

# Center for American Progress



## **SPECIAL PRESENTATION**

### **“NEGLECTING AMERICA'S INFRASTRUCTURE: A PATH TO RUIN?”**

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Good morning from Washington, D.C., and the National Press Club and this discussion regarding the state of critical infrastructure in the United States, sponsored by the Center for American Progress.

I'm P.J. Crowley, a senior fellow and director of the homeland security program at the Center for American Progress. I am pleased to welcome our viewing audience from C-SPAN, all of you in attendance and our distinguished panel of experts, each with varied perspectives on this vitally important topic.

Following the recent tragedy in Minneapolis, the Senate majority leader, Harry Reid, suggested it was a wake up call regarding critical infrastructure in the United States. Actually, it was the fourth major infrastructure-related disaster in the past six years – 9/11, where infrastructure was targeted by terrorists; the Northeast blackout, where a cascading energy failure stemmed from poor private sector maintenance; Hurricane Katrina, where water- and flood related infrastructure failed literally by design; and the Minneapolis bridge collapse, which is still being investigated.

We are mindful as we open this program that authorities in Minneapolis yesterday recovered the 13th and final victim of the bridge collapse. It is a tragedy that we will reflect on today, but it also could have been much worse. Also, as we speak, Hurricane Dean, now a category five hurricane, is bearing down on the Yucatan Peninsula and Mexico, having caused significant destruction already in the Caribbean. Dean appears to have spared New Orleans and the still fragile Gulf Coast, but we still are only at the midpoint of the 2007 hurricane season.

We at the Center for American Progress will release a paper next week that addresses the prospect that – on the impact of global warming and at least the prospect of more severe and unpredictable storms in the future. This reality collides with developing patterns in the United States where 50 percent of our population now lives within 50 miles of a coast and is thus vulnerable to a range of natural disasters, given this vulnerability, in addition to taking concrete action to address global warming as well as increasing investment in disaster mitigation strategies at the local level.

What is certain is that risk of infrastructure failure is rising and potentially at an alarming rate due to the threats associated with terrorism, more severe weather, functional obsolescence, and neglect. Roughly 85 percent of what we call critical infrastructure is owned by the private sector. But with obvious exceptions such as nuclear power and energy production, the really big stuff is owned by federal, state, and local governments, particularly infrastructure associated with transportation networks that are critical to our way of life.

Unfortunately, we do not think about it until we experience a major catastrophe, even while there are pledges to fix what was destroyed, there is already little agreement and some disagreement regarding the resources necessary to avoid future disasters. It is

still more popular to build a bridge to nowhere that is new than to maintain existing bridges to somewhere.

I'm pleased to introduce a genuinely distinguished panel of experts to discuss the implications of current trends regarding the increased use, decreased investment, declining maintenance, and rising risk of our infrastructure from natural and manmade causes. We will look at the implications for our country, particularly for our cities: what must be done, what it might cost, and how the resources can be generated, and the potential applications of new technology to help with this effort.

In the interest of time, I will not recite their extensive biographies. If you want to know more about our distinguished panelists, you can visit our website, [www.americanprogress.org](http://www.americanprogress.org). But to my left is Dr. Stephen Flynn, the Jeanne J. Kirkpatrick senior fellow at the Council on Foreign Relations and author of the *Edge of Disaster: Rebuilding a Resilient Nation*, which is available at local bookstores.

To Steve's left is Dr. Valerie Rawlston Wilson, senior resident scholar at the National Urban League Policy Institute. To Valerie's left is Dr. Dawn Bonnell, trustee professor of material science at the University of Pennsylvania and director of the Nano/Bio Interface Center. And finally, on the other side of the – our anchor, Scott Lilly, a fellow, senior fellow at the Center for American Progress and former staff director of the House Appropriations Committee. And with this, we'll start the discussion with Stephen.

DR. STEPHEN FLYNN: Thank you very much P.J. and I'm delighted to be here and to have an audience to talk about this critical issue. Unfortunately, of course, the motivation comes from, as P.J. outlined, the most recent tragedy in Minneapolis. Just two days after that event, I was still on the south bank of Mississippi looking at the tangle wreckage of what had once been the major transportation lifeline with the Twin Cities, and I couldn't help to have a flashback to a similar visit I had just a few days after 9/11 down to ground zero.

In this case, of course, the good news was the loss of life was a tiny fraction of the percentage that was lost on September 11<sup>th</sup>. For me, though, what was particularly heart-wrenching about this particular catastrophe is that was entirely of our own making. Two things we can rule out as not being causable variables were terrorism and a natural disaster. The ground didn't move. The winds didn't blow – just folks on a very typical nice summer evening on the commute home had a bridge fall out from underneath them.

Now, precisely why it collapsed is going to take folks a while to sort out, but there's little doubt that two contributing factors will be a part of that mix. One would be age and the other would be lots of use. To put this in perspective, it was in 1967 when the bridge was first built and launched. The population of the United States at that year just went over 200 million. This past year, of course, the population went over 300 million.

In the case nationwide, not only did we just plus up that number of people, but we bought a lot more vehicles. In 1960, the year I was born, there were 74 million vehicles registered around the country, and in 2006 we're up to 248 million vehicles registered around the country. In the case of Minneapolis and Minnesota, there had actually been a plus up about 40 percent of traffic, largely concentrated in that area and with lots of truck traffic it was heavier material. And I point out these issues of age and use because I think what's extraordinary about where we are as a society right now is that we seem to be like a generation that's inherited a mansion and we decide we're just not going to do any of the upkeep.

People drive by and say, "Nice house," but what's going on inside is the plumbing's essentially out of age, the wiring's not up to snuff, the foundation's getting pretty shaky, and yet we are taking these foundations of our society – what truly made our advanced society advanced – for granted. And not only are we not upgrading it to meet the demands of a growing population, but we are not even adequately maintaining that infrastructure. And when it fails catastrophically, as it did on August 1<sup>st</sup>, instead of looking back and being introspective as a society to say "What's going on here? This is the world's sole remaining superpower, the wealthiest country on the planet, with a GDP over \$13 trillion, and the core foundations of the society are falling out from underneath everyday citizens," we go to the one bridge and we'll say we'll replace the one bridge. What we need to recognize, as P.J. lays out here, is there are a lot of alarms going off that infrastructure is getting old and not aging gracefully, and we need to attend to it sooner versus later.

I think it's difficult for most Americans today to recognize the fact that it was once a source of national pride to have great public works. For my generation, it was my parents and grandparents who were around when we celebrated the Hoover Dams and the Golden Gate Bridges and the Holland Tunnels. My young daughter, on the other hand, has the images of failed flood control systems drowning a city, not even when the hurricane was at category three but barely above category one in terms of winds that hit New Orleans; the searing images of this bridge collapsed; lights going out in the Northeast. Americans should be appalled at the images that are now sent around the world essentially showing that this is a superpower rotting from within.

What needs to be done? Clearly we need to stop taking this for granted. What made our advanced society advanced are foundations which we must continue to maintain and adequately upgrade, and we have to recognize that in fact we're falling behind what's going on elsewhere on the planet because elsewhere people recognize infrastructure as an investment. Here we seem to think of it only as a cost.

China, in 2005, invested over \$200 billion in infrastructure. That represented 9 percent of their GDP, twice the amount that Washington invested in infrastructure for an economy six times the size of China.

