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Technology and Innovative Finance:
Creating "Mobility"

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The transportation landscape has changed significantly in the first years of the new century, with substantial completion of the Big Dig, funding changes due to SAFETEA-LU, and the issuance of the Governor's 20-year transportation plan. The Transportation Finance Commission also continues its work to produce a strategic vision for transportation and suggest the means to pay for it. This Pioneer Institute conference posed key strategic questions: What kind of transportation infrastructure do we need? How we will pay for it? And what role can technology play in improved service?

This event featured a keynote address by Joseph Giglio, entitled "Rethinking Mobility for the New Century." Professor Giglio is Executive Professor for General Management at Northeastern University, author of a new book entitled *Mobility*, a Board Member for Pioneer Institute's Shamie Center for Better Government, and Vice Chairman of the Hudson Institute.

Professor Giglio's work was discussed by two distinguished panels, "Technology and Transportation Management" and "The Role of Public-Private Partnerships." These panels brought together transportation experts from government, business, and the financial community. This transcript includes Professor Giglio's presentation and comments from each panelist.

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JIM STERGIOS: This morning's program comes at an exciting time for transportation policy in Massachusetts. The final version of the governor's long-term transportation plan will be unveiled at the end of this month, the Transportation Finance Commission's report is due later this year, and the Big Dig is nearly complete. Now we need to consider the next generation of projects, and how to finance them.

Pioneer has long been involved with transportation policy, from MBTA financing and operations to procurement reform and advocacy for new technologies. We will continue to go beyond bottom line questions, examining how to balance cost efficiency with maintenance and expansion. We will also examine the intersection of transportation projects with economic development, housing, and other issues that relate to our competitive posture vis-à-vis other states.

Today, we are highlighting the publication of Professor Joseph M. Giglio's new book, *Mobility*. Pioneer is proud to have him on the board of the Shamie Center for Reinventing Government. He is also the vice chair at the Hudson Institute, the co-sponsor for today's event. In *Mobility*, Professor Giglio outlines technology and financing tools that can help address our transportation challenges here in Massachusetts as well as across the country.

Joe's presentation will be followed by two engaging and provocative panels that explore the potential of two of the approaches in *Mobility*—the role of technology and public/private partnerships in addressing our transportation challenges.

KEN WEINSTEIN: I'm honored to be here with so many dignitaries and leaders of the national and international transportation industry. Hudson is delighted to be doing this event with the Pioneer Institute.

I've seen the growth and the exciting work of the Pioneer Institute from afar. While Pioneer's mission is to change the intellectual climate in Massachusetts, which we have seen with the Weld and Romney administrations, its impact has been far broader. The Better Government Competition has been a force for innovation in Massachusetts and beyond. It's been duplicated in many states—and other countries. Your work on charter schools is known nationally. Hudson is delighted to co-sponsor this event.

Hudson is a Washington-based, international think tank, designed to meet the great policy challenges of our time. We recognize that today's transportation infrastructure is a challenge to America's future economic competitiveness. For years we tended to take that transportation infrastructure for granted. But today, with crowded highways, aging seaports, inefficient rail yards, and inadequate airports, we're beginning to see that America's future economic growth is threatened by the inefficiencies in our transportation system.

A couple of years ago, Hudson Institute undertook a major research project called, "2010 and Beyond: A Vision of America's Transportation Future." The report looked at major American demographic trends, the globalization of freight traffic, and the likely rise of alternative fuels that will reduce gas tax revenues.

It also looked at the tremendous shortfalls in the revenues needed to maintain our current transportation infrastructure. Depending on which estimate you believe, if we don't radically change how we finance our surface transportation systems in the next 25 years, we are going to face either a $500 billion or $2 trillion shortfall.

Our study group determined that the most efficient way to deal with the challenges of increased crowding on roads and highways is to take advantage of some amazing new technologies. For example, in-vehicle transponders have already begun to change how we finance our surface transportation system.

We also proposed moving from a fuel-based motor tax to a mileage-based fee system, a user fee that would replace the inadequate and regressive motor fuels tax. Our report had major reverberations and was followed by similar findings from the U.S. Chamber of Commerce. It was read carefully by the U.S. Department of Transportation, which is

interested in expanding the use of technology to manage traffic.

We also published Joe Giglio's book *Mobility: America's Transportation Mess and How to Fix It.* Joe's book does more than explore the crisis of surface transportation. Using analogies from history, deep insights from strategic planning, and also a little bit of pop culture, Joe makes a powerful case for using technology to offer consumers greater transportation choices. The book is a phenomenal read and, in the couple of months it has been out, it has quickly become one of Hudson's best-selling books and has had real impact on departments of transportation around the country. Ladies and gentlemen, it is my honor to introduce Joe Giglio.

JOSEPH M. GIGLIO: This morning's panels promise to demystify technology and the latest financing tools. Let me step back and provide some context for their discussions.

We are celebrating the 50th anniversary of the Interstate Highway System this year. In considering the future of our surface transportation, one has to acknowledge that there are several trends that will influence and shape the next reauthorization bill, which is scheduled for the next 18 months to two years.

The transportation gurus in the country highlight two notable issues. First, this country lacks capacity in every transportation mode. For example, we've seen an 80% increase in vehicle miles traveled over the last 20 years, but only a two to four percent increase in new road lane capacity.

As for the rail freight system, since the passage of the Staggers Act in 1980, there's been a reduction in freight mileage capacity from 150,000 to 100,000 miles. As you know, of all surface transportation modes, only rail freight infrastructure is privately owned. Of the seven major freight railroads, four are experiencing record profits. They are in the enviable position of exerting premium pricing on major third-party motor carriers, which raises the question of whether we need to create a rail freight trust fund as we have for highways, aviation and water. We can go through the same metrics on passenger transit.

What keeps this country strong and powerful is the economy, and transportation is a principal underpinning of that economy. We need to accommodate and facilitate economic growth, so the undercapacity issue must be addressed.

The second issue is determining how we finance capacity growth. We all know that funding transportation capacity, designing it, developing it, building it, operating it, maintaining it, costs an awful lot of money. In recent years, many have questioned the future viability of the fuel tax.

