
The roundtable discussion on the fourth solution outlined in the 2009 Report Card for America’s Infrastructure—address life-cycle costs and ongoing maintenance—was moderated by Vice Admiral Michael K. Loose, P.E., M.ASCE. The participants included John Bennett, P.E., M.ASCE, Representative Earl Blumenauer (D-Oregon), Michael Deane, David Ehrhardt, Ginger Evans, P.E., M.ASCE, Alex Hergott, Andrew Herrmann, P.E., SECB, F.ASCE, Joe D. Manous, Jr., Ph.D., P.E., D.WRE, F.ASCE, Roger Millar, P.E., CFM, F.ASCE, James K. Murphy, P.E., CFM, M.ASCE, and Kevin Womack, Ph.D., P.E., M.ASCE.

The fourth solution, as published in the 2009 Report Card for America’s Infrastructure, reads as follows:

As infrastructure is built or rehabilitated, life-cycle cost analysis should be performed for all infrastructure systems to account for initial construction, operation, maintenance, environmental, safety, and other costs reasonably anticipated during the life of the project, such as recovery after disruption from natural or man-made hazards. Additionally, owners of the infrastructure should be required to perform ongoing evaluations and maintenance to keep the system functioning at a safe and satisfactory level. Life-cycle cost analysis, ongoing maintenance, and planned renewal will result in more sustainable and resilient infrastructure systems and ensure they can meet the needs of future users.

Because Blumenauer, an honorary fellow of ASCE, could not participate in the entire discussion, Loose began by giving him the floor and then opened the discussion to questions from the other participants. “I truly believe that the ability to get our hands around the subject of today’s panel discussion is to determine how we are going to solve the infrastructure crisis,” Blumenauer said. “I can’t say enough about what you have done—Andrew Herrmann and team—with respect to the report card and giving objective information to policy makers and the public. You have, I think, carefully documented the threats to the environment, our safety, and the economy.

“The problem is we have not been able to make this message compelling and comprehensive to the nonwonks. I’d suggest that our ultimate solution is going to be begin with articulating forcefully and clearly the need for an infrastructure vision for this century... The Gallatin plan drove the
Moderator

Michael K. Loose, P.E., M.ASCE, is a vice admiral in the U.S. Navy and became the deputy chief of naval operations for fleet readiness and logistics in January 2007. Loose attended the University of Kansas on a Naval Reserve Officers Training Corps (NROTC) scholarship. He earned a bachelor of science in civil engineering and was commissioned an ensign in the Civil Engineer Corps in 1975. He earned a master of science in civil engineering and completed the integrative program in administration at the University of Washington in 1980, and in 1996 he completed an executive program at the University of Michigan. Loose is a Seabee combat warfare officer and a registered professional engineer in California. His personal decorations include the Distinguished Service Medal, the Legion of Merit (five awards), the Meritorious Service Medal (two awards), the Navy Commendation Medal, the Navy Achievement Medal (two awards).

Participants

John Bennett, P.E., M.ASCE, leads policy development with Amtrak’s strategic partnerships unit. He has more than three decades of experience in rail and public transportation strategy, policy, planning, and management, including extensive experience in capital program development and management. His collaborative planning experience includes multiyear investment programs for the $100-million Penn Station Central Control project, in New York City, infrastructure investment requirements to add capacity to Amtrak’s Northeast Corridor, and the definition of capacity enhancement projects for the I-95 Corridor Coalition’s Mid-Atlantic Rail Operations Study.

Earl Blumenauer (D-Oregon) is a lifelong resident of Portland, Oregon, and has devoted his entire career to public service. Elected to the U.S. House of Representatives in 1996, Blumenauer has created a unique role as Congress’s chief spokesperson for livable communities, that is, places where people are safe, healthy, and economically secure. From 1996 to 2007 he served on the House Transportation and Infrastructure Committee, where he was a strong advocate for federal policies that address transportation alternatives, provide housing choices, support sustainable economies, and improve the environment. A member of the Committee on Foreign Affairs from 2001 to 2007, he now serves on the Committee on Ways and Means and the Committee on the Budget. He is also the vice-chair of the Select Committee on Energy Independence and Global Warming. Blumenauer’s academic training includes undergraduate and law degrees from Lewis & Clark College.

Michael Deane is the executive director of the National Association of Water Companies, which represents all aspects of the private water service industry and development of the United States well into the 1800s. [Albert Gallatin was the treasury secretary during the administration of President Thomas Jefferson.] One hundred years later, on the anniversary of the Gallatin plan, Teddy Roosevelt convened all of the smart people he could find in the country. And I will tell you that if you haven’t looked at the proceedings of that three-day conference in May of 1908, it’s worth a look—at what they were contending with, the way that they framed it, and where it went. In fact, Teddy Roosevelt and his cousin Franklin Roosevelt really started us off in the 1900s. The Park Service planted the seed of the interstate highway system that germinated in Franklin Roosevelt’s basement and blossomed under the leadership of President Eisenhower.

“It’s the only pitch I have made personally to the current president when I had a chance—trapped on a bus with him when he was then candidate Obama—that we need an infrastructure vision for this century. Now, to his credit, this popped up a little bit in some of his speeches, but we haven’t yet seen it comprehensively in the policies of the administration, and the bizarre partisan breakdown over financing infrastructure has meant that they’ve just held back. They’re not going to get in the cross fire. In the House, there were exactly zero Republican votes for the recovery package last year—in part because it was felt that it included too much infrastructure. Be that as it may, we have got to see if we can help unite around the vision that I think will help ameliorate some of these problems.

“Second—and here’s where you come in—we have to change the value proposition for infrastructure in this country. In tough economic times, people want—reasonably included too much infrastructure. Be that as it may, we have got to see if we can help unite around the vision that I think with him when he was then candidate Obama—that we need an infrastructure vision for this century. Now, to his credit, this popped up a little bit in some of his speeches, but we haven’t yet seen it comprehensively in the policies of the administration, and the bizarre partisan breakdown over financing infrastructure has meant that they’ve just held back. They’re not going to get in the cross fire. In the House, there were exactly zero Republican votes for the recovery package last year—in part because it was felt that it included too much infrastructure. Be that as it may, we have got to see if we can help unite around the vision that I think will help ameliorate some of these problems.

“Second—and here’s where you come in—we have to change the value proposition for infrastructure in this country. In tough economic times, people want—reasonably enough—to make sure that their public dollars, their business investments, and their utility bills are getting maximum value. They want them stretched and multiplied.

“Dealing meaningfully with the life cycle of our equipment—of our infrastructure—will cost a little more in year one. Maybe a lot more in year one. But to enhance efficiency, reduce the carbon footprint, and effect long-term savings
“The problem is we have not been able to make this message compelling and comprehensive to the nonwonks. I’d suggest that our ultimate solution is going to begin with articulating forcefully and clearly the need for an infrastructure vision for this century.”

—Earl Blumenauer

promotes the value of the private sector as the provider of high-quality, sustainable water services and innovative solutions. Deane served as an associate assistant administrator for water in the U.S. Environmental Protection Agency (EPA) from 2007 to January 2009, and before that he served as a senior policy adviser in the area of infrastructure finance for the EPA’s Office of Water. He also has executive experience at several water management companies, including United Water and its parent company, Suez Environnement, and the U.S. operations of Vivendi (now Veolia Water), and in those positions he focused on innovative financing and infrastructure policy. Deane began his career in water at the EPA, where he worked on the state revolving fund and public-private partnership programs. He holds a master’s degree in environmental management from Duke University and a bachelor’s degree in biology and geography from Gustavus Adolphus College.

David Ehrhardt, the chief executive of Castalia, has designed, implemented, or advised on public-private partnerships (PPPs) and privatizations in Australia, New Zealand, the United Kingdom, and many other countries. He has designed or managed 23 PPP transactions worth over $17 billion. These include innovative PPPs for the operation of trams and trains in Melbourne, Australia, and water services on the island of St. Lucia. Because of his extensive experience, he is often asked by governments around the world to provide advice on implementing PPP programs. His publications include “Approaches to Private Participation in Water: A Toolkit”; “Good Practice in Long-Term P3 Contract Design” (P3 here denoting PPP); and “Sample Management Contract and Bidding Documents for Water and Electricity.” Ehrhardt holds a degree in economics from the University of Otago, in New Zealand, and a law degree from the University of Victoria, in British Columbia.

Ginger Evans, P.E., M.ASCE, is a senior vice president and the manager of aviation for the transportation business unit of the engineering and construction firm Parsons, of Pasadena, California. She directs international and domestic aviation programs from the firm’s Washington, D.C., office. The recipient of the U.S. Environmental Protection Agency’s Outstanding Achievement Award, ASCE’s President’s Medal, and Engineering News-Record’s Award of Excellence, Evans is the author of the airports section in the McGraw-Hill Encyclopedia of Science and Technology.

Alex Herrgott is a member of the professional staff of the U.S. Senate Committee on Environment and Public Works and is working on reauthorization of the federal highway program, which expired last year on September 30. He joined the committee in 2004, having served on the transportation team that negotiated the transportation reauthorization bill of 2005, the Safe, Accountable,
Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). As a member of that team he focused on transportation research issues, highway project eligibility, and financing. Herrgott also assists in oversight of the Environmental Protection Agency and its environmental justice programs and of Department of Transportation and U.S. Fish and Wildlife Service issues within the committee’s jurisdiction.

Andrew Herrmann, P.E., SECB, F.ASCE: See page 64.

Joe D. Manous, Jr., Ph.D., P.E., D.WRE, F.ASCE, serves as the future directions team leader within the U.S. Army Corps of Engineers’ Institute for Water Resources but has been on detail to the Office of the Assistant Secretary of the Army (Civil Works) since April 2009. A civil engineer specializing in the areas of water resources and environmental security issues associated with water, Manous was a professor at the United States Military Academy at West Point from 2000 to 2008. He retired from active duty with the rank of colonel in 2008 with more than 28 years of service in the Corps of Engineers. He holds a bachelor’s degree in civil engineering from the Georgia Institute of Technology, a bachelor of science in physics from North Georgia College and State University, a master of science in civil engineering from the University of Illinois, a master’s degree in strategic studies from the U.S. Army War College, and a doctorate in environmental engineering from the University of Minnesota.


James K. Murphy, P.E., CFM, M.ASCE, has more than 30 years of experience consulting with the Federal Emergency Management Agency and, more recently, the Department of Homeland Security (DHS), and his work has included levee policy recommendations. He currently represents the Association of State Floodplain Managers as vice-chairman of a coordinating council on levees in the DHS’s Office of Infrastructure Protection and as a project director for the URS Corporation, which is headquartered in San Francisco.

Kevin Womack, Ph.D., P.E., M.ASCE, is a professor of civil and environmental engineering at Utah State University and the director of the Utah Transportation Center. He specializes in transportation infrastructure and policy, and he served on the staff of the U.S. Senate Committee on Environment and Public Works during the drafting of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Womack is also a former chairman of ASCE’s Transportation Policy Committee.

approach. I think the qualified asset management approach, which many states use, will put engineers in the room with the procurement guys, making the correct decisions. One of the biggest issues is the cash balance accounting that is in the highway bill. Many states use capital budgets, but when it comes to the highway program, we juxtapose the five-year authorization against seven-year outlook plans at the state level, and it’s very difficult to put a square peg in a round hole.

“The other problem,” Herrgott continued, “is an institutional problem in the construction industry. We live in a low-bid environment, and value engineering in many cases runs in conflict with life-cycle analysis because it’s very difficult to justify more expensive materials—corrosion materials, the more expensive composites, and new materials that will prolong the service life of an asset, optimizing its value—when you’re in a low-bid environment.”

Blumenauer responded, in part, as follows: “As part of any responsible bidding process for a major public investment, there should be elements that deal with long-term maintenance.... We need to make sure that federal policy and professional practice focus on the right questions so that the public knows what it is buying and what [it is] getting. If we do that, then these disparities are going to be minimized and we can make informed decisions about whether we’re going to build it on the cheap and have to tear it down or rebuild in 5 or 10 or 15 years. Now, some people will do it, to be sure. But a lot of people won’t and at least it will be an informed decision.”

