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MARCH/APRIL 2010

THE AWARD-WINNING BUSINESS MAGAZINE

- >> The Case For QBS
- >> Community-Sensitive Transportation Design
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## The Road Back

Strategies to Help Your Business Recover



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**HOW TO SURVIVE THE DOWN ECONOMY**  
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COVER PHOTO: C.J. BURTON

## Looking Forward

**A**CEC has a powerful new tool for our advocacy of Qualifications-Based Selection (QBS). A nationwide university study confirms what we have long asserted: QBS achieves lower construction costs and better project results.

The Council and the American Public Works Association (APWA) commissioned the empirical study, "An Analysis of Issues Pertaining to Qualifications-Based Selection," conducted jointly by the University of Colorado and the Georgia Institute of Technology.

ACEC has argued for decades that selecting the best-qualified design firm leads to better and more cost-effective projects. In 1973, we won passage of The Brooks Act, which enshrined QBS in federal agency procurement policies, and we have since repeatedly defended QBS at the federal, state and local levels.

This study provides a solid, quantitative foundation for our position. A review of the landmark study starts on page 23. For a copy of the full report, go to [www.acec.org/publications](http://www.acec.org/publications).

Also notable in this issue, "The Road Back" (page 8) outlines steps that firms can take to survive—and thrive—through the tail end of the recession.

Beating the recession will be the focus of the upcoming ACEC 2010 Annual Convention and Legislative Summit in Washington, D.C., April 25–28 (pages 12–13). For more information or to register, go to [www.acec.org](http://www.acec.org).

See you at the Annual Convention.



Timothy Psomas  
ACEC Chairman



David A. Raymond  
ACEC President & CEO



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## ACEC Works With USAID on Haiti Relief And Reconstruction Assistance

**A**CEC is assisting the U.S. Agency for International Development (USAID) in its Haiti relief and reconstruction effort by identifying Member Firms offering

to volunteer services in the earthquake-ravaged nation.

In response to an initial solicitation, more than 40 firms have signed up, and their names and capabilities were provided to USAID.

Immediately following the earthquake, ACEC President Dave Raymond contacted USAID Administrator Rajiv Shah to offer the engineering industry's assistance in addressing the island nation's relief and recovery needs.

"Many ACEC Member Firms have called our office in Washington, D.C., volunteering their services, and USAID has asked us to organize these offers and work closely with federal officials," said Raymond.

ACEC also maintains close touch with USAID on developments relating to the commissioning of technical resources for longer term infrastructure rebuilding efforts. ACEC's International Committee has taken the lead on this initiative. For further information, contact Mark Steiner at [msteiner@acec.org](mailto:msteiner@acec.org).



## ACEC Honored In National Media Contest

**A**CEC's *Last Word* earned a Gold Award as the nation's best association newsletter in a competition by *Association TRENDS* magazine, marking the fifth time in six years ACEC has received the top national honor.

ACEC also finished first in the "best manual" category with *Choose Engineering as Your College Major*. Its *Health Insurance Coverage for Engineering and A/E/C Firms* placed second in the "best manual" category, while its *2009 Business Practice Publications for Professionals* won third in the "best catalog" category.

## Engineers Better Than Doctors and Lawyers at Turning Income Into Wealth

**E**ngineers are more successful than doctors and lawyers at transforming income into wealth, according to a new survey by American wealth researcher Thomas Stanley.

The survey, conducted by the University of Georgia Survey Research Institute, was published in *Stop Acting Rich... And Start Living Like a Real Millionaire*. The book is the latest in a series by Stanley that explores the minds and behaviors of the wealthiest Americans. In it, Stanley attributes engineers' wealth-building capacity to a thrifty nature.

"Engineers in general are a frugal group," writes Stanley. "They are less likely to favor expensive status-denoting products and brands than other groups. For many of them, substance, design and endurance are more important factors in selecting a product, even a home, than showy style and status connotations."

Interviews were conducted with more than 1,500 respondents, representing more than 5,000 households from neighborhoods with a high estimated incidence of millionaires, whom Stanley defines as having \$1 million in investments, excluding their homes.

Findings show that:

- Mining and geological engineers ranked No. 1 in percentage of millionaires among the top 200 high-income-producing occupational categories in America.
- Overall, engineers produced about 22 percent more wealth per dollar of realized income than did millionaires in general.
- Engineers who are millionaires tend to live in neighborhoods where the median price of a home is, on average, 12 percent lower than for millionaires in general.
- Wealthy engineers often keep their cars longer (five years, seven months) than millionaires in general (four years, four months). Engineers also pay, on average, 11 percent less for their vehicles than do typical millionaires, the survey found.

According to Internal Revenue Service data, about one in 13 (7.6 percent) of all deceased males in 2004 with a gross estate of \$1 million or more once was an engineer. Yet engineers account for just 2.3 percent of the male working population in this country.

# New Market Opportunities with Wind Power

The U.S. Department of Energy's (DOE's) 2010 *Annual Energy Outlook* reports that although coal, natural gas and nuclear energy will remain the primary sources of U.S. electricity through 2035, their share of the market will decline and renewable energy's share will expand.

Wind power is expected to become a particularly strong player in the nation's overall electric generation mix.

Renewable energy will make up 17 percent of the U.S. electricity market in 2035, compared with 9.1 percent today. (See *Figure 1*.) Wind will fuel that surge and could replace half of the natural gas-generated electricity (which currently has a 21 percent market share) and one-fifth of the coal-fired electricity as soon as 2024.

New energy demand will require new distribution systems and transmission lines throughout the nation at a cost of at least \$93 billion, according to the National Renewable Energy Laboratory. A new "transmission super-highway" would carry electricity from parts of the country with lots of wind to places where demand is highest.

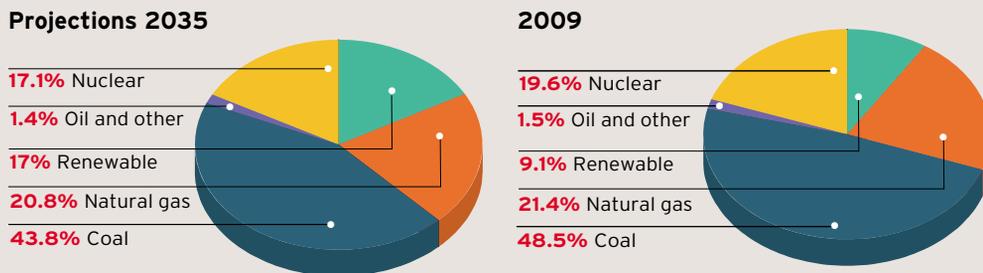
Solar power, which accounts for less than 1 percent of total electric generation, is not expected to build much on its share of the electric market by 2035 (its projected share is just north of 1 percent), as the industry must overcome a lack of infrastructure and accommodate its comparatively expensive installation and usage costs.

Nuclear generation is expected to decline slightly to 17 percent by 2035, from



BOB POOL/GETTY IMAGES

**Figure 1**  
Renewables gain electricity market share; coal share declines



**Table 1** 2008 and Projected 2035 Energy Costs per Unit

(prices in 2008 dollars)

	2008	2035
Crude Oil Import Price (barrel)	\$99.57	\$133.22
Natural Gas (mbtu) at Henry Hub	\$8.86	\$8.88
Coal - average delivered price/mbtu	\$2.16	\$2.13

Source: *Department of Energy's Energy Information Administration*

mbtu = one million British Thermal Units

Note: EIA made no projections in a preliminary 41-page PDF of tables from 2010 *Annual Energy Outlook* for prices of electric power from renewable sources.

Source: *EIA Annual Energy Outlook 2010*

nearly 20 percent today, primarily because no new U.S. nuclear plants are expected to come online before 2020.

Coal-fired electricity's market share also is expected to decline (44 percent in 2035, from 48.5 percent today), as the nation moves toward improved efficiency and cleaner energy sources. Testing of systems to cap-

ture or filter carbon dioxide from burning coal and sequestering it safely away from the atmosphere is still problematic.

Despite these shifts, fossil fuels are still expected to satisfy at least 78 percent of U.S. overall energy demand as far out as the year 2035, according to DOE's Energy Information Administration (EIA).

EIA projections also show that while the cost of crude oil is expected to increase, the costs of coal and natural gas will be nearly identical in 2035. (See *Table 1*.)

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Caption Text

## President's Focus On Jobs, Economy Creates New Openings

**P**resident Obama's recent State of the Union address has refocused his administration's emphasis on economic recovery. Major ACEC priorities in infrastructure investment, energy and tax relief were mentioned as components of a new jobs agenda.

"It was encouraging to hear the president talk about putting more dollars into infrastructure, investing in nuclear power and other issues long supported by the engineering industry," said ACEC President Dave Raymond. "But what remains to be seen—and what ACEC is advocating—are the concrete measures that will enable engineering firms and other businesses to start growing again."

The president also renewed his call on Congress to complete work on a health care reform package. ACEC has advocated a series of measures to control costs, such as medical malpractice reform and interstate competition, which are not yet part of the president's proposed program.

## ACEC Urges Senate to Move Beyond 'Shovel Ready' In New Jobs Bill

As U.S. Senate leaders continue to work on legislation designed to boost job creation, ACEC is leading an industry coalition that calls for strengthening states' ability to pursue more substantive improvement projects in transportation, water, energy and other infrastructure sectors.

The Senate approved the first bill of a multistage jobs agenda, featuring a \$15 billion tax package that includes a payroll tax holiday for certain new hires, an expansion of the popular Build America Bonds program, small business capital expensing, along with a \$19.5 billion infusion into the Highway Trust Fund to support highway and transit programs through the end of the year.

Subsequent Senate bills are expected to include additional investments in infrastructure, energy efficiency programs, small-business tax credits and public services.

The ACEC-led coalition cautioned the Senate to move away from basic maintenance projects and to fund larger infrastructure improvements that will do more to create and sustain jobs.

"States should be given broad flexibility to tackle a wide range of infrastructure projects, with contracting deadlines and funding eligibility that take into account planning, design, procurement and construction," the coalition wrote. "Such programs will engage a broad spectrum of engineers, equipment manufacturers, materials suppliers, contractors and other service providers that will enhance job creation as well as provide America with much-needed modernized infrastructure."