We spend, depending on your source, about $150 billion annually on surface transportation in this country. Approximately 42% of that is funded by federal, state and local fuel taxes. A real cottage industry has developed over the last ten years to try to define the shortfalls in infrastructure financing, notably surface transportation funding. Let me focus on the AASHTO (American Association of State Highway and Transportation Officials) Bottom Line Report, which is derivative of the *Federal Highway Conditions and Performance Report*, and which is prepared jointly with the American Public Transit Association. That report suggests that over the next 20 years, we have a shortfall of approximately $1.9 trillion dollars in financing cumulative aggregate transit and highway needs. When we look at those shortfalls, we should keep in mind that most of those need projections are based on future engineering standards and not on future economic demand. Please remember that my rule is not to trust any number with more than 3 zeroes behind it.

Over the last several years, certainly going back to the ISTEA (Intermodal Surface Transportation Efficiency Act) reauthorization bill in 1991, there have been several approaches to filling that shortfall. One has been the introduction of innovative finance. Some of you know that innovative finance is a cliché meaning, "I don't have any money. Do you?" We've seen it in various expressions, from the introduction of TIFIA (Transportation

Innovation Finance and Innovation Act), credit enhancement soft loans, additional bonding, GARVEE bonds and all sorts of ways of ways to leverage different revenue sources.

Over the last couple of years, we've seen the emergence of another financing tool—concessions—in order to attract private capital. We have also seen increased emphasis on tolling. We can anticipate a growth in tolling beyond the initiatives taking place in Texas, Florida, Indiana, California and other parts of the country.

We ought to be encouraging the development and the deployment of all these financing models, particularly those that enable cooperation with the private sector. What is the purpose of these various financing tools? What goals are they trying to achieve? This begs the question of what kind of transportation system we want, especially at the state and regional level. I'm not arguing for a return to the Articles of Confederation. I'm suggesting that our existing sources of financing, the federal fuel tax and state and local fuel tax, are in jeopardy going forward.

Let's talk about the federal fuel tax, for example. One contributor to our shortfall has been the failure to increase and index the federal fuel tax. It has not been increased for 13 years. It is currently at 18.4 cents. If adjusted for inflation over the last 13 years it would be about 27 cents. Every penny increase in the federal fuel tax generates about $1.8 billion.

So before we start talking about abandoning the federal fuel tax, we ought to recognize that we need it going forward. One point of clarification about the fuel tax: I make the same mistake as everyone else when I call it a tax. It is really a rough, average-base user fee that in a certain way represents an external tax. You know, we are in the silly season here. We have a senator from New Jersey who talks about abandoning the fuel tax. I think one has to consider the economic consequences of doing that.

When you consider the technology that our panelists are going to demystify today, one ought to consider its implications for our traditional definitions of turnpike authorities and toll road authorities. This new technology gives you the ability to generate net new resources and to fill the surface transportation infrastructure and financing gap. It not only gives you the opportunity to move effortlessly to market-based pricing, but it also helps us address congestion and integration of transportation modes. One point I make with monotony in the book is that states and regions ought to consider moving to a portfolio of assets approach.

Now, I know this angers and upsets my libertarian friends who, in generating their free market models, assume away a lot of business reality. What I'm suggesting is that certain states and certain regions should, based on the transportation system they want to develop, have the ability to subsidize mass transit, as in New York.

That decision ought to be made at the state and regional level, not by the carpenter ants in Washington. The New York model may not work in Texas or Florida, so let folks decide at the state level. When you look at the funding shortfalls, it seems that there is a place to innovate in finance. There is a place for privatization. There's also a place for my model, which is the third model of commercialization.

We have to be careful not to shortchange the future by just moving air from the front of the balloon to the back of the balloon. From my perspective, there are only two ways to fill our financing shortfall. One strategy is to milk the federal fuel tax as much as possible for the next 15 to 20 years, and the other is to use technology to move in the direction of market-based pricing of transportation.

The impetus behind vehicle-integrated technology is to take advantage of the 75 megahertz of spectrum that was allocated by the Federal Communication Commission in October 1999 for development of a communication infrastructure. The primary objectives were to promote safety and ease congestion. But that infrastructure lends itself to market-based pricing in a form that we've never seen before.

The real challenge is to ask ourselves what kind of

transportation system we want. Any answer to that must also include criteria for evaluating innovative finance, taxes, and user fees to fill the funding gap.

Strategic planning implementation requires leadership, which has been sorely lacking in transportation. Although there are exciting developments in technology and financing around the country, the challenge is to design a national reauthorization program that answers what kind of transportation system we want. How do we provide for consumer choice? How do we develop steady predictable revenue streams? It is going to present many challenges.

If you look at the history of the Interstate, you could easily get discouraged. That issue was debated for 20 years before we saw that legislation signed in 1956. It's a high mountain to climb, but it's worth doing. Again, I go back to my fundamental premise. What keeps this country strong and powerful is the economy, and surface transportation is a principal underpinning of that economy.

PANEL ONE: TECHNOLOGY & TRANSPORTATION MANAGEMENT

DAVID LUBEROFF: Good morning. I'm honored to moderate this panel, which will focus on three powerful ideas on how technology can help us squeeze more out of our transportation systems.

The first idea is to use technology to make the system work more efficiently for end users. By moving people through tollbooths faster, we can effectively increase the capacity of roads like the Massachusetts Turnpike

Second, we can use technology to make the system more efficient. By collecting more information, the organizations that manage our infrastructure can learn more about usage patterns and road conditions and then use that information to deploy their assets more creatively.

Finally, we can be more efficient in the collection of money. We know from the private sector that technology can cut transaction costs. In addition, the T suggests a key benefit of the Charlie Card is reducing leakage—which is a euphemism for money that should go in the fare box, but ends up somewhere else.

Our first two panelists will help us understand what technology can do, and our third, Massachusetts Secretary of Transportation John Cogliano, will give us the perspective of someone who manages a transportation system and, therefore, has to consider the political environment in making decisions about how to use technology to make that system more efficient. Let me turn first to Martin Capper.

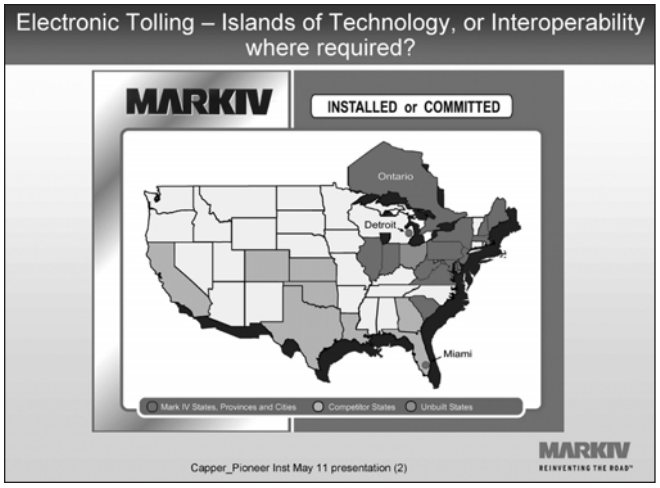
MARTIN CAPPER: Thank you, David. I'm going to cover current trends and issues, current examples of the technology, what we are doing here in Massachusetts and the rest of the country. I will look globally as well. I'll also give one man's vision of the future.