Deane posed the question, “Is it okay to start insisting on a certain level of up-front performance assurance if those resources are shared with the communities? If so, how do we get over that political hurdle of ‘we want the money, but don’t tell us exactly what to do with it.’”

Blumenauer’s response included the following: “I think there is the responsibility to make sure that federal resources are employed in ways that are not only transparent but that actually advance federal objectives. This doesn’t have to be onerous, but my experience is that doing this right actually makes it easier in terms of the ultimate project.”
“I think we need to set principles that can be adopted by every state so that we’re all talking the same language,” said Herzog. “There are some basic components that I think would help the Department of Transportation in developing guidelines that all states could use to develop their own qualified asset management systems and not subvert their own methods. It’s something that’s risk based. It should look at the user costs as well as the life-cycle costs, and must be dynamic—looking at both the condition and the performance. People forget that. We just look at the condition, but we also need to look at the performance as well to have a holistic approach when looking at the finite resources for infrastructure investment.”

Blumenauer responded, “That touches on part of the value proposition. Is it the federal government’s role to specify what the pavement management system should be, or is it the federal government’s role to say that if you’re going to get federal money you are responsible for a result? I would hope that you folks could help us think through what the future should look like. I think you could get rid of two-thirds of the people in the Department of Transportation—get rid of half or more of the people in the Environmental Protection Agency—if we move to something that is performance based, results oriented. We don’t specify what the management system should be, but we demand results and accountability, and if they screw up they can be penalized in terms of what goes forward. I say this with all due respect. Some of my best friends are bureaucrats, I’m not in a tug of war with them, but after all of this experience—a number of you could cite chapter and verse—what is the nature of the federal partnership that we need in order for this to flourish?”

“I would mandate a plan. I wouldn’t tell them what’s in the plan; I would mandate a plan and I would hold them accountable for the results and the environmental performance. But I would suspect that we could squeeze huge amounts of time and money out of this process if we reconfigured the federal partnership for infrastructure to deal with accountability and performance and for people to plan—to give us the big picture. We would be able to monitor results in terms of traffic flow, air quality, water quality that meet their targets, and then get out of their way. This value proposition needs to be changed.”

“We need community buy-in,” said Evans, “and we keep missing that step. We cannot create and support a program—especially of the visionary type that you are describing—until we get sustainable community support.”

Blumenauer responded, “I think it’s happening at the local level. I think your profession is helping to lead the charge. Where we have fallen down, I think, is in integrating it into the federal policy. But I think people are coming together in communities large and small. They know what to do, and you’ve got people who know how to do it. I’m very optimistic about that.”

Ehrhardt responded, “I’m interested in that link between how these ideas become election winners for candidates. How would the public get in a position where they would want to vote for candidates who will want to support the kinds of ideas we’re talking about?”

In response, Blumenauer said, “I suspect it’s treating the voters like grown-ups. Mayor Shirley Franklin in Atlanta became the ‘sewer mayor’ and made some very difficult decisions and was reelected. I do think there’s opportunity to engage people in this broader context. If we have the vision of why we’re doing it and we can show that we’re working hard to improve value—to eliminate unnecessary hurdles and costs—I think the public will pay. They’ll be supportive. We’re talking about voting on the future. We’re talking about dealing with problems of clean air, clean water, reducing congestion, economic development—of people having control over their communities.”

In closing, Blumenauer observed, “I think there’s momentum for [the infrastructure issue], and the work that you have done is helping raise the profile. I think our challenge is to figure out how to have these conversations in every community to give it a higher profile, and I would love to have the first 15 minutes of all of these forums be about the report card. I think it would be helpful.”

Loose then returned to the questions that had been prepared for the panelists, the first of which was, “How is life-cycle cost analysis beneficial to an infrastructure system?”
“There are many benefits,” noted Evans, “but the primary benefit that we read about in the literature is that it absolutely helps to make sure that we choose the most cost-effective alternative on a timely basis. It has absolutely proven time and time again to be the best way to save total taxpayer money and public funds. The second primary benefit is that the long-term economic implications are taken into account—both primary and secondary. The third is that it uses cost efficiency. It looks beyond the initial low-cost option, which has been the basis of decision making for a very long time. I am reminded of one example. Many years ago when the Bureau of Reclamation was analyzing whether or not to build a dam, they did a very comprehensive benefit-cost analysis, and most of the time they would build the dam. But then there was a change—a major change in their thinking. . . . They expanded their economic analysis to look at the various communities that were affected, not just the primary beneficiary of the project they were sponsoring. It totally changed the bureau’s outlook on the benefits of those structures. So there is precedent. It has been done, and we can do it in new areas as well.”

Herrmann added that “with respect to the life-cycle cost analysis, we also need to take a look at the cost of operation, the cost of maintenance, the cost of retirement, the cost of replacement. That should be taken into account when you’re trying to make a decision on what to do in the first place.”

“One additional item that we ought to consider in our life-cycle cost analysis,” noted Murphy, “and we deal with this all the time in disaster response, is the interdependencies of infrastructure. If this electrical system or this transportation system degrades because of a lack of maintenance, what is its impact on our ability to undertake other activities?”

Loose then posed the following questions: “What do you see as the greatest impediment to widespread implementation of life-cycle cost analysis? Is it solely financial?”

“Because these infrastructures are deemed public goods,” noted Deane, “they lack an ownership aspect, whereas if you own something, you’re much more likely to look over the life cycle. In the private water companies it’s easier for us to spend more up front looking out over the life cycle of a project because we’re an ongoing entity. You’ve got the chief financial officer over your shoulder who is insisting that you do that, as opposed to a city council member or others insisting that you don’t do that if you’re a public utility. . . . Until we get that sense of institutional ownership it will be very difficult for people to have the incentives and the opportunities to make those decisions correctly.”

“I would say that, fundamentally, it’s not financial at all,” said Ehrhardt. “It involves both an institutional and a political economy. It can’t be financial because a financial decision maker would examine the life-cycle costs because that’s how you save money. Why we don’t do that is because of our institutions. How to change that? We’ve got to change the political economy.”

“If we’re going to incentivize people to invest in...
infrastructure,” said Bennett, “I think we have to have a top-down view of what that vision is and then we can put the life-cycle costing into the mechanism for how we get it done. But life-cycle costing by itself is not going to give us the vision.”

“I’d like to take this discussion to a more fundamental level,” said Manous. “I think that in 1808 Albert Gallatin had the same discussion we’re having today, and Teddy Roosevelt had it in 1908, and we’ll have it in 2058, because inherently people don’t understand what it is we’re talking about. . . . Rarely do I hear discussion of engineers better educating the public . . . and getting them to accept the idea that infrastructure is important and something that we value.”

The next question Loose posed was this: “How can owners be made to understand the inherent benefits of life-cycle cost analysis? Legislators? Users?”

“I can certainly cite an example,” said Womack. “The Utah Department of Transportation has adopted an accelerated bridge construction program for all of their bridge replace-

ment, and that requires a life-cycle cost [analysis], and part of that is the calculation of the cost-benefit ratio. Initially, all of these bridges have been more expensive to replace than if they had done standard replacements, but they’ve been able to sell to the public the benefit of replacing a bridge over a weekend as opposed to taking six months. They have done a very good job of the public relations to the public. And then the public realizes that, okay, I’m going to be inconvenienced over a weekend as opposed to six months; that’s a great thing, even though I’m going to pay more for it initially. . . . I think that’s a really good example of an agency that has been very successful in educating the public, calculating life-cycle costs, calculating the cost-benefit ratio as part of that, and then implementing it to the public’s satisfaction.”

“How can we get the legislators to understand the inherent benefits of life cycle?” asked Loose.

“My experience,” said Millar, “is that people who are elected listen to the people who elect them. I think the key to motivating an elected official is having their constituents motivated and convinced that this is the right way to do business, and making the phone calls, sending the e-mails. I think we sell to elected bodies—whether they’re city councilmen, county commissioners, or congressmen—that it’s honest, it’s open, it’s objective, the public understands it, and the public insists on it. That’s what’s going to do it. Asking the Congress to dictate is very different from having their constituents demand it.”

“I think that at the federal level we need an institutional change to help states change a little faster,” observed Herrgott. “When it comes time to make decisions, our decision makers need to make the political decisions as to what is the life-cycle cost,” said Murphy. “What are the tolerable risks that they can accept or not accept? When you actually have limited funding, you have to make a decision. Do I want my water system to last 30 years or do I want it to last 5 years? I only have this much money. Is it tolerable to have zero accidents on Amtrak or is it acceptable to have an accident every 2 million operating hours?”

Loose then posed the following questions: “Why do you think insufficient maintenance budgets are so common? Why do you think the ASCE report card is what it is?”

“I would say, very simply, that maintenance projects don’t get people elected. There are common themes in all of these questions of separating the political decision from the right decision, and I think that’s fundamental to anything that we’re going to do that’s going to solve the problem. The reason why maintenance budgets are where they are is because you can’t cut a ribbon on a maintenance project.”

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April 2010 Civil Engineering [77]
procurement guys, then you’re actually going to see mainte-
nance as substantial portions of the budget and you’re going to
see new construction as a smaller and smaller part.

“I also think we’re at a pivotal point where we have a legacy
system that was built 50 years ago that’s crumbling under our
feet—not just the roads or the small drinking water systems.
We have an entire crisis that no one has seen. It’s a silent crisis
and engineers know about it.”

Millar noted that “we give money to agencies to build
things with the expectation that they’re going to maintain
them. Whether they’re going to maintain them or not, the
next time they come around for money they get the money.
There’s no contract that says, okay, we’re going to give you
money to go build something and you’ll maintain it, and
you’ll maintain it in a certain way, and you’ll come up with
the local resources to do that, and we’re going to check before
we give you money the next time.”

“There are many instances in which we have undervalued
and underestimated the knowledge and expertise of the main-
tenance professionals in our organizations,” said Evans. “We
can solve that by bringing them in very early on in the design
process and the thinking process, getting their input, and es-
ablishing those budgets and those needs as part of the proj-
ect description—as it goes through the design process, the
construction process, and the funding authorization process.”

Loose then asked, “How do we take care of the infrastruc-
ture we just did the report card on?”

“You analyze the physical condition and value of every
component of that building and you evaluate it,” said Evans.
“Should I replace it, should I let it fail, should I repair it? And
then you take all of that data, and like all good engineers, we
put it into a spreadsheet and we say to decision makers, ‘Here’s
the way to optimize your funding. The things that have val-
ue that we can repair, we repair. It’s going to cost you more to
keep putting Band-Aids on this wound; let’s rip it out and put
in a new one.’ We make the case systematically, component by
component, to show them the total cost of those alternatives
and what it means to them as an owner. You could absolutely
make that case, and you’ll win every time.”

“It becomes an issue,” said Bennett, “of what the perform-
ance is that you’re asking for in the future and what the total
cost is to ensure that.”

“I think that, fundamentally, one of the reasons that insuf-
icient maintenance budgets are so commonplace is because
they are government budgets and government budgets are
always done on a short-term cycle based around the election,
and maintenance can always be deferred because the asset life
cycle is much longer,” said Ehrhardt.

“I think if you look at the Metro system here in D.C. and the
issues over not having performed the maintenance, if you look
at the lead in the water in this area, it wasn’t until it became a
crisis that we addressed it,” said Murphy. “That’s how we do our
maintenance right now: when it’s broken, we’ll fix it.”

“Why are we here with Ds and Fs and C’s on our report
card?” asked Loose.

“It goes back to effective communication,” said Manous.
“I would say what makes communication effective or not is
whether it’s personalized. Does it reach out and touch somebody
from their perspective of the world?”

“As a matter of fact,” noted Deane, “the individual per-
sion doesn’t need to know that that pipe might be deterior-
ating. It’s about what is of value to them in their life. [The
engineering world should go out and say] we’re not talking
about infrastructure at all. We’re talking about the value of
water to your life as a parent from a public health and safety
standpoint or as a small business owner who needs water for
production. If you don’t have sustainable water, things hap-
pen. And that’s what they care about.”