RUTH TOMLINSON/GETTY IMAGES

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## Health Care Outcome Uncertain

The recent election of Sen. Scott Brown (R-Mass.) to fill the seat vacated by the late Sen. Ted Kennedy (D-Mass.) has altered the landscape for enacting major health care reform legislation. Barring any bipartisan agreement, congressional Democrats have limited options. One potential scenario would have the House adopt the Senate-passed health care bill without changes, sending it to the president for his signature. The House and Senate then would approve separate legislation to make changes requested by House Democrats.

The president endorsed this approach and outlined a modified version of the Senate health care package. His plan includes a requirement that individuals purchase health insurance, fines for some employers that do not provide health insurance, the creation of a health insurance exchange where individuals and small businesses can shop for coverage, and insurance reforms. An excise tax on high-cost health plans that would take effect in 2018 and a new Medicare tax on the investment income of high-income taxpayers would help pay for the measure. The proposal also includes a provision to create a federal regulatory board to review proposed health insurance premium increases.

The president's plan does not include key provisions endorsed by ACEC and others in the business community that seek to control cost growth for firms that provide health insurance to their employees. These proposals include medical malpractice reforms to hold down the costs of litigation and defensive medicine, as well as giving individuals and businesses the ability to purchase health insurance products across state lines.

Lacking Republican support, congressional Democrats are evaluating next steps, including the use of parliamentary procedures normally reserved for budget issues, to pass a health care bill. ACEC will continue working with leaders from both parties to build support for key reforms backed by the Council as negotiations proceed in the coming weeks.

## ACEC Opposes Legislation That Would Open Door to Frivolous Lawsuits

Two bills recently proposed in Congress could shatter vital safeguards against frivolous lawsuits. ACEC has initiated a grassroots campaign to oppose the bills and is working with industry allies to prevent such legislation from advancing.

The two pieces of legislation—H.R. 4115 and S. 1504—would overturn two U.S. Supreme Court decisions: *Ashcroft v. Iqbal* and *Bell Atlantic Corp. v. Twombly*. In each, the Court ruled that plaintiffs should not be able to bring a lawsuit in federal court if there is no plausible basis for their claims.

ACEC has raised concerns that eliminating the “plausibility” threshold would open the floodgates to baseless lawsuits, increase litigation costs for large and small businesses and divert resources from job creation and investment.

“The success of our effort is critical to protecting engineering firms and others from frivolous lawsuits,” said ACEC President Dave Raymond. Raymond urged ACEC members to visit the ACEC website ([www.acec.org](http://www.acec.org)) to download a sample letter they can send to House and Senate offices in opposition to this legislation.

ISSUES ON THE MOVE	WHAT'S NEXT
Senate Jobs Bills	Votes in late February and March
Health Care Reform	Possible action in March
Frivolous Lawsuit Legislation	Grassroots campaign initiated to oppose legislation

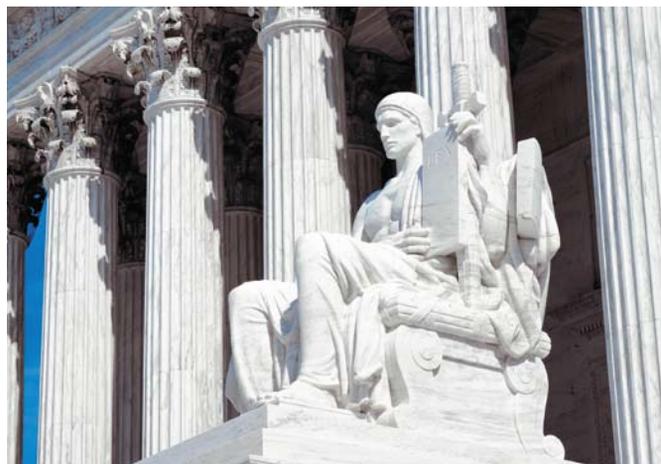
## High Court Case Opens Door To Corporate Funding of Election Ads

The U.S. Supreme Court ruled in January that corporations have the same right to engage in independent political speech as individuals.

The case, *Citizens United v. Federal Election Commission*, has a number of major ramifications on how corporations can spend money to influence federal elections. The decision permits corporations to make unlimited independent expenditures to advocate the election or defeat of specific federal candidates. The case also is noteworthy for the restrictions that it keeps intact. For example:

- The ban on corporate and union contributions to candidates and political parties is still in effect. Corporate donations still cannot be made directly to a federal candidate or a federal political party committee.
- Corporations still cannot coordinate their campaign spending with a candidate, political party committee, or their agents.
- Federal law governing the operation of PACs remains unchanged.
- State and local campaign finance laws in connection with contributions to state and local candidates must, at present, continue to be followed.

While ACEC's ability to engage in political races through its political action committee—ACEC/PAC—is unchanged by the court ruling, the decision does open the option for the Council to use corporate resources to engage in races at the national level in the future.



## For More News

For weekly legislative news, visit ACEC's *Last Word* online at [www.acec.org](http://www.acec.org).

# The Road Back

By Alan Joch



## Strategies to help your

### Takeaways

- » Though the recession has ended, analysts project 2010 to be a rough year for engineering firms, in large part to tight spending, higher competition and declining project backlogs.
- » Firms can stay competitive by maintaining relationships with existing and potential clients and being judicious about the projects and work they choose to pursue.
- » It is good to be optimistic. But firms also need to stay grounded and maintain a healthy balance with current economic realities.

**C**onventional wisdom says that the longer and deeper the recession, the faster and sharper the upturn. Unfortunately, one would be hard-pressed to find many engineers willing to bet even odds on conventional wisdom these days.

Though 2009 resulted in historic economic challenges for many engineering companies, some firms proved adept at dodging the struggles, thanks in large part to projects already in the pipeline. "Our billings and margins were up last year over the previous year," notes Ted Richards, CEO of Strand Associates, which has 11 offices nationwide and specializes in water/wastewater facilities and other public works projects. >>

business recover



# Survival Skills

**Hot Markets:** 2010 may be a good time to shore up business development activities in energy (especially power transmission and renewable energy), water and wastewater treatment, high-speed rail, oil and gas and any state or local project funded by fees, not taxes.

**Plan Ahead:** Develop a contingency plan now for the coming year and include strategies for addressing a variety of downturn scenarios from bad to worse.

**Cut Expenses Prudently, Part 1:** Dialing back on unnecessary travel is a no-brainer. However, travel to maintain close ties with top clients should never be considered “unnecessary” during a time of heightened competition.

**Cut Expenses Prudently, Part 2:** Reduced training budgets might unintentionally hint to staff members that a firm no longer plans to invest in their future. Such doubts make star performers vulnerable to talent poachers.

**Optimize Staffing:** Redistribute personnel among divisions to account for variations in demand. This will help avoid layoffs while ensuring that customers get the best talent available for their projects.

**Don't Forget Inflation:** Rising costs might seem like a distant threat, but mounting federal deficits and cheap money could change that quickly. Protect profits by including escalation clauses in long-term contracts.

But Richards and other industry leaders are well aware of the realities and know any good fortune enjoyed in 2009 isn't likely to carry through 2010, where the hazards of a gasping economy await. Across the nation, project backlogs have run dry and state budgets are awash in red ink. Compounding matters, federal stimulus funds have provided little in the way of sustained relief.

According to a survey conducted late last year by the Washington, D.C.-based Transportation Construction Coalition (TCC), nearly two-thirds of 571 nationwide transportation contractors reported that they had to lay off permanent employees during the year because of adverse business conditions.

The U.S. Bureau of Labor Statistics reports that the A/E industry lost roughly

than 20 percent in 2009 compared to 2008. (See *Figure 2*.)

Despite further projected U.S. construction spending declines in 2010, many industry observers carry hope that the dismal economic pattern might yet improve as the midterm elections near. Bill Siegel, CEO of San Diego-based Kleinfelder, says funds for new projects could materialize by summer, as candidates aim to create some political goodwill among voters along the campaign trail.

Still, he says, the uptick probably won't be enough to overcome widening deficits in state and local budgets. “States are going to have to cut spending, and infrastructure will be one of the areas that get cut first,” he says.

Even with recovery, few expect a complete return to the “boom” years that led up to the recession when engineering firms had more than enough work to go around. “Let's be honest, it was a pretty easy ride for the industry,” says Rod Hoffman, CEO of S&H Consulting, a business management group based in Cold Spring, Ky. So easy, he says, that as a result, “some firms lost their competitive edge.”

Getting that “edge” back today could be the difference between survival and failure.

“If you are waiting for things to come back to some dependable workload on a day-in-and-day-out basis, you are going to be waiting a long time,” says Kleinfelder's Siegel.

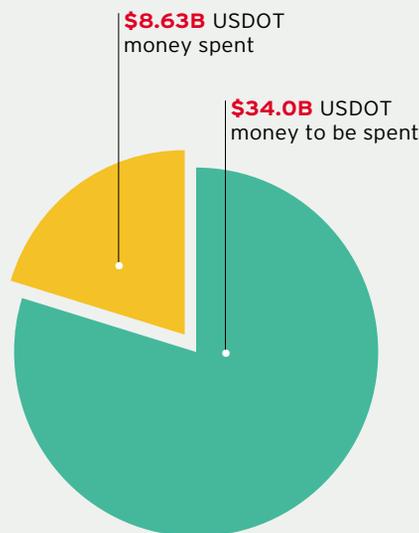
## Customer Is King

The day's economic realities have forced many firms to rethink their business development plans. One strategy: Keep your prospects close and your existing customers closer.

“Engineering firms will need strong client relationships to weather the competition when five new firms show up at a single customer,” says Gerry Salontai, principal at Salontai Consulting Group in Rancho Santa Fe, Calif.

Strengthening ties with top customers means staying in touch, even when clients don't have open RFPs. “We are much more focused on understanding the whole market, where our clients fit in and what pressures they are feeling,” Siegel says. “When things turn around, those customers are going to remember

**Figure 1**  
Money to Spend



The U.S. Department of Transportation has thus far doled out just south of \$9 billion for stimulus projects, with another \$34 billion still in the pipeline.