The mega-trends are clear. Commutes have gotten longer, not only because of congestion, but also because of the growing distance between home and work. Since 1990, vehicle miles traveled has grown by 38%. We leave earlier in the morning. We get home later at night. What that means for commerce is longer and less predictable lead times. In an environment where, for example, the automotive industry is working on a just-in-time basis, unpredictable is not acceptable.

In response to this trend, we see more willingness to pay for the open road. A number of examples show that drivers are prepared to vote with their dollars. In Washington State there was a vote for a gas tax increase. In New Jersey they changed to one-way tolling on the Garden State Parkway. Some of the traffic estimates showed they would lose 20% of their revenue, because traffic would go out on the free side and come back on a different road. That didn't happen. They lost about 2% of their revenue. Illinois just doubled their tolls and got support from the truckers. Why did they get support from the truckers? Because the state

promised they would take down the toll barriers. Electronic collection has expanded opportunities for tolls, and support for tolling.

If we flash back to the late eighties, before EZ Pass, there were huge traffic build-ups at the tollbooths. It was costing more and more money. It was wasting time, wasting fuel, and polluting the air. When the first EZ Pass booths were installed in 1994, some optimistic estimates said, "We will have about a million transponders out there." Well, today, there are over 14 million transponders, with three and a half thousand lanes equipped to take those transponders. The system collects $1.3 billion dollars a year annually and has reached sixty percent average market penetration across the network, in Massachusetts, New York, Texas, Florida, and other states.



RED: Mark IV States, Provinces, and Cities
BLUE: Competitor States
GREEN: Unbuilt States
Graphic: Martin Capper, Mark IV Transportation Technologies

We've seen other applications globally. They do congestion charging [of inner-city traffic] in London. Currently, they use cameras for this, but I believe as they expand they will move to transponders. An interesting story is that they started with a five-pound fee. It was a tremendous success, except that it cost them three pounds to collect the five. So from a revenue collection point of view, it was a little bit of a disappointment. But they solved that by increasing the fee to eight pounds.

Beyond tolling, there are also applications in the commercial vehicle arena—asset tracking, load-matching, truck-trailer matching, yard access, and even border crossings. We are also doing weigh station bypass. It is probably the single most successful application in the commercial vehicle arena. This is where the technology all started back in the mid-eighties, and now the various systems cover around 25 states. Over the past eight years, those states have done almost 120 million successful electronic screens. That means these trucks haven't pulled onto the weigh scales, and we've avoided the problems you get when commercial vehicles merge back into lanes. There's been close to half a billion dollars of operational cost savings.

In mass transit, Automatic Vehicle Location (AVL) systems have been introduced worldwide. The technology allows you to track each bus, so you can give the user more reliable information about when that bus will arrive. Electronic payment systems and smart cards are giving the transit authorities a lot more information about the demographics of their customer. You're doing it here with the Charlie Card, and they're doing it in London and Hong Kong and other places.

When I was last here, Jim Rooney asked the question, "What happened to the vision that Mass Pike had of a smart card transponder that could used in transit, parking and everything else?" My answer was, "You gave that vision up for another one. You gave that vision up for the possibility of interoperability with the rest of the northeastern corner." Joining the Turnpike and the New York Thruway would be crazy if you had different systems.

We should also look at what private industry is doing. OnStar is probably the single most successful application there is in North America—and it is successful, despite what everyone says. They are introducing it on every new vehicle this year. It gives General Motors millions and millions of customer interactions every year that they would not previously have had. They have now linked it to the OBD, which is a standard port on all vehicles manufactured in North America. Now

the car tells the driver when it is due for a service. He gets a call on his cell phone that says, "Please come in for a service. You have a problem with this, this, and this and we will fix it for you."

And so, the current trend is for a broad range of deployment across all the modes. Customers are demanding interoperability. The early adopters, the groups who introduced EZ Pass in '94, they made the larger investments and they took greater risks. The reward for that is wide consumer acceptance. If you went to a public meeting on the EZ Pass in the early nineties, you had armed guards at the public meetings because everyone was against it. I'd submit to you that if you tried to take a transponder off a user today, you would need an armed guard.

So that means that technology has really improved customer service. Now, are we ready for the next step? Here is our vision: Vehicle Infrastructure Integration (VII.) The basic premise of VII is that every new vehicle would be equipped with a standard transponder. The VII coalition has a number of partners. ITS America (Intelligent Transportation Society) has come to the table, along with IBTTA (International Bridge, Tunnel and Turnpike Association) and FTA (Federal Transit Administration.) These transponders will be capable of communicating with the roadside and with each other. It will be a nationwide, standard, roadway-based communications network.

Think of the information that can come out of it. When the staffers at USDOT started this process, they talked about safety. It was all they talked about. We actually need to move them off that aspect to another compelling reason. It's congestion. Think of our growth in miles traveled, and hours of delay. This is what VII can address: traffic management, improvement of the 511 program, and electronic tolling. Some of this we have now, but instead of regional interoperability, we'll have national interoperability. There are other benefits. We could tie user fees to service levels. Perhaps if the service is less than adequate, you give a refund. Imagine getting back a toll because you get stuck at a tollbooth for ten minutes. Most importantly, we need to manage the system as a whole, not piecemeal.

What are the challenges? Privacy is an issue, but it can be solved. Liability is an issue. Last November I sat in a car that was heading towards another car at speed. I was driving and the techie beside me was saying, "Don't take your foot off the gas, Martin. Don't take your foot off the gas." And my foot was hovering off the gas and towards the brake, when suddenly the car took over and stopped me from hitting the other car. As a manufacturer, think of the liability exposure of that.

Politically, have we got the funding and have we got the political will? I challenge you all here to answer that one. Are other technologies like video, like GPS, cell phones - are they competitive or complementary? I would submit to you that they are all complementary, that they all have their role, depending on the particular circumstances. VII adopts that premise. Also on the political side, how do we deal with the back office? Right here in Massachusetts, you've got two different back offices. You've got one at the MBTA. You've got one at the Mass Pike. How many back offices can there be nationally? Should they be public? Should they be private?