“What we need to educate people on is not that it’s a
$2.2-trillion problem,” said Millar. “We need to say that we
can put money in your pocket or we could take less money out
of your pocket if you listen to us, and the dollar amounts are
this. This is what’s in it for you as a citizen of this country or as
a citizen of this state or this locality. People will pay for what’s
important to them.”

Loose asked if more funding should be spent on research and
development “so people know what we need.”

“I think the biggest thing is inventory,” said Herrgott. “If
we don’t know what we have, we don’t know how bad it is.
As much as this report card is a good assessment, this is sam-
ple data. This is not a comprehensive look at all infrastructure
in the United States. This is using the best resources that we
have to tell us what we need to know. The maintenance bud-
gets may have been sufficient 20 or 30 years ago, but they’ve
stayed stagnant. The needs have changed and we haven’t been
dynamic in addressing them. Knowing what we have, get-
ing an accurate inventory of the condition and performance
of how the system is, bringing it live so it’s not in the dark
ages, would be very helpful in communicating our message.”

“We have a lot of work to do,” said Evans, “to somewhat
standardize the tools and data collection so that they can be
shared and can be brought to bear to make these cases the way
we need to. There are not enough real examples.”

“How do we help change this report card to have more poli-
ticians get pretty pumped up and fired up?” asked Loose.

“Unfortunately, I don’t think there’s ever going to be a
situation in which a politician is pumped up about maintenance,” said Herrgott, “and although they read the report card and use it as a talking point of why we need more funding generally, they don’t want to address the foundational issue that caused this, which is unpopular: inadequate infrastructure investment at all levels of government.”

“I think one thing from ASCE’s perspective that will make a big difference is the creation of state report cards,” said Manous. “There are a number of states that are doing that because this goes back to making it personal. If a state generates these data, it will be more from an asset database perspective than what can be done at the national level, and they’ll also engage the state legislatures and their representatives and senators so that they see where their data shortages are in a more compelling way. Now having said all of that, I don’t care how good your model is and how definitive it is—if the decision maker has another idea about what’s important, guess what’s going to happen? There’s always this break-even point about how much data do you gather and spend money and effort and time on versus what makes a reasonable case. The bridge between how much data there are and what makes a reasonable case is often determined by the person who is articulating the message. We need more people who can articulate the message, as opposed to just generating it.”

“How does ASCE help shape and influence the American public and the senior elected leadership so that everybody in America feels they have an obligation to future generations to build an America that is built on the lowest life-cycle costs?” asked Loose.

“If we could create some effective templates for many of the engineering infrastructures we have and bring them down to those individual congressional districts—showing the impact in that district of not maintaining that infrastructure—I would be willing to bet . . . we’d have more impact,” said Murphy.

“I suggest,” said Manous, “that ASCE, the Department of Defense, the Corps of Engineers get everybody involved and try to come up with more tools to help the design professionals carry the message forward. If the design community—the engineers, the architects—are the only ones who are carrying the message, it’s going to sound to some people like we’re serving ourselves because we’re the ones who benefit directly from the work. We need to enlist the assistance of other groups of people—economists, the financial community, the Conference of Mayors. Different groups who can become part of the dialogue to advocate these messages.”

“We’ve got some great people we could put on the road,” said Loose, referring to a speakers bureau of sorts composed of people knowledgeable about infrastructure issues.

Evans suggested a database of shared services: “It is possible for us to suggest models from other projects and bring those forward. That’s one of the things we need to do as working professionals—to spread those not just by means of a speakers bureau, but from owner to owner. Because that will actually accelerate the implementation more quickly than doing it from the grassroots level up. A database of shared services. There is a lot of time and effort put into those, and if we could spread those between owners more quickly that might be a way to ramp it up.”

“There is a very good regional model of communication that was put together by the Regional Plan Association—a 2050 plan,” said Bennett. “What they did was look at the regions around the United States and build a 2050 plan and an advocacy for economic units and their competitiveness—the Northeast corridor, the California corridor, the Chicago corridor—and the competitiveness with the rest of the world, not just within the United States. This basically brings back to the reader that this is a competitive world and infrastructure is part of that. It’s a much broader top-down sort of message.”

Loose concluded with an open-ended question addressed to all of ASCE’s members: “How can we mobilize the ASCE membership to help get them engaged and involved so that 10 years from now they can say, ‘I had a little piece of that and I’m pretty proud of what I did.’ I think we really could make a big impact, because we’ve got some really smart people in some great positions. But we know some other people who do pretty cool things. How do we help leverage and force multiply the membership we have to make a bigger impact on America today, tomorrow, and 45 or 50 years from now?”
The fifth solution, as published in the 2009 Report Card for America’s Infrastructure, reads as follows:

All levels of government, owners, and users must renew their commitment to infrastructure investments in all categories. All available financing options must be explored and debated. While great strides can be made with sustainable development and ongoing maintenance, if we are to make the necessary long-term improvements, significant funds must be invested. The longer critical investments to improve the operability, safety, and resilience of the nation’s infrastructure are withheld, the greater the future cost and risk of failure. We must develop and authorize innovative financing programs that not only make resources readily available, but also encourage the most effective and efficient use of those resources. Federal investment must be used to complement, encourage, and leverage investment from the state and local government levels as well as from the private sector. In addition, users of infrastructure must be willing to pay the appropriate price for their use.

Downey opened by stating, “To put our thinking in context, I thought we’d begin with some of the issues that are more broadly generic to all five of the recommendations in the report card and then turn toward the issue of financing. Let me start by asking, why do we have this problem? What is it that we haven’t done right that sends us back to the table again and again to say that America has an infrastructure problem? And when are we going to deal with it? Does anybody have the answer?”

“I would suggest, first of all,” said Curtis, “that America doesn’t have an infrastructure problem; it has infrastructure problems, plural. I believe that the various infrastructure sectors present quite different problems. In some ways they are unique problems, but they certainly share an important common element—the failure to adequately fund the upkeep, the rehabilitation, and the replacement of infrastructure as it wears out and ages beyond its useful life.”

“At least on the transportation side, it’s kind of a cliché at this point to talk about the loss of national purpose, about investment in transportation infrastructure,” noted Frankel. “The interstate program grew out of the American commitment to connectivity. We were able to organize the political leaders across party lines. With the completion of the interstate system we lost the sense of a coherent purpose, a clear national coalition.”

“When we’re looking at this question of why we are where we are, it’s critical to recognize that there is an institutional political problem that is going to have to be resolved if we’re going to move forward,” observed Staley. “We didn’t get here just by randomness. We’ve got a political process that tends to focus on the shorter term rather than in investments in infrastructure, which will play out over a number of years. When the interstate highway system was funded back in the 1950s, we were able to articulate a vision in a way that could get a broad base of support. That support could not be sustained for 50 years. It went on autopilot, and it couldn’t sustain itself on autopilot. So we’re here because we have a political decision-making process that does not map well over the long-term kind of commitment that is involved in infrastructure. I think it’s also important to recognize that this is not just a U.S. problem. This is an international problem. We’re doing work in China right now, and we’re very concerned about whether they have a political process that’s capable of sustaining the levels of investment that are necessary to maintain even the most recent investment.”

“How many decades ago,” asked Suttle, “did we hear Everett Dirksen say to his Senate committee, ‘Gentlemen, the election is over. We’re no longer Republicans and Democrats; we are United States senators, and we need to get about the people’s business.’ We’ve forgotten that. We’re no longer working on the people’s agenda. We are working on the Republicans’
agenda or the Democrats’ agenda. The systemic problem is that we are not about one people anymore.

“The second thing that’s haunting us is this philosophy—dogma is what it is—of no new taxes,” Suttle continued. “We have brainwashed our American electorate into believing that to a point that we have become more of a welfare state than we’ve realized. . . . We’ve really got to face the music on this threat. I’ll go even one step further. Great civilizations throughout time have failed more often from within than from without. We have this fear of the without. The biggest threat—bigger than Al Qaeda—is us, because we don’t have our act together.” Downey made the point that “if we begin to get into the subject of financing, that’s in many ways the more critical issue. We can always pull together a coalition to get one or two things done, but all of those things are what you’ve got to deal with.”

Curtis observed that maintenance “is just not sexy. When was the last time you cut a ribbon for the rehabilitation of a sewer line or a water pipe? It’s not the kind of event that politicians like. I would say we have an abject political failure at every level of government in the United States. It starts over there in the dome [of the U.S. Capitol]. It goes to city hall, state legislatures, multijurisdictional boards and commissions. At every level, elected leaders and appointed leaders have been unwilling to tell people that there is no free lunch—that we’ve got to maintain the infrastructure that in most cases our forefathers built for us,

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and the no-tax ideology is poisonous. I think if we don’t find a way to address the political dynamic that shapes this problem set, we are not going to solve it.”

“What seems to be happening,” said Kirk, “is that we either desire to do more, or our desire to do more or the requirements to do more are outstripping our ability to pay.”

“We have not done a good job of being able to show how we make infrastructure decisions from a priority point of view and sell that to the public,” said Mullett. “We don’t look for other solutions once the money is not available. We almost automatically say we don’t have enough money, so we can’t fix it. It’s a very myopic view.”

“Rather than admonish ourselves for a lack of leadership, are we demanding too much from the system and do we need to think differently?” Staley asked. “This is one of the reasons why we’ve been looking hard at how you might structure an infrastructure bank—something that’s long term. It’s

Moderator

Mortimer L. Downey III serves as a senior adviser to Parsons Brinckerhoff, providing management consulting services to the firm and its client base, including public and private owners, developers, financiers, and builders of infrastructure projects worldwide. During the 2008 presidential campaign Downey served on Senator Barack Obama’s transportation policy committee, and during the presidential transition he led the agency review team dealing with the Department of Transportation. Downey held the position of U.S. deputy secretary of transportation for eight years, a record. He also served as chairman of the National Academy of Sciences’ Committee on Science and Technology and has been a member of the Trade Promotion Coordinating Committee and of Amtrak’s board of directors. He also served as assistant secretary of the Department of Transportation and for 12 years was the executive director and chief financial officer of New York’s Metropolitan Transportation Authority. His professional awards include election to the National Academy of Public Administration, where he has served as chairman of the board of directors, and he has also been the recipient of the Transportation Research Board’s Frank Turner Medal for Lifetime Achievement in Transportation. Downey obtained a bachelor of arts in political science from Yale University in 1958 and went on to earn a master’s degree in public administration from New York University and to complete the advanced management program at the Harvard Business School. He also served as an officer in the U.S. Coast Guard Reserve.

Participants

Peter J. “Jack” Basso, a nationally recognized expert on transportation finance, joined the American Association of State Highway and Transportation Officials as chief operating officer and program finance and management director in March 2001. Before that Basso served as assistant secretary for budget and programs and as chief financial officer of the U.S. Department of Transportation. Prior to his appointment by President Bill Clinton to that position, he served as the department’s deputy assistant secretary for budget and programs. Basso’s 36 years of service as a career official have included such assignments as assistant director for general management of the White House Office of Management and Budget, deputy chair for management of the National Endowment for the Arts, and director of fiscal services for the Federal Highway Administration. He has also held numerous positions in administration and management in the Federal Highway Administration. Basso earned a bachelor of science in business administration from the University of Maryland at College Park and did graduate work in general administration there from 1980 to 1981.
focused on a different set of priorities, a different set of goals, a different set of incentives.”

“One of the interesting things about being able to sit through all of these roundtables is to see some of the commonalities that are coming out of them,” observed Andrew Herrmann, P.E., SECB, F.ASCE, who chaired the advisory council that helped ASCE prepare its 2009 Report Card for America’s Infrastructure and who observed the discussions. “In one of the earlier roundtables, the concept came out that he who benefits should pay. Right now, the public just doesn’t seem to understand what water, what highways, what

Brian F. Chase specializes in creating and implementing innovative strategies for financing and developing large infrastructure projects both in the United States and internationally. He frequently works on legislation that facilitates public-private partnerships and on procurement strategy and project implementation involving toll roads, mass transit systems, high-speed rail, water and wastewater treatment plants, ports, airports, flood control facilities, and border-crossing infrastructure. In addition to his current work with Castalia, an infrastructure finance advisory firm, Chase has been providing advice to the World Bank and the Asian Development Bank on practices that have proved to be highly effective in relation to procurement via public-private partnerships. Before joining Castalia he was a vice president at the Carlyle Group, a global private equity firm, and before that he practiced law at Nossaman LLP, a national law firm that frequently represents government agencies that wish to facilitate private investment in publicly owned infrastructure. Prior to joining Nossaman, Chase spent several years with two other large U.S. law firms, and his focus there was on global project finance and infrastructure-related corporate transactions involving the development, purchase, sale, or reorganization of water, wastewater, airport, and telecommunications assets in Latin America and central and eastern Europe. Chase holds a bachelor of arts from the University of California at Berkeley and a doctor of laws from the Georgetown University Law Center.