Source: [www.recovery.gov](http://www.recovery.gov)

95,000 jobs between December 2008 and December 2009. Compounding matters, the American Recovery and Reinvestment Act still has yet to provide the shot of adrenaline that many—especially the engineering industry—had hoped for. (See *Figure 1*.) Only a relatively small fraction of funds was earmarked for infrastructure projects, and much of that remains in the bureaucratic pipeline.

According to the U.S. Department of Commerce, spending for private commercial construction projects plunged more

who stuck with them when times were tough.”

But not every potential client rates star treatment. In an era of heightened competition, some firms are also now more selective about the clients they work with. Firms have to weigh the costs invested in pursuing a contract against a job's long-term profit potential. There also are liability and legal issues to consider. “We actually are trying to cut down our number of clients so we can focus on those that are truly meaningful to us,” Siegel explains.

To stay competitive in this environment, firms also must become much more proactive—for instance, helping customers find funding to pay for projects. Industry consultant Kyle Davy recommends that firms establish collaborative relationships with project owners and builders. The goal: to become more skillful at financing, so they can bring their own capital to the bargaining table.

“Why should firms be stuck in a traditional business model of selling technical services by the hour when they can move to a position that allows them to be rewarded more as entrepreneurs?” he asks.

It often comes down to pooling resources. That's what Virginia-based Dewberry did when members of its GPS mapping staff determined that a local agency and several federal agencies would benefit from updated GPS mapping in one of its market areas.

“By themselves, each of these organizations was unable to fund the project. But we knew that if we could pool their money, we could get the job done,” explains CEO Ronald Ewing. Dewberry took a similar approach to a climate change project



**“If you are waiting for things to come back to some dependable workload on a day-in-and-day-out basis, you are going to be waiting a long time.”**

BILL SIEGEL  
KLEINFELDER

maintain a wait-and-see attitude.”

Though projects might be slow in coming during 2010, the next several months could represent a real boom for firms in search of new talent, young and old.

“There are professionals today who have never been available in the market, including those thirtysomething engineers who are very good project managers,” Hoffman says. “One or two of these types of people in a midsize organization can make a huge difference.” Recent retirees

whose depleted retirement accounts have forced them back into the workforce are another potential source of talent.

On the other hand, firms should be diligent about keeping the employees they have. “We're locking the door and not letting anybody out,” jokes Dewberry's Ewing.

Other industry watchers see the potential for growth fueled by acquisitions in the months ahead.

“We are going to be pretty active in that area,” says Kleinfelder's Siegel; his firm recently finalized one acqui-

sition and reached preliminary terms on another.

### New Opportunities

Similar to Wall Street wizard Warren Buffett, who buys when everyone is selling, many in the industry have adopted a contrarian view of 2010's grim economic forecast. “If you believe all the pundits that the economy is going to get worse, you'll put yourself in a cautionary mindset that will cause you to sit on your hands during times like these,” S&H's Hoffman says. “There are huge opportunities to take market share if you don't

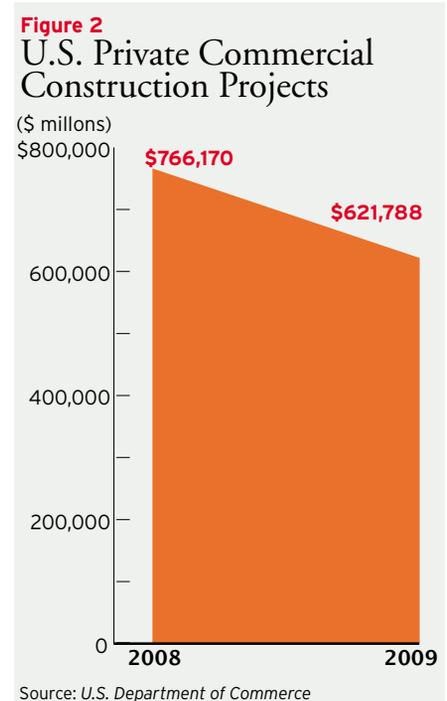
sition and reached preliminary terms on another.

Siegel considers three criteria when scouting an acquisition candidate: A firm must increase Kleinfelder's share of a target market, expand its service capabilities and extend its geographic presence.

Strand, meanwhile, is on the lookout for attractive domestic acquisitions, although Richards says he's cautious about moving too quickly. “Everyone is wondering when we are going to come out of the recession. The last thing you want to do is acquire somebody and then start to trim staff.”

### Healthy Balance

Though an upbeat attitude is an asset during tough economic times, there is such a thing as a healthy balance, says Ewing.



Just because your firm wins a major contract does not mean it's free and clear. “People think if we can just get this project, we won't have to worry. It will solve our problems,” he says. But too much optimism can be dangerous, especially if it distracts managers from dealing with economic challenges.

“You need to be realistic,” Ewing says. “You need to make sure your organization is sustainable and survives for those people who are still there.” ■

*Alan Joch is a business and technology writer based in Franchestown, N.H.*



**“The last thing you want to do is acquire somebody and then start to trim staff.”**

TED RICHARDS  
STRAND ASSOCIATES



## ACEC's Annual Convention and Legislative Summit

April 25-28, 2010  
Grand Hyatt,  
Washington, D.C.

# Engineering

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The *Capitol Steps*—the nationally famous satirical troupe of current and former Congressional staffers—returns to the Annual Convention for a hilarious, over-the-top performance on our national political scene.

## OPENING GENERAL SESSION

### THE STATE OF THE ECONOMY GREG IP

MONDAY, APRIL 26

The U.S. economics editor for *The Economist* will forecast the economy and recovery prospects.



## GENERAL SESSION

### ENGINEERING CEOs LOOK AHEAD MONDAY, APRIL 26

Leaders of top firms will discuss market challenges. Speakers include Len Rodman, Chairman, President and CEO, Black & Veatch; Robert Uhler, Chairman and CEO, MWH Global; and George Pierson, CEO, Parsons Brinckerhoff.



Len Rodman



Robert Uhler



George Pierson

## KEYNOTE LUNCHEON AND DEBATE THE CHANGING POLITICAL CLIMATE PAT BUCHANAN vs. ELEANOR CLIFT MONDAY, APRIL 26

Two of the nation's most renowned political observers—Pat Buchanan, analyst for MSNBC, and Eleanor Clift, contributing editor for *Newsweek*—will debate from opposite political perspectives where the nation should be headed.



LAWRENCE JACKSON/AP PHOTO

## LOBBYING AND FEDERAL BUSINESS OPPORTUNITIES SEMINARS

- Lobby Congress on Water, Transportation, Tax, Energy and other Key Issues
- Federal Officials Discuss New Markets
- Business Opportunities with U.S. Army Corps of Engineers, GSA, NAVFAC, NASA and the U.S. Veterans Administration

## TOP-TIER BUSINESS SESSIONS

- 25 Educational Seminars on Surviving a Tough Economy
- CEO Roundtables
- Hot Topics include: Green Building Design, New Business Development Techniques, New Federal Opportunities, Impact of BIM and Virtual Design on Your Business

## ENGINEERING EXCELLENCE AWARDS GALA

### EMMY AWARD-WINNING HOST ROSS SHAFER TUESDAY, APRIL 27

Known as the “Academy Awards” of the engineering industry, the annual black-tie reception, dinner and awards program honors the year's most outstanding engineering achievements.



## CYBER-ENGINEERING DINNER AND WORKSHOP SPONSORED BY BENTLEY SYSTEMS

TUESDAY, APRIL 27 AND  
WEDNESDAY, APRIL 28

Chief information officers from four of the *ENR* Top 500 design firms will discuss important IT management strategies in a Bentley Systems-sponsored workshop. Topics include:

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New philosophy

Shoreline Drive,  
Santa Barbara, Calif.

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Putting  
Transportation

● By Samuel Greengard

# Design in Context

makes 'divisive' roadway projects  
more community-sensitive

## Takeaways

- Some two dozen state and several local agencies nationwide have adopted Context Sensitive Solutions (CSS).
- CSS incorporates feedback from community members, neighborhood associations and other stakeholders to create buy-in for controversial infrastructure projects.
- There is no template or checklist for CSS. Every project is different, and it's important to tailor an initiative to the specific circumstances of various communities.

**F**or years, transportation planners considered a tired stretch of Dallas roadway known as Northwest Highway untouchable. The crumbling artery was a veritable mish-mash of outdated engineering methods and designs, and was incapable of keeping pace with evolving transportation requirements. Ongoing development in the region subjected its roads to regular flooding, while several previous attempts to fix the highway had failed. >>

## The Six Essential Elements of CSS

The Minnesota DOT offers these six key principles of CSS and CSD:

- » Balance safety, mobility, community and environmental goals in all projects;
- » Involve the public and affected agencies early and continuously;
- » Use an interdisciplinary team tailored to project needs;
- » Apply flexibility inherent in design standards;
- » Address all modes of travel; and
- » Incorporate aesthetics as an integral part of good design.

That's when the Texas Department of Transportation (TxDOT) turned to a process known as Context Sensitive Solutions (CSS). Working with various constituencies, including community groups, TxDOT developed a plan for modernizing and rebuilding bridges, reconfiguring low-lying sections of roadway and integrating new hiking and bike trails that run parallel to traffic.

"People were passionate about their neighborhoods," explains James Frye, associate vice president at HNTB Corporation, a Dallas-based engineering firm that worked on the project. "The ability to incorporate their ideas went a long way toward achieving success."

Across the country, CSS—also called Context Sensitive Design (CSD)—is gaining traction. Some two dozen states and several local transportation agencies have adopted the concept. And experts say those numbers are growing.

What separates CSS from other infrastructure design methods is its philosophy. Where more dated concepts stressed such factors as timeliness and efficiency, often at the expense of aesthetics and community buy-in, CSS approaches the design and engineering of infrastructure in a holistic fashion, incorporating input from citizens, neighborhood associations

and other agencies, toward a more balanced solution. Most important, it aims to maintain that balance through the project's entire lifecycle.

"CSS is a more comprehensive methodology," explains David Taylor, national director for sustainable transportation solutions at HDR Engineering, Inc., in Omaha, Neb. "It provides a way to build projects that are a good fit for a community."