Who is going to register all these transponders, on every vehicle coming out of Detroit? That debate needs to start now. I mentioned some of the folk missing from the VII coalition. Where is IBM? Where is EDS? Where are these back office providers? Where is the insurance industry? Where are the service providers? We need them at the table. There are benefits for the private sector. There's no doubt that companies involved in this and particularly the early applications will gain a competitive edge.

Is VII a quantum leap, or a small step? I'd submit to you that it could be either. The quantum leap requires more political will than we have at the moment, so we need to build that. We need to make small steps towards the big jump that will give us long-term sustainability. Let's not wait for the feds and the automotive companies to make their decision in 2008. Let's get out there. We have

that bandwidth. The technology works. Let's get some applications out there and let's get some early wins. Let's build that political will. Why not look at how Massachusetts can take some of those small steps?

Thanks for being a great audience. Joe, thank you for challenging us and the status quo. The status quo is not an option for us. We have to change. Thank you.

MIKE DOYLE: Thank you. Let me start by saying that the Intelligent Transportation Society (ITS) has always had a focus on safety and mobility, and that the United States has to confront the cost of congestion. The numbers show that cost as 5.7 billion gallons of wasted fuel and 3.5 million hours of lost productivity, not to mention 43,000 lost lives every year.

I'm here to offer Econolite's perspective on the future of vehicle technology integration. Econolite is in the equipment supply part of the industry. We deal with agencies, and we deal with contractors. It is easy to get confused about who the customer is. The customer is the person who uses the infrastructure for delivery of goods and services and himself. We need to make sure that when we focus on technology, we really are focused on who the customer is and how we serve that customer.

We just came from Philadelphia where the ITS America annual meeting was held. Most of the technical sessions dealt with VII, and there are lessons we can learn from their work.

First, we should keep in mind that VII began as a project of USDOT and the automakers. It made sense for the process to begin there. If the automakers can communicate with the car, they can save money on warranty and repair work. The federal government is data hungry, for a variety of reasons. Their dialogue excluded all of the rest of us- the states, the equipment manufacturers, everyone in the service industry.

About two and a half years ago, we joined with other players and developed the Innovative Mobility Showcase. We started with three companies. It became 40 companies. Those 40 companies dedicated $20 million of private capital to a demonstration of existing technologies, and to learn what VII could mean down the road.

VII is all about communication. It is not just about communication between an auto and a roadway or the auto and some other structure. VII is, in fact, communication itself. I want to talk first about some existing VII applications that focus on individual vehicles, and then look at systemwide uses for VII's communication potential. There's potential for VII-generated data to be shared across the system, and that raises other organizational questions.

Martin talked about the car that can stop by itself. BMW demonstrated another application that involves two cars. They put one of them into a spin. The car that was spinning broadcast a message, "It's slippery here." Then the car behind it got the message, "You know, it is slippery ahead." When the trailing car reached the slippery spot, VII said, "This is the slippery spot."

That's an example of vehicles talking to each other. There's also potential for the vehicle to communicate with the roadway. We saw a demonstration in Nagoya, Japan a year ago, where there were four lanes of traffic at 55 mph headed in one direction. Then, a car merged in from the left at 55 miles an hour. The cars were talking to each other. The drivers never saw each other. When the merging car approached, a car in the travel lane backed off and let him in. The driver never knew what happened.

Japan has focused on vehicle-to-roadway communication. Europe seems more inclined to exploit vehicle-to-vehicle communication. Where will we go in the United States? I think that may be up to us. Certainly the technologies that are being used in Japan and in Europe are available to us if we choose to use them.

Some VII applications are already here. Emergency services, for example. There are preemption units that let the fire department change a traffic signal. In many cities a fire engine can get a green light when they reach an intersection, to avoid running

a red into oncoming traffic. Police and ambulances could potentially use the same system. Priorities can be established for each of those various preemptive opportunities or needs.

Another application involves commercial vehicles. One of the fellows who was at our ITS America board meeting yesterday, a fellow named Dick Landis, heads a company called Help, Inc. It's a public/private partnership. Help technology pre-screens trucks for documentation, weights and other factors. That information is then broadcast to scales and weighing stations. If an approaching truck has the right information, they get a green light. They don't have to stop. Help says that in March, for example, they gave 4.6 million green lights to trucks across the country. That saved five minutes per truck and a half a gallon of fuel per truck, which is 2.3 million gallons in fuel. You can do the math. That's in one month.

I want to talk about market factors, because that's one of Joe's favorite themes. VII can be integral to a systemwide market-based approach. Users vote with their pocketbooks. If there is something out there that is going to make their lives easier for them or more enjoyable, they will buy it. Roadway pricing is an example. We think that it is not outside the realm of reason for there to be a guarantee in your tolling. As you approach the toll road, it knows what you're transit time will be and adjusts the toll based on that transit time. If you don't get good service, you shouldn't have to pay for it. The technology exists right now to be able to deliver on that kind of promise. Fee-based access could generate the new revenue Joe told us about.

For this systemic approach to work, there needs to be data sharing across networks. We find that there is some resistance to this. The fear is, "If I allow the adjacent community to communicate with my network, I somehow lose control or independence." Not so. We have peer-to-peer networks in cities that we serve across the country where there is no loss of independence or autonomy. There is sharing of data, which enables one jurisdiction to hand off to another jurisdiction. It is only the database that is being shared, not control of the system. In my view, this data sharing is a real benefit of VII.

Let me give you an example. We've done a system for one customer—a less populous state than Massachusetts—with a series of interconnected Autoscope cameras on their system. These cameras are used for detection on many freeways and intersections, but we combine them into a system. We pull the data out of the auto-scopes. We format it. We put it up on the Internet and make it available to our customer, who can then make it available to whoever they want.

In this smaller state, the IT department has integrated this system into their headquarters. They are making that information available to the police, to the fire, to the other emergency responders and they are making it available to the city planners and the governor's office. They're layering this network, using the same database for a number of different purposes.

We've done a similar system for the Louisiana DOT, and they will tell you that that was the only system that was working during Katrina. They were able to look at the freeway systems and determine what the loading was and make the decision to allow people to use the other direction, using this system.

This use of the database depends on some kind of overarching structure. In many parts of the country, Metropolitan Planning Organizations (MPO) are taking on this role. You know the role of the MPO is to receive and distribute and manage federal funds, but the MPO in many places has now taken more of a technical role. There are some positive results from MPOs insisting upon sharing of networks and data among adjacent cities. We've been able to cut across some of the institutional problems that exist between cities, or between agencies. We think the MPOs will take on a larger role in creating and managing these networks.