Tom Curtis is the deputy executive director for government affairs of the American Water Works Association. Previously he served as director of natural resources for the National Governors Association and as deputy director of the Environmental Council of the States. Curtis has more than 25 years of experience working closely with Congress and the U.S. Environmental Protection Agency on drinking water and other environmental issues. He served in the U.S. Army in Vietnam and worked for two governors in West Virginia. He holds an undergraduate degree in political science and a master’s degree in public administration from West Virginia University.

Emil H. Frankel is the director of transportation policy for the Bipartisan Policy Center, of Washington, D.C., and an independent consultant on transportation policy and public management issues. In June 2009, under his leadership, the center issued the report Performance Driven: A New Vision for U.S. Transportation Policy. In 2008 and 2009 Frankel was a visiting lecturer at Yale University’s School of Management and School of Forestry and Environmental Studies, where he taught courses on transportation, energy, environmental policy, and public management. From 2002 to 2005 he was the assistant secretary for transportation policy at the U.S. Department of Transportation. Appointed by President

Something that is critically important is, how do you educate the public about the importance of transportation and reinforce the important role it plays in their quality of life and the economy? I think the first step is getting some sort of clearer vision in Congress and articulating some type of national program that’s tied to national goals and national priorities that can be communicated to the public.” —Jill Ingrassia
George W. Bush, he was instrumental in coordinating and developing the administration’s proposal to reauthorize the federal highway, mass transit, and highway safety programs. From 2005 to 2007 he was a principal consultant of the international engineering and consulting firm Parsons Brinckerhoff. As commissioner of the Connecticut Department of Transportation from 1991 to 1995, he was responsible for managing an agency with more than 4,000 employees and an annual budget of more than $1 billion. Earlier in his career he served as a special assistant to the undersecretary of the U.S. Department of Housing and Urban Development and as a legislative assistant to Senator Jacob K. Javits (R–New York). Frankel served as a founding vice-chair of the I-95 Corridor Coalition and as a director of the Regional Plan Association, which encompasses 31 counties in the New York City metropolitan area. From 1999 to 2001 he was a selectman for Weston, Connecticut. Frankel earned a bachelor’s degree from Wesleyan University and a bachelor of laws from Harvard Law School and was a Fulbright scholar at Manchester University, in the United Kingdom. From 1981 to 1997 he served as a trustee of Wesleyan University.

David Gehr, M.ASCE, is the senior vice president for the Americas highway market for Parsons Brinckerhoff, which is headquartered in New York City. He previously served in several senior management positions with the Virginia Department of Transportation, including six years as chief administrative officer. Gehr has 40 years of professional experience in transportation engineering and policy and is active in several professional organizations.

Jill Ingrassia is the managing director of the government relations and traffic safety advocacy department of the American Automobile Association (AAA), where she directs federal and state government relations as well as traffic safety advocacy, policy, and programs. Ingrassia manages a staff of policy and public health professionals and oversees the development and implementation of public policies of concern to AAA members and AAA business operations. In her 13 years with the AAA she has represented the association on a number of coalitions encompassing national transportation and safety organizations, and she currently serves as a board member of ITS America. She also represents the AAA in the Transportation Safety Advancement Group, and in 2008 she chaired the Road Gang, an affiliation of transportation professionals. Before joining the AAA, Ingrassia worked as a legislative assistant to Jim Exon (D) when he was governor of Nebraska and when he became a U.S. senator. She holds a bachelor of arts from Nebraska Wesleyan University in Spanish and global studies.

Ken Kirk is the executive director of the National Association of Clean Water Agencies (formerly known sanitation cost. And if we can educate them on that concept, then maybe we can figure out a way to pay for it whereby people will be sharing the costs.”

“There are plenty of examples of people being willing to tax themselves if they know what they’re buying and they know that the elected officials will be held accountable for that list,” said Ruffalo. “We have not made progress convincing the American people that at the federal level we can give them that kind of accountability. Part of what I think our problem is, is that all of us talk to ourselves and lament the situation and ask why it doesn’t get any better. It’s always the same kinds of groups that sit around and do this, and at some point we’ve got to bring this down to the American people’s level and get them to understand that we can improve the quality of their life and their commute if we get them this vision. But I’m afraid that this time around, the top-down [approach] isn’t going to work. It’s going to have to be the American people saying, ‘We want that new waste-water system; we’re tired of the system we have.’ The same on transportation. I think without that, we’ll be sitting here five years from now, six years from now, having this same conversation.”

“Something that is critically important is, how do you educate the public about the importance of transportation and reinforce the important role it plays in their quality of life and the economy?” asked Ingrassia. “I think the first step is getting some sort of clearer vision in Congress and articulating some type of national program that’s tied to national goals and national priorities that can be communicated to the public.”

“This is not simply a matter of the political will to raise money or the distastefulness that user groups might find in paying additional money,” said Lanier. “It’s the whole notion of what we are buying with that money, where are the priorities, and what is the list of projects that we think are extremely important?”

“In terms of leadership, I think that there are a number of
as the Association of Metropolitan Sewerage Agencies (AMSA)). Earlier he worked with a private consulting firm based in Washington, D.C., where he had responsibility for the management of several associations, including AMSA. He also worked on legislative matters at the U.S. Environmental Protection Agency and was the public affairs manager at the Water Environment Federation. Kirk holds degrees from New York University, the Georgetown University Law Center, and the George Washington University Law School, his specialty being environmental law. He also serves as chair of the Water Infrastructure Network, a broad coalition dedicated to preserving and protecting the health, environmental, and economic gains that America’s drinking water and wastewater infrastructure provides. Moreover, he serves as president of the Clean Water America Alliance, a 501(c)(3) nonprofit organization he helped to found that explores the complex issue of water sustainability and plans for the future by raising public awareness in order to advance holistic, watershed-based approaches to water quality and quantity challenges.

Robin W. Lanier is the executive director of the Waterfront Coalition, a group of concerned business interests representing shippers, transportation providers, and others in the transportation supply chain committed to educating policy makers and the public about the economic importance of U.S. ports and foreign trade. Lanier helped to form the coalition in 2000. From 1990 to 2000 she served as the senior vice president for industry affairs and trade development for the International Mass Retail Association (now the Retail Industry Leaders Association), where she managed internal and external communications functions and served as the mass retail industry’s principal lobbyist on trade and consumer product issues. From 1979 to 1990 she was a vice president and lobbyist for the National Retail Merchants Association (now the National Retail Federation). She also served as a legislative assistant to Congressman Thomas J. Downey (D–New York) from 1975 to 1979. A native of New York, Lanier attended the University of Michigan and holds a bachelor of arts in political science from the State University of New York at Buffalo. She is married and has two children.

C. Randal Mullett is the vice president for government relations and public affairs for Con-way, Inc., of San Mateo, California. As the firm’s senior policy manager and executive representative in Washington, D.C., Mullett is responsible for the company’s relationships with national business and trade associations, as well as for federal legislative and regulatory advocacy efforts in the areas of homeland security, business sustainability, freight transportation, and other policy issues important to the enterprise. He also spearheads the program to promote sustainable business practices at Con-way and in freight transportation. Mullett has led Con-way’s
government relations program since 2002 and before that served in a number of field operations and management roles for the company, including 14 years as a service center manager. He is a frequent speaker at legislative commission and regulatory policy development conferences and is a respected voice within the transportation and supply chain management communities. A native of Berryville, Virginia, he holds a bachelor’s degree from Shepherd University and a master’s in business administration from Old Dominion University.

James O’Keeffe is the senior economist for the U.S. Senate Committee on Environment and Public Works. In this capacity he works primarily on transportation issues, but he is also responsible for budgetary issues pertinent to other programs under the committee’s jurisdiction. During the passage of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), he worked on most issues within the highway program, but his focus was on funding issues, the distribution of funds among the states, and innovative financing provisions. O’Keeffe joined the committee in 2003, when Senator James M. Inhofe (R-Oklahoma) took over as chairman. Previously he was the Senate Budget Committee’s senior analyst for transportation, and before that he was a transportation analyst at the Congressional Budget Office and a projects assistant in the World Bank’s transportation, water, and urban development division.

Kathy Ruffalo is a government affairs consultant with more than 20 years of public policy experience at both the federal and the state level of government. From 1989 to 1999, Ruffalo served as a senior Democratic policy adviser to the U.S. Senate Committee on Environment and Public Works, where she worked on the Intermodal Surface Transportation Efficiency Act (ISTEA) and the Transportation Equity Act for the 21st Century (TEA-21). From 1999 to 2004 she was a senior policy adviser to Governor Dirk Kempthorne (R) of Idaho, but she returned to Capitol Hill and the Committee on Environment and Public Works in 2005 to work on the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). She was recently appointed by Congress to be a member of the National Surface Transportation Infrastructure Financing Commission. Ruffalo earned a bachelor of science in industrial engineering and management sciences from Northwestern University in 1989.

Thomas S. Slater, P.E., M.ASCE, is a leading expert in aviation engineering and management, as well as an author and lecturer, and works in Raleigh, North Carolina, for Reynolds, Smith and Hills, Inc., a national airport planning and consulting firm. He is a former member of ASCE’s Transportation Policy Committee, and in 2004 he served as chair of the 28th International Air Transport
the voters, and it carries with the politicians because of the ribbon cuttings and many other things. The national level is much more difficult because translating national programs into plain English becomes a big problem. We’ve been talking for 30 years about massive needs analyses, but it means absolutely nothing to the average person. When you tell them, ‘We’re falling short by $200 billion a year,’ it doesn’t mean much. What does mean something is when you walk out and your street is falling apart in front of you. The federal government’s big success, I would say—in most anything it’s done in the area of infrastructure, be it highways or transit or whatever—was being able to translate into clear and specific terms. The interstate is a good example: a simple map was a translation of specific realities and specific areas.

“On the stimulus program, I do think that that money came at a time when it was critically needed. It has moved some projects forward. The problem is that the gap across the Rubicon was about 10 miles wide and the stimulus was about 10 feet long. That’s the real issue. It’s not that it wasn’t effective, but I do think that it was a relatively small amount of money in circumstances in which it has done some good.”

“What I’ve found with my electorate,” said Suttle, “is denial that there’s a problem. We’ve all read articles for the past 20 years that we are no longer saving. We spend with plastic, and so citizens—if they have something to pay for—they pay for it with plastic and worry about the bill tomorrow. Government can’t work that way—or at least government that has to balance everything on a regular basis.”

“We get these flashes of crisis when a bridge collapses,” said Staley, “but it still hasn’t gotten to the point where it’s a systemic kind of collapse that motivates voters on a national scale. I don’t think we’re quite there yet in terms of recognition among the general public that we are there. But I think we clearly are in an area where we need to start doing something significant. The deficits have been growing for so long, but you have to be a numbers person to really get into it and

Conference. Slater has more than 25 years of experience serving the airport and aviation community.