Interestingly, the day the bridge collapsed, the Minnesota secretary of transportation was in China. If want to see world-class transportation or infrastructure, you have to go overseas. China is a pretty good place to go. Go to Rotterdam. Go to

Antwerp. Go to Singapore. These are where nations are investing in the critical foundations that make you a competitive and ultimately vibrant player in the global economy.

We need to recognize out of our island mentality we often have in the United States, people put up of a lot of abuse to get here, but we have address this issue of infrastructure. If I were to summarize our state of transportation, I would say in just highways we spent about \$63 billion sitting in traffic last year. I'm sorry, 3.5 billion hours sitting in traffic at a cost of \$65 billion to our economy. We have second-rate ports. We have third-rate passenger trains systems – I took my local commuter train listening to the air conditioning rattle the entire hour home – and we have the most primitive air traffic control system in the modern world. Other than that, things are going great on that front. And we could tick away, as engineers have done, at the rest of the infrastructure.

So let me finish with what I give as my basic prescription. First, let's insist on report charts from our elected officials. Every mayor, every governor within his jurisdiction needs to give up a report card following the same protocol used by the American Society of Civil Engineers about the state of the infrastructure within their cities – A, B, C, D – and let's get out this Orwellian language where structural deficiencies isn't really structural deficiency, and functional obsolescence isn't really functional obsolescence. We need – obviously, engineers need to come up with language that actually communicates to the rest of us whether we have a problem or we don't have a problem, but we need a report chart. Assigned to that, a price tag to fix the deficiencies.

Second, the president needs to convene a commission modeled on the BRAC Commission – a bipartisan group of folks like the Base Realignment Commission used for the armed services to close down bases, informed by the Society of Civil Engineers and (unintelligible) sciences, going through the report charts and saying, "Here's the must-do list for the nation and here's the price tag." And Congress needs to allocate the money by potentially – hang to your seats – raising taxes to get the infrastructure that we need to stay an advanced society.

Can we afford investing infrastructure? I would argue that we need to set aside about \$250 billion a year for the next 10 years. That represents 1.9 percent of our GDP, about one fifth of what China has been spending. The idea that the wealthiest country in the world can't afford to do this I think it's a bit of a stretch. Of course we can. And it's an investment. It's good jobs building this stuff. It makes us a prosperous society, improves our quality of life. We get economic returns from these investments, so we must do it.

And I will finish with this to reminder that in fact the governor of Minnesota, Governor Tim Pawlenty, two months before the bridge collapsed in May, shot down – vetoed – the first attempt to raise the gas tax for the first time in 20 years with the words that it was an unnecessary and onerous burden. I think there're a lot of folks who went over that bridge on August 1<sup>st</sup> and most of the rest of Americans who would say maybe paying for the adequate maintenance and repairs is a necessary and appropriate burden.

DR. VALERIE RAWLSTON WILSON: Good morning. In my remarks this morning, I'd like to highlight the importance as well in investing in updated and structurally sound infrastructure not only as a matter of national security and public safety, but also as a means of economic stability, security, and revitalization for America's cities.

I want to begin by citing the overall conclusion from the New Orleans Index, which is a report that was released by Brookings and the Greater New Orleans Community Data Center this month. They conclude that two years after Hurricane Katrina and the subsequent levee failures, the New Orleans region has recovered most of its population and economic base. That's a good thing. Yet, in the past year progress has slowed, especially in the city, as critical public infrastructure that includes schools, law enforcement, and healthcare remains weak.

The report also states that stark disparities loom between the recovery of Orleans and St. Bernard parishes, which were the hardest hit, and the rest of the region. The impact of Hurricane Katrina on New Orleans and the rest of the Gulf region stands I think as one of the most striking examples of how vulnerable a society becomes when critical infrastructure is compromised. Whether the impetus is a natural disaster like Hurricane Katrina was, a terrorist attack like 9/11, or normal structural detonation, like the Minneapolis bridge collapse, like the steam pipe explosion in New York City, each of these events highlight weaknesses in the nation's current infrastructure. And as Stephen has already indicated, they serve as a warning of what can happen if we don't make the needed investments now.

Now, looking at Hurricane Katrina as an example, I think there are at least two lessons that we can take away from this – at least two. First of all, any of these events – a terrorist attack, a natural disaster, normal structural failure – each of these has ripple effects beyond the immediate physical impact, and as such represent additional costs or additional risks of not investing in infrastructure. For example, the breached levees and subsequent flooding of the city of New Orleans uncovered other weaknesses in other infrastructure throughout the city, including healthcare, law enforcement; as well as the lack of a viable, solid evacuation, as well as a recovery plan.

Furthermore, catastrophes like these can have economic consequences not only locally on terms of affecting the local population and the local economy, but also nationally and internationally. Again using that example, we saw what happened with oil prices as a result of Hurricane Katrina – how that rippled throughout the nation. And internationally, 9/11 – a major commercial center was affected and that had international ripple effects.

The second point I think that we can learn from natural disasters like Hurricane Katrina is while the occurrence of these events may strike indiscriminately – they can happen anywhere at any time – those who tend to have the most difficulty recovering from them tend to be the economically disadvantaged. And this again emphasizes the

importance of having a solid recovery plan and the physical infrastructure needed to carry it out.

Now just as a failure of infrastructure has a potential for tremendous negative effects, on the other hand investment in infrastructure can produce a number of benefits. Among them, first and foremost – the most obvious perhaps – is just the improved safety that comes from improving critical infrastructure; the second being the creation of new jobs, and that ranges from anywhere from jobs that go into the designing and planning of infrastructure to the actual building and operating of it. Also, there are opportunities for small businesses as contractors, to become involved in the rebuilding process. All of these are things that increase an area's chances of attracting and retaining residents and businesses. And this is especially critical when we look at the revitalization of poor urban communities and blighted cities in America.

Now, in light of these benefits I'm going to agree with Steve and say I would argue that is far more productive and beneficial to be proactive about strengthening the nation's infrastructure, as opposed to waiting for things to happen and reacting to it.

In closing, I would like to talk a little bit about some of the things that National Urban League is proposing that we do to improve our nation's infrastructure. During our annual conference in St. Louis at the end of July, we unveiled a document called the Opportunity Compact. This is it. This is our blueprint for economic equality, which outlines 10 policy priorities for empowering all Americans, but particularly those living in urban communities, to be full participants in the nation's economic and social mainstream.

One of the recommendations included in the Opportunity Compact calls for the creation of an urban infrastructure bank. This would be used to fund reinvestment in urban communities, which would include new schools, healthcare facilities, roads, housing that is both affordable and habitable, water and waste water just to name a few. Such a bank would allow a significant infusion of capital expenditures into employment generating activities in urban community.

Now, a few days after the annual National Urban League conference ended, Senators Dodd and Hagel teamed up to introduce legislation establishing a national infrastructure bank. This would be funded through the issuance of long term public bonds to private investors to help finance the rebuilding of the nation's deteriorating roads, bridges, public transit systems, sewers, schools and public housing projects, among other public structures.

Now, though the National Urban League can't take direct credit for the Dodd-Hagel bill – we may like to, but we can't – it is consistent with our recommendations, with the exception of a few differences, and represents a major step towards providing the financial means for making the much needed improvements. Now in the coming months, the National Urban League will produce a report further detailing what we see as an implementation plan for the urban infrastructure bank.

Thank you.

DR. DAWN BONNELL: Good morning. So it is possible actually for a scientist to give remarks without a PowerPoint presentation, but I'm not going to demonstrate that today. So my role here is to talk about what technology, nanotechnology specifically, and material science might be able to do for us – what's available now and what might be available in the future with the appropriate investments in order to help to monitor and improve our national infrastructure.