To wrap up, I believe that VII will develop beyond the existing discussion between the federal DOT and the automakers. We will have communication

among various agencies, and find ways to protect data. We will address the privacy issues. There are discussions underway right now to automate smog detection and re-registration of automobiles. We will use communication to make the roadway more efficient. And as we do that, we will find more opportunities for us to serve the public by allowing others access into the system at a fee. Thank you.

LUBEROFF: Our last speaker is John Cogliano, the state Secretary of Transportation. He will talk about how the state is doing on some of these issues, and respond to some of the ideas and possibilities that have been put on the table.

JOHN COGLIANO: Thank you, David. Good morning, everyone. Thank you for the opportunity to be here. I would also like to commend the Pioneer Institute and the Hudson Institute for putting this conference together, and the members of the panel and David for their efforts.

I am glad to see that everyone here is enthusiastic about ITS and believes in its ability to improve mobility and the quality of life. We need to do a better job educating the public about the importance of ITS. For example, if the Long Island Turnpike had the Fast Lane 50 years ago, Sonny Corleone would still be with us, and we would have been spared *Godfather III*.

Our challenge in the Northeast is unique. Other states have plenty of land, and rarely have the high concentration of development that we have in our city areas, especially in the greater Boston area. Because of that lack of land, excess of regulation, and limited capital, we cannot just build our way out of road congestion.

The Romney-Healey administration's long-range transportation plan identifies ITS as a key component for meeting this challenge. We are switching from just putting money into expansion to reinvesting, through what the Governor calls the Fix-it-First policy. Our 20-year plan will identify some 75 to 90 percent of the dollars that we are going to spend in the next 20 years, which will total about $30 billion in Fix-it-First type projects.

ITS is a key component of that plan. The Commonwealth has always been a great leader in technology and ITS. We began our Smart Traveler program in 1993, and we still have the most successful Smart Routes or traveler information program. We receive some 500,000 calls per month.

The Cape Cod Regional Transit Authority has been using ITS for ten years, and it has been a model for other RTAs (Regional Transportation Authorities) and the MBTA. And, of course, the MBTA's Web site for providing information to the public has been a national model as well. Our operation center is capable of not only getting crucial travel information out, but also capable of responding.

In the greater Boston area, most of the congestion is caused by traffic incidents—74 percent against a national average of 57 percent. We can bring that figure down with ITS. We have a state-of-the-art highway department operation center located right beside the turnpike. The MBTA has an operations center that will be able to track every one of its thousand buses. We will be able to reroute buses in response to a bus driver going off his or her route or pulling over.

We are about to begin the statewide deployment of our 511 system. This will give real travel time information to the public for all modes of transportation. In addition, it will also be able to provide emergency information in case of a natural or manmade disaster. We will also have the technology to do reverse dialing, so we can call people to forewarn them of various events.

ITS can also provide information to the public so they can plan their trip accordingly, which will save fuel as well as benefit the environment. Another great project that we are working on is in the I-91 corridor. In fact, this will be our first design-build project since getting that authority from the General Court in 2004 with their reform legislation. This 55-mile corridor will be a straight fiber-optic project that will not only provide us with real-time travel information but also benefit the universities and colleges in the western part of the state.

The new MBTA automated fare collection system, the Charlie Card, will be a great tool in fighting fare evasion, and it's also something that will give us the information we need to plan for our transit needs. We will know exactly how many people are getting on and getting off at a particular stop, which will aid our long-range planning. As we develop the technology, commuters will not only be able to use it on the MBTA but also on the Commonwealth's RTA systems, as well as on the Turnpike and for Massport parking.

As for automated dispatching, Mohammed Khan has made great progress at the Montachusetts Regional Transit Authority. He has set up a system where vendors compete against each other not just daily, but on an hourly basis. It looks like the stock market. And one provider may have some spare vehicles. He is able to lower his cost to that RTA. That's a great benefit, not only for the rider but, again, for the taxpayer. In fact, he was recognized nationally last year for his efforts in providing new ways of doing business that not only improve services but also lower the cost to the transit provider and the taxpayer.

We have been making good use of GPS (Global Positioning System) and AVL (Automatic Vehicle Location) for a long time. We've employed a GPS system in snow and ice removal to make sure that we assign the proper equipment to the proper location, and redeploy it as a snowstorm evolves. We have also found it effective for reducing fraud. Partly because of GPS, we were able to reduce our expenditures from $101 to $61 million between last winter and the winter before. The bus dispatchers at the MBTA are using GPS and AVL to track their buses. If they stop or move their routes, dispatchers are able to contact them immediately.

With the MIDAS system, a number of federal, state, and local agencies, including a number of transportation agencies, the state police, and the City of Boston, pool their video capabilities and share the results. The MBTA can use existing City of Boston cameras to monitor traffic flows, and redeploy its buses in case of heavy congestion.

One of the largest obstacles for implementing ITS was the fragmentation of the transportation system prior to 2004. We have made great progress in consolidating these systems, but as the Governor has pointed out, we still have far to go. We should be moving towards a DOT-type delivery system of transportation, since it is the most efficient way to provide transportation to the public.

I know that some of my colleagues here on the panel are very enthusiastic about vehicle infrastructure integration. We will begin to implement it in some of our road projects this year. It allows us to read travel times off vehicle transponders or electronic devices in the road. Currently we use it with bus companies who use our HOV lanes and report back their travel time to our operations center and Smart Traveler. This technology allows us to calculate the time to travel particular routes.

Technology is also crucial to maintaining our transportation system with our limited capital resources. We have some 500 structurally deficient bridges and miles of roads that need to be repaired or reconstructed. So it's important that we use technology, whether it's the Pontis bridge management system, which helps us maintain an up-to-date maintenance schedule, or event-reporting systems that enable us to track and notify the appropriate people as traffic problems occur.

Part of the solution will be expanding the MIDAS (Motorway Incident Detection and Automatic Signaling) system, which we are doing together with a number of transportation agencies. We are currently applying approximately 125 closed-circuit cameras to the MIDAS system, and we have the capability to expand to about 500. Similarly, we have unveiled a situation awareness system together with various agencies, including the state police, to identify and notify all the appropriate entities when there is a traffic incident.