**Sam Staley** is the director of urban and land use policy at the Reason Foundation, a market-oriented public policy think tank based in Los Angeles. Staley is a co-author of two books on transportation policy, *Mobility First: A New Vision for Transportation in a Globally Competitive Twenty-first Century* (Lanham, Maryland: Rowman & Littlefield Publishers, 2008) and *The Road More Traveled: Why the Congestion Crisis Matters More Than You Think and What We Can Do about It* (Lanham, Maryland: Rowman & Littlefield Publishers, 2006), and a coeditor of the book *Smarter Growth: Market-Based Strategies for Land-Use Planning in the 21st Century* (Santa Barbara, California: Greenwood Press, 2001). His research has appeared in a wide variety of professional and academic publications, including the *Journal of the American Planning Association*, the *Journal of Urban Planning and Development*, *Town Planning Review*, *Property Management*, and *Housing Policy Debate*, as well as in the *New York Times*, the *Washington Post*, and the *Los Angeles Times*. Staley teaches urban and regional economics at the University of Dayton’s School of Business Administration. He holds a bachelor of arts in economics and public policy from Colby College, a master’s degree in applied economics from Wright State University, and a doctorate in public administration from Ohio State University.

**Jim Suttle**, P.E., M.ASCE, was sworn in as the 50th mayor of Omaha, Nebraska, on June 8, 2009. From 2005 to 2009 he served on Omaha’s city council. Suttle is a former vice-chairman of the board of directors of the Omaha-based engineering and design firm HDR, Inc. He also served as executive vice president and director of corporate development for the company, the nation’s 17th-largest architecture and engineering firm. His responsibilities included expanding opportunities and managing programs for all the engineering and architecture business groups within the firm, both domestically and internationally. He was also responsible for the corporate safety program, international corporate communications, and national governmental affairs. Suttle formerly served as Omaha’s public works director, and he held transportation planning positions with local governments in Albuquerque, New Mexico, and Wichita, Kansas. He has also served on and chaired the Nebraska Board of Engineers and Architects.
really understand it. And communicating it is extraordinarily difficult to do."

"It’s going to take a president with some vision and purpose to convince the public that it is important and therefore worth paying for," said Frankel.

"In some cases, we are victims of our own success," said Curtis. "You’ve got to look very hard to find evidence of waterborne disease in the United States thanks to the disinfection and distribution of modern drinking water. Rivers don’t catch fire anymore. Transportation infrastructure—you know, I don’t like the potholes, but I know that I can get in my car and basically drive to any city in the United States. Is it the most efficient way? No. If I were a long-haul freight trucker, would I have a different set of concerns? Quite possibly. But the man on the street—the average citizen—thinks things are pretty good."

"I think we can identify problems," said Slater, "but what we’ve got to come up with is a new way—a better way—to fund our infrastructure. It’s not any one answer. The problem we have is that we’ve got an elected group that makes most of our infrastructure spending decisions on the federal, state, and local levels. A lot of that money is spent and appropriated through the decision making of folks who were elected. It’s a real challenge to make logical decisions about what we should do with our infrastructure and how we should fund it. . . . We need new taxes. We need a new fee or some other kind of way to generate money."

"One of the interesting things we run into in Texas," said Staley, "is that people honestly believe that they have paid for the roads. And you only have to go to the second or third layer of the analysis to show them that, no, they haven’t—that they are actually riding on roads that were paid for a while ago and have been deteriorating because they haven’t been investing in them. Making that argument requires literally sitting down with someone with a spreadsheet or a couple of charts. The political system—an open, democratic political system—doesn’t work that way."

"I probably differ a little bit with the White House taking the lead," said Ruffalo. "I think it would be great, but maybe not all that helpful either. Look at the health care debate. If you don’t have the public behind whatever the White House is talking about, you can still fall flat. If it became a White House issue, we’re in such a hyperpartisan atmosphere right now that if it was just a White House thing, it would become a political wedge issue and we’d find ourselves tied up in knots."

"I think we need to think carefully about whether an expanded federal role would really help," said Curtis. "It might help if there was enough money to come in and do everything pretty quickly. If there are dribs and drabs, what it does is encourage local officials to wait for the federal grant or the earmark instead of adjusting rates."

Downey made the point that "this certainly would not be an infrastructure conversation if we didn’t talk about public-private partnerships and where those are. I’d like to get some re-

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action to that. Are they in the same place that they were before the market melted down or are they in a different place? What can we look to in that regard? A national infrastructure bank has been mentioned. We all want to know exactly what that is."

"An infrastructure bank really frustrates me," said O’Keeffe, "not because there’s anything specific about it I don’t like, but because I don’t understand its purpose. I think there are a lot of people who talk about it in a very supportive fashion, and everybody has a different vision in mind when they’re supporting it. From what I understand, Governor Rendell [of Pennsylvania] is really supportive of an infrastructure bank because he wants to address megaprojects. I think it’s trying to accomplish a lot of different things, and I’m not sure it’s necessarily the best way to do any of them."

"I don’t know what it is, either," said Ruffalo. "There is some reason why different people have advocated it—each with different reasons—but I always struggle with what’s the problem
that we’re trying to solve with an infrastructure bank that can’t be solved with some tweaks to a current program? If we’re going to do something like this, we should be trying to solve a problem that’s not already being solved somewhere else.”

“In thinking about both infrastructure banks and public-private partnerships as funding tools that the public can understand and embrace, I don’t think they have any clue what they are or what they mean,” said Ingrassia. “That’s a tough sell.”

“I’m not sure [the members of the Waterfront Coalition] ever fully understood how the infrastructure bank concept is supposed to be any different from any other range of public funding that might be available for any given project,” said Lanier. “Every project out there is going to be funded by some mix of debt and equity financing, and some of them might have a revenue stream associated with them that makes the public-private partnership possible, or they might be the kind of thing where there’s real interest in a private party funding it for other reasons.”

Frankel pointed to a lack of solid information about infrastructure as a considerable stumbling block: “There is a lack of real information about infrastructure—a total absence of reliable analytical tools with which to make decisions—the kinds of decisions that are normal in the corporate private sector—what’s in the interest of a company to invest in and what kinds of returns can be expected as a way to advise informed decision making. All of that is absent from this field, and I think that’s really what we have to address.”

As Staley pointed out, “this is a problem that I think can be solved, but it’s recognizing the reality of how we fund—that we’re inevitably going to fund and finance national infrastructure projects, and this has reinforced my view that more and more of these projects need to be thought of as local or regional in scope, with the notable exception of freight corridors. . . . Most of those problems are local; they are not national.

“I think we need to think carefully about whether an expanded federal role would really help. It might help if there was enough money to come in and do everything pretty quickly. If there are dribs and drabs, what it does is encourage local officials to wait for the federal grant or the earmark instead of adjusting rates.” —Tom Curtis

Most of the solutions will be local. . . . So I see a lot of this moving increasingly to the state and local level, and that requires some out-of-the-box thinking because we’re thinking about the whole federal, state, and local relationship in a different way.”

“I would like to identify what I see as trends evolving out of public-private partnerships in the United States,” said Chase. “The type of deals that are being done has evolved in the last eight years. We started off with asset modernization deals—the Chicago Skyway, the Indiana Toll Road. It’s basically like giving the current elected official an infrastructure credit card. They charge a lot of money against it and they leave it up to future generations to pay it off without any corresponding benefit. Then we moved into what is sort of called ad hoc projects, represented by some of the things Florida has been doing—the I-595 Port of Miami tunnel, for example. Now we’re moving into a more pragmatic view of public-private partnerships. We’re not saying they are good or bad ideologically but that they will be a tool that may be helpful in a particular situation.”
"As a group, we’ve fallen into the same pitfalls that the politicians do,” said Gehr. “We’ve talked about the things that [are] easy to discuss at length and [have done so] almost ad nauseam without getting to the real crux of it, and that is that we’ve underinvested in infrastructure. Infrastructure banks and public-private partnerships have their place but they’re not the answer. What we need to do at all levels is get down to basic fees, taxes—those nasty words that fund infrastructure.”

At the conclusion of the discussion, Herrmann asked, “What can ASCE or civil engineers do to improve infrastructure?”

“I would like to reinforce the importance of the report card,” said Staley. “I would recommend that ASCE take its audience and begin to more strategically and tactically parse it out and recognize that each of those audiences has a different need for being informed and a different need in terms of the information provided to it.”

“I think the report card is a fabulous piece,” added Lanier, “and I think it goes a long way toward providing something quick that can be used to educate. I would add one other thing to it that I think would be enormously helpful, and that’s an analysis of what the costs are of doing nothing. If we don’t make this investment, there are costs associated with that—costs to air pollution, global warming, carbon footprint, all of the congestion stuff—and it also impacts our competitiveness.”

“You have a brilliant product,” noted O’Keeffe, “and you need to go to the next step, whatever that is. I don’t have the imagination to say what it is. But the more attention that it attracts nationally and locally, the better.”

Anne Elizabeth Powell is the editor in chief of Civil Engineering.
Concluding Thoughts

The objective of the five roundtables was to focus discussion of the infrastructure crisis on solutions. Here are further thoughts, including postscripts of the five roundtables.

Chairman’s Summary

Andrew Herrmann, P.E., SECB, F.ASCE

For the last two years, I have been privileged to serve as chairman of the advisory council that provided assistance to ASCE in preparing the 2009 Report Card for America’s Infrastructure. In early 2008, when the council was formed, our initial charge was to research and release the 2009 report card, which was accomplished with unprecedented success. The release of the report in January of last year was perfectly timed to influence debate on the American Recovery and Reinvestment Act of 2009, and more people than ever heard our message urging infrastructure improvement. Positive coverage in the media and praise from numerous political leaders, including President Obama, mean there is widespread acknowledgement that our infrastructure deficiencies require immediate action.

Despite that success more than a year ago, we have not seen a substantial increase in infrastructure investment; in fact, if we were to issue another report card today, we would find that few, if any, of the grades have improved. As the advisory council reviewed the 2009 report card, the question that kept coming up was, what else can ASCE and civil engineers do to raise these poor grades? We know that the five key solutions can be effective, but there has been little progress in achieving them.

This winter we set out to examine those proposed solutions more deeply and to determine if they were the right solutions. Can we implement them, and if so, how? Will we need large-scale political, institutional, or social change? Or do we just need to slightly modify current practices and thinking?

To answer those questions, ASCE convened this series of five infrastructure roundtables that brought together civil engineers and policy experts for three days of thoughtful discussion. These roundtables resulted in substantial agreement with our recommendations. What is apparent in the record of the proceedings, however, is that there are still many details to work out and competing demands that must be prioritized. What struck me the most is that several themes emerged from these diverse discussions.

The first and most obvious is the problem of funding. The consensus seemed to be that with sufficient funding, infrastructure conditions would not deteriorate and we could implement innovative design and management. The paradox then arises that without a stellar performance record that builds public trust and provides examples of successful infrastructure, increased funding from enhanced revenues is unlikely to become available. The question then becomes, how do we as civil engineers who design, build, and maintain the nation’s infrastructure show the value of increased investment in that infrastructure?

The answer to that question lies in the second major theme that came out of the roundtables: a need for a national vision for infrastructure. The members of the roundtable session on the need for federal, regional, and state infrastructure plans pointed out that while states, localities, and regions do plan, their plans rarely develop in an integrated manner. Perhaps more frustrating is that when these plans are developed, they meet only short-term goals and may change frequently as elected officials come in and out of office. There are no shared goals or priorities to achieve, no overarching vision. That need for a vision was apparent in all the roundtables. Participants in the roundtable that addressed the need

“Despite the media’s increased focus on infrastructure, participants mentioned again and again that the public just does not quite get it. We can pile up studies and issue report card after bad report card decrying the state of our infrastructure, but does the public perceive a crisis if they can still drive down the street or turn on the tap for clean drinking water? We need to do a better job educating people about the long-term costs—both the monetary costs and the quality of life costs—that failing infrastructure is causing and about future consequences if we continue to underfund and neglect our infrastructure.”—Andrew Herrmann
for sustainability and resilience questioned what the national standards and definitions are for sustainable and resilient infrastructure. How do we know whether what we have designed or built is sustainable unless we have uniform standards? Similarly, those discussing the need to address life-cycle costs and ongoing maintenance pointed out that there is little incentive to improve the planning, design, construction, maintenance, and management of infrastructure if the public and political leaders are not calling for that improvement or do not even realize that improvement is necessary.