So what I'd like to do is start first to tell you what nanotechnology is, give you an idea of what comes forth from that in terms of innovation, and then suggest some possible strategies for applying those technologies to some of the problems that we've been hearing about today.

So nanotechnology has come into the popular vernacular. In the media you will often hear – I can't even count the number of times I've heard someone say something happened in a nanosecond, and to me this is so striking because this is not language that happens as recently as five years ago. So it is becoming more commonly discussed anyway and why is that and who's interested in it from, let's say, the federal perspective?

So here're a list of agencies and their budgets that are devoted to nanotechnology in 2007 and request for 2008 to give you some idea. And the point of this is just to show you how pervasive the topic is across all of the agencies. There's another list that I will show you that is the agencies who are participating, and that means – I'm not sure what that means in terms of budget, but it means they're interested in it and have programs. So it's something that we've been interested in at the federal level – this is only a federal investment – also at the state level and at the local level from the public sector, and also there is private sector investment in this area.

And why is there being investment – why are we investing so heavily then in nanotechnology right now? Here's an estimate of the impact we think it will have on the economy. I've seen estimates like this that are almost double. So think of it as an order of magnitude idea. This \$1 trillion equates to two million jobs. So the idea here is that this is a technology that crosses the borders of all of our technology sectors and is making an impact now and will continue to make an impact in the future.

Well, you actually have this technology in your life right now and it's beginning to be more, I think, obviously marketed as such, everything from steam free pants to your computer hard drive, and we could go on with lists where nanotechnology is playing a role. And not only here in this country – this is an important point also – but also in other countries. So I show an example there from Germany as well, just as a byproduct.

So it is – it is encompassing what is it? So what is nanotechnology then? Nanotechnology has three components that separate it in a sense from other science and engineering disciplines. It's the creation of something functional. You make a functional device at some point. You do that by controlling matter on the nanometer scale and you take advantage of the fact that things have interesting properties at that scale. So that's

nanotechnology. And in fact another way to describe it is probably 40 percent of the cutting edge advances happening in the physical sciences and in all of the engineering disciplines. So it's not restricted to any one of those. So that's what nanotechnology is and so what does that allow us to do? What are the advances that have occurred over the last, let's say, 10 years that we might think of exploiting in order to solve some of the problems that we're talking about today?

Well, starting at the very level of the definition, we can today build things one atom at a time – materials by design, and there's an iconic image from a friend at IBM where she spelled IBM out of atoms. Those are individual atoms there and I'll show an example that we've done the portrait of the president of our university, and that portrait can go 40 times around one human hair. So this is an example of what we're able to do with the advances in nanotechnology at very precise scale, precise devices, so building with atoms and nanoparticles.

As an aside, you should note that we won't manufacture that way. That's not a very cheap way to make things, but it shows the capabilities that we have for nanotechnology front.

We are designing exciting new materials at this level, materials that have unique properties and that are inspiring a wide range of applications, and this is just an image that shows some examples of that. You may or may not have heard of nanotubes, nanowires, and so forth. These new materials are inspiring solutions to problems. So here's imagery from NASA which likes to think about using some of them as a space elevator, up to the space station. Now, whether this is realistic or not, we could discuss or we could debate, but this technology, the ability of having these new materials – these new classes of materials – offers new solutions to some of the problems and issues that we have today.

And finally, here are a couple of – too fast – there're a couple of examples of devices. If we can have new materials, we can have new solutions. We do that through making devices – things – and here's an example from Cornell, as well as a few from our university.

So the technology has advanced significantly so that we now have a toolbox that we can begin to apply to some of these issues in national infrastructure, and I've just listed few. The previous speakers have clearly much more extensive backgrounds in all the details of the infrastructure, but the point I want to make here is that I think of infrastructure to include not only bridges and roads and so forth, but communication systems and transportation systems and issues with air traffic systems have been mentioned already a couple of times today.

The point here, though, is that some of the solutions that we could offer or that we would think to develop for some of the infrastructure problems are going to be similar in these classes; that is, the development of sensors, the development of wireless communication systems for remote sensing – and I'll be a little more specific in a minute – could be applied to our roads and highway systems as well as to our medical health care

system. Some of the technologies that underlie those solutions actually have similar origins, and so there's synergy in this.

And so when I think about how to apply technology or to think about applying technology to these – to these physical infrastructure problems, I like to think of two issues. First, that has been mentioned a few times today, is the fact that the infrastructure is aging – the physical infrastructure. It's noted that the highway – highway system passed its 50<sup>th</sup> birthday last year from the origin, and so that's the age of some of those structures. I was reminded recently, after a spout of rain in New York, that this subway system that was designed in 1910 or sometime around that period, so we are looking at systems where the physical pieces are old. The pipes was just mentioned and so forth.

But in addition to that, many of them have been under-designed. The director of the Federal Highway Administration recently pointed out that when we designed the highway system, for example, we didn't expect it to carry freight. I was shocked by that, but – and now 40 percent of the traffic is trucks, so we have, at the same time, the original infrastructure has been under designed for the way that we've been using. The things that engineers call safety factors should have been increased by many factors if we were going to be using them in this way.

So there could be two strategies from the technology perspective. One is structural monitoring, techniques to monitor the structures as they exist now so that we can – we can understand where they are in the aging process and when they need to be replaced, and the second is the performance improvement that comes when we replace them. So when we replace these systems, we're going to be replacing them with newer technologies, with newer technologies even in the steel that we make, let's say, a bridge out of.

So let me just suggest, then, some strategies that people are developing currently across the country in both our national lab systems and in researching universities for structural monitoring. I can think of at least three technologies that we could imagine implementing currently. One is pressure sensors that can be installed around – let's use bridges as the example – around bridge components that would have a smart, wireless communication system so that you would be monitoring constantly in real time at the critical junctures – the critical junctures where they could fail. Another solution I've heard to this is polymer nanotube skins. So imagine a very cheap plastic film you could wrap around the components of your bridge and you would be noting every time it had a creak that caused a little bit of a failure and you could be monitoring it constantly.

There are suggestions that have to do with acoustic emission technology sensors, and so we could go into the detail offline in some of the ways that these work. So there is technology out there being developed to exactly do this monitoring as well, and so the examples – I show devices up there. One comes from Sandia National Lab and one comes from our lab.

So that was strategy one is monitoring. The second is performance replacement – performance improvement and replacement. And I just point out that when you replace

the bridge that was built 50 years ago, you're replacing it with materials that have 40 to 50 percent improved properties, longer lifetimes, better corrosion resistance, so forth and so forth.

There are new materials that have been developed. So the concretes that are used today are not the same concretes that were used and they will have longer lifetimes as well. So when the components need to be replaced, we're going to benefit from the investments that we've made in science and technology over the last 50 years as we implement the new solutions, and that's refers back then to the discussed point that we have been making some investments and the investments we're making in science and technology these days are not keeping up. And so we'll get to the point where we won't have these innovations coming at the rate that we need them if we don't continue the investments in science and engineering.

So I'd like just to finish by saying that we have – we do have a vast infrastructure of technology innovation in this country that is in some regards the envy of the world, in our national labs system, in our universities system, and these come out of the Department of Energy, the Department of Defense, National Science Foundation, National Institutes of Health, and so forth.