As ITS develops, we discover more applications that will help us fight congestion and improve our lives without spending more money on building highways. Naturally, there is room in Fix-it-First for some road expansion, but this is not Texas—we

do not have that kind of land. So we need to work together and think cooperatively about improving transportation. However we do it, ITS will play a crucial role. Governor Romney and Lieutenant Governor Healey have identified that in the long-range plan. We're very excited about working on these issues with our colleagues on the panel, in this room, and in the private sector. Again, thank you very much for the opportunity to speak today.

PANEL TWO: THE ROLE OF PUBLIC-PRIVATE PARTNERSHIPS

DOUGLAS FOY: Congratulations for assembling such an illustrious and talented panel. This particular group of panelists has deep history in the intriguing topic of public/private partnerships. I think this will be a nice opportunity to benefit from their insights. Our first presenter is Maria Matesanz, from Moody's Investors Service.

MARIA MATESANZ: My focus today is to discuss the benefits and risks of privatization of public assets. Just about every major transportation conference that I've attended over the last couple of years has featured a panel on this topic.

It's a broad, complex topic that I'm going to approach from the credit perspective. In order to understand why we are seeing such interest now in this idea of asset privatization, I will talk about the Moody's toll facility portfolio from the public, tax-exempt sector; financing models and recent case studies of actual privatizations that have occurred in the U.S.; the risks and the benefits of privatization, and finally about what we expect to see going forward.

In the U.S. there's been a long history of private toll roads, starting with the Philadelphia to Lancaster Turnpike in 1792. By 1808, N.Y. State had 50 chartered private toll roads and 21 bridges. With the advent of the railroad system in the 19th century, and beyond that the 1956 Federal Highway Act, we saw abatement in private activity until the early 1990s. Since then we have seen a resurgence of privately funded toll roads.

A case in point is the SR-91 toll facility in Orange County, California, which links employment centers in Orange County with residential centers in Riverside County. That project was deprivatized in 2003 and assumed by the Orange County Transportation Authority. Political opposition resulted from a non-compete clause that prohibited improvements to the free adjacent roads that paralleled this exclusive access toll facility. The SR-91 currently has the highest tolls in the U.S.

In San Diego, privately financed SR-125 is slated to open in 2007. The Dulles Greenway project in Virginia is also private. This road should not be confused with the Dulles Toll Road in Virginia, which is in the process of being assumed by the Metropolitan Washington Airports Authority in an interesting arrangement where they've committed to leverage the toll revenues from the asset to build a transit link to the airport.

The current revival of the privatization idea, with respect to transportation and toll roads, dates back to the success of the Chicago Skyway transaction. Why the resurgence in interest now? First, as Joe's book points out, we have a very large unmet need for transportation funding - aging infrastructure, increasing traffic and congestion, and increasingly stringent government financial constraints. Privatizations are viewed as a way to eliminate or extract public officials from the long-term controversy and difficult decisions of implementing steady and regular toll increases, , which are often viewed as a form of taxation.

Second, we see a global market for transportation finance. A significant number of non-U.S. investors—with considerable cash and experience—are coming into the U.S. market. This is happening in part because of limited growth potential in other areas of the world, particularly Europe, and in part because of a higher risk profile in the developing countries where privatizations have occurred. We are seeing successful models being imported from all over the world—Europe,

Latin America, Australia and Canada.

Let me talk about the sector covered by my team at Moody's, which is the sector of government-owned toll facilities that are typically financed and owned by public authorities or public governments and financed with tax-exempt debt. We rate $47 billion of debt issued by these 47 toll facilities in the United States. We also have ratings on another 38 non-U.S. entities throughout the world. The U.S. toll road sector outlook is currently stable. The median debt rating for the U.S.-government owned sector is relatively strong rating, at A2—well into the investment grade category.

We have a very well-established model for financing toll facilities in the U.S., which has been increasingly leveraged and tapped. As regards governance and risk, on one end of the spectrum are the government entities that can raise taxes and secure their debt with taxes under their direct control. On the other end are the pure corporate structures, typically a private corporation, that will build or acquire a road. We tend to view those as potentially more risky, with very limited involvement by the government. Across the middle are models that may include various degrees of privatization—from engineering and consulting to toll collection and violations enforcement.

Government entities that secure debt through taxation include city, states, municipalities, and various school districts. They tend to have a relatively lower risk profile. As we move toward the public authority structure, which includes toll facilities as well as transit, water and sewer, and public power utilities that are supported by user-fees, Moody's considers the market forces that affect them, and their ability to price the product or service in a way that recovers the cost of service and associated debt. We also consider relative positioning in the market. Further along the spectrum, we get into higher risk profiles for organizations such as private or non-profit colleges and universities, private or non-profit healthcare providers and project financing. Off this scale is the corporate world, where we see higher default rates and technically lower ratings. This category includes fully privatized projects.

So let me return to government-owned but independent authorities. They generally have non-elected boards and management and quasi-independent toll setting authority. I say "quasi-independent" because there is always an element of political involvement even when you have a non-elected board appointed by publicly elected officials, as is the case in many of the authorities in Massachusetts.

Government-owned and independent authorities encompassing airports, toll facilities and ports engage in a lot of private sector or public-private partnership activity, such as sub-contracting for services and construction contracts. "Privatization" could involve pass-through payments by government to a private contractor to build or operate a toll facility. Payment could be based on project completion, or, less common in the U.S., payments could be based on the attainment of certain traffic levels. The focus on the credit analysis here is on the appropriation risks by the government that makes the payment. Government is still involved, so some political risk remains.

There is also the model employed for the Chicago Skyway, the Indiana Toll Road and frequently across Latin America and Europe: concessions. The long-term concession to private developers or operators is for the benefit of building and operating a toll road and guarantees a preset rate of return on that facility.

In the U.S. each state is coming up with its own model for how these concession grants are awarded. So capped rates of return may be perceived as limitless, which is part of the reason why there's a lot of interest in the U.S. market currently. But it's simplistic to view the concession model as a privatization per se. There is still government involvement, oversight of the performance terms and the concession contract, and mandates concerning capital reinvestment, availability and level of customer service. As privatized concessions begin to ratchet up toll rates, to

recover the cost of service and debt payments, there is potential for a backlash. This may involve a call for deprivatization, as we saw with the Orange County SR-91 toll road.

The only privatization that has been fully executed thus far is the Chicago Skyway, a 99-year concession sold by the City of Chicago to Cintra-Macquarie for $1.8 billion, or about 40 times annual revenue. We have a published rating of AAA based on mono-line insurance for that transaction.