Third, despite the media’s increased focus on infrastructure, participants mentioned again and again that the public just does not quite get it. We can pile up studies and issue report card after bad report card decrying the state of our infrastructure, but does the public perceive a crisis if they can still drive down the street or turn on the tap for clean drinking water? We need to do a better job educating people about the long-term costs—both the monetary costs and the quality of life costs—that failing infrastructure is causing and about future consequences if we continue to underfund and neglect our infrastructure.

Other themes emerged, including the need for stronger leadership—particularly from the president of the United States—to put forth an infrastructure vision, to educate the public on infrastructure conditions, and to articulate solutions. In addition, we must collect better data with which to measure performance and help illustrate the problem.

Of those themes, none seemed quite as important as the need for a vision. At the end of each roundtable, the participants were asked what they thought ASCE should do next. How should we try to raise the grades, increase public awareness, influence policy development? Some participants made detailed recommendations; others offered more theoretical observations. But the consensus was that ASCE has already established itself as the leader and the expert on the condition of the infrastructure and it must continue and expand that role into implementing the five key solutions.

The members of the report card advisory council take that charge seriously. As we work to achieve ASCE’s infrastructure improvement initiatives, what should that leadership role be? The roundtable participants have voiced their call unequivocally for a strong vision. As civil engineers, we must commit ourselves to defining, communicating, and implementing the future of our nation’s infrastructure.

This is a formidable task, but one we can and must accomplish. We look forward to the challenge but we cannot succeed without your contributions. Please share your thoughts and ideas to help as we establish our national vision for infrastructure. To share your ideas, e-mail reportcard@asce.org.

“...It is of paramount importance that the federal government establish an overarching bold vision for infrastructure. That vision should be supported by visions for particular sectors. These visions must be very long term, perhaps a century.” —Henry J. “Hank” Hatch
Two cars are covered in mud on Monday, November 18, 1996, after being buried in the parking lot of the Pocasset Village Apartments, in Cranston, Rhode Island, after an embankment washed away due to flooding caused by a water main break. The break caused several streets to flood and forced the evacuation of more than 100 people.
by presidential initiatives that focus on real national priorities. Those initiatives must be sustained for the long term and must transcend partisan politics. Lack of focus on large priority needs and the fierce competition for resources result in insufficient funding for priority megaprojects and the distribution of funding over too broad an array of projects and programs. Roundtable participants cited several examples. The interstate highway system was mentioned several times as an example of successful, focused leadership.

Master plans or strategies are necessary to move from visions into reality. To realize progress toward the visions, the strategies would have to articulate the broad challenges and challenges pertaining to various sectors, along with goals, sources of funding, and roles and responsibilities at the federal, regional, state, and local levels. They would also have to address interdependencies in infrastructure sectors (such as transportation, energy, and water), and within each sector there would need to be a way of establishing a balance that is consonant with environmental, economic, and social needs. The strategies would also have to include performance standards.

Infrastructure discussions usually address one side of the equation: the supply side, bringing in more resources and increasing capacity. There is also an imperative to consider the demand side and address how we might mitigate the growth of demand by improving system performance, applying technologies, better balancing various modes of transportation, and seeking nonstructural ways to reduce demand. This would include incentivizing public behavioral changes. Moreover, we must demonstrate that we are doing our best to ensure that dollars are being spent where they are truly needed and that we have done as much as we can to effectively and safely squeeze everything possible out of the available resources before we ask for that next dollar. The group generally agreed that demand management and the application of “the beneficiary pays” principle (user fees) must be part of the solution.

The federal government should create an infrastructure policy framework that draws from both the government and the private sector to incentivize prudent public and private investment in infrastructure. Today there are no broad policies addressing infrastructure as a whole or any of the sectors. For example, we do not have a water policy or a transportation policy.

The federal government must assume the leadership position and execute its responsibilities properly or get out of the way. The lack of sustained federal leadership and the regulatory hoops that people have to jump through to actually put a shovel in the ground are very frustrating. There is a definite need for process efficiency in the regulatory arena. The replacement of the bridge in Minneapolis carrying Interstate 35W over the Mississippi that collapsed in August 2007 was cited as an example of a streamlined process that succeeded because of resolute political will reflecting intense public interest.

There was general agreement among the participants that, as a matter of policy, trust funds should be inviolate and that their use should be restricted to the purposes for which they were established. There was concern that the rules for the application of trust fund assets, however, not be so rigid as to preclude adaptation to changing needs and technologies.

There is a critical federal role in increasing and improving infrastructure investment from all potential sources, public and private. For example, in transportation a major portion of it is funded, planned, and managed by the public sector, but we still have such large private-sector components as the freight rail system. The federal role in working with the private sector in addressing those infrastructure issues must be better defined.

Performance measures are more important than measuring the percent of gross domestic product invested in infrastructure, although the latter may help in making global comparisons. Something akin to the new principles and standards that will guide federal water resources development should be developed for other facets of infrastructure, such as transportation. Doing so would add an element of discipline to the process.

Infrastructure directly affects the public, but there are very few who really understand the intricacies and implications of infrastructure. Public awareness and understanding need to be improved. The report card is a good step, but we need to ensure that the public, rather than seeing this as a hopeless situation, believes that something can be done about it.

The federal government has a role and a responsibility to make the case to the public of why infrastructure is important. We still have not been able to make a convincing and inspiring case demonstrating the relationship between the condition and capacity of the nation’s infrastructure, on the one hand, and the security and economic and social well-being of the country, on the other. An effort must be made to develop the case for infrastructure investment. Such a case should address not only the opportunities and consequences associated with different levels of infrastructure investment but also the resulting capacity and condition. Without that, gaining broad and sustained public and political support will continue to be very difficult.

Henry J. “Hank” Hatch, P.E., Dist.M.ASCE, moderated the roundtable on the first solution.

**Promote Sustainability And Resilience**

By Gerald E. Galloway, Jr., Ph.D., P.E., Hon.D.WRE, Dist.M.ASCE

*In issuing its 2009 Report Card for America’s Infrastructure, ASCE offered five solutions that would lead to the raising of the pitifully low national infrastructure grades. The second solution—promote sustainability and resilience—focused on better integrating sustainability*
“Public apathy with regard to infrastructure or a lack of understanding of the problems besetting it poses significant challenges to a sustainable and resilient future. Much of the population sees quality infrastructure as a given, an entitlement to be provided by the government, and the public gives little thought to the responsibility of citizens to become engaged in planning and in obtaining funds for needed structures.”—GERALD E. GALLOWAY

and resiliency into the effort to improve our infrastructure. Sustainable practices ensure that future generations can use and enjoy what we build today, just as we have benefited from the work of past generations. Providing resilience ensures that the structures that we build can gracefully adapt to both present and future physical, economic, and social challenges. Sustainability and resilience give us the capacity to endure.

Our roundtable began with the recognition that the nation and the world are in a period of great change and uncertainty and that we must deal with megatrends that will affect the way we conceive, design, build, operate, and maintain our infrastructure. The U.S. population in 2050 is projected to be 420 million, and the development that will be required to support such population growth and replace our aging infrastructure will strain our capabilities, pose threats to sustainability, and stress the resilience of our existing facilities. In dealing with this uncertain future, engineers will have to be vigilant in recognizing and adapting to changes as they occur.

Public apathy with regard to infrastructure or a lack of understanding of the problems besetting it poses significant challenges to a sustainable and resilient future. Much of the population sees quality infrastructure as a given, an entitlement to be provided by the government, and the public gives little thought to the responsibility of citizens to become engaged in planning and in obtaining funds for needed structures. Planning horizons are very short, and attention to long-term needs is often pushed aside in favor of expenditures that provide an immediate payoff. Plans are frequently focused on solving short-term problems rather than considering the needs of future generations. Previous generations built a New York City water supply system that has lasted nearly 100 years and a comprehensive interstate highway system that ties together our country. Today such visionary projects are lacking. Engineers need to be not only maintaining and upgrading today’s infrastructure but also developing the infrastructure of the future.

Gaining the support of public officials and the public will require engineers to effectively communicate current and future challenges and to highlight the role that engineers play in underpinning the nation’s economy and our quality of life. While the media are sometimes quick to criticize engineering shortfalls, engineers seem to back away from publicizing their many successes. Engineering has played and will continue to play a significant role in ensuring our economic, social, and environmental growth, and much could be accomplished by sharing with the public case studies of how civil engineering makes society more efficient and effective. There are already successful sustainable and resilient communities. Much has been learned, and these successful experiences need to be shared with both the public and the engineering profession.

Public officials are looking for economic efficiency, and in the process of developing sustainable and resilient solutions, civil engineers need to seek innovative ways to meet project objectives and reduce life-cycle costs. While in the past, the economic conditions of the day have driven many engineering decisions, the future must see a new focus on life-cycle economics. We must also develop and support innovative approaches to financing infrastructure maintenance, upgrading the infrastructure, and carrying out new development. The current approach of piecemeal funding will not work, and sustainable and resilient infrastructure will not be attained unless the need for funding support is clearly recognized by the public at large and political officials in particular. Many, including ASCE, have suggested new methods of financing, but little effort has been made to move ahead, and civil engineers have not been major players in this effort.

Engineers have been blessed with the trust of the populace, and the public has assumed rightfully that we are competent to work with the uncertainties that exist. In most cases we have lived up to the expectation. However, as we move into increased uncertainty, resource constraints, and the need to act sustainably, we must guard against overconfidence or hubris that could lead us to believe that we already know the solutions to the problems that will occur. We must ensure that we are educating future engineers to deal with this uncertain future. We must aim at performance-based results rather than strict adherence to practice-based solutions. Many of the intellectual tools we’ve used in the past century may not be as effective in the 21st century, so we need to find new tools and methods. The 21st century will see new ways of achieving our desired outcomes, and our efforts should not be hampered
by how we’ve done things in the past—a past that did not necessarily reflect sustainability and resilience.

Working more closely with other disciplines and with our partners and clients will move us farther faster. There are no simple solutions that will bring about the desired sustainable and resilient future. However, there are things that engineers can do to improve their chances of meeting these future challenges. Much could be gained if we, as a profession, would seek collaborative solutions and engage in interdisciplinary dialogues and cooperative efforts. The complexities we face are unprecedented. For example, nanotechnology and advanced information technologies are revising our very understanding of materials and fundamental processes. Their presence demands that we work as part of larger teams and that we be ready to lead these teams.

Sustainability and resilience should be the engineer’s best friends. No one wants a project to fail or lose its utility prematurely. Attention to sustainability and resilience protects initial investments, allows operations and maintenance to be efficiently conducted, increases the life span of projects, and reduces the need for renewal. Sustainability and resilience just make good sense.


Develop Federal, Regional, and State Infrastructure Plans

By Andrew Herrmann, P.E., SECB, F.ASCE

A common topic in all five roundtable discussions was the need for a long-term national vision for infrastructure. Clearly this lack of vision is extremely detrimental when we discuss how best to plan for infrastructure. If there isn’t a national vision that prioritizes the infrastructure needs of the country, how can the nation plan its future at any level?

Participants in this roundtable discussed not only the barriers to effective infrastructure planning caused by the lack of sustained leadership beyond political cycles but also the difficulties in communication and in dealing with the relationships between various levels of government that are sometimes in conflict.

They also discussed the regulatory, institutional, and jurisdictional roadblocks that have either hampered planning or rendered existing plans unworkable. While these issues must be examined and streamlined, there are ways to work within the current system to obtain a clear consensus regarding goals and responsibilities. Some elements of infrastructure development and management must be at the state or local level, while others require federal or regional leadership. We must clarify these lines of duty and then demand measurement, accountability, and follow-through.

This is where civil engineers can and should play a dominant role in the process. As stewards of the nation’s infrastructure, we know what must be improved, where we have gone wrong in the past, and what we can do in the future to better design, build, and maintain the infrastructure we require. Our task must be to communicate these needs to the public and to the policy makers who represent them.

When we look at ASCE’s actions in everything from our Code of Ethics to our strategic initiatives, we have made clear statements about public policy and about the type of infrastructure that would support those goals. We hold public safety above all else, but we are also striving for communities that are more livable and more in keeping with the principles of sustainable development. Our infrastructure plans should form part of this.