### Driving Results

As more engineering firms adopt CSS, the national landscape is changing. Not unlike Northwest Highway in Dallas, troubled projects—once mired in frustration and bureaucratic morass—are moving again.

Before CSS, the Shelby Farms Parkway in Memphis, a proposed 1.8-mile stretch of roadway through a 4,500-acre urban park, sat untouched for more than 30 years. Public opposition and disagreements over the scope of the project made it impossible to move forward.

In 2004, the Tennessee Department of Transportation (TDOT) introduced a CSS-based approach to the project. Soon plans were moving again.

Several groups worked with the metropolitan planning organization to study travel demand and examine how various scenarios would impact traffic flow at different

times of the day, particularly during peak travel hours. Engineers employed simulations and visualizations to better understand the project and keep constituents informed. They also examined similar projects and gleaned best practices. In February 2006, TDOT presented a final design recommendation with four 12-foot traffic lanes and provisions for walkers, runners and bicyclists. The \$20 million project is slated for completion in 2014.

CSS also is making inroads in Washington State. State Route 20, which runs



**"CSS is a more comprehensive methodology. It provides a way to build projects that are a good fit for a community."**

DAVID TAYLOR  
HDR ENGINEERING, INC.

through Deception Pass State Park, had a long-suffering history of collisions and traffic mishaps, with some vehicles careening off the road.

One of the main sources of trouble was a 1930s-era stretch of guardrail. The structure employed stone masonry bollards to hold its long metal protective rail in place. Though the design fell short of modern engineering and safety standards, Washington State Department of Transportation's (WSDOT's) Dave Olson explains, "it was a sticking point for the Park Service because they wanted to retain the character of the park."

Working with community members, engineers and others, WSDOT eventually settled on a modern guardrail system that met NCHRP 350 standards—FHWA safety criteria for traffic control devices—yet fit the character of the park. A plastic composite gives the new system the appearance of wood logs, which are mounted in front of the stone barriers. One of the first such installations in the nation, Olson calls it a "textbook" example of how CSS can shape a project and create a better outcome.

### Designs on Progress

It wasn't always this way. Half a century ago, transportation planners designed and built highways with a primary goal in mind: moving traffic from Point A to Point B.

Officials frequently relied on eminent domain laws to clear a path for infrastructure projects. They often paid scant attention to aesthetics, landscaping, the needs of cyclists and pedestrians, environmental impact or other potentially serious social implications. Minimizing upfront project expenses drove the process; everything else was an afterthought.

"A project would wind up 60 percent or 70 percent complete, and the public would find out about the plan and object to certain elements of it," says David Linderman, vice president at Palmer Engineering Company in Winchester, Ky. As a result, agencies sometimes faced strong opposition, lawsuits and protracted legal skirmishes. "In some cases, the planners would have to



**"These are things that good planners and good engineers have been doing for many years."**

JERRY STUMP  
WILBUR SMITH ASSOCIATES



Members of the Shelby Farms Parkway Resource Team meet to discuss implications of a proposed 1.8-mile roadway through an urban park in Memphis.

go back and completely redesign things,” he says.

Though this holistic approach to project planning is relatively new, “the principles revolving around CSS have been around for quite a while,” explains ACEC Chairman-elect Jerry Stump, COO and executive vice president at Wilbur Smith Associates (WSA) in Columbia, S.C. “These are things that good planners and good engineers have been doing for many years. Now, a growing number of agencies are looking to formalize the CSS process.”

Typically, a lead agency manages the CSS process and builds a framework for public input. Various groups and teams—usually composed of political leaders, homeowners’ groups, activists, environmentalists and community organizations—provide input and ideas at different stages throughout the process.

“The goal is to build consensus through cooperation,” says Jeff Mize, project manager and head of roadway design for the mid-south region at WSA. “It isn’t about pitting groups against each other. It’s all about monitoring issues and concerns and balancing sometimes conflicting goals.”

There’s no template or checklist for CSS. Every project is different, and it’s important to tailor an initiative to the specific circumstances and needs of various stakeholders. One project might examine how to integrate a bike path, pedestrian walkway or

light rail with a bridge; another might focus on improving access to local businesses by managing traffic flow and maximizing on-street parking. How engineers and designers approach the project is dependent upon the circumstances.

Mize makes it clear that “it’s not always possible to please everyone.” But, more often than not, “discussing all the issues and engaging in a dialogue alleviates concerns, because different groups wind up understanding issues and problems much better.”

### The Road to Results

Still, not everyone is sold on the merits of CSS. The perception among engineers who haven’t yet bought into the concept is that excessive negotiations and compromises often add unnecessary time and expense to a project. And there is some truth to that. Upfront meetings, discussions and surveys require additional time and effort, which often means higher costs.

Proponents of the CSS approach say additional upfront expenses often can be recouped on the back end, especially if extra effort helps the project run more smoothly from start to finish.

“There is nothing gained in the long run if you push forward quickly and wind up with something that unravels or doesn’t meet specific needs,” says WSDOT’s Olson. Others, such as WSA’s Mize, say

CSS actually shortens and simplifies projects by reducing the risk of lawsuits and costly redesigns.

The CSS process is becoming more sophisticated all the time. As engineers learn to use the technique effectively, they’re incorporating a broader array of elements, including environmental expenses, total project lifecycle costs, how a project impacts overall transportation patterns and the economic and social impact on the community. With CSS, “it ultimately becomes a focus on livability and community viability, rather than only a highway or road,” explains HDR’s Taylor.

Others believe CSS has applications beyond transportation, and that those involved with large public projects—museums, parks and public buildings, to name a few—should consider employing similar methods.

“Ultimately, the more a project can integrate into the environment and the community, the better off everyone is,” says WSA’s Stump. “CSS and CSD are valuable tools that can shape a project so that it more closely matches the needs of a community. It’s a significant step forward in transportation project design.” ■

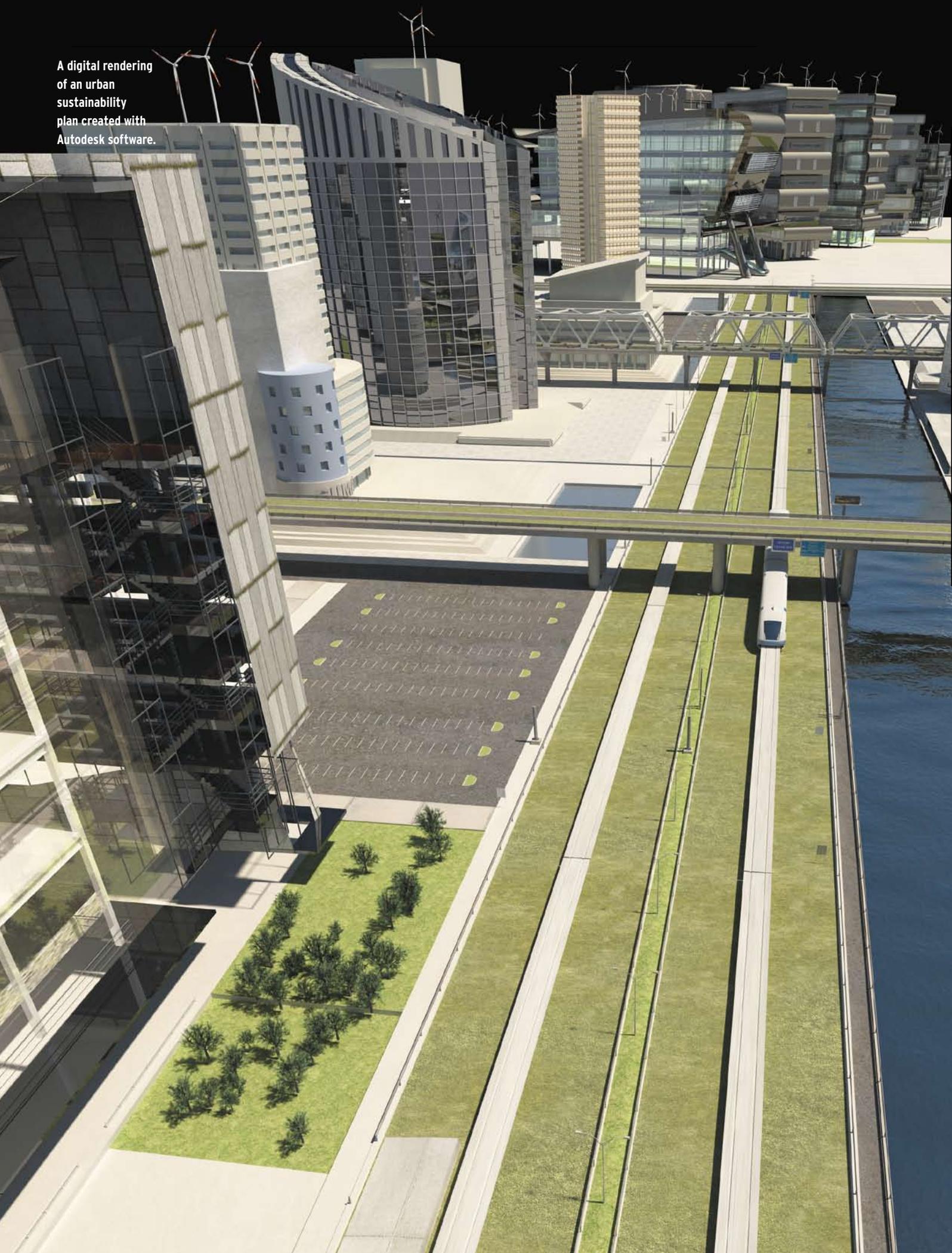
*Samuel Greengard is a business and technology writer based in West Linn, Ore.*



A national dialog about Context Sensitive Solutions (CSS) was held in February in Charlotte, N.C. For more on that event, and to see videos, discussions and other items from past CSS events, visit

