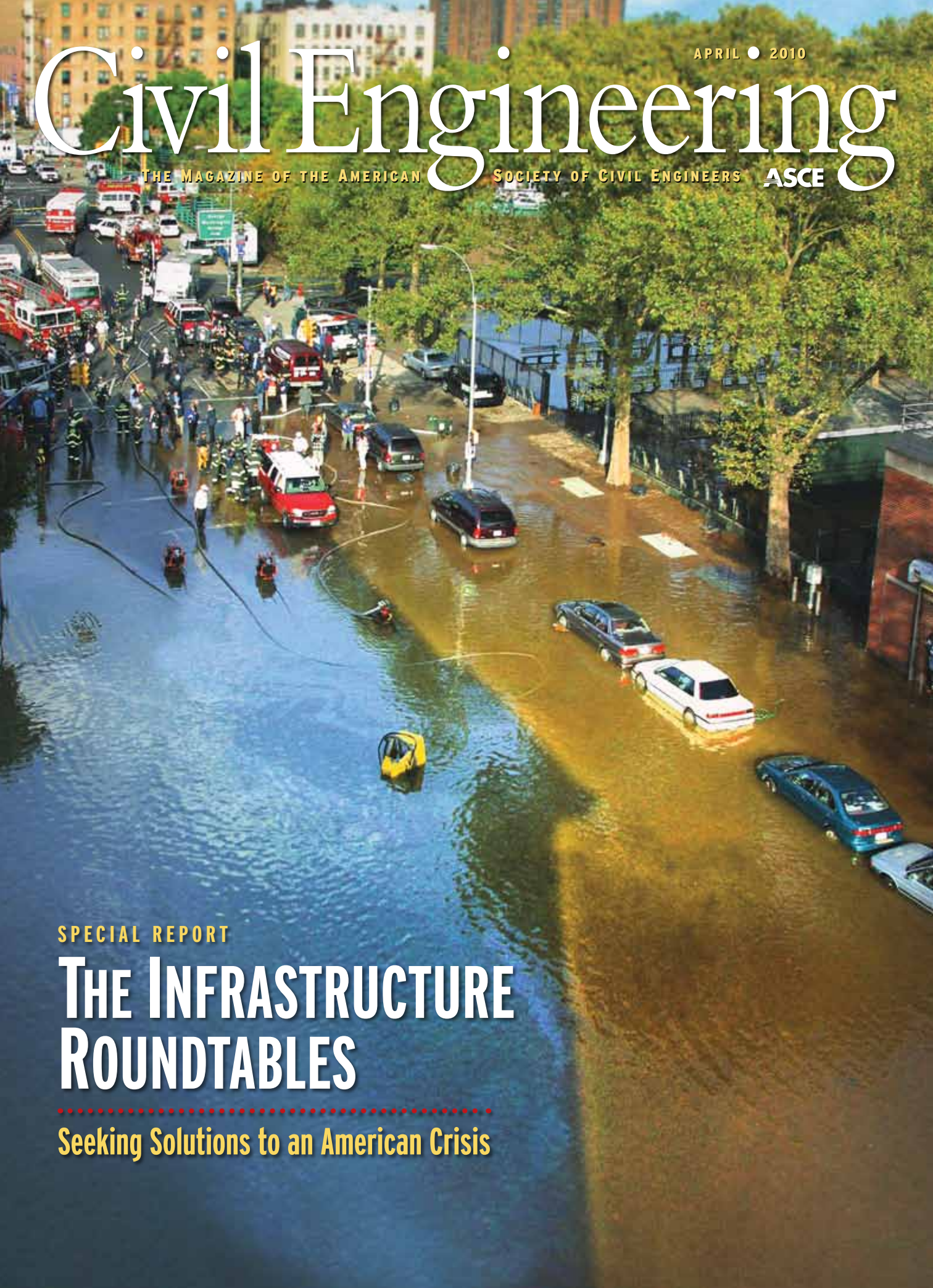


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SPECIAL REPORT

THE INFRASTRUCTURE ROUNDTABLES

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Seeking Solutions to an American Crisis

The Infrastructure Roundtables: Seeking Solutions to an American Crisis

In mid-January, the American Society of Civil Engineers (ASCE) convened a series of five roundtables in Washington, D.C., that were conceived as in-depth discussions of how best to address the nation's significant infrastructure deficiencies, which threaten not only the safety and welfare of the public but also the nation's economic growth and competitiveness. Each roundtable had its own moderator and slate of participants, and the participants included well-respected political leaders, policy leaders, and members of ASCE who are well versed on the subject of critical infrastructure. The starting points for these discussions were the five key solutions outlined in ASCE's 2009 Report Card for America's Infrastructure, which was released in March 2009. In essence what these roundtables were striving to achieve was to develop a framework for giving full dimension to these solutions and securing for them positions of high visibility and high priority on the national agenda.

BY ANNE ELIZABETH POWELL

PORTRAITS BY SKIP BROWN

IN THE POST-WORLD WAR II years of the 20th century, the United States constructed what was recognized globally as the greatest infrastructure of the modern world. Now, half a century later, we find ourselves grappling with a crisis of enormous proportions as that infrastructure ages and deteriorates and the burgeoning American population places ever-increasing demands upon it. Between 1970 and 1996 the resident population of the United States increased by an astonishing 28 percent—from 210.1 million to 267.4 million. With a current population of approximately 309 million, the United States is the third most

populous nation in the world, and the U.S. Census Bureau projects a U.S. population of 420 million by 2050—a 36 percent increase above the population of 2010.

In 1998, the American Society of Civil Engineers (ASCE) released its first *Report Card for America's Infrastructure*, an assessment of the nation's critical infrastructure conducted by an advisory panel of the nation's leading civil engineers whose specializations and areas of expertise covered a broad spectrum. That report card conferred an overall grade of D. Since that time, ASCE has issued three subsequent report cards—in 2001, 2005, and 2009—as well as the *Progress Report for America's Infrastructure*,

which was released in 2003. The 2001 report card conferred an overall grade of D⁺; the 2005 report card, a D; and the 2009 report card, a D. The 2003 progress report also conferred a grade of D. These assessments have trained a spotlight on the fact that America's critical infrastructure—principally its roads, bridges, drinking water systems, mass transit systems, schools, and systems for delivering energy—may soon fail to meet society's needs. The underlying threats—and these threats are quite significant—are those of deteriorating economic strength within the global marketplace and a diminished quality of life across the spectrum of American society.

ASCE produced its report cards not only to inform the public and policy makers about the condition of the nation's infrastructure; it also produced them to sound an alarm. As noted in the executive summary of the 2009 report card, "The nation's infrastructure faces some very real problems that threaten our way of life if they are not addressed." The executive summary also places the estimated five-year investment needed to upgrade the nation's infrastructure to a satisfactory level at \$2.2 trillion.

For more than a decade, ASCE's report cards have made it quite clear that America's critical infrastructure may soon fail to meet society's needs. Clearly, a multipronged prescription is needed for rebuilding America's infrastructure, and as a first step toward formulating one ASCE developed five key solutions for raising the grades on the nation's deteriorating infrastructure as part of its 2009 report card. The proposals are as follows:

- Increase federal leadership in infrastructure to address the crisis.
- Promote sustainability and resilience in infrastructure to protect the natural environment and withstand natural and man-made hazards.
- Develop federal, regional, and state infrastructure plans that complement a national vision and focus on systemwide results.
- Address life-cycle costs and ongoing maintenance to meet the needs of current and future users.
- Increase and improve infrastructure investment from all stakeholders.

In an effort to stimulate a more focused national discussion of the infrastructure crisis and the solutions that can be effected to rectify it, ASCE convened a series of roundtables in Washington, D.C., in mid-January. These discussions were framed to lay the groundwork for developing national, state, and regional infrastructure plans that can emerge from the planning and legislative processes with sufficient vision, muscle, and funding to ensure that quantifiable headway will be made in the short term in addressing our critical infrastructure needs.



Panelists cited the reconstruction of the bridge in Minneapolis carrying Interstate 35W over the Mississippi that collapsed in August 2007 as an example of rapid response to a public sense of urgency.

AP PHOTO/ST. PAUL PIONEER PRESS, SCOTT TAKUSHI

MODERATOR

Henry J. “Hank” Hatch, P.E., Dist.M.ASCE, retired from the U.S. Army as a lieutenant general and was the chief of engineers and commander of the U.S. Army Corps of Engineers. He has been an active volunteer with several professional organizations, among them two boards of the National Research Council. Hatch is also active in the affairs of the American Association of Engineering Societies and ASCE. A former national president of the Society of American Military Engineers, he currently chairs the Natural Sciences and Engineering Committee of the U.S. National Commission for the United Nations Educational, Scientific, and Cultural Organization. Hatch earned a bachelor’s degree from the United States Military Academy at West Point and a master’s degree from Ohio State University. He is a registered professional engineer in the District of Columbia and a member of the National Academy of Engineering.

PARTICIPANTS

Joseph A. “Bud” Ahearn, P.E., Dist.M.ASCE, is well known and respected for his executive leadership in the engineering business lines of transportation, environment, water, industrial design, and related infrastructure. He was previously the vice-chairman of the board of CH2M HILL, of Englewood, Colorado, where he worked in collaboration with business group leaders to effectively represent the firm and was responsible for strategic planning, governmental affairs, strategic communications, and leadership development. Prior to joining CH2M HILL, Ahearn had a distinguished military career spanning three decades, and he achieved the rank of major general in the U.S. Air Force. During his 34 years with the Department of Defense, he was responsible for shaping strategy, developing budgets, and executing infrastructure programs totaling more than \$7 billion annually. As the senior civil engineer for the air force, he directed the development and operations of all U.S. air bases around the world. His numerous military awards include the Distinguished Service Medal, the Legion of Merit, and the Bronze Star, as well as a medal from the Federal Republic of Germany. He has also been the recipient of the air force’s Order of the Sword, the highest honor the noncommissioned officer corps of that branch can bestow in recognition of leadership and solicitude for the welfare of the enlisted troops.

J. Richard Capka, P.E., M.ASCE, is the chief operating officer for Dawson & Associates, Inc., of Washington, D.C. He served as the administrator of the Federal Highway Administration and as acting administrator of the U.S. Department of Transportation from 2005 to 2008 and as the chief executive officer and executive director of the Massachusetts Turnpike Authority from

The five roundtable discussions corresponded to the five solutions outlined in the *2009 Report Card for America’s Infrastructure*:

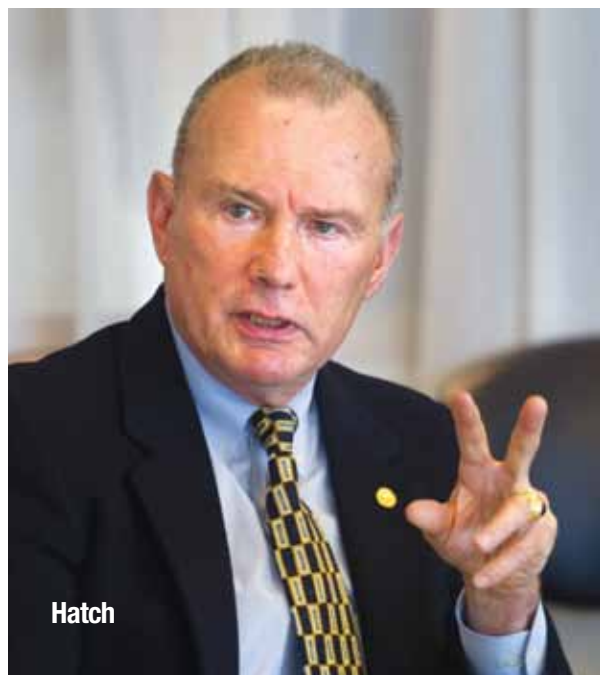
- 1) Increase federal leadership in infrastructure.
- 2) Promote sustainability and resilience in infrastructure.
- 3) Develop federal, regional, and state infrastructure plans.
- 4) Address life-cycle costs and ongoing maintenance.
- 5) Increase and improve infrastructure investment from all stakeholders.

Increase Federal Leadership in Infrastructure

THE ROUNDTABLE that addressed increasing federal leadership in infrastructure was moderated by Henry J. “Hank” Hatch, P.E., Dist.M.ASCE, and the participants were Joseph A. “Bud” Ahearn, P.E., Dist.M.ASCE, J. Richard Capka, P.E., M.ASCE, David R. Conrad, James Kolb, Representative Steven C. LaTourette (R-Ohio), John H. Moyle, P.E., M.ASCE, Kerry E. O’Hare, and T. Peter Ruane, Ph.D. (Ahearn participated by phone.)