But we'll go back to two points that were raised. I just want to emphasize them again – two points that we've raised earlier. One is that we need to – we need to have a level of investment in these areas that is consistent with the innovations that we're going to need to maintain our economy. One in a very sort of concrete sense of we need to have the sensors right now because the bridges are falling down now or the water treatment plant needs to be working at a different level or our nuclear power plants need to be monitored.

We need those technologies and that had to have been developed beforehand, but secondly and more broadly is the impact that will happen in terms of human capital; that is, science and technology is the engine for innovation that drives our economy – not just the maintenance of our infrastructure, but drives our economy. And so it's very critical that we pay attention to that.

MR. SCOTT LILLY: I'd like to identify myself with the comments of the previous speakers, but I think it's important to recognize that what is happening in physical infrastructure is not an isolated policy. It's part of a bigger picture. This investment in roads and bridges can produce more immediately visible evidence of the effects of disinvestment, but the federal government is failing to maintain responsibility to invest in the nation's economic future in a wide range of areas.

The enormous growth that we enjoyed in the 1990s was not only a product of our physical infrastructure, but as Fed Chairman Alan Greenspan pointed out in his speech before the New York Economic Club in 1999, much of that was the product of technological and scientific breakthroughs that had taken place in the 1950s, '60s, and '70s when it was finally capitalized on by the American economy in the 1990s. Most of

the product of government funded research and development in the space program, the Science Foundation, the Department of Defense, the National Institutes of Health.

Today we are seeing that effort steadily shrink not only in terms of keeping pace with GDP which is, I think, the critical measure, but also in terms of maintaining the same level after adjusting for inflation and even in terms of maintaining the same level in terms of nominal dollars. The president had a press conference at the White House touting a new research goal only a week ago talking about the importance of research, but if you go to the AAAS website and look at their accounting, which I think this is the best there is on scientific investment, you'll find that the actual nominal level of federal spending for research and development will decline in 2008 if the president's budget is adopted.

The same thing that is happening with respect to physical infrastructure in science investment is also happening in terms of human capital. The federal government is spending less in real dollars today than it was four years ago to help preschoolers get ready for school and get ready to learn, to improve the quality of instruction in elementary and secondary education, or to assist young people to attend college. We are declining in all of those areas.

You might think with a \$3 trillion budget that it would be easier to make the necessary investments. I think you have to understand that first of all nearly two thirds of that budget is on automatic pilot. It goes to the large entitlement programs – Social Security, Medicare, Medicaid – programs that are vital to a major segment of our population, programs that have improved the quality of life for millions of people, programs that have very little to do with what our economic future is going to be about.

Of the remaining portion of the federal government – slightly more than one third of the total budget – well over half goes to defense and foreign affairs. While some of the defense budget represents important investments in research and development, even here within the Defense Department investments in research are declining. But most of the money that we have to invest in infrastructure, in science, in education, sewage treatment plants comes from the remaining 15 percent of the federal budget. It is a portion of the budget that is repeatedly expected to take nearly all of – make the entire contribution to any effort at fiscal discipline.

In terms of budget policy, we do not put investment first. We put it last. And when tax cuts or military activities create deficits, this is the portion of the budget we turn to to resolve the deficit. The problem is that portion of the budget is too small to make very much of a contribution without truly draconian reductions. All domestic discretionary spending, including tax collecting, law enforcement, prisons, the operations of the White House and the Congress, all of those activities where the investment portion of the budget is, total only about \$450 billion, a sum that you would have to cut in half to eliminate even the smaller deficit that was reported in July of more than \$200 billion.

The importance of the I-35 bridge collapse is that it has caused people to go back and read the warnings of organizations such as the American Society for Civil Engineers,

warnings that they have been issuing for years and recognize that those are not idle warnings, but reflective of conditions that will eventually have painful consequences. And the same is true for the underinvestment that is taking place in science, the underinvestment that is taking place in human capital.

This is not something that we can think about in terms of long-term legislation, in terms what might happen in the next administration. This is a battle that goes on every day in Congress, one that I think we pay too little attention to.

As bad as our problem is with bridges, and I think recent events have shown that we have the serious problem there, the American Society for Civil Engineers rates bridges as one of the least problematic areas of infrastructure. One of the most problematic is sewage treatment and clean water for drinking. That is an issue in the Interior bill, which passed the House in July, which will be before the Senate in September or October. That bill has a major increase in sewer and water: \$887 million above the president's request. And the administration had this to say and the statement of the administration policy about it: "The administration opposes the committee's increase in the total funding for EPA by \$887 million above the president's budget request. In particular, the \$437 million increase for the Clean Water State Revolving Fund which would exceed by 63 percent the level requested by the administration." And it goes on.

Now, I think it's striking when you compare the fights that we're having today, as I think Steve outlined very clearly, about whether or not we're going to keep the mansion that was given to us and think about the mentality that built the mansion. In the years after World War II, we had an extraordinary commitment with leaders in both parties recognizing that the future of this country economically depended upon what we invested. We had a period where most of the infrastructure in terms of sewer and water was built. Those pipes last about 60-70 years and we're right at the end of the period that they're going to last. We had President Eisenhower sign a highway bill in 1956 creating the Highway Trust Fund and committing to 44,000 miles of four-lane, divided highways with 10 foot shoulders, 16,000 interchanges, 50,000 overpasses – all agreed to on a bipartisan basis. That's the mansion.

What's happened to the commitment to retain the mansion? I think that's a very important question and my feeling is that we have had the emergence of a libertarian movement in this country which is not widely based in terms of political support by the general population, but is incredibly well financed and who's job it is to prevent these, to create political deadlock anytime anyone tries to solve these problems. Now, I think the I-35 bridge creates a huge problem for that group and that movement to sustain their momentum, to explain why they have blocked all of these necessary investments, but it depends on the rest of us to point that out and to show the deficiencies in that philosophy and the way back to a philosophy of investment that we had in this country on a broad, bipartisan basis in the 1950s.

Thank you.

MR. CROWLEY: Thank you very much.

We'll start off and ask a couple of questions here among the panelists and then we'll open up the floor for questions, so moderator's prerogative here for the panel. We heard two frames: we heard the need for investment and we heard the need for innovation. Recalling recently being on a radio talk-show debate with a person who believed that we should take our interstate system and turn it over to the private sector – obviously has no faith in government's ability to either drive investment properly or innovation properly, but each of the four of you have reflected on the fact that there's a role here for the federal government, state and local government, the private sector. How do you assess who has to do what? What are some of the indispensable roles that any of these suppliers in the infrastructure requirements – what do people have to do now to have us get to a point where we can turn this situation around?

DR. FLYNN: I think clearly must start with this must-do list. We have to have a good idea where we're aiming, where we're going, and that's not something the federal government has taken on as a "let's get the big picture" kind of activity. We're basically reacting to failings as they move along. So first thing, you need to have that picture. And now we're in this impossible (unintelligible) where states in many cases are underinvesting in inspections, so we don't know if things are breaking and therefore we don't know there's a problem, so we don't invest in addressing the problem. So we need to upfront basically say, here's what were dealing with and here's the price tag associated with getting it right.

And then we need to have a conversation about who pays, and clearly there's a lot of private capital that can move into this and there are disincentives right now that could perhaps be looked at. One, though, I think very promising opportunity – most bonds of course come out of private capital. The people who write the bonds can rate conditions: I want certain technologies used, I want certain safeguards put in place before I'm just writing you checks. If (something else?), it's going to cost you more for your money, state and locals. So private sector can leverage best practices so you don't just end up with legacy things that people have little faith in by potentially using their capital in that way.