The roundtable concluded that we need national leadership to establish a long-term vision and priorities for our nation’s infrastructure. Such a vision can be implemented by government through national, regional, and state infrastructure plans.

Andrew Herrmann, P.E., SECB, F.ASCE, moderated the roundtable on the third solution.

Address Life-Cycle Costs and Ongoing Maintenance

By Allison Dickert and Brian Pallasch

Infrastructure experts, including those who participated in the roundtable addressing the need to address life-cycle costs and ongoing maintenance, have long lamented the fact that politicians jump at the opportunity for a ribbon-cutting photo opportunity for a new project, preferring to fund new infrastructure rather than maintain what currently exists. Despite the diminished opportunity for publicity, there is a strong business case for building more sophisticated infrastructure and properly managing it over its life span.

By building smarter projects and systems that take into account the external factors and dynamic conditions of the future, owners benefit in terms of much higher value for their money and receive a better level of service over the life of the asset. The other roundtables in this series explored questions of how to plan and build infrastructure that is more sustainable and more resilient, and makes the most of the limited funds available. Life-cycle cost analyses and proper maintenance over the life of infrastructure assets are important tools in attaining those goals. Owners and operators in the private and military sectors seem to have adopted these principles, but there is far from wide acceptance at the federal, state, and local levels.

As the panelists point out, there are many obstacles to changing current practices. These range from the institu-
tional to the cultural. Government accounting is not easily adaptable to determine present value, and there are few regulations requiring life-cycle cost analyses and asset management programs. With respect to the cultural, aside from some qualifications-based selection requirements, public agencies and owners typically favor the low bid as a means of demonstrating efficiency. Finally, there is no accepted definition of what should be covered in the analyses, and data have not been collected to prove effectiveness on a large scale.

Despite those hurdles, the roundtable participants conclude that the use of life-cycle cost analyses must be expanded and that owners must properly maintain their assets. Without these requirements, the infrastructure crisis will not be easily solved. Taking a broader view, the tumultuous political cycles of the past few years show that the public is weary of the status quo and is demanding change. Elected officials may love cutting ribbons, but there will be fewer ribbons to cut if they do not first address the pervasive voter anger and distrust. Responsible and sophisticated development and management of infrastructure will make it possible to begin reassuring the public that the problems will be solved.

Representative Earl Blumenauer (D-Oregon), one of the panelists, urges engineers to become vocal participants in the decision-making process and to equip owners with the tools that will give their projects longer service lives. He points out that civil engineers working through ASCE have made tremendous strides in educating the public and politicians about the needs facing infrastructure, but guidance is still needed in providing solutions. The tools are available; it is time they be put to full use.

Allison Dickert is ASCE’s manager of issues development. Brian Pallasch is ASCE’s managing director of government relations and infrastructure initiatives.

Increase and Improve Investment From All Stakeholders

By Mortimer Downey III

O ONE SHOULD BE SURPRISED that the consensus of this investment roundtable was that we as a nation are not investing enough in our infrastructure, be it public or private, water, transportation, or something else. And while I didn’t observe any of the other roundtables, I would imagine that participants concluded that the real problem boils down to lack of money. What struck me was that despite the depth and diversity of opinion around the table, no clear path has been determined by which we can achieve the higher level of investment we all agree is needed.

We began the session by addressing the “why” of the problem. How did we arrive at such an underfunded state? Again, a consensus formed that it was a political and institutional problem. Those who call upon the public to oppose any new taxes and increased government spending have done their job so well that such proposals have a hard time gaining consideration.

At the same time, we in the infrastructure community may be fooling ourselves if we try to achieve the same things we did 50 years ago by the same means. We did not have the same political system then that we do now, so how can we believe that building and funding infrastructure will be undertaken in the same manner?

In many ways, this insistence that we keep on the same path is limiting our progress overall. It was mentioned in the discussion that while wastewater utilities, for example, must keep plants and service operational, they delay making large improvements because they are waiting for federal money. Not only are they waiting a long time, but they are waiting for money to make improvements on infrastructure that does not necessarily address the needs of the future. If we simply sit and wait for the handout, we will probably find ourselves farther behind than ever.

What do we do? Options frequently offered include public-private partnerships and infrastructure banks, but we came to the conclusion that they’re really only financing tools. Such options can provide important leverage and support from the business community as well as the potential for better project delivery, but they don’t provide the additional funding required to meet our needs. That leads us back to the same proposition we began with, and on the same political landscape.

If we step back a bit and examine the political system as a whole, it is not difficult to understand why we cannot seem to garner the public support to do what seems so obvious to us around the table. Without the certainty that they will get value for their money, the public is skeptical.

“If we step back a bit and examine the political system as a whole, it is not difficult to understand why we cannot seem to garner the public support to do what seems so obvious to us around the table. Without the certainty that they will get value for their money, the public is skeptical.” —Mortimer Downey
“We need to demonstrate and articulate a strong link between a healthy infrastructure, a strong economy, and an improving quality of life. While this connection is largely intuitive to many of us who are close to the infrastructure issue, it isn’t as clear to the general public. We need to make the personal connection between essential infrastructure and our individual lives.” —Blaine Leonard

enumerated projects. Demonstrating exactly what would be done with the extra funds or how tolls on a road might be used for upkeep has been helpful, but it is probably not feasible on a national level.

This means we need to be creative about how we demonstrate that value and attack the problem of funding in another way. Securing additional revenue should not be our ultimate goal; the funding should be the means of achieving the goal. If we can provide the public with a vision of what the future might look like, we might get people to start wanting that vision and increasing their willingness to pay for it. But that vision has yet to be developed.

At the end of the session we asked what ASCE can do to better address the infrastructure problem. Participants all commended the work the Society has undertaken so far and suggested only that it make an even greater effort to communicate the problem and make it more immediate for people. Communicating the problem may be achieved more easily than making it personal. We need to show people what they would be gaining and how they would benefit from increased investment in infrastructure.

The give-and-take in this roundtable shows us that we still have a long way to go in figuring out how all the i’s are dotted and t’s are crossed when it comes to doling out the money, financing structures, and determining who is in charge, but those concerns may prove to be secondary. The key to unlocking the necessary funding will be in articulating a positive vision and persuading people to believe in it. We can’t let the naysayers be the most vociferous in the debate.

Mortimer Downey III moderated the roundtable on the fifth solution.

Questions on the Five Key Solutions Roundtables

1. In each of the roundtables, the participants cited the lack of a strong national vision as a major impediment to making substantive improvements to the nation’s infrastructure. Do you agree that we need a national vision for infrastructure and what should some of the goals be?

2. To achieve this vision, we will need strong leaders who can articulate the goals and objectives. Do we have those leaders in power now? If not, how do we foster their development? What are the qualities of these leaders? How do you lead on these issues?

3. How do we spread the message about the need to improve the nation’s infrastructure? How can civil engineers best engage the public and policy makers?

4. Nearly all the participants in the roundtables mentioned that a lack of sufficient funds was really at the core of our infrastructure problems. What options and strategies can be used to increase the funding for infrastructure? Why haven’t infrastructure supporters been successful in arguing for more funding?

Blaine Leonard Responds

1. We built a strong and pervasive infrastructure because we had a national vision and leadership. I often wonder what kind of interstate highway system we would have today if the federal government hadn’t provided a master plan with uniform standards and controls and significant financing. It’s possible we would have had a disjointed system of varying quality and effectiveness. As we move forward to rebuild, renew, and rethink our infrastructure, similar national visions are needed. We are having discussions about high-speed rail, but are those being planned with a uniform focus on where the facilities need to be, how they are built, and how they connect to other modes? Will we end up with many different types of systems and a lack of intermodal connectivity?

2. I believe we have some leaders today who are capable of putting forth a vision for the infrastructure. In most cases, unfortunately, our leadership has either chosen to champion other causes or has been unable to rally significant support for this cause. Leaders need to be open-minded and willing to listen with the intent of understanding all of the pertinent issues relative to the topic. On an issue this complex, leaders must be collaborative, bringing together the people and resources necessary for success. On many of today’s important issues, partisanship has gotten in the way of progress; being open-minded and collaborative are the antithesis of this partisan attitude.

3. We need to demonstrate and articulate a strong link
Water leaks from an earthen dam holding back Lake Needwood in Rockville, Maryland, on June 28, 2006. More than 2,000 people from the area were evacuated because the weakened dam near their homes threatened to break after three days of heavy rain.
between a healthy infrastructure, a strong economy, and an improving quality of life. While this connection is largely intuitive to many of us who are close to the infrastructure issue, it isn’t as clear to the general public. We need to make the personal connection between essential infrastructure and our individual lives. We also need to help the public to understand the cost and impact of failure. How will our businesses suffer with nonfunctioning infrastructure? How will our quality of life be impaired? This impact must be understood.

4. It is particularly difficult to secure additional funding in an unhealthy economy. There are numerous competing needs and programs. We need to focus on value, not cost; our overall economy will be worse—and our long-term economic competitiveness will be weakened—if we can’t produce and move goods because of infrastructure deficiencies. We need to discuss funding in comparative terms—that is, a gas tax increase of 10 cents will cost the average driver only eight or ten dollars per month, which is less than we are spending in congestion delay or on vehicle wear and tear. We also need to be innovative. The gas tax should be replaced with a vehicle miles tax; it is more equitable and more forward-thinking. Beyond funding, we need to find innovative ways to renew our infrastructure. We can be more efficient, we can be more creative, and we can find new materials and tools.

Blaine D. Leonard, P.E., D.GE, F.ASCE, is ASCE’s president.

Wayne Klotz Responds

1. I believe that we should create a national vision for infrastructure. The vision must be based on what society would receive from making the investment. We should extol the social, economic, ecological, and quality of life benefits of better infrastructure systems. We should also define the direct costs of inadequate infrastructure on those same items. It must have a concise tagline so that it can be communicated in short bursts.

2. We should first decide if the leaders we need are elected officials or professionals. We currently rely on Governor Ed Rendell (D-Pennsylvania), Representative Jim Oberstar (D-Minnesota), and Representative Earl Blumenauer (D-Oregon). We do not seem to be getting anywhere. If we need elected leaders, we may simply need to define our vision and then provide additional support to our existing spokesmen. Personally, I believe we need to find more elected officials willing to show leadership on the issue. We should either elect some people who promote our issue or engage more aggressively with those who are already elected. If we need professional leaders, we must get out of the “ASCE year” mentality. We should find and engage leaders who would work with us for several years. Continuity is essential. One idea that I have suggested is to find a “celebrity” leader on infrastructure. If Al Gore can turn global warming into an international imperative, we should be able to find someone to promote infrastructure. Imagine what we could do if we could engage a former senator or cabinet secretary to deliver every speech in terms suggesting that failure to improve infrastructure was a blow to the survival of the country. I am not joking.

3. We have to engage on two fronts. First, we must engage fully in the political process. We may not like our process, but it remains the only one we have. We should not wonder why we are unsuccessful when we choose not to participate in the political aspects of governing. Second, we must find a way to have engineers see infrastructure improvement as essential to their livelihood. We know how to engage the public and policy makers. We do not have the will to do it.

4. We have not been successful arguing for more funding for several reasons. Infrastructure is neither sexy nor emotional. We are competing with children and the environment for limited funds. We have no vision, and our message is not easily understood. We must make our message one that speaks of value, not expenditure. The options are myriad and well known. We will obtain the money that is needed when we convince the public that infrastructure merits a higher priority.

D. Wayne Klotz, P.E., D.WRE, Pres.09.ASCE, is the immediate past president of ASCE.

“I believe that we should create a national vision for infrastructure. The vision must be based on what society would receive from making the investment. We should extol the social, economic, ecological, and quality of life benefits of better infrastructure systems. We should also define the direct costs of inadequate infrastructure on those same items. It must have a concise tagline so that it can be communicated in short bursts.” —Wayne Klotz
How Do We Spread the Message About the Need to Improve the Nation’s Infrastructure? How Can Civil Engineers Best Engage the Public and Policy Makers?