In opening the discussion, Hatch read the first solution—*increase federal leadership in infrastructure*—as it was published in the *2009 Report Card for America’s Infrastructure*:

America’s infrastructure needs bold leadership and a compelling national vision. During the 20th century, the federal





LaTourette

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government led the way in building our nation's greatest infrastructure systems by means ranging from the New Deal programs to the interstate highway system and the Clean Water Act. Since that time, federal leadership has diminished and the condition of the nation's infrastructure has suffered. Currently most infrastructure investment decisions are made without the benefit of a national vision. That strong national vision must originate with strong federal leadership and be shared by all levels of government and the private sector. Without a strong national vision, infrastructure will continue to deteriorate.

"I would point out from my experience in addressing this with the National Research Council, with ASCE, and with others that it's a very complex problem, and I think we're all aware of that," said Hatch. "Each one of those sectors has a different array of actors at the federal, state, local, and private-sector levels. In some cases, the majority of that particular sector is owned primarily by the private sector—almost entirely by the private sector. In other cases, it's owned almost entirely by the public sector—such

2001 to 2002. Capka retired from a 30-year career in the U.S. Army Corps of Engineers in 2001 as a brigadier general. Among his posts, he served as commander of the Corps's South Atlantic Division and South Pacific Division and of the Corps district headquartered in Baltimore.

David R. Conrad began his work on water resources issues in 1977. He has served for the past 20 years as a water resources specialist and senior water resources specialist for the National Wildlife Federation, the nation's largest conservation education and advocacy organization. For the previous eight years he was a legislative representative and water specialist for the organization Friends of the Earth. In recent years his major areas of activity have included the water resources development programs of the U.S. Army Corps of Engineers and federal river protection and floodplain management programs. More recently he has been involved in legislation and a range of public policy activities regarding flood hazard mitigation and floodplain management. An important goal here has been helping communities seeking assistance to move high-risk residences and businesses out of flood-prone areas and expanding opportunities for nonstructural flood damage reduction. Conrad has also been actively involved in legislation at the federal level for developing water resources that has encompassed projects and programs for the Corps of Engineers.

James Kolb serves as the staff director of the U.S. House Transportation and Infrastructure Committee's Subcommittee on Highways and Transit. He joined the subcommittee, which is responsible for highways, highway safety, and public transportation, in January 2007. Before that he was the vice president for congressional relations for the American Road and Transportation Builders Association. As a senior member of that group's government relations team, he was the primary liaison to the U.S. Congress. In that capacity he played a key role in the association's efforts to bring the transportation construction industry's concerns to the attention of the U.S. Department of Transportation and was involved in legislative efforts during the development of the 2005 legislation reauthorizing the nation's surface transportation programs.

Steven C. LaTourette (R-Ohio) is serving his eighth term in the U.S. House of Representatives and represents Ohio's 14th Congressional District, which includes all of Lake, Geauga, and Ashtabula counties and part of Cuyahoga, Summit, Trumbull, and Portage counties. LaTourette is a fiscally conservative moderate Republican who is well respected in his district. He strives to take a bipartisan and regional approach to governing and is widely credited with spearheading the congressional effort to save more than 1,100 jobs at the Defense Finance and (Continued on next page)

Accounting Service's offices in Cleveland, which the Pentagon hoped to close as part of its base realignment and closure process. LaTourette is a member of the House Committee on Appropriations and three of its subcommittees: the Subcommittee on Transportation, Housing and Urban Development, and Related Agencies, the Subcommittee on Interior, Environment, and Related Agencies, and the Subcommittee on the Legislative Branch. He brings extensive experience in our nation's transportation policy to his subcommittee work, having served on the House Transportation and Infrastructure Committee in several leadership positions over the past 14 years. As a member of the Subcommittee on Transportation, Housing and Urban Development, and Related Agencies, he continues to focus on the maintenance and growth of our nation's infrastructure, with a particular emphasis on northeast Ohio. In his work on the Subcommittee on Interior, Environment, and Related Agencies, he plays a role in setting funding priorities for our national parks, wildlife refuges, forests and other public lands, cultural agencies, and means of protecting water resources.

John H. Moyle, P.E., M.ASCE, holds a bachelor of science in civil engineering from the New Jersey Institute of Technology and is a licensed professional engineer. Moyle has been working on dam and flood control projects in New Jersey for 31 years. As chief of the Bureau of Dam Safety and Flood Control within New Jersey's Department of Environmental Protection, he is responsible for the engineering, economic, environmental, administrative, and emergency response aspects of New Jersey's flood control and dam safety program. Currently the National Flood Insurance Program coordinator for New Jersey, he is also responsible for administering the \$110-million dam restoration loan program and \$25-million flood control grant program for New Jersey. Moyle is a board member and the president-elect of the Association of State Dam Safety Officials and was president of that organization in 2001. He was also a board member of the National Dam Safety Review Board, which is administered by the Federal Emergency Management Agency, from 2001 to 2009. Moyle is on the U.S. Department of Homeland Security's Dams Sector Government Coordinating Council, which has been created to provide effective coordination in the area of dam security.

Kerry E. O'Hare is the vice president of Building America's Future, and she brings to her position nearly 25 years of experience in policy development and implementation; management; congressional, state, and local governmental relations; coalition building; and issue advocacy. O'Hare previously served as deputy administrator of the Federal Highway Administration, where she provided executive leadership to an agency with more than 2,500 employees and *(Continued on next page)*



as certain aspects of transportation versus, say, telecommunications on the other hand.

"So with that said, let me ask you a question: What do you think we really mean by federal leadership? What do we mean by federal leadership beyond money? What is the role of the federal government besides simply funding?"

O'Hare responded with a question of her own: "What's the vision? I think [the federal government's role] is coming up with the bold vision of where this country needs to go."

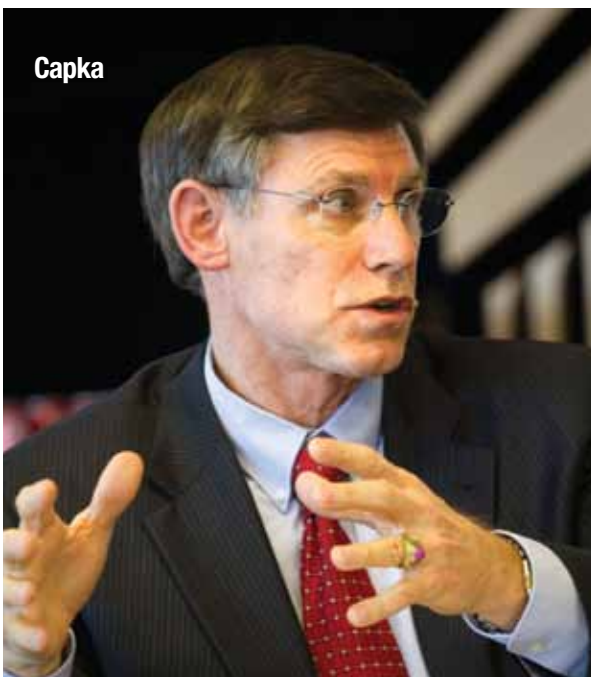
Conrad noted that such a vision should address the long term: "The country needs that vision to [encompass] a longer time frame. Some of the vision that the federal government has provided in the past has been century-level vision—it has looked past several generations and asked, what are the long-term needs of the country that are going to be met by this basic infrastructure that we build? I think that is an area to explore. I really don't believe we have kept our eye on that long-term factor."

Capka noted that "there is direct impact on the public, but there are very few who really understand the intricacies of infrastructure, and somehow there needs to be leadership providing the basis of public education and public awareness. I think the report card is a good step, but I also think that we need to ensure that the public doesn't see this as a hopeless situation—that there is something that can be done about it—because unless the two are connected in that fashion, everything else is going to get wrapped around the proverbial axle that we've seen over the last four years."

Ruane made the point that federal leadership must involve "sustained involvement," noting, "We've had federal leadership in the past, but it's never been sustained over time. It's got to be consistent, nonpartisan, and long term—making investments in strategic assets that further the country's goals. What are our goals? If, for example, one is to make our port system work better for foreign commerce, then make sure those investments in the ports go to the ports that really have the impact."



“There is direct impact on the public, but there are very few who really understand the intricacies of infrastructure, and somehow there needs to be leadership providing the basis of public education and public awareness.” —RICHARD CAPKA



an annual budget of \$40 billion. Before that she served as deputy assistant secretary for governmental affairs at the U.S. Department of Transportation, and in that capacity she was part of a select team that implemented the secretary's national strategy to reduce congestion on the country's transportation network. This team worked to educate state and local leaders, as well as the business community, in certain states about how to develop public-private partnerships and innovative ways to address traffic congestion. O'Hare has twice been honored with a medal from the Department of Transportation. Earlier in her career she served as deputy director in the Office of Federal Affairs for Governor George E. Pataki (R) of New York, as legislative director for Congressman Pete King (R–New York), and as legislative assistant to Senator Alfonse M. D'Amato (R–New York).

T. Peter Ruane, Ph.D., is the president and chief executive officer of the American Road and Transportation Builders Association, a 107-year-old national federation headquartered in Washington, D.C., of public and private transportation construction interests having more than 5,000 members. Ruane has more than 35 years of diversified experience in the economic development, transportation, and construction fields. He joined the American Road and Transportation Builders Association in 1988, and before that he served for nine years as the president and chief executive officer of the National Moving and Storage Association, an international trade association with members in more than 50 countries. As the deputy director of the U.S. Department of Defense's Office of Economic Adjustment and the President's Economic Adjustment Committee, he worked on complex economic development projects stemming from military base closures in more than 30 states in the period from 1970 to 1980. In 1999 he became the first association executive ever to receive the American Public Works Association's Distinguished Service Award, and *Engineering News-Record* named him one of the most newsworthy individuals of 1998. Both of these awards were for his unique personal leadership in the passage of the Transportation Equity Act for the 21st Century (TEA-21), at the time the largest public works legislation in the history of the United States. In December 2000 he was the only construction industry trade association executive to be appointed to the transportation transition team set up to help the new administration of President George W. Bush. In 2004 he was named one of the top 100 private-sector transportation construction professionals of the 20th century, and in 2005 the magazine *Public Works* named him a trendsetter for his leadership in helping to pass the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).

“We’ve identified 1,800 high-hazard dams throughout the United States that need to be rehabilitated. When I say ‘high-hazard dams,’ I mean those dams that if they were to fail there is the potential for loss of life. So we need a national program to provide assistance to states to make sure those dams get fixed.” —JOHN MOYLE

In part, this failure to establish the “strong national vision” the *2009 Report Card for America’s Infrastructure* calls for stems from the very complexity of the nation’s infrastructure stewardship. Decision makers within each infrastructure sector are layered among federal, state, and local agencies, and achieving cross-sectoral integration of effort is difficult but certainly not impossible.

“There needs to be a kind of a master plan first—a framework upon which various components need to be built,” said Capka. “What is of federal importance, what is of state or regional importance, what is of local importance? They all build onto the same framework, but we need that framework.”

In LaTourette’s view, such a framework or vision should be established by the president—or “administration,” as he put it, noting that “this administration has not decided that it’s going to be a priority for them and I think that that’s unfortunate.” Ruane agreed: “I think absent presidential leadership, it will not happen. The whole question assumes that there is federal leadership, and I could make a case that it’s

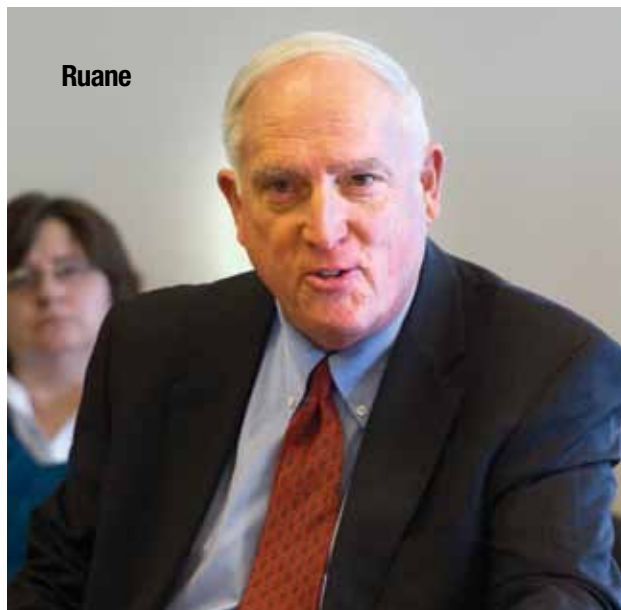
“I have seen a continuous evaporation of the willingness to work together on what used to be a bipartisan issue: infrastructure. I was schooled at the knee of Norm Mineta and Bud Shuster and Don Young and Jim Oberstar, and these were really not difficult decisions as to what direction the country should go in.” —STEVEN LATOURETTE



O'Hare

lacking dramatically.... You’re not going to get the...biggest bang from limited resources unless it’s driven by some kind of presidential initiative that focuses on what the real priorities are and then stays with it and transcends the political parties. It goes on beyond the four-year cycle of the president into the next one, because we’re not going to do it in four years. It will not be accomplished in four years. It has to be long term to be a redundant approach.