The federal government, though, the world that we're – the upside down world we're in, states have to let their bridges fall apart before they can get federal money. There's a great incentive not to do preventive maintenance. You spread – you get somebody else to pay for your infrastructure if it falls apart. Well, obviously, the federal government could potentially say, I'm going to give states more money if they demonstrate they do adequate preventive maintenance for certain projects than those who don't, in parallel with the current move with Medicare holding back money for those who end up – are not paying for – not continue to do bad practices that need to be fixed, not just blank checks.

So we could create incentives at the public sector level. We could create incentives at the private sector level, but what's really missing is a sense that this has to be a top national priority. What made our advanced society advanced were the generations of Americans whose innovation, ingenuity, and resources built the critical

foundations that we are benefiting from and we should feel some moral obligation to want to pass that legacy on to our children and our grandchildren, not to squander it and leave them to clean up the mess.

MR. CROWLEY: You mentioned New Orleans Index, and I think it is important that New Orleans, even though it is moving in the right direction, it's still is – what? – 20, 25 percent below in terms of pre-storm population and pre-storm economy, but here you have an example of where there is a federal tsar to help oversee the national contribution to this and then you have the intersection of the state of Louisiana, the city, and parish governments. What do you draw from this in terms of how it's worked and what are the critical pieces? To the extent there's been progress in New Orleans, what has worked? What has not worked?

DR. WILSON: Well, I think that the fact that the recovery has been uneven, particularly as I mentioned in Orleans and the Saint Bernard parishes that were hardest hit, they are still far behind what's happened in Jefferson, in (unintelligible). I think in terms of the population, those two parishes I just mentioned are only at 36 percent of their original population now two years later, compared to others who are almost completely restored. So in that sense, I'm not – I don't have a hard and fast answer for how to address that, but I think is definitely critical as we look at investing in infrastructure that investments are made equitably, that we don't have this shift away where areas are sort of forgotten about, and typically they're the areas where the most economically disadvantaged people are typically areas where minorities – predominantly minorities – live. I think it's important that investment is equitable, and I think that's one of the issues that can arrive if we leave it all up to private investment. It is necessary to have some oversight so that all areas receive the investment needed to make the improvement.

MR. CROWLEY: And you have this chicken-and-egg situation where the population will come back as the infrastructure's repaired and jobs are available, but jobs may not be available until the population is there and the workforce – that interaction that makes it difficult for the recovery to occur.

DR. WILSON: Yes. And even now, the report mentions that the recovery that has been occurring has stalled because the infrastructure is still weak, so they do go hand in hand.

MR. CROWLEY: Dawn, you talked about innovation and Scott mentioned DARPA before, because up until recently much of the innovation from the internet to Teflon to whatever came about through major government initiatives such as the space program as one example. To what extent now is the development of nanotechnology going to be a matter where it's private sector innovation? I mean, there's a lot of people who believe in that, but what will drive this process going forward?

DR. BONNELL: Definitely there will be private sector investment as the technologies get sufficiently close to an application that the stakeholders can see an immediate profit. Having said that, it's pretty interesting to note that the report that's

called “Rising Above the Gathering Storm” that speaks to some of the issues of sort of infrastructure and development of innovation in this country, was led by industry, who are pointing out that they can’t solve this problem – that the development of research, I’ve heard – I ran a panel that was basically on this topic about six months ago and it had vice presidents of major corporations – IBM and Dupont and so forth – from different sectors, and one of the comments that came out of there was this innovation ecology now has shifted to the point that companies can’t do the early stage parts that they even did 10 years ago, so this is shifting and the companies see that there needs to be a partnership between federal organizations, universities, and industry as well.

MR. CROWLEY: And, Scott, we talked about investment, and where is the money going to come from? Steve, you mentioned \$250 billion over five years or \$250 billion a year, so you’re talking \$1.2 trillion over five years. I think Mr. Oberstar has called for some sort of increase in the federal gas tax to be able to focus on, say, transportation, but if we’re going to have the level of investment that Steve has described in order to be able to effectively compete in the future, where does the money come from?

MR. LILLY: I’d say, first of all, there’s a lot of discussion about private sector involvement in this, and I think that it makes a lot less sense than it sounds like it makes at first blush. We’re essentially talking about going back to the old, privately-owned toll roads that existed in this country before the American Revolution, and I think the reason they were abandoned was it’s obvious that free markets don’t work very well with toll roads or bridges. A guy puts up a bridge and it’s the only bridge around, he charges whatever he wants unless he’s got regulation.

If you’re going to get yourself into that type of situation, it’s just a lot smarter to do it with public funds. The federal government can borrow for less money than any other borrower in the world. There’s no point in having a company borrow the money to do it because they’ll have to pay more, and on top of that they’ll have to have a return on their investment, which means that whoever uses that bridge or highway is going to have to pay both for the high rate of borrowing that the private company has to pay and for the profits that that company hopes to make on the infrastructure.

Two hundred and fifty billion dollars sounds like a huge amount of money. It’s actually – we’re talking about less than 2 percent of GDP and we’re talking about something that can be easily done. But the current highway gas tax of 18.4 cents was adopted in 1993. Inflation has eroded about 30 percent of that. If we wanted to have the same amount in real dollars to pay for highways as that gas tax was generating in 1993, we’d have to raise it by more than the five cents that Congressman Oberstar’s talked about. So the money is there.

The federal government spent 50 percent of GDP to fight World War II and the American economy emerged from that and grew very rapidly, and in fact it benefited from a lot of the innovations and things that occurred there. We were able to build this infrastructure in the first place. We certainly have the resources in this country to pay for more infrastructure. It may involve crossing some lines that have been created by

politicians, but they are not economic lines, they are not things that this country can't do. It's simply to have the will to make the investments and recognize that we want to leave a society that has a brighter future than the one that we live in rather than one that's falling apart day by day.

MR. CROWLEY: And one last question for across the panel before we open it up. We use the term critical infrastructure, and the Department of Homeland Security, for example, has established 17 different infrastructure sectors. Some have more narrow application to continuity of government, some do have broad-based application in terms of major social benefit, but when we talk about – Steve mentioned the need to set the list and establish some priorities; where would each of you place a particular emphasis so that if we look at – if we're building this priority list as a group this morning, what would be on that list?

DR. FLYNN: Well, I think it's very clear that if we step back and look at the broad totality, you really see two challenges: one of those that relate directly to our economic competitiveness and those that affect safety. We can't isolate, of course, these sectors nicely into 17 processes, and a very important point that Valerie made, they have ripple effects across each other. But I would certainly put power generation/energy as something that's pretty basic that you need to make everything else work, and (running us?) on the edge, as we have been, is not a sustainable enterprise.

When you think about it, it gets hot every summer, so we have a lot of energy use and the lights go out periodically in parts of our country. This kind of thing happens in Baghdad because people are blowing it up or in Haiti because they can't afford much, and we just sort of play along. So energy is clearly there.

Transportation is absolutely vital, and I guess (unintelligible) Coast Guard (unintelligible) but the ports – you know, China's building the equivalent of a new port of New York/New Jersey every year and will for the next five years in terms of port capacity. The West Coast has stalled out on virtually all port development. Well, how do you stay connected to the global economy if you don't have the transportation infrastructure, not just ports – doesn't help when the ship comes in if you can't connect to the rail, if you can't connect to the roads to get that into the interior to distribution centers and so forth here, and we deal with these in pieces instead as of a totality and we need to see it a construct of a global network, so I place that here.