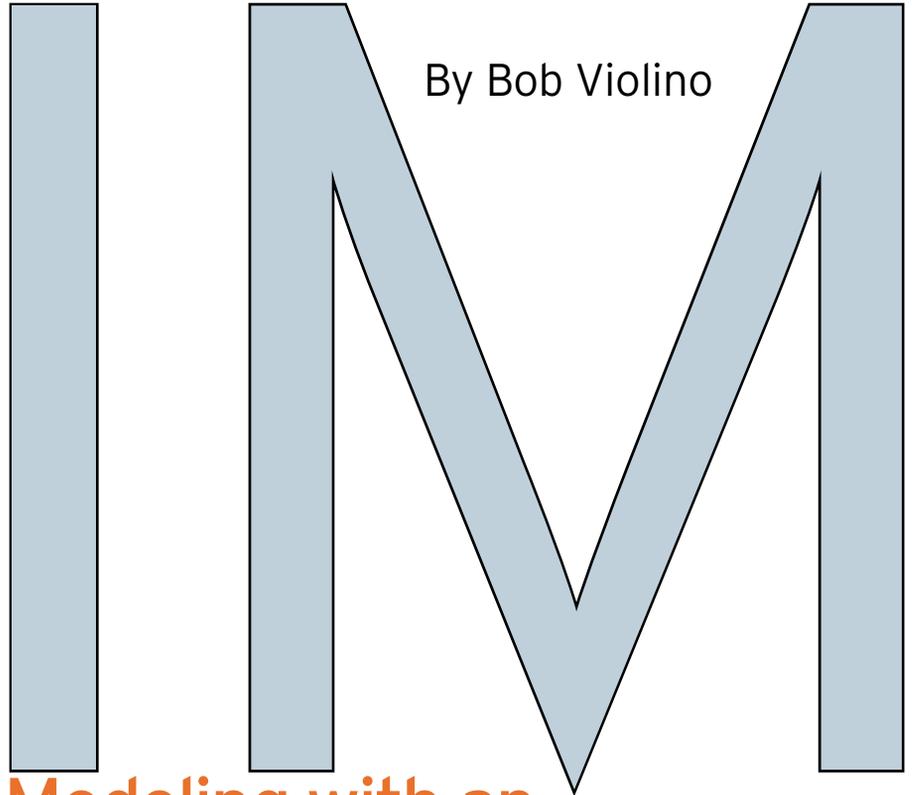
[www.contextsensitivesolutions.org](http://www.contextsensitivesolutions.org).

A digital rendering of an urban sustainability plan created with Autodesk software.



# Sustainable

By Bob Violino



## Modeling with an environmental conscience

**T**wo major trends are revolutionizing the design industry: the emergence of Building Information Modeling (BIM) as a tool to integrate sustainable strategies in engineering design, and the move toward more socially and environmentally responsible engineering practices.

Industry experts say these developments together will likely have a long-term impact on how firms plan and complete projects into the future. The upshot: potentially more efficient and cost-effective designs that contribute to greener buildings and infrastructure.

BIM already has made an undeniable mark on the design industry; the practice has enabled new forms of collaboration using models created from consistent, reliable design data, including automated document coordination, 3D systems coordination and virtual building simulation. Potential benefits include faster decision-making, better documentation and quicker, more economical project delivery.

Now, the practice is creating new opportunities for sustainability.

A 2009 report by McGraw-Hill Construction that surveyed more than 2,200 industry professionals in North America, shows that nearly 50 percent of the industry has adopted BIM. What's more, the survey says, practitioners plan to increase their use of BIM, and the vast majority report benefits directly attributable to the technology.

## Takeaways

- » BIM technologies are allowing engineers to incorporate sustainable design practices that can reduce a project's carbon footprint over its full lifecycle.
- » Research shows that nearly 50 percent of North American A/E firms have adopted some form of BIM in design practices.
- » As BIM gains popularity, many firms also are aiming to be more socially and environmentally responsible, and they believe the technology can help.

Experts say the deployment of BIM and further enhancements in collaboration will allow for better exchange of information over the lifecycle of a facility by all stakeholders involved: owners, architects, engineers, contractors and operators.

The U.S. government is a major driver of BIM adoption. The General Services Administration (GSA) created the National 3D-4D BIM Program, designed to allow for advanced and more cost-effective management of federal buildings and facilities. GSA has more than 35 projects currently employing BIM, and the agency has mandated that every new facility and major modification project deploy a BIM model for spatial validation.

To illustrate the true capabilities of BIM, “we chose a wide array of ongoing projects where BIM technology might provide a benefit,” says Charles Matta, director of



**“Building a model and making it a highly realistic model helped us engage stakeholders and understand their requirements.”**

MIKE WILLIAMS  
PB

strategic programs and professional resources at GSA.

“From the renovation of a historic courthouse in Oregon that required seismic base isolation underpinning of the entire masonry load-bearing structure, to a security upgrade at a federal building in New York City, each BIM case study investigation illustrated how 3D modeling could solve project-level problems and save time and significant amounts of money,” Matta says.

Most important to GSA in these studies was the realization that BIM could benefit several building types—new and old—across the entire lifecycle of planning, design, construction and facility

management and operations.

Although efforts have been under way since 2003—GSA funds about 20 BIM projects a year—the federal BIM initiative is just now bearing fruit.

Key benefits thus far include improved

coordination of construction documents resulting in the detection of design errors and omissions and the avoidance of costly and time-consuming change orders in the field; faster and more accurate as-built data of existing buildings; and, in at least one project, a 19 percent reduction in construction duration using 4D phasing techniques.

Matta says GSA’s commitment to BIM has emboldened several owners—public and private, from the U.S. Army Corps of Engineers to the U.S. Department of State—to follow the agency’s lead in adopting BIM projects.

The latest BIM advancements might soon increase the role energy modeling plays in design and building operations, leading to a reduction in energy consumption by GSA buildings. “Current pilot projects compare BIM-based energy modeling methods and results to more traditional energy modeling practices, and explore opportunities to use BIM to support facilities management,” Matta explains.

#### Firms Buy In

“The relationship between virtual design and construction and the model-based approach and sustainable design is strong,”



A BIM rendering of a school project created with Bentley software.

says Mike Williams, senior vice president and CIO at New York-based PB (formerly Parsons Brinckerhoff).

PB relies heavily on BIM and virtual modeling for its sustainable design projects. Take, for example, the Alaskan Way Viaduct and Seawall Replacement Program in Seattle. When state and local officials decided to replace the seismically vulnerable downtown viaduct and seawall, they turned to PB, which employed BIM tools to “support the decision-making process and help facilitate a consensus solution that provided sustainable value and benefit to the people of Seattle,” explains Williams.

By modeling the entire lifecycle of the project, including design, engineering and construction, PB engineers were able to analyze a host of environmental factors, including traffic patterns and density, noise levels and carbon emissions. The model was a major factor in the city’s decision to rebuild the viaduct and seawall in the area.

Says Williams, “Building a model and making it a highly realistic model helped us engage stakeholders and understand their requirements.”

Syracuse, N.Y.-based C&S Engineers Inc. is another firm that recently has embraced BIM for sustainability projects.

“Our BIM tools allow us to right-size a building,” says John Trimble, president and chief operating officer at C&S. “By creating a very exact, virtual model of a project, we are able to design the most efficient building footprint and envelope.”

By modeling not only the architectural and structural features, but also the mechanical, electrical and plumbing components, C&S is able to establish exact building dimensions. “This reduces initial building materials, thereby saving resources, and reduces ongoing operational costs by not heating and cooling unneeded space,” says Trimble.

BIM also allows the firm to create graphic-based energy models. Such models account for the impact of geographic orientation and day lighting and contribute to the analysis of mechanical and electrical energy usage. “Performing this analysis through the graphic model enables us to explore different scenarios and go through an iterative process to optimize design,” Trimble says.

The firm recently leveraged BIM for just such a purpose during work on a new Military Entrance Processing Station for the

U.S. Army Corps of Engineers in upstate New York.

A BIM model of the entire project helped C&S engineers right-size the steel structure and attic space to accommodate mechanical, electrical and plumbing (MEP) components; develop an energy model for the project; eliminate trade-to-trade conflicts during construction, thereby decreasing waste and rework; and provide the Corps with true-to-life virtual walkthroughs of the project.

about prescriptive-based results. Owners are asking for outcome-based requirements as well, such as zero carbon footprint or zero water footprint,” Bennett says. “It’s not that architects and engineers don’t comply with standards. But they want to make sure they’re designing with a very light footprint on the environment.”

Sustainability is a highly interactive process, Bennett says; it requires that designers try different approaches and tweak designs



### A Social Conscience

As BIM gains popularity, many firms also are aiming to be more socially and environmentally responsible, and they believe the technology can help.

Since the mid-1990s, there’s been growing awareness about energy costs, finite natural resources and other environmental concerns, all of which have made sustainability a focal point of design and construction.

“In the past, engineering and architectural projects were very prescriptive-based, where you had a set of building codes and engineering standards and city regulations and you followed these set requirements and rules,” says Terry Bennett, senior industry manager for civil engineering and heavy construction at the AEC Solutions Division of Autodesk Inc., a BIM software provider.

“In the last few years, as sustainability has come more to the forefront, it’s not just

multiple times. “It’s very hard and expensive to rehash paper plans,” he says. “That’s where the power of modeling comes in. Designers can run a model to see if the design meets with preconceived expectations, and they can reprocess the model quickly if it does not and try another alternative.”

BIM enables the collaboration that’s necessary when working toward sustainability. “The engineer and the architect can see on the desktop how their designs work together and complement each other’s approach from a sustainability standpoint, rather than compete against each other,” Bennett says. “The model shows you how changes will impact the overall scope of the project and other design professionals.”

The industry trend toward BIM adoption is important for green technology

A BIM model of a tunnel cross-section, part of PB’s work on the Alaskan Way Viaduct and Seawall Replacement project in Seattle.



**“By creating a very exact, virtual model of a project, we are able to design the most efficient building footprint and envelope.”**

JOHN TRIMBLE  
C&S ENGINEERS INC.

companies to understand and incorporate into their market strategies, says Brian Moura, global product marketing manager at BIM software provider Bentley Systems, Inc.

“Rapidly growing worldwide demand for high performance buildings means the ability to accurately predict energy consumption, CO<sup>2</sup> emissions, operating costs and occupant comfort

is now critical to the success of projects ranging from the small and simple to the very large and highly complex,” Moura says. “The adoption of BIM gives stakeholders a way to work collaboratively on performance issues throughout the design lifecycle. It also means architects, MEP and building services engineers, and energy assessors need the right tools to effectively and productively design, analyze and simulate building energy systems.”