“The best example I can think of is SAFETEA-LU [the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users],” said LaTourette. “I thought it was a brilliant idea—to come up with projects of regional and national significance, and I think these projects were scheduled to cost \$30 billion and then it all got scaled down to \$17 billion and then it passed out of the House [of Representatives]. And I knew as a member that I was going to try for one. I was going to try and get the \$1.2-billion Innerbelt project [Cleveland Innerbelt Modernization Plan] in Cleveland.... When it



Ruane

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went over to the Senate they savaged it. Rather than \$1 billion for the Innerbelt in Cleveland they were able to squirrel \$200 million out of this account. They all went in there and took \$200 million here, \$300 million there. But you can't build a \$1-billion project with \$200 million.”

Kolb presented a similar scenario: the Port of Long Beach plan to replace the deteriorating Gerald Desmond Bridge. The existing bridge is so overtaxed that it has been outfitted with nylon “diapers” to catch falling chunks of concrete. The replacement bridge would be taller, wider, and better suited to serving the ports of Los Angeles and Long Beach, which constitute the nation's busiest port complex. But while the Port of Long Beach announced on February 4 that it would move forward with the plan, it is still subject to public hearings, and as Kolb pointed out, “they haven't done anything because it's a \$1.2-billion project and they've got a \$465-million funding gap right now.”

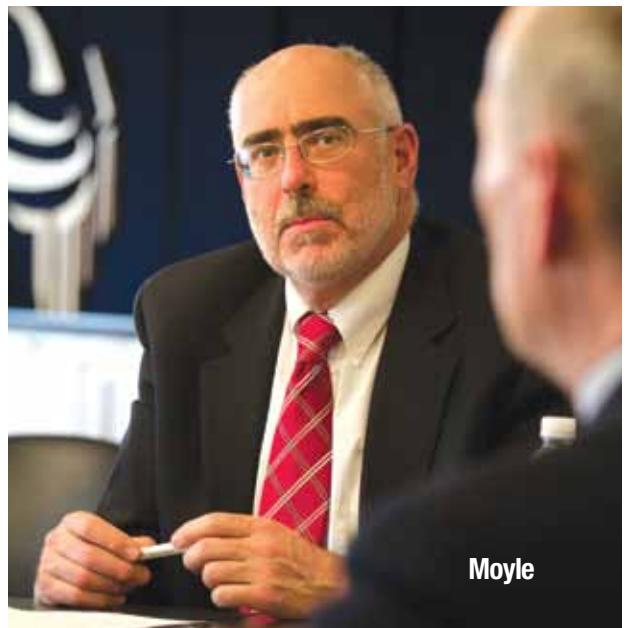
And Moyle linked the funding gap with a threat to public safety: “We—the Association of State Dam Safety Officials—would like to see federal legislation that would create a funding mechanism to help repair dams. We've identified 1,800 high-hazard dams throughout the United States that need to be rehabilitated. When I say ‘high-hazard dams,’ I mean those dams that if they were to fail there is the potential for loss of life. So we need a national program to provide assistance to states to make sure those dams get fixed.”

LaTourette laid the blame for the national funding gap on a lack of political will. “I have seen a continuous evaporation of the willingness to work together on what used to be a bipartisan issue: infrastructure. I was schooled at the knee of Norm Mineta and Bud Shuster and Don Young and Jim Oberstar, and these were really not difficult decisions as to what direction the country should go in. Today, everyone is going to run like a scalded cat from the 800-pound gorilla in this discussion—and I don't care what you're interested in, whether it's water or rail or roads or bridges—which is, where is the money going to come from? I don't sense the political will to find that money.

“I'll be a bipartisan basher. We had that with President Bush. President Bush and his OMB [Office of Management and Budget] folks got it into their heads that \$256 billion was enough in the last bill to take care of the problem. It was not. We were two years delayed, and as a result not a lot of things were planned or designed and we're paying the price for that in terms of unemployment and [the marks on] your report card.”

Funding, of course, is a thorny issue in the current economic climate, in which a need for deficit reduction looms large. Prioritization becomes important in such a climate,

and presidential influence on this goal setting becomes paramount. “One of the questions we've raised had to do with the role of the president and how important that is,” Hatch noted. “Several of you have said it's damn important. I would point out—having come from an agency—that it's very important in terms of the public and the influence the president may or may not have with the Hill, but it's extremely important with how the agencies themselves are driven and what they end up working on and proposing through the legislative process be included in the bills. The public sort of forgets the role that



the agencies have in helping work with the Hill and developing plans and programs. If the president—and his OMB, hopefully—have a clear and unambiguous direction, it's amazing what the agencies then can do, because those politically appointed members who head those agencies and their secretaries and undersecretaries may be responsive, and when they are they can produce awfully good work and it can be coherent, but there is not a single voice coming through the executive branch of government to provide that.”

“When you're talking about the resources to be invested—the amount of the resources that would be required to be invested in infrastructure—it's a major chunk of change and it attracts attention,” said Capka. “There are many other priorities out there, and without that leadership from the very top to say ‘this is important,’ it's going to be difficult to avoid having that sliced up and parceled out to other areas.” LaTourette agreed: “You're going to get people who are gagging on the spending, and it

“In my humble opinion, we civil engineers owe it to society as we serve it to not only provide for their needs but also to help them mitigate that demand. You can satisfy the infrastructure needs in two ways: one is to provide it and the other is to manage the demand. What you were talking about was a way of managing demand.” —HENRY J. “HANK” HATCH

doesn't matter what it is—even if it's worthwhile, even if it's beneficial, even if it creates jobs. There is a gag reflex going on.”

Which is why, as Ahearn noted, private funding is an option well worth exploring: “If the promise of increased funding for infrastructure is relatively low from the federal government perspective, [why not investigate funding possibilities] from the finance companies in the United States and the global cash that's sitting in other financial institutions around the world? Is that not an element of a policy framework that needs some real wire brushing and some partnership creation? It just seems to me that there is a reality within the context of the huge deficits that we somehow or other have to manage and that threatens our capacity to get federal resources. So we've got to reach out to other financing alternatives.”

Kolb pointed out that one of the concerns of lawmakers on the Hill is that “private investment is not necessarily a complete replacement of the need for public investment, which needs to grow as well. Another is that when there is private investment—and let's be real about this, guys—they're in it to make money. That's their job. But it needs to be done in a way so that ultimately these public facilities are being done for public benefit. So there is an inherent tension between the desire of these folks with the cash to try to make sure they're getting a return on their investment and how we balance that with making sure that the public that has to use these facilities is not being disadvantaged. But it's not a substitute for the need to increase federal, state, and local investment.”

Ahearn responded, “I think we would conclude that there's a need for a policy framework that enables both sources to contribute to the solution.”

Capka made the point that it might be prudent to “look at the demand for resources and kind of figure out how we might be able to do more with what we have right now with the technologies that are emerging—balancing the use of the infrastructure so it's not all piled up on perhaps one mode when there may

be capacity in other modes. There may be an opportunity to work on both sides of the equation, and I would expect that in making the case to the American public, we have to show that we are doing our best to ensure that those dollars are being spent where they need to be spent—that we have done as much as we can to effectively and safely squeeze resources out of the system we have before we ask for that next dollar.”

With respect to increasing the capacity of existing infrastructure, O'Hare cited Michael Bloomberg's plan for a congestion pricing program to provide funding for additional mass transit in New York City. “If you take a metropolitan area, for example, where there are a lot of people, a great need—a lot of people coming in and out of the city—there are things you can do to increase that flow without actually building a new highway or building a new bridge. You price things and you get people to change their behavior based upon that, and you create other alternatives. Like Mayor Bloomberg in New York City, who was [considering] a congestion pricing program [that would] charge drivers coming into the city \$8 a day to go into a particular zone, and all the money collected was going to go into a fund that was going to provide for more mass transit. It was going to fund great mass transit alternatives. Unfortunately, some politics in Albany prevented him from going forward. But there are solutions—using technology that is available now and is being developed now to make better use of our current system and facilities.”

In response, Hatch introduced the concept of pursuing nonstructural solutions. “In my humble opinion, we civil engineers owe it to society as we serve it to not only provide for their needs but also to help them mitigate that demand. You can satisfy the infrastructure needs in two ways: one is to provide it and the other is to manage the demand. What you were talking about was a way of managing demand. To me, they go hand in hand, and as the federal government addresses its policy opportunities in this area, they should look to nonstructural

But the group also concluded that if the federal government is to assume the leadership role in addressing the infrastructure crisis, it must do so in a judicious, sustained manner. The lack of sound, sustained federal leadership in this arena, combined with the regulatory hoops that are attendant upon infrastructure projects large and small, has created high levels of frustration.

ways and, in a very broad sense, nonstructural ways of managing the demand as well as meeting the demand.”

Hatch then introduced “the beneficiary pays” notion: “There is another philosophy that creeps in here now and then, and it has to do sometimes with how one funds trust funds, inviolate or not. That was the concept I first heard of during the Reagan administration: the beneficiary pays. Some of us remember that from our days in the Corps. ‘The beneficiary pays’ referred to our new requirement to charge those who wished to use certain of our recreational facilities. They had never been charged before. Well, if they’re going to come to the lake and camp out, you know they had to pay \$15 or \$20 for the night—or whatever it was; it was fairly small—but it was the start of the idea that if you are the beneficiary of some federally or state or locally provided thing and you benefit disproportionately to the common person on the street, you ought to pay for it or at least contribute a little more than they do. I think one of the inhibitors there is that to the extent we have trust funds that can be raided or managed, the public lacks confidence in those trust funds. If I were the beneficiary of a particular program, I would be far more willing to pay my added charge to use that program if I were confident that the revenue arising from that would, in fact, come back and enhance or improve that particular feature of the public service that I was using, if there’s a loop. You’re talking about having a loop there. We don’t have very tight loops.”

Using the interstate highway system as an example of a long-term infrastructure success that was brought about by means of federal leadership and a clear vision of what the country needed, participants pointed to the need to establish “an operating platform,” as Ahearn dubbed it, or a set of “principles and standards,” as Conrad put it, that would help shape a broad policy framework for a federal infrastructure program. Such principles and standards would, the group believes, help avoid the fragmentation that has been occurring with respect to infrastructure funding. The group’s thinking is that a framework similar to the principles and standards that will guide federal resources development should be formulated for other types of infrastructure.

But the group also concluded that if the federal government is to assume the leadership role in addressing the infrastructure crisis, it must do so in a judicious, sustained manner. The lack of sound, sustained federal leadership in this arena, combined with the regulatory hoops that are attendant upon infrastructure projects large and small, has created high levels of frustration.

The group was also in agreement that there is considerable need to establish process efficiency within the regulatory arena, and as an example of a streamlined effort the members of the group cited the replacement of the bridge in Minneapolis carrying Interstate 35W over the Mississippi that collapsed in August 2007. “There was leadership there to crack the

whip,” observed Capka. “There was a public sense of urgency, and nobody wanted to step in front of that public sense of urgency. That’s one of the reasons why I say that leadership up front and establishing the case for infrastructure are so important, because without those there is room to second-guess. The replacement of that bridge is a really good example of how things get done. When the will is there and the leadership is saying, ‘It will happen,’ we can find a way of checking all of the boxes in a very efficient way. What happened was that the process constraints were removed.”