When it comes to safety issues here, I'd have to put public health as a core infrastructure. The most sobering threat we face out there today, I would argue as a national security guy, is probably pandemic flu and those who aren't "with us" or "against us" kinds of viruses. They're just the usual, garden variety trying to – you know, going to cause some real mischief that's going to have impact across everything and if we don't have that public health capability to manage an incident like that, then we're in very, very serious trouble indeed in terms of lots of unnecessary loss of life.

DR. WILSON: To add to that, looking at it from a perspective of natural disasters, and, P.J., you mentioned earlier that 50 percent of the population is going to be

living within 50 miles of a coast or currently does, so in light of that I think it's important that we have the infrastructure necessary not only to protect cities, such as levee systems and things like that, but also I look at it as well in terms of having a plan, having a method – an orderly method of being able to evacuate, of being able to recover, of being able to communicate when natural disasters hit, so that's one area in the public safety domain. Looking at it on a more micro-level from the city level, I would agree as well that public health is critical. Healthcare infrastructure needs to be updated.

Second, looking at it on the sort of micro – the city level, are schools. Public schools are crumbling. And part of the work of the National Urban League, we have – a major part of our work goes toward education and improving the quality of life through education and it's absolutely critical that schools have the technology that they need, they have the facilities that they need to train and prepare children to be competitive in a more global economy.

DR. BONNELL: Well, from the technology – let me just start that I think that obviously, energy and water availability are pretty basic from even a geopolitical perspective and have a large influence, but since I'm supposed to talk about technology, from the technology perspective when we address issues in these various areas, very often the solutions are similar, so let me just use the example of if we're talking about civil defense in the train system in the Northeast Corridor, for example, there's a system put in place as a response to the sarin event in Japan. That's a chemical sensor. It's also a chemical sensor that – you would use a different one, mind you, but a chemical sensor that you would do to secure water supply safety and understand whether it had been contaminated or not.

So as you go across these areas from the technology point of view, a lot of the strategies apply to several rather than just one, and therefore I return to the fact that the development of this technology infrastructure is going to have a big effect across all of them.

MR. CROWLEY: Dawn, you've mentioned – internet was on your list, which of course is critical to a number of systems that we rely on, including electro-generation, as Steve mentioned. On nanotechnology, are we at a point where we're going to be able to have self-healing systems so that it can detect and defeat a virus without having human intervention?

DR. BONNELL: You're talking about in computer systems?

MR. CROWLEY: Yes. Right.

DR. BONNELL: I think that there are technologies – so I don't know the direct answer to that. I can't point to a technology right now, but there are strategies being developed that have sufficient redundancy and new algorithms for calculations that will allow, if they aren't self-healing, bypassing some of these, and so maybe that's what your definition of self-healing is. In a way a network can – in the way your power network when one node goes down can bypass and reroute. So those kinds of strategies are being

developed for computer networks and there's no doubt that that is a critical infrastructure. Our economy, from the air transportation control to our banking systems, goes down if that's not secure.

MR. CROWLEY: Scott, last word?

MR. LILLY: I don't think that our problem is that we have big distortions in the way we're funding things. I think the system that we have, which is actually a fairly sophisticated system of trying to identify the greatest needs and put money where it will do the most given the range of needs we have probably gets it right most of the time, but the problem is that we have too few dollars trying to solve too many problems and we're stretched thinly, but we're stretched pretty much thinly – as thin on physical infrastructure as we are on intellectual infrastructure, and I think one of the mistakes that could be made in the wake of the I-35 bridge would be to divert money from research into concrete. I think we've got to recognize that we're underinvesting all the way across the board and we need to address all of these things and we need to have ongoing, very thoughtful detailed analyses of where our problems are and where our federal funding would produce the biggest bang and the greatest return.

MR. CROWLEY: And we at the Center have paid a lot of attention to chemical plants and that sector of infrastructure, and a lot of that infrastructure exists in private hands, a lot of it exists in and around major cities, either in terms of a chemical facility or in terms of freight rail lines that bring hazmat through your major cities, and investment also has to include ways in which through a combination of incentives and regulation that we can reduce or even potentially eliminate risk as we update facilities.

Dawn mentioned water, for example, and while many cities and towns that have water treatment facilities are making a shift from chlorine gas to other forms of disinfection that are less onerous and cannot be exploited by terrorists, for example, that process is very slow. So in some cases it will be the private sector that innovates and adapts to make their operations more secure and more safe, but it could involve some sort of incentive by the federal government to be able to push that pace of change more dramatically in the future.

At this point, we'll welcome questions from the audience. As you raise and are recognized, wait for the microphone and then please identify yourself, and obviously, if your questions are short and crisp, we have more time for more questions. Let's start over here.

Q: Paul Gallagher, *Executive Intelligence Review* magazine, I guess primarily for Dr. Flynn. You're recommending federal investment, which is realistic, which is at least in order of magnitude larger than the investment in the Dodd-Hagel bill that Dr. Wilson mentioned, or the Barney Frank-Keith Ellison bill in the House. Those bills are very focused on private capital and you see private capital (in crisis?) of fleeing head over heels for the safety of public credit – the federal credit (unintelligible).

Would you be supporting a federal capital budget speaking of the – as Mr. Lilly mentioned, the lines that politicians, elected officials have not been willing to cross up to now. Would you support a federal capital budget, and would you tie gas tax pennies or other user fees to a capital budget to raise these levels or to remit these levels of investment?

DR. FLYNN: You certainly push my envelope when you get me into budgeting, but I feel some responsibility putting that number out there to talk about a mechanism to get there. I do believe that we need such a dedicated fund. I'm calling it a very sexy, infrastructure resiliency fund, but it would be made up of the inheritance tax dedicated to this fund, with the notion here that the likely way which you accumulate lots of wealth was because you benefited from the foundations that were put in place by prior generations, you should be willing to pass it on, but you know it's going to investing in the infrastructure as a legacy to pass on.

I would recover the tax increase – the tax break back to 2001, dedicate it to it, and I would increase the gas tax to pay for this. And of course, you can have cost sharing arrangements with states and you can ultimately use incentives, again. If you do preventive maintenance, you get a certain amount of dollars as an incentive (that's going to be made available?) when you have money to leverage to accomplish that. And you can look at private capital opportunities as well.

But this again is – we have never been wealthier as a nation than we are right now, and the issue is the equity with which we're spreading that wealth around and the resources, but in terms of the resources available, our nation was a lot poorer when they built this stuff in the first place. Surely we can maintain it and we certainly can do the upgrades. And it just simply – we've got to move out of a time when we just say we can't afford it. It's like a very well to do person complaining that he's got to fix his roof when the hurricane is barreling down on him. Yes, it costs something. What's the cost of losing the whole house?

You have the resources. You just have to make the commitment to get there and we can find mechanisms and I would say a dedicated fund. I would use this BRAC commission-style for the oversight of it. I would insist on a more moratorium of congressmen – no pet projects until we get through the must-do list. And you have to restore public faith in this kind of thing and you have to have a president who's willing to sort of hold feet to the fire to make this thing happen. And it's informed by the National Academy of Science, informed by the American – we have plenty of expertise, lots of reports. What we don't trust is a political process that essentially allocates resources around constituent services based on where you sit versus one that actually is addressing national needs.

MR. CROWLEY: Right here.

Q: Good morning. I'm Dave Cole (sp), the legislative political director for the Ironworkers International Union. We represent the people that build the bridges in the water and so forth. My question is, as the discussion is taking place up here, we're

talking about a global economy, and on the same hand we're talking about homeland security or national security. And as we're facing a situation right now where our toys aren't safe, we don't have controls – we talk about 1957 and Eisenhower doing the highway bill; we built – we had manufacturing, we had the steel, we were able to build that. It still took till 1965 to really start completely any of that.