The Indiana Toll Road is in the process of being privatized. Cintra-Macquarie has agreed to pay the state of Indiana $3.8 billion for that. The Pocahontas Parkway, which is in process currently, is a start-up toll road that's about to be sold. [Since this event, both transactions have been executed.] We rate both Pocahontas and the Trans-Urban company that had agreed to purchase that asset. Though Trans-Urban's rating is fairly strong for a corporate entity at A3, we revised the rating outlook from stable to negative based on the higher degree of risk that this acquisition represented in the company's portfolio.

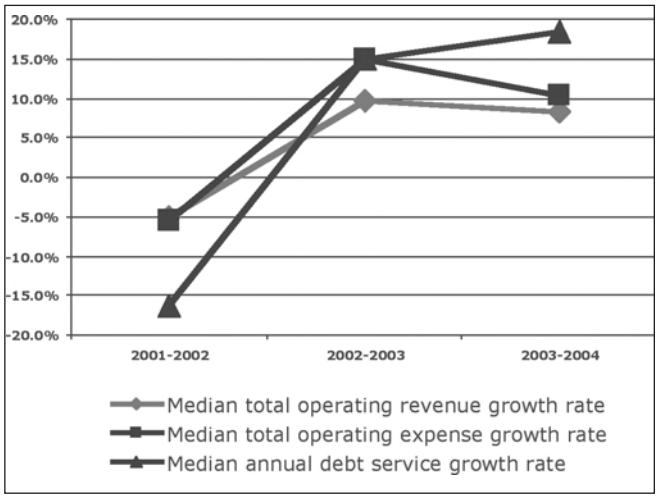
Let's move to the benefits of these privatizations. First, the cash infusion to the local government is significant and very attractive. It potentially allows for the acceleration of funding for new transportation projects. In the case of Chicago, however, a big chunk of the proceeds of the sale went for other public service projects, not strictly transportation. Second, private operation removes the political obstacles for toll increases. Third, it eliminates most maintenance expenses from the government's responsibility and may enhance quality of service. Finally, in theory, it operates the enterprise more efficiently—like a business.

There are risks, however. There are significantly higher degrees of leverage with these transactions. In the case of Indiana, the Toll Road had $200 or $300 million in debt before privatization. Now it has been leased for 75 years for $3.8 billion, much of which is paid for with debt. Chicago used much of its $1.8 billion sale proceeds to fill general government deficits, rather than for transportation improvements. As for asset maintenance, the jury is still out. Non-compete clauses may limit reinvestment in other transportation services. There is also the risk of private sponsor bankruptcy. Finally, in terms of operating like a business, there is a responsibility to provide a guaranteed return to the shareholders, which may perhaps lead to diverting funds out of the system.

Currently, the U.S. portfolio is composed of 47 toll roads with $47 billion in debt outstanding in our portfolio of government-owned enterprises. Overall, we have seen a significant spike upward in debt issuance, especially over the last two or three years. They are increasingly being tapped and leveraged to fund needed transportation improvements, capacity enhancements and just basic maintenance.

The darker, purplish line in this graph highlights the median annual debt service growth rate for this grouping relative to revenue growth, which is in red, and expenses, in blue.

We expect the debt issuance trend to continue to accelerate, notwithstanding the privatization trend as well.



Graphic: Maria Matesanz, Moody's Investors Service

In closing, as we consider privatization, we should focus on measuring success for investors, governments and end users. Likely candidates for privatizations will be assets in pretty good condition, but

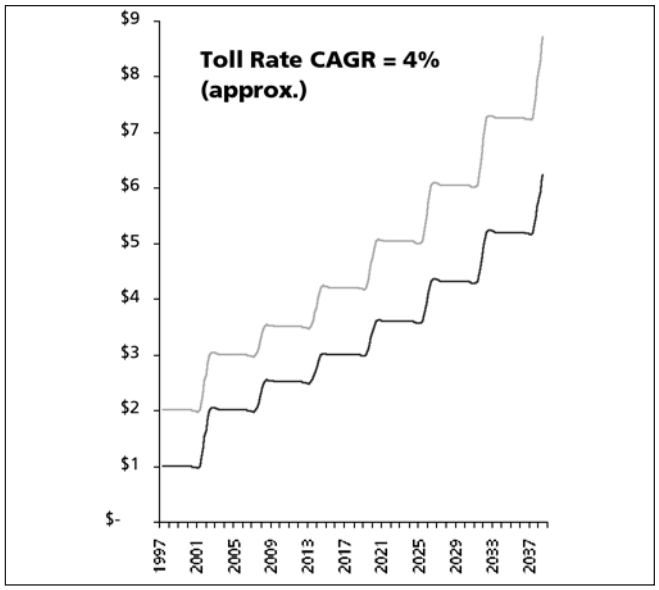
where there is little political will or support to capitalize on revenue potential by increasing toll rates. Start-ups are more risky, and we feel less likely privatization candidates. Thank you very much.

HENRY DORMITZER: I'm going to start with the attractions of privatization. We've been doing privatization for some time, whether for design, construction, operation, maintenance or financing. There is a whole range of risk factors that one can transfer to the private sector. In every one of those areas, you trade control for potential efficiencies. That is the key reason why we are here talking about privatization.

In Massachusetts, we've done all but the financing portion of privatization. And we've come to terms with questions regarding control versus potential efficiencies. The theme of my presentation is that privatization is a tactic in the war on financing, not the strategy itself.

The good Dr. Giglio is always provocative. The last chapter of his book, entitled "The Case for Intellectual Dishonesty," poses an interesting question regarding deferred maintenance as a hidden cost of operating our transportation systems. "A great many of our public services actually cost more than we admit," he says. "Intellectual dishonesty is what we practice when we pretend we don't have to fund depreciation. Private sector participants can't be expected to do this without paying for depreciation." So, he asks, does private sector efficiency—again, here's that word "efficiency"—encourage appropriate budgeting and revenue generation, or does it camouflage the tendency to ignore depreciation?

Well, let's talk about that. Privatization is a big deal. *Barron's* weekly of May 8th had a cover story entitled "Privatization." The lead article declares: "Foreign companies are paying billions to operate U.S. toll roads, creating wealth for some state and local governments. For drivers the trend will likely mean more efficient highways but higher tolls." The premise that *Barron's* is putting out there is that we are going to get more efficient highways but it is also going to be expensive.