The group also drew the conclusion that funding the nation’s infrastructure is dependent upon strong leadership and public acceptance. As Capka noted, “Pragmatically, if the decision were made to reduce the federal draw—the demand on the trust fund—somebody else would have to pick up, and that means the state and local governments. But that can’t be done in the short haul because there are legislative cycles the states have to go through in order to create enabling legislation in whatever they do.... I think it has to

come from the public to say, ‘Man, we have to make a change.’” But as O’Hare pointed out, “You first have to have the leader to articulate that.”

Andrew Herrmann, P.E., SECB, F.ASCE, who served as the chair of the advisory council that helped ASCE produce its 2009 *Report Card for America’s Infrastructure* and who observed the roundtable discussion, asked this question of the group: “What can the civil engineer and ASCE do to help solve the infrastructure problem?”

“I think it’s incumbent on the civil engineering profession to take more of a vocal role in this whole area of infrastructure and to use some tactics that may make some of the leaders uncomfortable,” said Ruane. “The report

card is now a brand. You’ve done a remarkable job. I think it’s been really, really helpful. But you are the ones who design, build, and manage all of this infrastructure all over the world. You’re the experts on it, and I think you should stand up and start telling people how vulnerable we really are. It’s only when we have a bridge collapse or an earthquake or a flood that the country all of a sudden says, ‘Oh, my God! Our infrastructure has been disrupted!’ So ASCE should get out there as the international experts on this and put the fear of God in people, and [let them know] that we’ve got to do something about this, and get the press and everybody else to focus on it—scare the crap out of them.

“We’ve done a good job—especially in the last couple of years—of defining what the needs are. There’s a lot of great research out there—hard, empirical evidence—about how big the problem is. But we haven’t done a good job of articulating what the cost of inaction would be—the cost of this inertia we have right now, the cost of doing nothing. We have not articulated that in a convincing manner.”

“I think it’s incumbent on the civil engineering profession to take more of a vocal role in this whole area of infrastructure and to use some tactics that may make some of the leaders uncomfortable.”

—PETER RUANE

Promote Sustainability and Resilience

The roundtable addressing the need to promote sustainability and resilience was moderated by Gerald E. "Gerry" Galloway, Jr., Ph.D., P.E., Hon.D.WRE, Dist.M.ASCE, and the participants were Glen T. Daigger, Ph.D., P.E., BCEE, F.ASCE, Richard J. Dolesh, Arthur L. Guzzetti, James A. Hanlon, P.E., M.ASCE, Dale Jacobson, P.E., BCEE, F.ASCE, G. Tracy Mehan III, Victor Mendez, P.E., M.ASCE, Paul F. Mlakar, Ph.D., P.E., F.ASCE, and Dennis R. Schrader, P.E., M.ASCE.

THE SECOND SOLUTION, as published in the 2009 *Report Card for America's Infrastructure*, reads as follows:

America's infrastructure must meet ongoing needs for natural resources, industrial products, energy, food, transportation, shelter, and effective waste management, and at the same time protect and improve environmental quality. Sustainability and resiliency must be an integral part of improving the nation's infrastructure. Today's transportation systems, water treatment systems, and flood control systems must be able to withstand both current and future challenges. Both structural and non-structural methods must be applied to meet challenges. Infrastructure systems must be designed to protect the natural environment and withstand both natural and man-made hazards, using sustainable practices, to ensure that future generations can use and enjoy what we build today, as we have benefited from past generations. Additionally, research and development should be funded at the federal level to develop new, more efficient methods and materials for building and maintaining the nation's infrastructure. Sustainable development will not only preserve our high quality of life and environment we enjoy today, but improve conditions in the future.

Galloway opened the discussion by asking, "What do we mean by 'sustainability'?"

Mehan responded that part of the definition speaks to its financial aspect: "Most people who talk about sustainability—at least in the corporate social responsibility area—are talking about the triple bottom line of environmental, economic, and social."

Dolesh cited the Sustainable Sites Initiative, an interdisciplinary effort by the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center, and the U.S. Botanic Garden to create voluntary national guidelines and performance benchmarks for sustainable land design, construction, and maintenance practices. "Their definition of sustainability," he said, "is the design, construction, operations, and maintenance practices that meet the needs of the present without compromising the ability of future generations to meet their own needs. We found it to be a very workable defi-

inition in terms of looking at the ecosystem services and long-term sustainability of the natural environment."

Mendez emphasized collaborative thinking: "At the U.S. Department of Transportation we have created a partnership with the U.S. Environmental Protection Agency and the Department of Housing and Urban Development to begin really looking at sustainable communities. You know, what we do today clearly will have an impact not only on how we live today but what the future looks like with respect to our communities. What we're attempting to look at is not only how people are living today, but with the investments today what they're going to mean in the future and try to create safer, healthier, vibrant communities. You do that by ensuring that there are really not the silos that we traditionally would have—by trying to break down those silos and make sure that we're all talking together so that if, in fact, we're going to build high-speed rail, it's going to operate properly within communities."

Mendez raised the issue of communicating with the public: "Over the years I believe we've done really well in addressing environmental issues and sustainability issues, but we simply have not done a very good job of communicating that to the taxpayer. Our ability to communicate with policy makers or the taxpayer really needs to be improved so that people understand what we have been able to accomplish. I can rattle off a whole list of things that we do in transportation and have been doing over many years to really preserve and enhance the environment. If you look at the numbers in terms of dollars that we have invested—transportation dollars that have been invested in environmental mitigation enhancement—it's incredible. And yet I'm not sure that people out there really know what we have done. We should take credit for what we have done, but we need to continue looking at best practices and evolving practices. We need to continue pushing the industry and ourselves internally to look at different ways because we are moving into a new era."

The "new era" concept struck a chord with the participants, who agreed that the world is in a period of significant change and that the issues engineers address and the means by which they do so are different from those of the past. Guzzetti pointed to the issue of conflict as it is applicable to



Cars block River Road, in Bethesda, Maryland, after being trapped in rushing water released from a 66 in. water main break on December 23, 2008.

sustainability: “One issue that I’m going to build on in connection with sustainability is the avoidance of potential conflict. In the future water is going to be a divisive issue in this country. Landfills and things like that can also be divisive issues, not to mention oil in an international sense.”

Galloway then raised the question of how resilience should be defined with respect to sustainability: “If somebody said, ‘I want you to go out and make a resilient highway system or wastewater system or whatever,’ do we all agree what that is?”

Mlakar referred to the work done by the report card’s advisory council: “When we released the report card this time we said there are four Rs to resilience. Robustness is probably what comes to everyone’s mind first of all, but you also achieve resilience through redundancy. Rapidity of repair is the third one, and resourcefulness is the fourth. I think robustness usually comes to mind first, but there are other ways of achieving resiliency.”

Mehan responded, “When I look at those four elements—robustness, redundancy, repetitiveness, and resourcefulness—most things would fit under resourcefulness, which implies different approaches to what are traditionally viewed as hard engineering problems.”

Building on that, Daigger observed that “the greatest challenge really is changing mind-sets. I think many of

us realize that we have more tools to build better systems, but somehow we have too many people who are kind of locked into a mind-set that is maybe the 20th century versus the 21st. So there are two challenges: one is to actually move into the 21st century in terms of using the tools, and then as we do that to build on the science that’s developing to develop the next generation.”

Galloway then referred to a statement that had been prepared for the panelists:

“Over the years I believe we’ve done really well in addressing environmental issues and sustainability issues, but we simply have not done a very good job of communicating that to the taxpayer. Our ability to communicate with policy makers or the taxpayer really needs to be improved so that people understand what we have been able to accomplish.”

—VICTOR MENDEZ

The United Nations’ *World Economic and Social Survey 2009: Promoting Development, Saving the Planet* concludes that the appropriate responses to the climate crisis can also contribute to long-term economic prosperity. Specifically, the survey argues that mitigation and adaptation efforts can move forward effectively only if they are part of a consistent development strategy built around a massive investment-led transformation along low-carbon, high-growth paths. The same argument is often made regarding infrastructure renewal—that necessary investments can contribute to long-term prosperity. Taken together, these positions support the position that investments in sustainable infrastructure can be a key driver for long-term economic prosperity. However, the survey also contends that to achieve this win-win strategy, a critical role must be played by governments able to

Moderator

Gerald E. “Gerry” Galloway, Jr., Ph.D., P.E., Hon.D.WRE, Dist.M.ASCE, is the Glenn L. Martin Institute Professor of Engineering at the University of Maryland, where he is also an affiliate professor of public policy. Active in water resources research and analysis, he recently chaired an interagency levee policy review committee for the Federal Emergency Management Agency and a study of flooding in California’s Central Valley for that state. A presidential appointee to the Mississippi River Commission, in 1993 and 1994 he led a White House study of the causes of the 1993 Mississippi River flood. During a 38-year career in the military, he held a variety of positions in the United States and overseas, retiring in 1995 as a brigadier general and dean of academics at the United States Military Academy at West Point. Galloway is a registered professional engineer and a member of the National Academy of Engineering.

Participants

Glen T. Daigger, Ph.D., P.E., BCEE, F.ASCE, is a recognized expert in wastewater treatment, especially the use of biological processes. Currently a senior vice president and chief technology officer for CH2M HILL, of Englewood, Colorado, where he has been employed for 29 years, Daigger has also been a professor and the chair of the environmental systems engineering department at Clemson University. As the author or coauthor of more than 100 technical papers, four books, and several technical manuals, he has made substantial contributions to engineering practice. A senior vice president and the president-elect of the International Water Association, he has also chaired several committees of the Water Environment Federation (WEF), including the task force that developed the most recent edition of the *Design of Municipal Wastewater Treatment Plants*. He has also lent his time and expertise to the Water Environment Research Foundation, serving on its board of directors and chairing its research body. A member of the National Academy of Engineering, Daigger has been honored as a Kappe distinguished lecturer and has been the recipient of ASCE’s Simon W. Freese Environmental Engineering Award and the WEF’s Harrison Prescott Eddy, Morgan, and Gascoigne awards.

Richard J. Dolesh is the chief of public policy for the National Recreation and Park Association, of Washington, D.C. He is responsible for national public policy development and contributes to the association’s national legislative and advocacy program. Dolesh has worked for nearly 30 years in parks and natural resource management at the state and local levels, serving as the chief of natural and historical resources for the Maryland–National Capital Park and Planning Commission and then as director of the Forest, Wildlife, and Heritage Service of the Maryland Department of Natural Resources. In his current position Dolesh represents the



mobilize public finance and build appropriate technological capacity. The president embraced the importance of developing green technology as part of the stimulus plan, but most efforts have been directed toward energy. Is there any serious work under way within the civil engineering profession to provide the technological capacity that is needed to expand this approach to broader applications?

In response, Daigger cited the importance of investing in education: “We’ve all benefited from the investments that past generations have made in education. As civil engineers, one of the things that we need to be doing to a greater extent is mobilizing public finance to support engineering education. . . . There’s a real opportunity in terms of investing in the future, in terms of investing in research and development at universities, which will help us create that better future.”

Guzzetti linked the environmental and economic aspects of sustainability: “The drivers of the economies in the past, like steel and automobiles, aren’t going to be the same in the future. There are whole new opportunities ahead as we develop the clean energy economy. And I would throw in high-speed rail. Those are going to be huge issues for the engineering profession to focus on. It involves a shift toward economically viable, forward-looking economic trends toward sustainability. I see that the word ‘adaptation’ is used [in that statement] and I think there’s another idea that’s on the cusp here. What are going to be the implications of climate change and whatnot, and how does the infrastructure need to adapt? I think we should start to get an inventory of those needs—perhaps in transportation. That’s a whole new program—federal program, maybe—to inventory and eventually adapt transportation systems.”

Dolesh highlighted the need for public investment and the attendant need to mobilize public opinion to secure that investment: “There is strong public support for multiple-use and multiple-benefit projects and for focusing on the livable community. What this means is creatively looking at using the public infrastructure as a way to promote the livable community strategy—for example, to look at putting trails



Mendez

on any utility corridors. I can take you to dozens of wastewater or storm-water management ponds that are fenced off and closed to the public that have no benefit whatsoever other than their structural benefit, and so they have no public value. In fact, they're a liability and a nuisance because they're a danger to kids who want to go fishing in them or play around and flip over rocks and connect with nature. [Or look at] the notion of a trail connection along the new Wilson bridge [in the Washington, D.C., metropolitan area]. It was within a hair's breadth of being dropped. What a way to build public support for the necessary public infrastructure by having this multiple-benefit and multiple-use strategy—moving the public finance needle to say, yes, we want this because it gives us many benefits.”