The industry slowly embraced BIM and sustainability. Firms were well entrenched in older design methods—and change was not easy.

“BIM brings the project team together much earlier, much the same way Design/Build brought engineers and contractors together at the onset, unlike the traditional design-bid-build process,” says Moura.

What’s more, existing computing technology needs to advance to the point where modeling tools could be used optimally on regular desktop computers.

“Four or five years ago, most firms were still focused on drafting as the final output,” Bennett says. “Now there are better tools for visualization and simulation, and we’re starting to see a transition where they’re switching more to modeling tools.”

Desktop computing power that didn’t exist even a few years ago—coupled with higher network bandwidth—enables firms to share large files as part of the collaborative development needed for sustainability.

Early industry adoption of BIM also proved difficult because of interoperability issues between the technology’s two primary software providers—Bentley and Autodesk. To address these issues, the companies agreed to expand interoperability between their portfolios of architectural, engineering and construction software.

Hurdles still exist to greater industry-wide adoption of BIM. Perhaps the biggest challenge is changing people’s perception, Bennett says. “For the last 100 years, we’ve focused engineering design on delivering a set of plans that allows contractors to con-

struct” a building or piece of infrastructure.

Slow start notwithstanding, the growing adoption of BIM and the increased focus on sustainability are profoundly changing the way facilities are designed, constructed and operated.

“We’re going to see people rethink how to approach projects from the beginning to make infrastructure more sustainable and resilient as a desired outcome,” says Bennett. “But it takes time.” ■

*Bob Violino is a business and technology writer based in Massapequa Park, N.Y.*



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# The Case for

# QBS

Study determines **Qualifications-Based Selection** offers better cost and higher-quality construction than 'lowest bid'

By Gerry Donohue

## Takeaways

- » National survey indicates QBS often results in lower construction costs, higher-quality construction and better overall results than other procurement methods.
- » The industry average for construction cost growth is about 10 percent. On projects employing QBS for design procurement, construction cost growth averaged just 3 percent, the study says.
- » Study results demonstrated that 94 percent of design firms and 93 percent of project owners had a high or very high perception of the success of QBS-based projects.

Qualifications-Based Selection (QBS) and procurement procedures that stress technical acumen over simple project costs (as in lowest-bid procurement) often result in lower construction costs, better overall results and higher customer satisfaction, says a new nationwide survey.

The landmark QBS survey, dubbed "An Analysis of Issues Pertaining to Qualifications-Based Selection," lends statistical relevance to a long-standing industry view that QBS procurement, though typically more involved upfront, actually can save firms money, boost their reputations in the business community and make clients happier in the long run. »»

“From a scientific perspective, the comprehensive and quantitative research found that QBS procurement has substantive advantages on projects,” says Paul Chinowsky, associate professor in the

Department of Civil, Environmental and Architectural Engineering at the University of Colorado and one of the authors of the report. “Engineering firms can use this data to bolster their case to owners that QBS is

the appropriate method for contracting design.”

The research was conducted by Chinowsky and Gordon Kingsley, associate professor at Georgia Tech’s School of Public Policy, both noted experts in the construction field, and was sponsored by ACEC and the American Public Works Association (APWA).

Under QBS, A/E firms compete for design contracts on the basis of experience and technical expertise, not simply on cost. After evaluating and short-listing firms as a result of their qualifications, project owners negotiate a fair and reasonable price with the top-ranked firm. If the parties cannot agree on a price—which researchers say rarely happens—the owner begins negotiations with the second-ranked firm. The end result: the selection of the most technically qualified firm for a given project, at a price that fits the owner’s budget.

“QBS incorporates multiple criteria developed by the owner for the selection of professional services, with particular importance placed on the experience of a firm in addressing similar projects,” explains Kingsley. “A single variable, such as cost, would not automatically eliminate a firm from consideration, as in low-bid procurement. This multiple-variable outlook is the basis of the argument that QBS ensures a well-rounded competitive process.”

### **Brooks Act Placed Value on Experience**

ACEC was a major force behind the 1972 passage of the Brooks Act, which mandated that federal agencies must use QBS in procuring engineering and architectural services for public projects. Since then, most states and many municipalities have adopted procurement laws based on the federal statute.

Though design services make up only a small fraction of the total cost of a project, the Brooks Act holds that design has a disproportionately large impact on safety, function, performance, constructability and lifecycle costs—all of which contribute to final product performance.

Says Chinowsky, “while the benefits of QBS have been an abstract belief for a long time, there was never any quantitative confirmation.”

This study was commissioned to fill that void. Chinowsky and Kingsley solicited information on nearly 200 public and



**“On critical measures, such as construction cost and schedule growth, QBS-based projects consistently have results that are superior to national averages.”**

GORDON KINGSLEY, GEORGIA TECH

MARTIN BARRAID/GETTY IMAGES

private construction projects throughout the nation. Projects included transportation, water, commercial and industrial efforts in a range of prices and sizes.

The study compared various procurement methods, including QBS, best value, lowest bid and sole source, and a range of other factors, such as total project cost, projected lifecycle cost, construction schedule and project quality outcome.

In-depth interviews were conducted with select firms and owners addressing 10 key areas: project demographics, cost, schedule, project risk, design complexity, project complexity, social factors, trust, transaction costs and performance.

### Lower Cost, Superior Performance

Eighteen months of research yielded clear and consistent results.

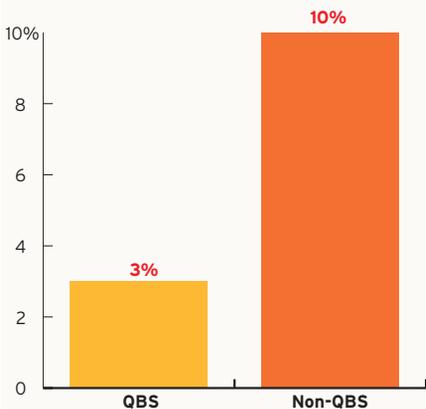
"QBS has a positive correlation with successful projects," says Kingsley. "On critical measures, such as construction cost and schedule growth, QBS-based projects consistently have results that are superior to national averages."

That superiority was evident in the area where QBS is most often criticized: cost.

Researchers identified a remarkable consistency among QBS projects: most demonstrated fewer change orders and stayed on budget during construction. The industry average for construction cost growth, which the study defines as the total cost of change orders as a percentage of the final construction cost, is about 10 percent. On projects employing QBS for design procurement, construction cost growth averaged just 3 percent. (See *Figure 1*.)

Figure 1

### Construction Cost Growth



Source: *An Analysis of Issues Pertaining to Qualifications-Based Selection, 2009*

Among the projects in the study, those employing QBS had a median design fee of 10 percent, while the median fee for non-QBS projects was 8 percent. "Projects wherein QBS is used to procure design tend to be marginally more expensive," says Chinowsky, who adds, "But you more than make up for it in terms of real cost savings."

"Since the design component of a project is just a small fraction of the overall project cost, the use of low-bid procurement at this critical early stage would undercut the effort to obtain the most successful design solution," says ACEC President Dave Raymond, "especially as projects become more advanced and apply a higher degree of importance for public safety or economic return."

Results show that QBS-based projects also better limit construction schedule growth. The national average is 10 percent; QBS projects in the study demonstrated average construction schedule growth of 8.7 percent. Sixty percent of the QBS projects in the study reported construction schedule growth of 3 percent or less.

These numbers are especially relevant, given that study participants identified cost and schedule growth as the two highest-risk elements within a project, researchers say.

Study results demonstrated that 94 percent of design firms and 93 percent of project owners had a high or very high perception of the success of QBS-based projects.

Respondents indicated that QBS has led to stronger relationships between owners and designers than non-QBS projects. "The owners have built a bond with the firms because of their qualifications," adds Chinowsky.

Another key finding: the ability of QBS procurement to protect a design firm's intellectual property rights. When providing a statement of qualifications in response to the QBS application process, competing firms are not



**"Engineering firms can use this data to bolster their case to owners that QBS is the appropriate method for contracting design."**

PAUL CHINOWSKY  
UNIVERSITY OF COLORADO

required to disclose proposed solutions to demonstrate their relevant expertise and experience.

"Because the process uses a 'Request for Qualifications' model and not a 'Request for Proposals' model, engineering firms that responded to the study were not worried about giving up their good ideas until the choice of the most qualified firm for the project had been made," says Chinowsky.

### Dispelling Myths

This study effectively rebuffs criticisms of QBS procurement by opponents of QBS who assert that low-bid procurement should be the key determinant in contracting.

The study also takes exception to the view that engineering services have become little more than a commodity with the use of standardized designs for vertical structures, such as schools, and horizontal projects, such as roads and pipelines.

The research found it was not "low-bid" designed projects, but rather projects procured by QBS that produced lower overall costs. On the topic of the commoditization of engineering, researchers say that the opposite actually is the case.

"The deteriorating infrastructure within the United States, together with the changing requirements for new infrastructure, establishes an even greater demand on contracting officers than previously encountered," says Kingsley. "The increasing number of factors that design firms must address—on behalf of beleaguered owners striving for sustainable infrastructure solutions—reinforces the need for Qualifications-Based Selection." ■

*Gerry Donohue is ACEC's senior communications writer.*

To obtain a digital download or hard copy of "An Analysis of Issues Pertaining to Qualifications-Based Selection," go to [www.acec.org/publications](http://www.acec.org/publications).

# Guest Column

By T. Wayne Owens

## AASHTO Uniform Audit & Accounting Guide: New Solutions for an Old Problem

Updating the American Association of State Highway and Transportation Officials' (AASHTO) new *Uniform Audit & Accounting Guide* took two years to finalize and required much time and effort from the AASHTO Task Force and ACEC.

Calling the *Audit Guide* an update or a guide probably is unfair. This new version contains more meaningful information and clearly defines what should be included in an overhead rate. In addition, it recognizes that staffing issues at state DOT audit agencies result in more reliance on external CPAs. Plus, standard forms have been created to help build trust between states and create more consistency in reporting for consultants.