By Tom Warne, P.E., M.ASCE

Conveying the need for improved infrastructure in a compelling manner is a difficult challenge today. Such competing issues as the economy and national and world security dominate discussions at the state and national levels. These issues aren’t going away anytime soon, so waiting until they do to finally send the message about infrastructure would be a mistake. Our challenge is to communicate the need within the context of these other national priorities and not wait or hope that someday the national priorities will change.

Thus far, the single most effective tools for communicating our nation’s infrastructure needs have been ASCE’s report cards. Industry groups and individuals have long cited statistics about job creation, economic impacts, growing congestion, and mobility needs. These are all valid. But none of them has created the message that resonates with lawmakers or the public to a point that results in action. That said, the simplicity of the report cards’ clear and compelling message makes them the most powerful tools we have.

But the report card is effective only if presented to those who can make a difference in this discussion. ASCE and some of its members have done a good job of promoting the report card at the national and state levels, and it is the most widely cited assessment of the condition of our nation’s infrastructure in use today. National media and elected officials are starting to rely on the ASCE report card as the gauge that everyone can understand. But much more must be done.

Time and time again elected officials have demonstrated that public momentum prompts them to act. What we have today is limited public momentum, and that has to change. Each member of ASCE must engage in the infrastructure debate and discussion. Members must become involved in discussions with their local and state elected officials. They must contact their members of Congress, and they must also talk to their neighbors.

History shows that Congress responds most effectively to a crisis. Whether in the case of a national emergency or a conflict somewhere in the world, it acts when not acting is not an option. The whole purpose of the ASCE report card is to help Congress recognize that there is an infrastructure crisis and that it must act now to avert major problems in the future. We need to do much, much more to get this message to them so that they will act.

In particular, our nation needs a vision of its transportation system in the 21st century. Without such a vision, efforts to fund and construct systems will be haphazard and less than effective. That said, a vision of our country’s future transportation system must incorporate both state and national components. Just as the nation’s interstate and passenger rail systems and freight networks serve an important national need, there must also be a state vision that looks to the future and the needs within a state or community. Perhaps it is two visions that coalesce and complement one another at some level. Alternatively, it may be one vision with many parts or a national vision that includes state components. In any event, this vision must address transportation at both levels within our governmental system.

At the national level there is no mistaking the fact that the United States must have a transportation system that meets the broader needs of the country. That vision for the 21st century is multimodal in nature and addresses the mobility needs of people and goods. Much has been said of President Dwight D. Eisenhower’s vision of transportation that launched the United States into the modern interstate era. It was broad and national in its application but singular in its focus on controlled-access highways. A similar vision at the national level is needed today. But this new vision must embody a wide range of solutions and pay close attention to its effects on society.

The national vision should not only address the need to transport people on a daily basis but also solve the ever-growing freight demands of our economy. Furthermore, this 21st-century vision of transportation should encompass the concepts of sustainability, livability, and other environmental concerns. These environmental concerns go far beyond the traditional interests in air quality and the stewardship of wetlands and wildlife, for they deal with our quality of life, resource conservation, and much more. This 21st-century vision of transportation must be compelling and easily understood. Just as the interstate highway system was compelling in its purpose and understood by all, so too must this new vision for transportation inspire the public and their elected officials to act and be easily understood.

This vision of transportation will fall short of our nation’s needs if left to stand alone and apart from what transportation should be like to serve the needs in the states themselves. Just as “all politics is local,” much of the transportation system that serves Americans on a daily basis is local as well. A transportation system that does not include local and statewide mobility issues will not meet the daily needs of the users.

Many state and local elected officials understand the need to invest in the transportation systems within their jurisdictions. Citizens also understand the importance of the local transportation systems in their daily lives. The depth of this understanding is demonstrated time and time again at the ballot box. Evidence of this is seen in the fact that in the last several years more than 60 percent of the transportation funding voter initiatives have passed.

Failure on the part of our nation’s leaders to advance a
national vision for transportation does not preclude states from moving ahead and addressing their multimodal needs within their borders. In fact, many states have taken matters into their own hands and have developed transportation systems with minimal or no help from the federal government. Some states have gone from being almost wholly dependent on the federal government for their transportation funding to relying mostly on locally generated money. Most of Arizona’s urban freeway system in Maricopa County would not have been built had the state waited for federal money and a national vision to address its crushing mobility needs. Washington State and Utah also have been leaders in establishing a vision and finding funding solutions to achieve those goals. Their system improvements in the last 20 years are equally noteworthy. Today, as a consequence of vision and leadership within those states, substantial improvements have been made in the absence of a national vision. The improvements are the outcome of having a state vision and then acting on it.

Make no mistake: a national vision is necessary with its own dedicated revenues to address interstate needs. However, that national vision will be insufficient if there is a failure on the part of the states to establish visions of their own. Both must be advanced. Both must be adopted. Both must be funded. Both must be compelling. Our nation needs both. Now.

Tom Warne, P.E., M.ASCE, served on the advisory council that helped ASCE prepare its 2009 Report Card for America’s Infrastructure.

It’s Time to Get Serious about Investing in Our Infrastructure

By Governor Arnold Schwarzenegger, Governor Edward G. Rendell, and Mayor Michael R. Bloomberg

While “INFRASTRUCTURE” is one of the least sexy words in the English language, it is one of the most important. Infrastructure is about the quality of life we want for ourselves, our families, and our communities. It is like the circulatory system of the body. It provides the opportunity for other things to happen. It is our roads, rails, and bridges. It is our electric grid. It is the water and sewer systems that are so important to our buildings and communities, as well as broadband, the Internet, and cell phones. Without a strong and healthy infrastructure, our nation will fall behind and we will lose our competitive economic edge.

As the American Society of Civil Engineers reported last year in its 2009 Report Card for America’s Infrastructure, the state of our nation’s infrastructure is poor. Too many of our communities are operating with outdated and costly infrastructure systems: we have water systems and pipes that were built in the 19th century; more than 4,095 dams in the United States are considered unsafe; rolling blackouts and inefficiencies in the electric grid costs an estimated $80 billion annually; and from 1980 to 2006 the total number of miles traveled by cars has increased by 97 percent while the total number of highway lanes grew by only 4.4 percent. Currently, the U.S. is spending only 2.5 percent of its gross domestic product on infrastructure—peanuts compared to China’s 9 percent, Europe’s 5 percent, and India’s 4.6 percent.

Clearly our investments are not keeping pace with our needs. How has this happened in a nation that sent the first person to the moon, constructed the transcontinental railroad, and built the Erie and Panama canals?

We need strong national leadership to make infrastructure investment a priority or we will fall behind other nations in productivity and lose the high quality of life that Americans have enjoyed for decades. As the co-chairs of Building America’s Future—a bipartisan coalition of elected officials dedicated to bringing about a new era of investment in infrastructure that enhances our nation’s prosperity and quality of life—we have been working to do just that. Together with our fellow governors and mayors, we are ratcheting up the pressure on the federal government to get serious about infrastructure and to make it a top national priority.

Over the past two years we have been holding events around the country—and are planning more this year—to talk about the critical role that a vibrant and modern infrastructure plays in boosting our economy, our international competitiveness, and our quality of life. We have also met with key policy makers in Washington, including the president, cabinet secretaries, and congressional leadership, to put infrastructure back on the map. Our approach has already yielded dividends. For example, last year’s American Recovery and Reinvestment Act included a significant infrastructure component, recognizing that smart, targeted infrastructure investments will create and sustain thousands of jobs. While we are pleased with those investments, we look forward to increasing them significantly.

More than 90 percent of Americans believe that investing in infrastructure should be a priority. But at the same time, Americans do not want to see the federal government throwing more money into the same tired programs. We need to reform the way Washington invests in infrastructure, starting with bringing greater accountability and transparency to how those dollars are spent. For example, communities should meet certain performance goals—reducing traffic delays; completing projects on time and within budget; reduc-
ing carbon emissions; leveraging state, local, and private-sector dollars—in order to receive federal funds.

Establishing a national infrastructure bank is one way to start making those changes. Right now, there is no one federal entity that can provide the scale and scope of investments needed for large-scale projects that are regionally or nationally significant. Such a bank could provide funding and financing options for all types of infrastructure, including roads, rails, water, broadband, and a smart grid. And with the right governance and leadership, making project decisions based on merit instead of politics would be another key benefit of a national infrastructure bank.

We also need to find new ways to fund these investments. If we are truly going to address the scope of our nation’s needs, we need ongoing and stable streams of revenue dedicated to infrastructure. With regard to transportation, a wide variety of options exist, including user fees and reserves built into capital budgets. We also need to embrace private-sector funding and public-private partnerships.

But Washington needs to hear from you. You and your fellow engineers are on the front lines and live and breathe infrastructure. More than anyone else, you understand what is at stake and your voices need to be heard.

The challenges we face are great, but so are the opportunities they present. Our great nation was built on American ingenuity and hard work. We pride ourselves in knowing how to get things done. Working together, we can make a difference and build the 21st-century infrastructure that Americans need and deserve and that will provide lasting economic dividends for future generations. If we do this—if we accomplish the level of investment we need across America—then we will remain the best country in the world.

Arnold Schwarzenegger is the governor of California, Edward G. Rendell is the governor of Pennsylvania, and Michael R. Bloomberg is the mayor of New York City.

What Can You Do about the Infrastructure Crisis?

The Infrastructure Roundtables chronicled here have gone a long way toward more clearly defining our national infrastructure problems and devising solutions to them. But what can the individual civil engineer reading this magazine do? Quite a bit, actually.

Stay Informed

ASCE publications regularly include information on the infrastructure crisis and what elected leaders are doing to address it. For the most up-to-date information on public policy activities, ASCE members can join the Key Contact Program to receive This Week in Washington, a weekly e-newsletter on public policy activities in Washington, D.C., and the state capitals that affect the profession of civil engineering.

Spread the Word

As Andrew Herrmann, P.E., SECB, F.ASCE, who served as the chairman of the advisory council that provided assistance to ASCE in its preparation of the 2009 Report Card for America’s Infrastructure, points out in his commentary, the general public is often ignorant of the urgent needs facing our infrastructure and the future consequences we face if we continue to invest inadequately in these vital systems. Indeed, the public is often ignorant of the connection between underinvestment and the price we already pay in the form of lost time, wasted fuel, and resources, et cetera. So do your part to educate your neighbors, friends, family, and community members about this situation. ASCE has resources available to members willing to give presentations to local community and civic groups on the report card and what can be done to improve the grades. Send a request to reportcard@asce.org.

If you’re using online social media tools, you can join the online infrastructure dialog by becoming a “fan” of “Save America’s Infrastructure” on Facebook or following ASCE government relations on Twitter. You can also check out the “Our Failing Infrastructure” blog. Just click on “All ASCE Blogs” from the ASCE homepage at http://www.asce.org.

Hold Elected Officials Accountable

As part of solution one presented in the 2009 report card—increase federal leadership in infrastructure—engineers should make elected officials at all levels of government aware of these problems and of their collective responsibility to address them. Pay attention to votes on infrastructure-related legislation, and hold officials accountable for their actions. ASCE publishes a voter scorecard on votes in the U.S. Congress relevant to civil engineering and is available to ASCE members on the ASCE Web site or upon request from the government relations department. Send a request to govwash@asce.org.

To easily contact your federal and state elected officials, visit the Report Card Action Web page at http://www.infrastructurereportcard.org/takeaction. From this page you can read background on issues and send messages to your elected officials using sample talking points.

Be a Part of the Solution

Civil engineers are all too familiar with the often poor conditions of the nation’s infrastructure. Not only are we responsible for designing, building, and maintaining these structures and systems, we are the end users of many of them and must endure the consequences when they break down just as any other citizen does. Part of the profession’s duty is to inform the public and our elected and appointed leaders of the needs of our infrastructure, what is required to address these needs, and the consequences of failing to address them in a timely fashion. ASCE has resources to help you accomplish this important task. After all, if we don’t inform the public, who will?
For complete information on the 2009 Report Card for America’s Infrastructure
Please visit http://www.infrastructurereportcard.org

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ON THE COVER: Firefighters try to relieve flooding in the Washington Heights section of New York City after a water main break on October 16, 2003. The break flooding forced the temporary closing of the lower level of the George Washington Bridge. AP Photo/Malcolm Linton

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