“To add a little bit to that,” said Mendez, “as we move forward and we educate the new generation and bring forth our solutions and strategies, they're not going to be simply technical solutions anymore. I believe you have to have a whole new perspective and a whole new reference and a different kind of approach to education. Because if we continue to educate engineers purely in terms of technical solutions, we'll continue to come up with great technical solutions, but maybe we'll drop the bike path or pedestrian path. What I'm talking about is adaptation strategies. . . . We're not at the forefront of working with the environmental community, identifying the issues, and then looking for those strategies. It seems like we're always trying to catch up, and when you're in that situation that's not good. We need to find a different way within the infrastructure arena to work with everyone else while we move along the same path.”

Galloway then asked what civil engineering was doing to find new ways to blend the talents of civil engineers with environmental skills. With regard to bioengineering and geoengineering, he said, “I spent the last two weeks with climatologists and hydrologists who said that around the world there are people looking seriously at geoengineering as a way to modify the climate. I was in Beijing on October 1—the 60th anniversary of the People's Republic of China—and it was going to be a cloudy

National Recreation and Park Association in a number of national coalitions, including the steering committee of the Sustainable Sites Initiative, a partnership of the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center, and the U.S. Botanic Garden; the Sustainable Urban Forestry Council; the National Review Group of the National Center for Safe Routes to School; and the Coalition for Recreational Trails.

Arthur L. Guzzetti has more than 30 years of experience in public transportation at the local, state, and national levels and serves as the vice president for policy for the American Public Transportation Association (APTA), the trade group representing the public transportation industry. Guzzetti's responsibilities include APTA's extensive policy research agenda, policy analysis and development, and cultivating ideas that hold promise for propelling public transportation forward. During the past year he has given special attention to working with APTA's membership, the U.S. Department of Transportation, and other key industry partners to help shape a vibrant national program for high-speed rail. Widely regarded as an expert on transportation policy, Guzzetti has traveled widely and is a frequent speaker at national conferences and seminars dealing with transportation policy issues. He joined APTA in 1997 and before that was the assistant manager for government affairs for the Port Authority of Allegheny County, in Pennsylvania, where he focused on grants, government relations, policy, and capital programming issues.

James A. Hanlon, P.E., M.ASCE, is with the U.S. Environmental Protection Agency (EPA), where he serves as director of the Office of Water's Office of Wastewater Management. As director he oversees the office responsible for the management of the National Pollutant Discharge Elimination System (NPDES) program, which regulates municipal and industrial wastewater discharges, and for the administration of federal financial and technical assistance for publicly owned wastewater treatment works. Hanlon is a career civil servant with more than 30 years of government service with the EPA. In 1984 he was appointed to the position of director of the Municipal Construction Division and thus became responsible for managing the EPA's national construction grants and state revolving fund programs, which provide assistance to municipalities in their wastewater infrastructure construction programs. In 1991 he was named deputy director of the Office of Water's Office of Science and Technology and in that capacity was responsible for the scientific and technical basis of the federal water quality and safe drinking water programs. From January 2001 to April 2002 he served as the Office of Water's acting deputy assistant administrator.

Dale Jacobson, P.E., BCEE, F.ASCE, is the president of Jacobson Satchell Consultants, a consulting engineering firm with offices in Omaha, Nebraska, and Lakewood, Colorado. A professional

engineer with 40 years of experience in municipal and industrial wastewater, drinking water, groundwater, solid waste, hazardous waste, and low-level radioactive waste, Jacobson has served as a project principal, project manager, or project engineer on numerous endeavors. He is the president of ASCE's Environmental and Water Resources Institute and serves on the board of Civil Engineering Certification, Inc.

G. Tracy Mehan III is a principal with the Cadmus Group, Inc., an environmental consulting firm headquartered in Boston. He joined the firm in 2004 and before that was with the U.S. Environmental Protection Agency (EPA), where he served as assistant administrator for water from 2001 to 2003. In 2004 he served as an environmental adviser on the planning body for the G8 (Group of Eight) summit that was held in Georgia that year. Mehan served as director of Michigan's Office of the Great Lakes from 1993 to 2001. In 1992 he was the EPA's associate deputy administrator, and from 1989 to 1992 he was the director of the Missouri Department of Natural Resources. A graduate of Saint Louis University and its School of Law, Mehan currently serves on the Water Science and Technology Board and the Committee on the Mississippi River and the Clean Water Act for the National Academies' National Research Council. In 2006 he served as an independent expert judge for the Municipal Water Conservation Achievement Award program, which is sponsored by the U.S. Conference of Mayors and its Urban Water Council. Mehan is a former board member for the Great Lakes Protection Fund and a current board member for the Great Lakes Observing System.

Victor Mendez, P.E., M.ASCE, heads the Federal Highway Administration. He previously served as director of the Arizona Department of Transportation (ADOT), and under his leadership ADOT completed a freeway project in the Phoenix area six years ahead of schedule and consistently delivered statewide construction programs on time. In 2006 Mendez was elected president of both the Western Association of State Highway and Transportation Officials and the American Association of State Highway and Transportation Officials. He served as ADOT's deputy director from 1999 to 2001, and during that period his leadership resulted in major infrastructure improvements throughout the state. His 24-year career at ADOT, where he implemented innovations in management, financing, research, technology, infrastructure, and planning, promises to serve him well as the nation's top federal highway official. Mendez earned a civil engineering degree from the University of Texas at El Paso and later obtained a master's in business administration from Arizona State University.

Paul F. Mlakar, Ph.D., P.E., F.ASCE, is the senior research scientist for weapons effects and structural dynamics at the U.S. Army Corps of Engineers' Engineer Research and Development Center (ERDC). In this capacity he conducts original research and guides the overall program in the response of structures to extreme loads. Mlakar was a key



Hanlon

day. And Hu Jintao said, 'No, it will not be a cloudy day,' and sure enough it wasn't. They put 18 aircraft into the air and shot pellets into the air and it was a beautiful, sunny day. What are we doing to deal with the challenges that you all know about, and what should we be doing, for example, to store water on the land instead of in reservoirs—those sorts of things? What opportunities are there to make civil engineering more a part of that?"

"I quite frankly don't see a lot of creativity in this country in the water and wastewater area," observed Mehan. "I think there's a lot of great stuff going around, but quite frankly I don't see it being adopted by the profession as readily in this country as it appears to be in other countries. That may be controversial. It may be an uninformed statement, but that's a sincere observation as somebody who has been in this area for 20 years. Maybe some sort of benchmarking on an international scale is what's really required."

Jacobson, however, cited low-impact development as an important step in the right direction. "The Environmental and Water Resources Institute of ASCE is heavily engaged in low-impact development, and we are finding the most important part of that is collaborating with other professions. We've had a couple of conferences, and we have another one coming up later this year on [low-impact development], and we're meeting with landscape architects, with architects, with social scientists, with economists, and with parks and recreation people, and the interest is huge. It's a little bit uncomfortable for the civil engineers because we're used to talking to ourselves in some sense, but the attendance is incredible and we're working it. The interest is there and it's beginning to gel. I think you'll see more of that."

Mendez cited advances within the transportation sector: "Let me give you some technical things that we are doing that we haven't communicated to the public or the policy makers but these are really good things—things like recycled asphalt. That's a sustainability issue because you don't have to go and use virgin resources. You can recycle stuff. Warm-mix asphalt—that's another. We are using a process that emits fewer emissions—rubberized

“We’ve all benefited from the investments that past generations have made in education. As civil engineers, one of the things that we need to be doing to a greater extent is mobilizing public finance to support engineering education. . . . There’s a real opportunity in terms of investing in the future, in terms of investing in research and development at universities, which will help us create that better future.” —GLEN DAIGGER

asphalt. We did a lot of that in Arizona and people loved it. They saw it as a noise mitigation issue. We saw it as a pavement preservation issue. Plus, we took tires out of landfills. It’s a win-win for the environment. The issue is, how do you communicate that? About a year and a half ago the Oregon Department of Transportation started their solar highway initiative. What they’re doing is working with a power company to install solar panels on an interchange that will power their interchange lighting needs. There really are all kinds of things we’re doing in transportation that are really good for the environment. But I’m not sure how many people know about them.”



member of the Interagency Performance Evaluation Task Force, which evaluated the way in which the New Orleans hurricane protection infrastructure responded to Hurricane Katrina. Following the September 11, 2001, airliner crash into the Pentagon, Mlakar was selected by ASCE to lead a study of the Pentagon’s structural behavior. The results of that study were published in 2003 (*The Pentagon Building Performance Report*) and are helping the engineering profession design structures in such a way as to reduce the progression of collapse from extreme loadings. From 2000 to 2003 Mlakar was the technical director of the ERDC and in that capacity was responsible for innovations in military engineering to rapidly upgrade transportation infrastructure and ensure cross-country mobility. In 1984 he founded the structures division of Jaycor, Inc. (now part of L-3 Applied Technologies–Jaycor), and from that year until 1995 he guided the development of the new division as vice president. This group carried out research and provided consulting services on structural engineering and related problems for a variety of government and commercial clients. The work included the invention of a patented hardened air cargo container capable of resisting the effects of internal explosions. Mlakar graduated from the United States Military Academy at West Point and subsequently earned a master of science and a doctorate in engineering science from Purdue University. A registered professional engineer and the author of some 150 technical publications, Mlakar has been the recipient of numerous honors, among them the 2003 Forensic Engineering Award from ASCE’s Technical Council on Forensic Engineering and the 2004 Purdue Alumni Achievement Award.

Dennis R. Schrader, P.E., M.ASCE, is the president of DRS International, LLC, of Columbia, Maryland. He offers his clients more than 30 years of experience in executive and engineering administration and possesses expertise in emergency preparedness, homeland security, hospital administration, and project management. Prior to launching his own company, Schrader served as deputy administrator of the Federal Emergency Management Agency’s National Preparedness Directorate after being confirmed by the U.S. Senate in August 2007. In that capacity he oversaw the coordination and development of resources and tools needed to prepare for all hazard scenarios, including acts of terrorism. These included strategy, policy, and planning guidance to bolster prevention, protection, and recovery capabilities. Prior to that assignment Schrader served in Maryland as director of the Governor’s Office of Homeland Security. He also served as a U.S. Navy Civil Engineer Corps officer, remaining on active duty until 1987 and on reserve status until 2007. He retired from the navy with the rank of captain. Schrader holds a bachelor’s degree in industrial engineering from Kettering University and a master of science in industrial engineering from the State University of New York at Buffalo.

Hanlon made the point that part of the problem in communicating information about infrastructure is the attitude of the American public that infrastructure is an entitlement. “The average ratepayer or taxpayer understands that they sort of own water systems, wastewater systems, and the streets in front of their house—just like the roof on their house—and that these need maintenance over time and that they need to be part of that decision-making process. It shouldn’t be, ‘I’m here. I pay my taxes, and therefore I deserve all of this.’ Until that changes, I think whoever is sitting around this table 20 years from now is going to be having this same conversation.”

Galloway focused the discussion in another direction by asking whether the environmental regulatory process needed to change to address the infrastructure challenges.

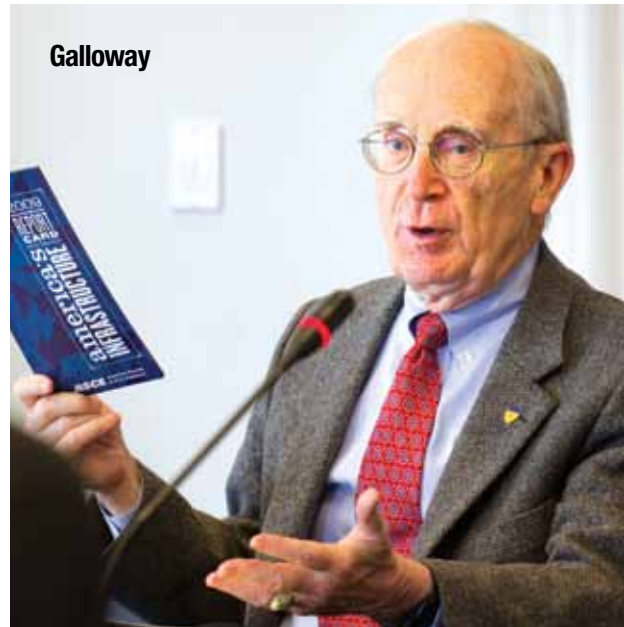
“The answer is yes,” said Mehan. “When you think about it, the environmental laws have not changed very much. The Clean Water Act was in—what, 1987? There’s been no reauthorization. The Superfund hasn’t been touched in years—the Clean Air Act, not since 1990. The Safe Drinking Water Act, I guess, was the last major reauthorization—in 1996. So the political gridlock follows a kind of cultural gridlock in many ways, and I think any reform is going to have to be very targeted, very focused, and require a lot of buy-in from diverse people so that hopefully we can get to compromise.”