Is anyone looking at the comparison, how we have national security and rebuild it as we had a list of the products up on the stage? I think the one spray bottle was the only thing I noted that could have been made in the United States. The rest of the things were shipped in. To give one quick example, you talked about the bridge collapse. They just built the I-280 bridge – the largest federal highway job in northwest Ohio. Five members from my local were killed on that job because a crane was manufactured in one company, purchased by another company, and then used in this country. We have to look at, when we're rebuilding, how we're setting federal funds that are going to be going into the private sector and are being shipped overseas. Is that being addressed and how? I mean, that was a lot of information, but that's a piece that kind of emotionally hit me.

DR. FLYNN: On this national security argument, I would make the case that we need to make the investment in our critical infrastructure to reduce basically our exposure as an increasingly brittle society that we are, which makes it attractive for adversaries who want to hit us. They get big bangs for their bucks. So I think just as Eisenhower used the national defense rationale for the investment in the interstate highway system to mobilize and evacuate, resiliency is going to be a key component and an element of deterring our adversaries from wanting to carry out these attacks on U.S. soil, because if they have no benefit, the effort starts to be less attractive for them to use. So it's not the sole piece, but there's a missing ingredient to date.

Clearly the investment, the jobs that you're using and so forth going in here are American jobs. It's skilled labor, materials were likely going to have come from the (unintelligible); we don't have enough all over the place, so we're going to have to manage that, but the fact is I think when you make infrastructure and building the foundations back, there's a lot of investing back into our society, investing in good paying jobs. This goes back into the economy and ultimately we benefit as a nation, and the rest of the world as well.

MR. CROWLEY (?): We've done – just to follow up on that for a second – there's no guarantee – there will be innovation in the world, but there's not necessarily a guarantee that the innovation will occur here, but to the extent that we are able to identify and provide innovative solutions to challenges that we are confronting in this country, you also potentially create new industries, new opportunities to take our innovation and apply them to similar challenges, say, in the environment for example that China – and we'll have to confront at some point if we're going to make progress in global warming, so part of the competitiveness aspect that Steve was talking about earlier, the longer it takes us to capture this innovation, to drive this R&D process, then to greater risk that innovation will be lost here and we'll be looking to other countries to do so.

DR. BONNELL: I think that's right and in the area of nanotechnology, one of the reasons for the enthusiasm is a lot of those technologies would be technologies that would be manufactured here – would be manufacturable here based on the way that our economy is developing. So that is one of the impetus points for investment in nanotechnology, but I'd also make the point that even in some of our traditional manufacturing technologies like steel making, it's not all done overseas. It's not all done overseas. There are specialty mills in the high margin things that are beginning to be done in this country as well. So I think it is important, and this is where the investment in innovation will maintain those that the global economy allows us to maintain here, but also generate the new solutions and provide the solutions then for people in other countries as well.

MR. CROWLEY: Scott, you want to –

MR. LILLY: Yes. I'd like to respond to this question and the previous question. I think the capital budget is a particularly bad idea, and the reason is that we need to look at where our needs are and address the biggest needs and this is a good example. There isn't any question that nanotechnology is going to be the road to the future, and there is a lot of investment going on. The extent to which that investment takes place here will have a great deal to say about how much the innovations from that affect American business rather than other businesses.

If you want to have world-class steel manufacturing, you need to have these research technologies and you need to have them based here. You need to have the best engineers and scientists that understand those here so that the plant managers and the companies can go back to them and have an interactive relationship with them. It makes this a much better place to do business and to perform manufacturing if you do that.

If you set up a wall around a set of money or a pile of money and you say that's only going to go infrastructure, then you're basically keeping it away from other things, and it may well be that the best thing for infrastructure and for the economy generally is to put some of that money into nanotechnology.

MR. CROWLEY: Over here.

Q: Hi. I'm Gary Harwood (sp) with the Steelworkers Union, so I'm glad there is some comments about steel, but our conversation here and the broad comments that everybody's made about policy and budgets are all very good, and I was glad my colleague from the Ironworkers said something about people. I think what is missing a lot of this conversation is discussion about how this also makes jobs for middle-class Americans – good jobs. And I'd like to hear from somebody – Dr. Valerie mentioned about some of the comments about creating good jobs, but we need to make sure these jobs are here. I'm not here to make a statement, but I'm saying that the comments being made by everybody here should talk about how this helps middle-class Americans, how we keep these jobs here, how we make steel, we mine copper, we make fiber cable, we make nano-products, which our members make. I'd like to hear more conversation about that in your commentaries.

MR. CROWLEY: Dr. Wilson?

DR. WILSON: Yes. I will say that the recommendation for the urban infrastructure bank and the opportunity compact is under what we call our opportunity – what is it? – opportunity to earn and that focuses on jobs. And the opportunity compact is a blueprint for economy equality in America, so definitely we see the development and the improvement, the investment in infrastructure as a means of creating good jobs, quality jobs for Americans here in this country. So that's the comment I would have in response.

MR. CROWLEY: We'll take a question over here then we'll come back here.

Q: Thank you. Good morning. I'm Paul Marino (sp) with *EIR*, and two questions which are quick, one for Dr. Wilson and Mr. Lilly. After reading the Dodd-Hagel bill, I was reminded of an old commercial from the '80s for the hamburgers where the old lady picks up the bun and says, "Where's the beef?" Well, when looking at the Dodd-Hagel bill, it relies solely on public – I'm sorry, private financing for a very large infrastructure. And just taking a gander at the condition and the health of the markets in the last week, I'm not sure it's going to happen. The Fed and European central banks have pumped about 400 billion into some of our friends who have invested in mortgages that are not going so well. So I think perhaps a reinvestigation of what a capital budget will mean –

MR. CROWLEY: Let's get to the questions if we can.

Q: Sorry. It's always important to bear these things in mind. So the question of a capital budget becomes key. Now, my friend, Mr. LaRouche, has written a capital budget which is under consideration –

MR. CROWLEY: Again, let's get to the question rather than the statement. Do you have a question for the panel?

Q: Yes. The capital budget, would you reconsider that, and Mr. Lilly, take your gloves off on this one? And my second question for Dr. Flynn and Dr. Bonnell is U.S.-Russia relations. The Russian government has offered to build nuclear power plants coming out of the Kennebunkport meeting with the United States and also speaking in Moscow with Governor Hickel, my friend again, Mr. LaRouche–

MR. CROWLEY: Let's – let's stick to the question.

Q: I understand these are –

MR. CROWLEY: Tell you what, I think we got the gist of it.

Q: I know I'm a bit younger and perhaps and perhaps have a little more enthusiasm, but we need to build things like the Bering Strait tunnel.

MR. CROWLEY: Yes. We're not trying to get to where you can make what amounts to a statement here. Okay. We'll take it from here. Okay. So Scott – here.

MR. LILLY: I'd say first of all, I agree with your assessment about private borrowing. I think one thing that we're seeing going on in world markets right now is not an excess of liquidity or a place that investors are looking to go. Having the federal government come in with a massive new borrowing scheme, regardless of how it's financed or the structure that it's in, doesn't strike me as probably the best thing we could do for the economy right now.