The Federal Highway Administration (FHWA) plans to issue a rulemaking, which will incorporate this document into regulation by reference and make it authoritative, meaning all of the guidelines as they apply to federally funded projects must be followed.

The guide is effective after Dec. 31, 2009, and all states have agreed to drop individual policies in favor of a uniform standard. Any departure from the guide must comply with state.

### Cognizance at Last

Consultants who contract with multiple states spend considerable time trying to comply with the various "interpretations of the Federal Acquisition Regulation (FAR)" and other limitations established by various states. Firms that have presented a cognizant letter have been forced to modify their overhead rates to comply with unique state requirements. Indiana, for example, can handle only one rate, forcing firms to contract on a blended rate as opposed to, say, their home office rate. Such practices have resulted in as much as a 50-point drop in the overhead rate. Other states have salary limitations (caps are illegal), and cognizant rates have been modified for "excess compensation" or "unallowable bonuses."

The problem of multiple rates is not simply one of lost time. Firms in cognizant states with policy limitations have been forced to use artificially low overhead rates, thus putting them in the position of having a lower profit than firms from non-policy states.

Starting this year, the guide will become authoritative, and states must comply or risk losing federal highway funds. FHWA will monitor state compliance and provide guidance where necessary.

### Reasonable Compensation Defined

Labor and benefits are the single largest items of overhead and represent the greatest risk to the government. Unlike other

costs, there is no single piece of documentation that supports the allowance of this cost. In addition, executive compensation represents the greatest risk, since the owners typically are the executives. For the purposes of overhead, "executives" are defined as the five highest compensated individuals, plus 2 percent shareholders and family members of this group.

Under prior guidance, firms enjoyed significant flexibility

in their compensation policies—so much so that it was not unusual for firms to achieve the 75th percentile in allowable compensation. Compensation levels of firms that earned a majority of revenues from commercial clients were set by the market. The only limitation to allowable compensation was the Benchmark Compensation Amount, the highest amount firms can charge to a government contract. With the new guide, these presumed levels of compensation no longer are available. To achieve maximum allowable compensation, firms must use a combination written compensation policy and a written bonus plan.

The written compensation policy must include an analysis of the compensation structure. Practically speaking, standardized job titles must be used along with three surveys to establish a base compensation for all executives. Although a lower compensation level could be established and the difference made up in bonuses, there is a risk of the bonus plan being unallowable, thus the firm would have much lower compensation.

Scrutiny of bonus plans has increased with the new guide. Plans must be written and cover an entire group or class of employee with a reasonable, justifiable basis. A reasonable exclusion would be non-exempt employees who receive premium overtime, which compensates them for extra efforts. Care should be taken to develop bonus plans that eliminate the possibility that such plans are seen as a distribution of profits. This can happen if the only participants in the plan are owners. Even if the bonus percentages do not match the ownership, a DOT could successfully challenge these efforts.

The guide recommends the development of a compensation matrix by FHWA that can be used to determine reasonable-



T. Wayne Owens

**"Starting this year, the guide will become authoritative, and states must comply or risk losing federal highway funds."**

ness. This matrix will be based on survey medians and will be updated annually. The significance of the matrix is that it limits compensation if a firm does not conduct its own compensation analysis. This is because the median (midpoint) can be as much as 20 percent lower than the mean (average). This is useful for firms that do not expect to achieve high levels of compensation by eliminating some unnecessary work.

An important point to remember is that the government cannot tell a firm what its compensation policy is, only what it is willing to reimburse. If flexibility in compensation structure is important for a firm, then that should be the driver, but it must be weighed against the level of government work and the overall profit picture.

## Accounting Systems

There has been a great deal of flexibility among states when dealing with small firms. States have allowed noncompliant accounting practices and estimated overhead rates. The new guide, however, eliminates this flexibility. All government contractors, regardless of size, must have a functioning job cost system under general ledger control using the accrual basis of accounting.

## Overhead Audits

The guide is consistent with CPA professional standards and addresses many of the problems to blame for poor-quality audits. The starting point is the selection of a CPA firm. To perform an overhead audit, a firm must be proficient in three areas: the FARs, the cost systems and business practices of an engineering firm, and compliance auditing for a government contract. The starting point for this knowledge is the *Audit Guide*; however, a thorough understanding of these three areas is necessary. It is up to the consultant to understand the selection criteria and to choose based on qualifications as determined by an interview process.

## Conclusion

It has been a long road, but the new AASHTO *Uniform Audit & Accounting Guide* is complete and is a very workable document. AASHTO, FHWA, ACEC and AICPA all had input into the guide, and the finished product reflects the dedication of these groups. Consultants now must apply this same commitment to government contracting processes. Consultants must understand their responsibilities and manage their policies, procedures and decisions. Over time, this will result in a business that is more proactive in its management and will enhance bottom-line profits. ■

*T. Wayne Owens is a CPA with Deemer Dana & Froehle, a accounting firm with offices in Atlanta and Savannah, Ga. He also is a member of the ACEC Transportation Committee.*

## Uniform Audit and Accounting Guide Seminar Downloads Available

All four recent online seminars regarding the new AASHTO *Uniform Audit and Accounting Guide* are available for purchase and download on-demand through the ACEC Bookstore at [www.acec.org/publications](http://www.acec.org/publications).

Available on-demand downloads include:

- *New State DOT Compensation and Audit Rules That Will Affect Your Bottom Line*
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### Why Connecting Is Job No. 1 in Business Development; The First Engineering Expert Witness

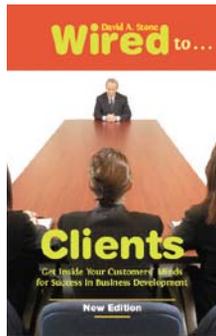
**business development**, n: The proactive cultivation of a personal, trust-based relationship between individuals who have interest and motivation to do business together.

According to the new ACEC Press book, *Wired to... Clients*, by David A. Stone, establishing a personal, one-to-one relationship with clients is vital. At the end of the day, the only thing the client has to go on is when you look him in the eye, shake his hand and say, "I'm going to look after you," writes Stone—to which the client can say, "I know you, I believe you. I trust you. I've got confidence that you will look after me."

Confidence does not come from a brochure or a written proposal, but from a trust-based relationship between two individuals, explains Stone: "It comes because that client knows and trusts, at a personal level, the individual who looks him in the eye and makes that promise. Now, after he has signed the document and made that commitment, he can go home and go to sleep at night knowing, in the pit of his stomach, that things are going to be just fine."

His point: Connecting with clients on a technical level via proposal or presentation is not enough. Failure to connect on a personal and emotional level through business development efforts lessens the chance that you'll win the job.

Learn vital techniques to connect with your customers in *Wired to... Clients* by David A. Stone. Go to [www.acec.org/publications](http://www.acec.org/publications) to order your copy today.



#### The First Engineering Expert Witness

The earliest known use of an expert witness in a legal case occurred in England in 1782. The case involved the silting up of a harbor in the Norfolk area north of London.

The court accepted evidence from John Smeaton (1724–1792), a leading civil engineer often regarded as the father of civil engineering and founder of Great Britain's Institute of Civil Engineering.

The decision to accept Smeaton's evidence on littoral silt still is widely cited in England as the root of modern rules on expert testimony. Today, expert witness work is a vital part of any court proceeding that requires technical expertise.

ACEC now offers a detailed expert witness course that qualifies engineers, architects and surveyors for recognition as expert witnesses. ACEC's next Expert Witness course will be offered in Denver, June 10–11. To participate in this new content-rich program, visit [www.acec.org/education](http://www.acec.org/education).

#### Interpretation of Indemnification— Watchword and Warning

Engineers are being asked (and are sometimes required) with increasing frequency to sign contracts that indemnify their clients (and sometimes others) against any losses potentially suffered during a project.

Depending on the wording, a contract can be so broad as to require indemnification against losses, whether attributed to an engineer's design or not. Such an approach should be viewed as an attempt by an owner to impose, through a contract, more liability on an engineer than the law would impose, even when an engineer has adhered to the professional standard of care.

Where parties to a contract are concerned, one universal goal is a successful project with no claims. The best way to achieve project success, according to Chicago attorney Justin Weissburg, is to "keep specific risks in the hands of those in the best position to control those risks."

Standard contracts sold and promoted by ACEC provide recognition by the engineer of their responsibilities as a licensed professional. Though most engineering firms condemn the practice of indemnification, ACEC contracts provide language that can be used if indemnification is needed to satisfy the client.

Two elements are involved in handling indemnification. One is negotiating with the client about such matters; the other is agreeing upon appropriate language. Both approaches are discussed as part of the upcoming ACEC Contracts and Negotiations course, which covers negotiating controversial language and comparing indemnification and other language in the various standard contracts frequently used by engineers.

The course, which assists professionals in understanding and applying important legal principles related to engineering contracts, is scheduled for May 20–21 in San Francisco and features James Brown of Malcolm Pirnie as lead faculty. To view the course brochure and register online, go to [www.acec.org/education](http://www.acec.org/education). ■

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# Members in the News

## Mergers & Acquisitions



C.K. Satyapriya

**C**TL Engineering, the Columbus, Ohio-based engineering and consulting firm, has acquired **Industrial Communications and Sound (ICS)**, a 30-person Cincinnati-based firm specializing in audio-visual and security systems solutions and professional customer support. “By providing a variety of services under one roof, clients will see less time spent looking for alternative vendors and establishing contracts,” said CTL Engineering President and CEO C.K. Satyapriya.

**S**TV has acquired **Civil Structures, Inc.**, a Dallas-based bridge and highway design firm. The new group, called **STV/Civil Structures**,



Dominick M. Servedio

will continue to operate in the Dallas/Fort Worth Metroplex and will become part of STV’s Transportation & Infrastructure Division.

“This acquisition allows STV to continue its expansion of services in Texas, particularly in the Dallas/Fort Worth area,” said Dominick M. Servedio, STV chairman and CEO. “Texas is the second-largest state in the country, and it is facing the problems that come along with an aging infrastructure. With this strategic acquisition, STV is even more prepared to help Texas meet its needs.”