“I agree absolutely with the need for regulatory reform,” said Daigger. “But I actually think the concept of sustain-

ability is the engineer’s best friend because sustainability is about doing things in a better fashion, and oftentimes the sustainable solution is the most innovative solution. The sustainable solution is the one that puts higher quality materials in place because they’re more long lasting. All engineers want better solutions, and sustainability is just about being able to bring a broader perspective into decision making.”

Dolesh suggested that greater collaboration and incentive-based approaches are needed: “I think part of the approach has to be an incentive-based approach rather than a fear calculation. Now it’s the penalty of noncompliance—the consequences of what will happen if regulations are violated.” Progress, he contended, would not be made “until there’s a collaborative approach that promotes innovative thinking that builds on common goals and produces trust rather than fear of consequences or fear of a penalty for noncompliance.”

“Let me comment from the perspective of surface transportation—primarily highways,” said Mendez. “The regulations that are in place are what they are whether we like them or not. So I think part of the challenge—from an innovation perspective—is to move toward solutions within those constraints. It’s actually good, because in transportation today you see a lot of strategies that we’re deploying that I’m not sure we would have deployed if we didn’t have the constraints in place or the regulations in place. For example, right now we’re beginning to look at building bridges



“There is strong public support for multiple-use and multiple-benefit projects and for focusing on the livable community. What this means is creatively looking at using the public infrastructure as a way to promote the livable community strategy—for example, to look at putting trails on any utility corridors.” —RICHARD DOLESH

“I quite frankly don’t see a lot of creativity in this country in the water and wastewater area. . . . I think there’s a lot of great stuff going around, but quite frankly I don’t see it being adopted by the profession as readily in this country as it appears to be in other countries. That may be controversial.” —TRACY MEHAN

Jacobson



Guzzetti



off-site and basically moving them into place. Now that’s good from an environmental standpoint, and it’s generally good for the public if we construct infrastructure to minimize [its] impact. So I think to some degree it’s not a bad thing. I think part of it is on us as an industry to evolve and look for those new ideas—those creative ideas.”

Schrader said he wanted to go back and address “this state of mind issue and the fact that we are going to have 100 million more people in the United States within the next 40 years—which is a huge increase. Where they move and how they think are going to be critical. When I come into D.C., I always take the Metro even though it would be easier to take my car. Thousands of people make that same decision every day. But there are still a lot of people who want to drive every day. Now if those 100 million people end up in places like the Southwest or places where you don’t have mature transportation infrastructure, what are the implications there? What about water? We already have a water crisis. How do we get people to migrate differently? I think these macro issues are critical to where we are going to go. A hundred million people is a lot of people. These are serious problems, and they speak to the state of mind as to how we think about our quality of life and how we’re willing to live.”

Schrader also made the point that the engineering profession does not celebrate its successes. “We’ve got to learn how to excite people about the things we do and be proud of it and celebrate our heroes instead of working for nickels and dimes on the side and begging for commissions.”

Guzzetti expanded on that a bit, noting that a great infrastructure project “is a project that connects you with broader goals. It’s not the infrastructure itself. For example, the Hudson-Bergen Light Rail line, in New Jersey across from Manhattan—when that was built it opened up a whole area of that region that was not developed. It was like a valley there. It made an economic contribution. It wasn’t the infrastructure itself. So the connection could be with some kind of energy or environmental or economic or social objective.”

The panelists then delved into the issue of the engineering skill set of the 21st century. “I’m not sure what the proper skill mix needs to be,” said Mendez. “I would be a little concerned to go away from having experts, and I would equate it to a surgeon. If someone is going to do bypass surgery on me, I want the surgeon who knows about hearts. I could care less how well they communicate with Congress. I think that’s something that we as an industry need to figure out. We have some ingenious people out there coming up with some incredible solutions, and if we give that up, who is going to solve those problems in the future? I don’t have the answer.”

“We need to more broadly educate ourselves,” observed Daigger, “and to think about ourselves not as the engineering profession doing this, but as engineers working in collaboration with other professionals. We need people with that broad perspective. We do need the specialists—and ideally what we’re building is people with complementary skills even within the profession—but you know, I think everyone needs

a deep understanding of something and breadth to go with it. Those are the best people.”

“I think it comes down to whether or not the engineering profession wants to be in a leadership role, as opposed to technical guys who do technical fixes,” said Mehan. “If you want to be a leader dealing with the issue of sustainability, how do you not engage with economists? How do you not engage with sociologists? How do you not engage with ecologists? In listening to this, I think you’re kind of facing an identity crisis as to whether you want to be an engineer or you want to move into a leadership role. You guys have got to answer that.”

The consensus of the panel was that collaboration is very much a necessity today for engineers, as is thinking more broadly. Hanlon noted that “if we’re talking about the role of engineers and society... I think it’s important as a profession to bring the perspective of not only what the milligrams per liter answer is but what does that mean in terms of the larger environmental or public health problem or challenge you’re trying to deal with, whether it’s the design of a bridge or a drinking water or wastewater plant.”

“Part of the issue is being able to communicate a systems approach to why it is you’re doing it,” said Schrader.

Galloway noted that ASCE has been creating the report card as a document that makes a case for “full employment for engineers and that it does not, in fact, take into account that if we applied demand management—if we applied other approaches, if we dealt with environmental issues and green infrastructure—that we could sell this [infrastructure problem] much better by saying this is the value project that we have, not necessarily just going out and taking care of everything we’ve got by rebuilding it in place. How do we answer that?”

“I think taking that broader approach makes it more understandable,” said Mlakar. “When my friends ask me that, I draw the analogy to the medical profession. When the medical profession says, ‘We’ve got a possible epidemic coming up, and everyone ought to do this, this, and this for their health,’ [people] don’t accuse the medical profession of being self-serving. In fact, if they did not do that, [the public] would find them to be irresponsible. I think we’ve got that same role for infrastructure.”

Hanlon said, “I think a different question is, what are the short-term and long-term implications? If we stay on the current course, are there tipping points out there where there will be failures?” As he put it, “The analogy I use is the financial services industry. Four years ago, there were probably people sitting around tables like this saying unless we do something different, this system is going to collapse. So those people weren’t listened to, and basically we know what happened over the 24, 36 months. I think responsibly look at that question, you need to look not only at what the needs are—we’ve got lots of needs surveys around—we need to examine the implications. Are there tipping points out there that are buried in the report card in terms of what the implications are of doing nothing?”

Mehan took issue with the report card: “When you come up with a D⁻ on wastewater, I ask myself, what does the en-



gineering profession think the reason for that is? Is it a lack of money, or a lack of management, or is it just total political irresponsibility in local mayors’ offices? I personally think if it were really a D⁻ wouldn’t people be sitting around in sewage? I must say I never found it very credible. I mean, the prices aren’t reflecting the crisis. If there were a shortage of good treated wastewater, wouldn’t the price of it go up? Wouldn’t people be spending more? We spend less than 1 percent for wastewater and drinking water. We spend at least 6 or 7 percent for food. I will confess that on this one I’m skeptical.”

Andrew Herrmann, P.E., SECB, F.ASCE, who served as the chair of the advisory council that helped ASCE prepare its *2009 Report Card for America’s Infrastructure* and who observed the discussion, noted that “yes, we have clean water, but what are we putting into it? When was the last time we had a major initiative in this country for clean water?”

Galloway brought the discussion to a close with the following challenge: “What I would like to do is go around the room very quickly and give you a last chance to [present] your thoughts on how we’re heading toward resilience and sustainable infrastructure in the future.”

Jacobson: “I’m an optimist going forward here, and from the perspective of the water and wastewater sector, I think there are two keys. One is going to be for the civil engineers to collaborate with the various entities we’ve talked about here

“We are going to have 100 million more people in the United States within the next 40 years—which is a huge increase. Where they move and how they think are going to be critical.” —DENNIS SCHRADER

“When the medical profession says, ‘We’ve got a possible epidemic coming up, and everyone ought to do this, this, and this for their health,’ people don’t accuse the medical profession of being self-serving. In fact, if they did not do that, the public would find them to be irresponsible. I think we’ve got that same role for infrastructure.” —PAUL MLAKAR

today. The second issue is going to be financing. It’s going to take a lot of money to achieve some of the goals that we have here, and as we go forward in the water and wastewater sector, collaboration and financing are my two thoughts.”

Hanlon: “I think as time goes on the challenge will be public education—to ensure that the public and the local city and village councils, the state legislatures, and the [people on the Hill] understand that we, the American public, own the infrastructure and that it’s sort of like the roof on your house or the furnace. We need to invest in it.”

Guzzetti: “I would suggest that ASCE stick to its guns and that we do it right. There is a fear in some that any revenue is bad, and I think that’s had consequences. We’ve done things less than in the optimum way, and that’s wrong. We need voices to speak to that issue, and I think you do a good job of it and should keep doing it.”

Dolesh: “There is a winning message for the civil engineering profession to concentrate on the sustainability and resiliency issue. The public really doesn’t want to hear the gloom and doom scenario. They don’t want to hear that things are falling apart and going to hell in a handbasket. I would challenge ASCE to come up with some case studies and win-win examples of how innovation and creativity have been applied to these issues and to show success and sell success. I think that this is a productive start. You’ve got a great approach here, and I appreciate the invitation to be here to

listen to other voices. It’s been a very stimulating dialogue.”

Daigger: “I agree with the point about the positive message. Also, we talk about the federal government—what the federal government should be doing and so forth—but the legislatures need to respond to voters, and if you look at the constituency that we represent, it’s a way to engage them. I wonder if we need a message that resonates more broadly with the people out there. If you look at what some of the other professions do—the medical profession is probably the most successful in terms of playing the leadership role. It isn’t about making engineers or civil engineers more successful; it’s about civil engineers making society more successful. I suspect that it’s getting out and communicating with the population in general. That’s something we need to do because that’s how we’re going to motivate the legislators to do something.”

MLakar: “I think two important things we discussed are that we need to take a very broad systems approach to all the opportunities we have and, secondly, we need to communicate very effectively so that a broad audience understands it and that when decisions are made, they are informed decisions.”

Schrader: “I’m a big fan of a guy named John Kotter, who talks about change leadership. He’s out of Harvard, and he has a methodology, but creating the sense of urgency is important, and I think the report card does. The issue is that when I think about these things it would be easy for me as an engineer to take the document and agree wholeheartedly that, man, things are awful. It’s a very legitimate point of view from a pure engineering perspective. When you talk about creating change—as change leaders, as we should be—you have to come at it as a whole. You’ve got to build a guiding coalition. You’ve got to create a sense of urgency. If we’re going to lead the effort, then we have to do things a little differently.”

Mehan: “I think sustainability develops from the bottom up, not the top down, and Washington may be the least sustainable place on the planet. At least in the water sector places like Portland or Philadelphia—even Chicago and Milwaukee—are pursuing sustainability and providing models. I would keep a local focus. That’s where the battle really has to be joined.”

Galloway concluded with the following observation: “I think we have talked a lot about asset management. We’ve talked about knowing what’s going on. The report card tells us what’s going on, but I couldn’t agree more with those of you who say we have an opportunity ahead to do things differently—to build into the future something that will allow us to be sustainable and resilient for decades ahead, and we’ve just got to figure out a way to convince people to support us in doing that.”



Daigger

Develop Federal, Regional, and State Infrastructure Plans

The roundtable discussion that addressed the third solution outlined in the 2009 Report Card for America's Infrastructure—develop federal, regional, and state infrastructure plans—was moderated by Andrew Herrmann, P.E., SECB, F.ASCE, who chaired the advisory council for that report. The participants were Larry Frevert, P.E., M.ASCE, Angie Giancarlo, David I. Maurstad, Shannon Menard, Roger Millar, P.E., CFM, F.ASCE, Alan E. Pisarski, Robert Puentes, Jim Tymon, and Stephen D. Van Beek, Ph.D.