I think the federal government ought to pay for what they're doing and these projects take eight, 10 years to complete in many instances. We have a mechanism to do that. Now, we do have something that's like a capital budget, which is basically the highway trust fund. We the gas tax and other excise taxes of highway users that are dedicated to paying for specific things that benefit the people that use them, and I think that we ought to adjust those taxes so that they actually cover the cost of maintaining the infrastructure that's there. I don't see going out and borrowing a lot of money as the solution to it. It gets you around this question of the gas tax. I think it's better just to take it on straight.

MR. CROWLEY: Come over – okay.

DR. FLYNN: I just would say on the capital setting aside specific dollars for the repair of the existing infrastructure, I just think there is no economic case to be made, and there certainly isn't a safety and well-being case to be made, for allowing critical infrastructure to deteriorate. So if we have a well vetted list of what in fact needs to be repaired and what it costs, we need to allocate the money to do that and the process I think needs to be identified as clearly that that's where it's going toward. And so this by no means is a tradeoff issue here, but in order to raise the priority and the focus on the key issue that we have to recover where we have lost in repairing this infrastructure, I think you need to set aside the dedicated funds for that.

But I'm a guy from the Council on Foreign Relations: the idea that we want to do this in isolation from the rest of the world is not, I don't think, consistent with how we've been prosperous and succeeded in the world. We're 5 percent of the world's population at the end of the day. We've got a lot of the wealth, but certainly a lot of infrastructure it's also continental and we deal with Canada and Mexico, that's (unintelligible) ports and rail or whether it's energy infrastructure, it has to be dealt within that context. So we have to be able to invest here at home to be clearly capable to continue to operate in the broader sphere, and whether it's with the Russians or whether it's with our neighbors to the north and south, the key variable here is that what keeps an advanced society advanced is investment in adequate infrastructure to support that and that has a human capital dimension, an intellectual capital dimension, but it has very much a physical dimension as well.

MR. CROWLEY: We'll take a final question right here in the front.

Q: Yes. Eric Kulisch, *American Shipper* magazine. I think another think tank also proposed like an infrastructure commission a couple of years ago. My question is: is that politically realistic? Will Congress be willing to outsource its decision-making for pork and other things to a stand-alone commission? And then also do you see – since the Minnesota bridge collapse, do you see some critical mass forming about some rethinking of willingness to raise some of these taxes to invest or is it still kind of sporadic? After the 9/11 attacks, it seemed like everyone would band together and politics might be a little different. I'm not sure that occurred. So do you or Mr. Lilly see any change there to invest?

DR. FLYNN: None of the effort that needs to be made to address the problems that we've been discussing here this morning will happen without presidential leadership and which this is a core priority of that president. You'd have to embarrass Congress into essentially doing a structure of rational investment to support that things we have to get at. I don't expect that the American people will be willing to share a lot of their revenues with the existing process given how it works – the bridge-to-nowhere kind of approach versus fixing stuff that needs to be done. So it's going to take presidential leadership. It's got to be something that's a true national priority, otherwise we're going to continue to react to these events.

I think already the bridge collapse is fading behind us. The new cycles move on. There will be other things that will capture our attention. I'm sure there's some other Hollywood gal or guy who's going to split up of marriage or something like that will grab our attention, but what we miss is, I think – and this is the final point I'll make here – this is a legacy that we have been given as a gift by our forbearers. It was their sweat, their labor, their investment that got us to where we are. We need to commit as a nation to not just sustain it, but to improve it to pass it on to our children and their children.

MR. CROWLEY: Final comments across the panel?

MR. LILLY: I'd like to just respond to that. If you take the mid range of estimates of what it would take to maintain our highway system, it's about \$20 billion a year in order to keep it from sinking lower. The Federal Highway Administration says \$10 billion and the state transportation officials say \$30 billion, so I would say maybe \$20 billion to do that. If you look at what the Congress wanted to do in the Highway Bill that passed in 2005 – and I would be the first one to say I think it was an outrage what they did in that bill, the earmarks, all of the stuff that was in there. I've got a paper on that topic that you can access online that I wrote a month after it was signed. But if you look at what the Congress originally wanted to do on that bill, they wanted a bill that was between \$350 and \$400 billion over five years.

The White House came back and said – I think the first bill that came out of the House was \$485 billion. The White House came back and said that's an unacceptable level. We will not agree to anything over \$275 billion. Now, the difference between those figures is roughly that shortfall in the amount that it takes to maintain the system. The political solution that evolved was that the president told the speaker and other

leaders in Congress, you can sell this bill for a lot less money if you give people a lot of projects. So you not only got less money than you needed but you had it spent in ways that it should have never been spent.

Having said that, the total amount in earmarks in that bill was \$23 billion, that is about \$4 billion a year. Now, I would be willing to say a large portion of that was actually not bridge-to-nowhere, but it was repairing infrastructure exactly the way we're talking about here. But let's say that it was all bad and we cashed that in and we saved \$4 billion a year. You still, according to (unintelligible) numbers, have a \$246 billion shortfall, so do not let what the people – the people that are opposing this program are exactly the people that were responsible for the misuse of the money. Don't let them mislead you into thinking that you can solve the problem by not doing the mistakes that they committed.

DR. BONNELL: Okay. So I'd like to just summarize with several points in complete agreement with this idea that we should follow a professionally determined set of priorities. I point out that there are a number of agencies for doing this: the National Academy was mentioned and a whole range of professional societies, some of whom are represented here. So that makes infinite sense and that's where the science and technology community can help in this dialogue.

The second point I'd like to make is to reiterate something that Scott had said earlier, and that is as we figure out ways to address this very critical infrastructure issue that we're addressing now, we do need to make sure that we aren't mortgaging our investments in innovation and research that develops innovation because these are the jobs of the future not only in our traditional industries, but also in the emerging industries. And so it's very important not to have that skewed. And as has been pointed out, this is happening currently. The Department of Defense basic research budget has shifted dramatically because of our current needs in the Middle East, and so if we respond to each issue as it comes up, eventually our investment in innovation will go to zero and it is the solution for some of these problems in physical infrastructure as well as nonphysical infrastructure.

MR. CROWLEY: Valerie?

DR. WILSON: I think that anytime we have discussions such as this one, I try to look for where the consensus is, and it seems that I don't think anybody would disagree that we need to invest in infrastructure. I think that's the point that we can all agree on. I think now where the work needs to be done is in terms of determining what specific infrastructure needs priority, and you mentioned a list and a number of agencies and organizations that can help to compile that list.

And secondly, perhaps the most difficult area of gaining consensus will be on how to pay for it. And it's not the responsibility of any single entity or agency. I think the greatest strength can be gained by drawing upon federal, state, local, and private entities to help to make this very critical investment in our nation's infrastructure.

MR. CROWLEY: Thank you very much. I think the final word which (unintelligible) go back to where we started at the beginning 90 minutes ago, which is we have had four major infrastructure related failures or events in the past six years. These are not one-off events. They are a pattern and the pattern shows that the risk to our society is increasing and that it is vitally important for us to maintain a focus and attention, as Steve said, across these issues and try to start to develop a process, a plan, and a commitment to solve them. And that will take a lot of effort within the government, but also a lot of effort among the people to help their elected representatives maintain this focus and set this commitment so that we can make our infrastructure as safe and secure as it can be.

Please join me in thanking our distinguished panel, Dr. Stephen Flynn, Dr. Dawn Bonnell, Scott Lilly, Dr. Valerie Rawlston Wilson. Thank you to those of you who have attended here and thank you to our C-SPAN audience. We are adjourned.

(Applause.)

(END)