton Thomas & Associates, Inc.
ARS Engineers, Inc.
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ACEC of Missouri
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Al-Farooq Corporation
American Council of Engineering Companies
American Engineers, Inc.
American Geotechnics, Inc.
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Anderson and Hastings
Anderson, Eckstein & Westrick, Inc.
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Architectural Engineers, Inc.
Arredondo, Zepeda & Brunz, LLC
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BB&E, LLC
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BJLJ Engineers & Architects
Blackburn Consulting, Inc.
Bladykas Engineering P.C.
Blue Ocean Civil Consulting
Bollinger, Lach & Associates, Inc.
Borton-Lawson Engineering, Inc.
Bowman Engineering & Consultants
BP Consulting Engineers, Inc.
Brandt Engineering, Inc.
Bridge Gap Engineering, LLC
Bridging Solutions, LLC
Brooks Jackson & Little, Inc.
Byce & Associates, Inc.
C. A. Wehsener Engineering, Inc.
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C.T. Male Associates P.C.
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Cameron Engineering & Associates, LLP
CBC Geospatial Consulting, Inc.
Christian-Roge & Associates, Inc.
Christy Cobb, Inc.
Civil Consulting Group
Civil Design Group, Inc.
Civiltech Engineering, Inc.
CK Group, Inc.
Collins Engineers, Inc.
Consolidated Technologies
Core Consultants, Inc.
Credere Associates, LLC
Creegan & D'angelo Consulting Engineers
Crist Engineers, Inc.
Cunningham-Allen
D. Mark Goodwin & Associates
Dahl, Taylor & Associates, Inc.
DCS Engineering, LLC
Design South Professionals, Inc.
Dixon Engineering, Inc.
DJ & A, P.C.
DJG, Inc.
Donohue & Associates, Inc.
Dorman Project Services
Duffield Associates, Inc.
EBL Engineers, LLC
ECI, Inc.
EDI, LTD
EMCS, Inc.
EMK Consultants
Engineering Design Source, Inc.
Engineering Strategies, Inc.
Entellus, Inc.
Environmental Engineering and Technology, Inc.
Erdman Engineering, P.C.
Erdman Anthony Holding Co., Inc.
Excelsis, Inc.
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FK Engineering Associates
Florida Engineering Society, Inc.
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Gausman & Moore Associates, Inc.
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Geodesign, Inc.
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Geotechnology, Inc.
Gervasio & Associates, Inc.
Gestra Engineering, Inc.
Gibson Engineering
Gilsanz Murray Steficek, LLP
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KS Engineers, P.C.
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Lilker Associates
Lin Engineering, LTD
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LSC Transportation Consultants, Inc.
LSW Engineers
Lunsford Associates, LLC
Mathew J. Thompson III, Consulting Engineers, Inc.
Maxon Enterprises
Maxson Engineering
MB Bim Solutions, LLC
McGoodwin, Williams & Yates, Inc.
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Meyer, Meyer, Lacroix & Hixson, LLC
MGA Structural Engineers, Inc.
Midtown Engineers
MK Engineers Group
MKK Consulting Engineers, Inc.
Mohr & Associates, Inc.
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MSA Professional Services, Inc.
Murray, Smith & Associates, Inc.
N-Y Associates, Inc.
Neser, Roomsburg & Workman, P.C.
Neyer, Tiseo & Hindo, LTD
Nishkian & Associates
Nishkian Chamberlain
Nishkian Dean
Nishkian Monks
Nobis Engineering, Inc.
Northwest Hydraulic Consultants, Inc.
OLA Consulting Engineers, P.C.
P.W. Grosser Consulting
Pack Engineering, Inc
Page Engineering Consultants, P.C.
Palanisami & Associates, Inc.
Peoples & Quigley, Inc.
Peters Construction Consultants, Inc.
Pharmer Engineering, LLC
Pickets Engineering, LLC
Pinyon Environmental, Inc.
Ponzer Youngquist, P.A.
Potomac Energy Group, Inc.
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Professional Engineers, Inc.
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Rani Engineering, Inc.
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Shaffer Baucom Engineering
Sidhu Associates
SJB Group, LLC
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