HERRMANN OPENED THE DISCUSSION with a review of the third solution as it was published in the *2009 Report Card for America's Infrastructure*:

Infrastructure investment at all levels must be prioritized and executed according to well-conceived plans that both complement the national vision and focus on systemwide outputs. Goals of the plan should center on freight and passenger mobility, intermodality, water use, environmental stewardship, and encouraging resiliency and sustainability. The plans must reflect a better defined set of federal, state, local, and private-sector roles and responsibilities and instill better discipline for setting priorities and focusing funding to solve the most pressing problems. The plans should also complement our broad national goals of economic growth and leadership, resource conservation, energy independence, and environmental stewardship. Infrastructure plans should be synchronized with regional land use planning and related regulation and incentives to promote nonstructural as well as structural solutions to mitigate the growing demand for increased infrastructure capacity.

Herrmann then followed with the question, what do you see as the current state of roles and responsibilities among these various entities, and is it sufficient or does it need to be changed?

Puentes responded by first citing the three-pronged “lead, power, and maximize” strategy called for, especially as it relates to the reauthorization of the surface transportation bill. “There are certain places where the federal government [must take] the lead because these issues are just too big and broad for the states and metros and counties to deal with by themselves—things like the national freight strategy or high-speed rail. These are issues that are just national in size and scope and they matter to us as a country, and the federal government should appropriately be in that space where heretofore they’ve been kind of absent for a long time.

“Then there are other areas where the federal govern-

ment probably needs to get out of the way and not be that much of a presence—needs to set up some broad parameters and some frameworks and perhaps some funding. But then it needs to allow states and metropolitan areas to be innovative and to make investments and reinvestments in places that matter to their particular needs and provisions. And the federal government can hold these places accountable for meeting its set of goals and objectives. So putting that structure together and sorting out those responsibilities and really working in a partnership between the different levels of government would help sort out this particular goal.”

Millar suggested that the linear structure in place now be rethought: “The relationship today between the federal, state, and local governments is linear. The federal government talks to the states, and then the states talk to local governments. It’s very difficult for me in local government to get a direct connection to federal programs—transportation being a key one in our community. The federal government sets policy. The money comes to the state DOT and then the state DOT distributes it as the state DOT [sees fit]. What I would like to see is to allow local government to be a full partner with the federal government and not have to go through this filter with the state to make things go.”

Van Beek proposed a shift from modal solutions to systems solutions at regional and state levels as well as a reliance on both private and public funding. “I think a lot of our conversation should focus on what the goals of the system are and how we institutionally develop plans in a way that is sustainable, and then how do we seek funding in order to achieve those ends—not just public funding but better use of private funding.”

As a follow-up to the concept of systems solutions, Tymon pointed to the lack of a national vision: “One of the big missing pieces here is the lack of a national plan. We don’t really have a national infrastructure plan.... I think the way that we envision it is more of a bottom-up approach. You’re building on some of the existing planning processes that are



On June 3, 2004, more than 70 people were evacuated to higher ground when a levee on the Jones Tract, an island in the delta of the Sacramento and San Joaquin rivers in San Joaquin County, California, broke, flooding as much as 11,000 acres of land. The next day, Chuck Walker, a project supervisor with Dutra Materials Company, a division of the Dutra Group, of San Rafael, California, watched as one of Dutra's boats entered the break to take depth readings.

in place at the metropolitan level and the state level, expanding them beyond the traditional highway and transit planning regime that's in place and asking them to look more multimodal, and then take that information and identify projects and strategies that are in the national interest. This will also help us better identify projects of national and regional significance."

In response to Tymon's suggestion, Van Beek sounded a note of caution: "We don't have to shift the paradigm in one authorization cycle. I think there should be an effort to create what I call an Omaha Beach scenario, whereby you get on the beach and then in subsequent authorizations you fight off the beach and try to expand outward to reform the program. Because if we're going to rely in a sense on turning the thing upside down—given the number of interests [in Washington] and the uncertainty that they would understandably feel about the program—I just don't think we can go that way. Instead, we have to find some good programs like the TIGER program [the U.S. Department of Transportation's

Transportation Investment Generating Economic Recovery grants]—a national transportation plan—and try to build out from that."

And Millar voiced concern about a bottom-up approach: "It's such a cluster at the bottom. It would be better if at the top we decided what the federal role is and what the federal vision is and then let the states plan for their goals within that context and the local governments plan for their vision within that context."

Frevert equated the issue with managing a municipal government. "You've got all of these departments that are delivering services to their citizens, and everyone's plate is full. The closer you are to the citizens, the fuller your plate is. The higher up in the organization you move, the more you need to have a broader perspective of what's going on. For example, the focus of the city manager, the city administrator, the mayor—whoever is at the top of your government—needs to be on the quality of life of the citizens, and you need to make sure that's being pushed down

"I think a lot of our conversation should focus on what the goals of the system are and how we institutionally develop plans in a way that is sustainable, and then how do we seek funding in order to achieve those ends—not just public funding but better use of private funding."

—STEPHEN VAN BEEK

Moderator

Andrew Herrmann, P.E., SECB, F.ASCE, is a partner of Hardesty & Hanover, LLP, which is headquartered in New York City, and serves as partner in charge on many of the firm's bridge projects. In his 35 years with the firm, Herrmann has been responsible for the design, inspection, rehabilitation, construction support, analysis, and rating of fixed and movable bridges, highways, railroads, and major transportation projects. Currently ASCE's treasurer and a former member of the Board of Direction, he chaired the advisory council for the Society's 2009 *Report Card for America's Infrastructure*.

Participants

Larry Frevert, P.E., M.ASCE, is a vice president and the national program director for public works for HDR, Inc., in Kansas City, Missouri. He holds a bachelor of science in civil engineering from the University of Missouri. Prior to joining HDR he spent 17 years with the Missouri Department of Transportation. He also worked for Burns & McDonnell and for the City of Kansas City, Missouri, where over the years he served as assistant engineering director, street and traffic division engineer, deputy director, and acting director of public works. Frevert served in the U.S. Army during the Vietnam War. He was on the American Public Works Association's board of directors from 2002 to 2009 and was that organization's national president from 2007 to 2008.

Angie Giancarlo is a professional staff member with the U.S. Senate Committee on Environment and Public Works. She joined the committee staff in 1999, and in addition to the environment and planning aspects of transportation policy, her portfolio of issues currently includes the U.S. Army Corps of Engineers and related water resources policy, general National Environmental Policy Act oversight, and economic development issues. Giancarlo earned a bachelor's degree in political science from George Washington University.

David I. Maurstad is a vice president of PBS&J and works out of the firm's office in Chantilly, Virginia. He has more than 30 years of experience, and he is also the national manager for PBS&J's emergency management business sector. In that capacity he has full operational responsibility for the national business unit focused on federal, state, and local emergency management, including evacuation and mitigation planning, emergency preparedness, risk engineering, flood hazard mapping, debris management, and recovery. Before joining PBS&J he served as an assistant administrator, federal insurance administrator, and regional administrator for the Federal Emergency Management Agency. Maurstad holds a bachelor's degree and a

so that your departments are making that happen. In government, local governments are closest to the citizens. So they're the ones who are going to understand what the quality of life issues are. Yet you're going to ask the federal government to mandate the rules and the directions as to how the quality of life is going to be enforced. There is a disconnect here."

The need for a national vision was emphasized throughout the discussion—as it was in the other four roundtable discussions. "The first step," said Millar, "is, what's the vision and what is the national role? What is the vision and what is the state's role? And what is the vision and what is the local role?"

Van Beek agreed: "We need a national vision, and we



need to establish a set of relationships. I don't think we really understand what a performance system would look like in its relationship between the national government and states and MPOs [metropolitan planning organizations]. You have a national goal and then you say, 'Let's have discretion available at the state and local levels.' What is the level of abstraction then at which we write the federal goal, and what are we actually holding states and localities accountable for? The goal is either broad and, therefore, by definition they have discretion and they may think they're taking the best strategy to meet it. Or the goal is drawn fairly narrowly, in which case you don't have a lot of discretion and it increases the chance for measurement. But I'm really not sure how that waterfall from the national to the state to the local is actually achieved. . . . I have yet to see a compelling vision of how all of those things fit together and how we really get beyond saying we want a performance system and discretion at the local level, put the two together, and come up with sort of a hypothesis for how we're going to do it."

Van Beek also proposed that the federal government develop a list of targeted national infrastructure projects:

“One of the big missing pieces here is the lack of a national plan. We don’t really have a national infrastructure plan.” —JIM TYMON

“Imagine the impact the federal government could have if it targeted the top 100 national projects—regardless of mode—in transportation in the national interest and took them over the finish line by managing the regulatory requirements, funding, cobbling together the modes like we did with the Alameda Corridor [in the southern part of Los Angeles County], which was a program built out of whole cloth.”

But Giancarlo wondered whether it is possible to develop an objective way of prioritizing projects: “That assumes that there’s an objective way of—that there are truly 100 projects that are in the national interest. That’s not really the case. We’ve had this argument in the water resources world for the Corps of Engineers. There’s long been an argument over—well, we just need to prioritize the projects for the Corps and then fund those top priorities and everything will be fine. But everyone has different ways of prioritizing the list.”

And Pisarski cautioned against placing too great a leadership role in the hands of the federal government: “It may be worth thinking about that we don’t shift the world too much toward the feds for the future’s sake,” he said. “I’m particularly concerned about the focus on having federal programs selecting projects and the TIGER type of idea by which everybody fills out applications and mails them to Washington, and some really smart guy at [the U.S. Department of Transportation] picks the



master’s in business administration from the University of Nebraska, and he has served as that state’s lieutenant governor, as a Nebraska state senator, and as the mayor of Beatrice, Nebraska.

Shannon Menard serves as the policy manager for the National Association of Regional Councils and in that capacity works on public policy and legislative initiatives in four core areas: transportation, economic development, homeland security, and the environment. She also acts as a liaison to Congress, the administration, and association partners. Before joining the National Association of Regional Councils Menard served as the director of research and corporate communications at Williams Mullen Strategies International, a lobbying and government relations firm, where she managed legislative and congressional affairs at both the state and federal levels. She also worked for several years at Blakey & Agnew, LLC, a public affairs and communications firm, where she supervised the Coalition for America’s Gateways and Trade Corridors, an umbrella group focusing on the formulation, development, and implementation of policies pertaining to freight transportation. While at Blakey & Agnew she also maintained a portfolio of transportation, defense, and education clients. Menard is a native of Rhode Island and a graduate of Providence College.

Roger Millar, P.E., CFM, F.ASCE, is the director of the Missoula City-County Office of Planning and Grants, in Montana. He was named director in January 2007, and the office he oversees seeks to realize the vision of the city and county as it relates to existing and proposed land use and the built environment. Millar’s experience, which includes 13 years in local and state government and 15 years in private practice, has given him a broad understanding of the relationships between transportation, land use, and the environment. The projects in which he has played a leadership role—particularly the Portland Streetcar, in Portland, Oregon, and the development plan for that city’s Pearl District—are seen as national models for urban livability. He has also managed or participated in signature projects for rural, resort, and national park gateway communities throughout the American West. He serves on ASCE’s Transportation Policy Committee and is the president of the Montana Association of Planners. A 1982 graduate of the University of Virginia, Millar is a professional engineer and a certified floodplain manager.

Alan E. Pisarski is a writer, analyst, and consultant in the fields of transportation research, policy, and investment. At the national level he has frequently been invited by both houses of Congress to testify on economic and demographic factors that define travel demand, infrastructure investment requirements, and public policy. At the state level he has been invited to advise

gubernatorial and legislative commissions regarding their economic, social, demographic, and infrastructure circumstances. Internationally he has served the U.S. Agency for International Development, the World Bank, the United Nations, the Organisation for Economic Co-operation and Development, the European Union, the World Tourism Organization, and the European Travel Commission. His work has been reviewed, discussed, and quoted in major national news magazines and newspapers, and he has often discussed national transportation topics on such programs as *The Today Show*, *Good Morning America*, *NBC Nightly News*, *CBS Evening News*, *ABC World News*, *Nightline*, and *20/20*. Last year he completed work on the third edition of the Transportation Research Board's report *Commuting in America*, and in the spring of 2009 his report for the American Association of State Highway and Transportation Officials, *Bottom Line Technical Report: Highway and Public Transportation National and State Investment Needs*, was released. In 2007 Pisarski received the W.N. Carey, Jr., Distinguished Service Award from the Transportation Research Board.