**K**ansas City-based **TranSystems Corp.** recently acquired Louisville, Ky.-based **Aegis Security Design**, a 16-person firm that provides professional consulting services, including risk and vulnerability assessments, security program development and security systems design.

Brian Larson, CEO and chairman of the board of TranSystems, said, “Aegis brings highly experienced professionals and advanced techniques to our mission of keeping our clients secure in their facilities and in the transport of goods and people in every mode.”

All 16 Aegis employees transferred to TranSystems. The acquisition enhances TranSystems’ security offerings and gives the firm a total of 1,100 professionals in 45 offices across the United States.



Brian Larson

## On The Move

**Parsons Brinckerhoff (PB)** appointed **George J. Pierson** CEO, succeeding **Keith J. Hawksworth**, who becomes chairman.

**Robert J. Paulsen** has been appointed the new chairman of **The PBSJ Corporation**, replacing John B. Zumwalt, III, who has served as chairman since 2005. Paulsen joined The PBSJ Corporation in 1986 and was

named president in January 2009. Paulsen also serves on ACEC’s 2010–2012 Executive Committee.

**Draper Aden Associates** appointed **Jeffrey N. Lighthiser** CEO and president, succeeding co-founder **Bill Aden**, who will continue as chairman. Lighthiser currently is EVP and director of marketing and strategic growth. Aden will remain active with the firm,

handling business development and special strategic projects.

**CH2M HILL** elected CEO and President **Lee A. McIntire** chairman of the board. McIntire assumes the role from interim Chairman Jerry Geist, who will continue to serve as an outside director.

**Patrick Flynn** has joined **Nolte Associates, Inc.**, as senior vice president and

regional managing director for Northern California, responsible for streamlining and building Nolte’s business in this region. He will be based in the company’s Sacramento office.

**Bryan P. Mulqueen** has joined **Gannett Fleming’s** Raleigh, N.C., office as a vice president and manager of transit and rail for the firm’s Delmarva and Southeast



George J. Pierson



Robert J. Paulsen



Jeffrey N. Lighthiser



Lee A. McIntire



Patrick Flynn



Bryan P. Mulqueen

# Members in the News

## Awards

**A**CEC Member Firms **CDM** and **Bechtel** have made *Minority Engineer* magazine's 18th annual list of America's Top 50 Employers. It is CDM's first appearance on the list and Bechtel's fourth.

The magazine compiled its list by sending approximately 1,000 questionnaires to randomly selected subscribers, each of whom was asked to nominate three companies that they believed offered a positive and inclusive working environment for minority engineers.

Readers' nominations determined the companies' nationwide rank, identifying top places to work and organizations that have proved progressive in hiring minority engineers.

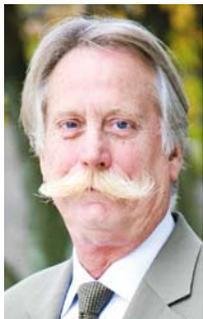
*Minority Engineer* is a recruitment magazine for minority (black, Hispanic, Asian American and Native American) engineers in the United States. It provides readers with career and affirmative action news, job-hunting techniques and articles highlighting the achievements of engineering students and professionals.



regions. He will be responsible for growth and development opportunities in these two industry sectors.

**Dewberry** named **Michael K. Buckley** vice president for strategic initiatives of management and consulting services in the firm's Fairfax, Va., office. Previously, Buckley served as the acting assistant administrator for FEMA's Mitigation Directorate.

**Bruce Dobbs** recently joined **TranSystems** as assistant vice president for its Norfolk, Va., office and will be a leader in the firm's federal market sector. Dobbs comes to TranSystems from the Washington Group International / EG&G Division—URS, where he served as director, security programs—threat reduction and security.



Michael K. Buckley



Bruce Dobbs

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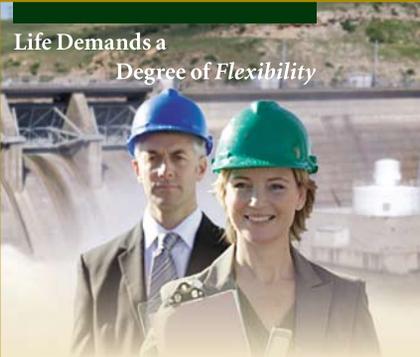
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## Calendar of Events

### MARCH

**8-9** **ACEC/Wisconsin Transportation Improvement Conference, Green Bay, Wis.**

**9** **Lean Design and Construction: Defining the Three Opportunities of Management-Based Project Delivery (online seminar)**

**10-13** **The Business of Design Consulting: Managing for Success in a Climate of Change, Salt Lake City**

**11** **Project Management for Structural Engineers as a Sub-Consultant (online seminar)**

**16** **Recommended Practices for Engineering Expert Witnesses (online seminar)**

**18**

**DOE Energy Efficiency Block Grant Funding: Market Opportunities in a \$3 Billion Program (online seminar)**

**25**

**Understanding AIA B101 Agreement Between Owner and Architect (online seminar)**

### APRIL

**8**

**Understanding and Using AIA C401, Agreement between Architect and Consultant and CASE's Recommendations to It (online seminar)**

**13**

**U.S. Water Demand, Supply and Allocation: Trends and Outlook (online seminar)**

**25-28**

**ACEC Annual Convention and Legislative Summit, Washington, D.C.**

Additional information on ACEC's events is available at [www.acec.org](http://www.acec.org).

## Welcome New Member Firms

**ACEC/California**  
Hellmuth, Obata + Kassabaum, Inc. (HOK), San Francisco  
Inclendon Consulting Group, Costa Mesa  
JF Jones Company, San Rafael  
NMG Geotechnical, Inc., Irvine

**ACEC/Colorado**  
Brien Gidlow, Denver  
Richard Parsons, Denver

**ACEC/Idaho**  
Bowen, Collins & Associates, Inc., Eagle

**ACEC/Illinois**  
Garza Karhoff Engineering, LLC, Chicago  
Structure Designs, Inc., Chicago

**ACEC/Louisiana**  
Industrial Engineering Management, Inc., Walker  
Lambert Engineers, LLC, New Orleans

**ACEC/Maine**  
Schonewald Engineering Associates, Inc., Cumberland

**ACEC/Maryland**  
Arenco, LLC, Mount Airy

**ACEC/Minnesota**  
Engineering Partners International, LLC, Minneapolis  
Stonebrooke Engineering, Inc., Savage

**ACEC/Mississippi**  
Fred Sock & Associates, Inc., Biloxi

**ACEC/New Jersey**  
Bohler Engineering, Warren

**ACEC/Ohio**  
Dynamix Engineering, Ltd., Columbus

**ACEC/Oklahoma**  
Nicholls Consulting, Owasso

**ACEC/Oregon**  
American Consulting Engineers, Inc., Beaverton  
VLMK Consulting Engineers, Inc., Portland  
WDY, Inc., Portland

**ACEC/Washington**  
Northwest Civil Engineers PLLC, Bellevue

**ACEC/Wisconsin**  
Computerized Structural Design, Milwaukee  
Fish & Associates, Inc., Middleton  
M Squared Engineering, Cedarburg

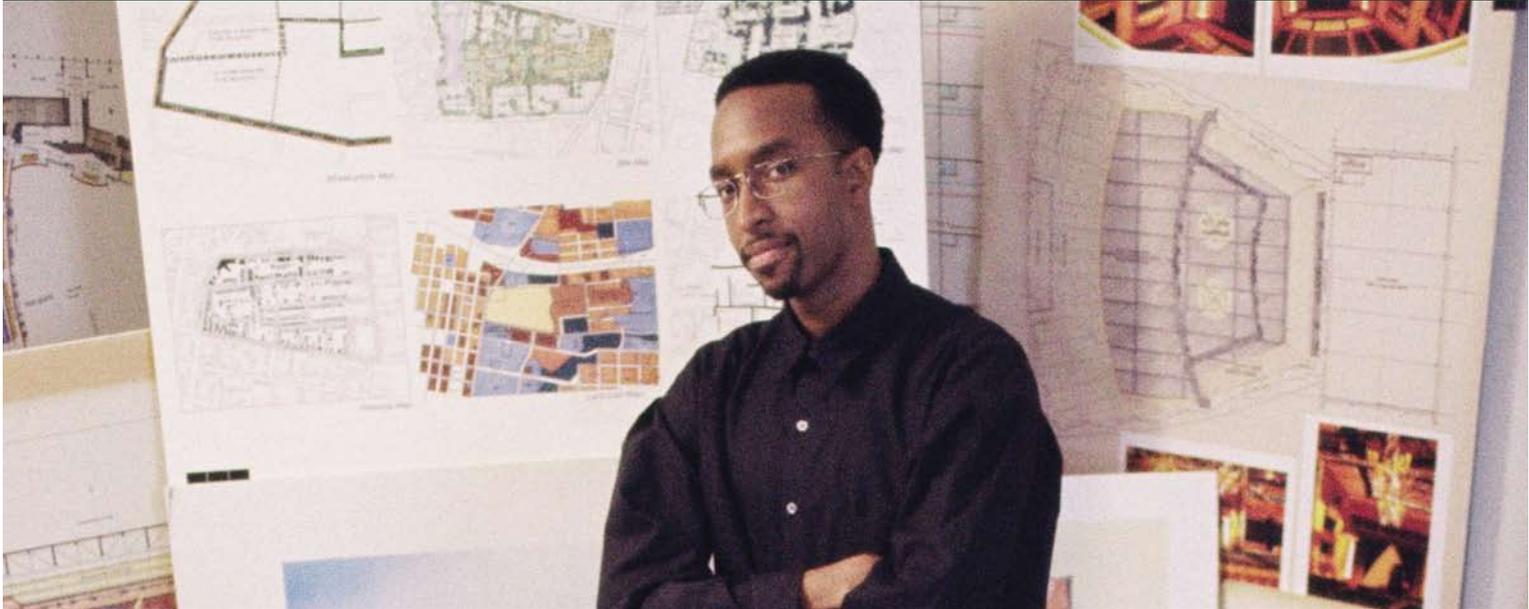
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- Strength in numbers, in that coverage is provided to an exclusive group of engineering peers and member firms frequently pay less than the average cost of insurance in their area
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