Robert Puentes is a senior fellow with the Brookings Institution's Metropolitan Policy Program, and he also directs that program's Metropolitan Infrastructure Initiative. The latter was established to address the pressing transportation and infrastructure challenges facing cities and suburbs in the United States and abroad. Puentes's work focuses on the broad array of policies and issues related to metropolitan growth and development, and he is an expert on transportation and infrastructure, urban planning, growth management, suburban issues, and housing. His recent publications include the following reports:

- *A Memo to the President: Invest in Long-Term Prosperity*
- *The Road...Less Traveled: An Analysis of Vehicle Miles Traveled Trends in the U.S.*
- *A Bridge to Somewhere: Rethinking American Transportation for the 21st Century*
- *America's Infrastructure: Ramping Up or Crashing Down?*
- *Challenges Ahead: New Urban Demographics and Impacts on Transportation*
- *A Review of the Land Use Regulations in the Nation's 50 Largest Metropolitan Areas*
- *Prosperity at Risk: Toward a Competitive New Jersey*
- *One Fifth of the Nation: A Profile of Change in America's First Suburbs*

Prior to joining Brookings, Puentes was the director of infrastructure programs at the Intelligent Transportation Society of America. He holds a master's degree from the University of Virginia, where he serves on an advisory board, and he is an affiliated professor with Georgetown University's Public Policy Institute.

Jim Tymon is the Republican staff director of the U.S. House Transportation and Infrastructure Committee's

ones that are going to be the winners. I'm concerned that we get too fedcentric. I think we're going to lose an awful lot."

The consensus of the group was that while the relationships between the various levels of government merit examination as they pertain to infrastructure planning, development, and management, it's important to work within existing structures and the regulatory and jurisdictional challenges that these structures produce.

Herrmann then redirected the discussion to address the formulation of a national vision and a national plan by posing these questions: "If we in this room had the authority



to lay out a plan as to who is in charge and what they would do, what would we say? How would you set this up? Who would have the ultimate vision? Who would be the doers? Who would be in the middle? How would it filter down into the local units? Is there some overlying scheme we could just lay on the table to talk about?"

Puentes suggested that a starting point might be an infrastructure bank. "Given the fact that we've talked about the lack of leadership, the lack of a national vision, the whole depoliticizing of the process, public-private partnerships, innovative financing, if what we do believe we're missing on the national level is this vision and this mechanism for funding those projects that are truly of national significance—whether they are port projects, freight projects—all of these things matter to the national government. That infrastructure bank could be the lens for getting those kinds of projects the type of attention that they need and could help shepherd them through the regulatory process. It's not going to solve the challenge that we have with the trust funds; it's not going to fix the challenges with the crumbling infrastructure. But if we really need to make those kinds of investments like they're making in Canada and in some other places, the infrastructure bank is a model that has some merit."

“Given the fact that we’ve talked about the lack of leadership, the lack of a national vision, the whole depoliticizing of the process, public-private partnerships, innovative financing, if what we do believe we’re missing on the national level is this vision and this mechanism for funding those projects that are truly of national significance—whether they are port projects, freight projects—all of these things matter to the national government.” —ROBERT PUENTES



“I think there are a lot of unanswered questions on something like that,” said Tymon. “I know one of the things that concern some folks in the transportation world is that an infrastructure bank is kind of broad based and looks at water and power and public housing-type projects and school construction. A lot of those types of projects have a traditional revenue stream—a user-based revenue stream that would be able to support, say, a loan-type competitive process or a credit program better than most

Subcommittee on Highways and Transit. His responsibilities include highway policy, highway finance, and pipeline safety issues. Tymon joined the Transportation and Infrastructure Committee in 2002 and was the primary staff person responsible for the highway and highway safety sections of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), the highway and mass transit reauthorization bill signed into law in August 2005. He also represented the committee in negotiations leading to the final agreement on the Pipeline Inspection, Protection, Enforcement, and Safety Act of 2006. Prior to joining the committee Tymon spent three years with the Office of Management and Budget, where he worked as the program examiner responsible for overseeing the Federal Highway Administration and the Federal Motor Carrier Safety Administration.

Stephen D. Van Beek, Ph.D., is the president and chief executive officer of the Eno Transportation Foundation, a nonprofit organization founded in 1922 with the mission of improving transportation policy and the industry’s public and private leadership. Van Beek is an expert in the areas of aviation and transportation policy, and before joining Eno he was with Jacobs Consultancy, an aviation management consulting firm, where he was a director and the chair of the federal practices group. He also served as the executive vice president for policy with Airports Council International–North America, where he managed aviation and airport policy development on behalf of commercial service airports in the United States and Canada. Prior to that he was nominated by President Bill Clinton and confirmed by the U.S. Senate to serve as the Department of Transportation’s associate deputy secretary and director of its Office of Intermodalism. In that position he was responsible for promoting and coordinating the development of intermodal passenger and freight transportation systems, improving connections between transportation modes, and enhancing services for passengers and shippers. Van Beek was a tenured professor of political science at San José State University and was appointed a research associate at its Mineta Transportation Institute. He holds a bachelor’s degree from the University of California at Santa Barbara and master’s and doctoral degrees in government and foreign affairs from the University of Virginia. A senior transport adviser to the North Atlantic Treaty Organization, he serves on the board of directors and teaches at the University of Denver’s Intermodal Transportation Institute.

transportation projects whereby the user or the revenue stream is not necessarily connected directly to the project. You would only be opening yourself up to toll road-type projects and maybe some freight projects whereby you can identify a container fee or something like that, but it's harder to compete with, say, a wastewater project whereby you can assess a fee directed at all customers and have that be part of the financing plan to repay, say, a loan to the national infrastructure bank. We in Congress are waiting to see what the administration is going to put forward."

Van Beek brought up the importance of funding: "As we think about roles and responsibilities, we need to sort of align that with both our institutional mechanism and the way we think about funding. There are some people in this system who can take care of themselves, and there are people—particularly in rural areas across all modes—who can't. And our system has to have accommodation for both if we're going to be able to move forward. That's why we have to get away from a pure merit model based on national interest to

"Most infrastructure issues are local issues and constitutionally we have a federal role and then the rest of it goes back to the states, and the piece that's missing is the regions.... I think how we need to think about it in terms of roles and responsibilities is, what can local government do with regional government?" —ROGER MILLAR

sort of a mixed system, and what does that mixed system look like with roles and responsibilities?"

Millar suggested organizing around regional economies: "Most infrastructure issues are local issues," he said, "and constitutionally we have a federal role and then the rest of it goes back to the states, and the piece that's missing is the regions.... I think how we need to think about it in terms of roles and responsibilities is, what can local government do with regional government? Most of it should be there. And then what is so big that it's beyond their scope, that should be the national interest.... The regional governments and the regional planning, I think, are where the action is going to be and should be."

Tymon agreed: "I think this idea of accountability of local officials to make their own decisions is important, and we need to keep that in mind. That's part of what we're struggling with here at the federal level right now with respect to raising the federal gas taxes. There are a lot of members of Congress who say, yes, there is absolutely a need. I don't



Frevert

think anybody is going to walk out and say there aren't trillions of dollars' worth of infrastructure needs out there, but I think there's concern that increasing the federal gas tax and being accountable to the constituents in this economy are really stalling an effort to raise a substantial amount of money devoted to infrastructure."

Maurstad suggested establishing an infrastructure commission: "It seems to me that the best shot is some type of commission that's charged with this and that has the necessary individuals within Congress as sponsors who are going to marshal it through and provide the national leadership." It would then, Maurstad contended, be necessary for those sponsors to "provide the national leadership [and]...involve all of the public-private sectors at various levels over a long period of time, but not provide [the commission] with a charge that can't be reasonably accomplished within a six- to nine-month period. This is going to take some time to flesh out the whole development of the plan and the execution



Van Beek



Menard

and all the other parts of it, but it seems to me that that's a framework that could be used, especially when you consider that what's being done right now has not gotten us to a point that anybody is too enamored with."

Pisarski cited reconstruction of the interstate highway system as the most pressing infrastructure problem: "The real issue is that we don't know how many states have fixed how much," he said. "That's the real problem: to make an assessment of what reconstruction of the interstate would [cost]. It's a very, very big number. I promise you that."

Frevert made the case that water is the most pressing issue we face: "Look at states that are on the verge of being uninhabitable in 20 years because of a lack of water. Western Kansas is so dependent on the aquifer that's being drawn for the farmers who are irrigating in Nebraska that western Kansas may be uninhabitable in 20 years. Georgia and Tennessee have been fighting for 150 years over the border because Georgia wants access to the Tennessee River.... You know, we have made



Puentes

great strides forward with the Clean Water Act and things like that, but there is not an inexhaustible supply of water in this country and we've got to deal with that. We can deal with transportation in other ways. It may be more efficient to take people off highways—certainly it would be more efficient to take freight off of highways and put it on rail—but how are we going to deal with it if we don't have water?

"We also have an issue with energy. We have not invested in our electrical grids, and our electrical grids are continuing to fail and we've got to do something about our energy in this country. I think one of the biggest problems we face right now is, how do we continue to engage the American

"I think one of the biggest problems we face right now is, how do we continue to engage the American public? What is the call du jour and what are they motivated by today? The public does not continually stay engaged in infrastructure. They take it for granted. We have fewer and fewer people who are going into the sciences, engineering, technology, and education. How do we inspire young people? The time is right. We've got to do something now, and we need a plan. I think the plan needs to be focused on what the public sees as the value it provides to them. We've got to engage the public throughout the process." —LARRY FREVERT

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Menard made the point that infrastructure must be defined in terms the general public understands—that tackling this issue is a major problem: “[Infrastructure] is still too much in the stratosphere somewhere. It’s not down at the local level where people understand it. If I mentioned the word ‘infrastructure’ to most of my friends they wouldn’t know what I was talking about. They think about it as the Metrobus they ride to work or the Red Line they hop onto. I think you have to be very local, very specific so that people can understand what the everyday impacts are.”

Millar made a convincing case for infrastructure educational programs in schools: “I was on the board of an organization that developed a salmon watch program—a two-week curriculum at every elementary school in the state that talked about salmon and their life cycle. Environmentalists, Native Americans, industry—everybody was at the table. And we put together a program that educated all the kids in Oregon on the importance of salmon, and when you are educated that way you can’t help but think it’s important. And they brought it home to their parents. We need to get an infrastructure curriculum together and start educating the American public. It’s going to take a generation to do it but it’s taken generations to get where we are. It’s time to get this back in the forefront, and if people don’t have the vocabulary we need to start creating that vocabulary. I think we do it in partnership with education.”

Frevert suggested a proactive approach that involves formulating a comprehensive national plan: “We’re 16 years away from the 250th anniversary of this country. John Kennedy had the vision that by the end of the 1960s we would put a man on the moon. Where is that vision now? What if we put a vision in place that we’re going to have a comprehensive national plan in place by the 250th anniversary of this country? How do we do it? Well, maybe we do it through ASCE chapters. Maybe we do it through MPOs. Maybe we do it through our public universities—maybe we make it a requirement of our public universities that they do regional planning within



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each of their areas and roll it up to the state university. They roll it up to the federal level, and then it’s accepted as the comprehensive national plan. Congressmen still have the authority—they still have the responsibility to implement that plan; the president will have responsibility to implement that plan. And that’s how they would be held accountable and that’s how they would be reelected. But it would be something that rolls up from the grass roots.”

Tymon made the point that Congress hasn’t been sitting on its hands with respect to the infrastructure issue. “To Chairman Oberstar’s credit,” he noted, “he’s gotten tired of waiting and said he’s trying to push through his own idea. But any major change in transportation has always used the White House as the bully pulpit that’s pushing it forward. Whether you look all the way back to what Eisenhower had to do in the 50s to push the interstate highway system forward or to what President Reagan had to do in finally getting behind a gas tax increase to push through that piece of legislation back in the early 80s, if you don’t have strong support from the White House in this town it’s just not going to go anywhere.”

As the discussion drew to its conclusion, Frevert asked what else ASCE should be doing to engage the public: “Is our report card enough? Obviously it’s shared among those of us in the profession. But do the people who count—the people who elect, the people on the Hill, the guy [in the White House]—do they understand what infrastructure does for their quality of life? Do they understand what the balance of trade looks like in this country and why we are in an import-export deficit to other countries right now and what influence infrastructure has on that? I don’t think so. It may be part of ASCE’s responsibility to educate the public on what that impact is. And I think we need to look for partnerships. We need to be looking at and working with the National League of Cities, with the Conference of Mayors, and bring all of these groups together because we bring the technical expertise that the politicians can use to better explain [infrastructure] to the public.”



Tymon