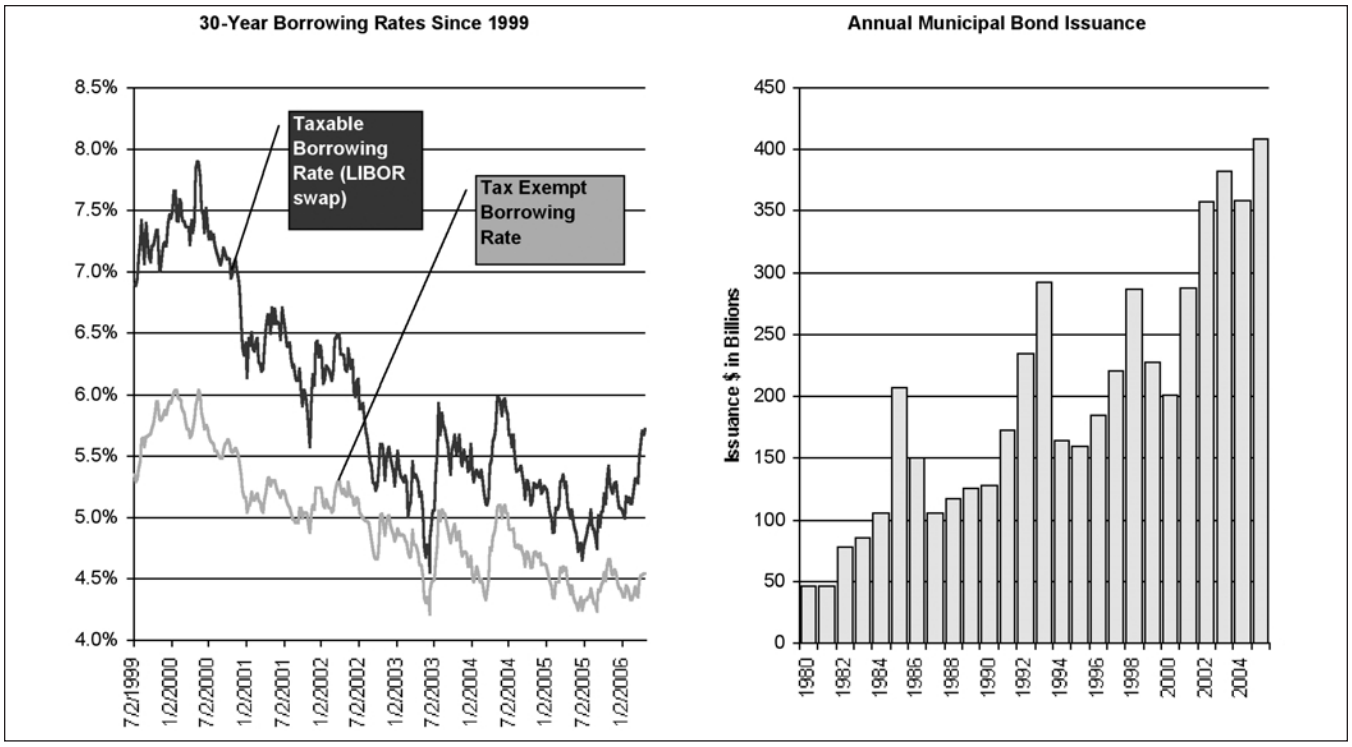
Graphic: Henry Dormitzer, UBS Investment Bank

I'm intrigued by the link. Do privatization and efficient highways mean higher tolls? Is privatization the reason for higher tolls? The *Barron's* article reflects the common belief that higher tolls and privatization are linked. But look at the graph at right, which shows a very ramped toll schedule. Consider an experiment. Imagine that Skyway followed this ramped toll schedule. They'd make a lot of money from that, right? What's interesting is that this graph is the Mass Pike toll schedule.

So we've already done this. The question isn't, "Does privatization lead to higher tolls?" Tolling is a public sector policy question. Access to capital, I would propose, isn't the issue. Privatization, however, may be the tool for addressing this policy question.

Private financing is new in the U.S. but not new everywhere else. They've been doing it in Europe, South America, and Australia for a long time. We have a culture of quasi-public authorities, and a tax benefit, which the federal government conveys to local governments, that makes their borrowing tax-exempt.

The blue line on the left is what you pay to borrow in the taxable markets, going back to 1999. The green line is what you pay on the tax-exempt market. So it's cheaper for governments to borrow than for corporate entities to borrow.



Graphics: Henry Dormitzer, UBS Investment Bank

The bar graph [on the right] is how much governments have borrowed to finance their infrastructure. As you can see, since 1980 it has grown substantially. Last year, governments borrowed $408 billion dollars in these markets. Interestingly, one could argue that part of the reason that the federal government conveys the tax benefit of letting local governments borrow tax-exempt is because local governments don't pay taxes at all, and don't get the benefits of depreciation or the tax deductibility of interest costs. This can be an efficient structure for private entities to finance, contrary to the suggestion in the *Barron's* article that it will lead to tolls going up.

All forms of project procurement involve a trade-off of control. Consider the three elements of a triangle: operational and procurement efficiency, financing efficiency, and control. Choose any two. If you are willing to transfer elements of control, you can have all that private sector operational and procurement efficiency and you can have some financing efficiency, as we have discussed. If you want to retain control, you are not going to have as much of the other two. A lot of the discussion of privatization comes down to how badly you want to retain that control—and that is a political question. If you want a financing solution, procurement efficiencies, and operating efficiencies, you know you can get those with privatization—but at the cost of less control.

How do we balance our desire for efficiency with an integrated, statewide transportation plan? Maybe our priority is to get the workforce into central Massachusetts better, to better accommodate the rising cost of housing in eastern Massachusetts. Maybe we could use the proceeds of privatization for the integrated transportation strategies discussed earlier.

Hypothetically, what could we privatize? The obvious opportunities are the Mass Pike and the harbor tunnels. They have substantial debt outstanding and, as we saw, we are already looking at ramped toll increases. These facilities are a vital commuter and trucking approach to Boston, so I would not give up all control of them. The Tobin Bridge, similarly, is an important commuter and trucking approach to Boston.

Logan Airport is critical to the regional economy. They just released a study about how important to the economy it has been. It's one of the few true compensatory airports. Logan is an airport where government controls access to the airport very actively.

As for ports, we all watched the Dubai episode unfold and saw the security concerns with that. The Port of Boston is important to the regional economy, but its revenue is limited; I believe it operates at a loss. We also have a very effective transit system that is better every day. But in spite of its high traffic levels, the system is clearly operating at a loss, with a 35% fare recovery rate. It's tough to privatize something like that.

To reap large financial benefits from privatization, I believe that the Commonwealth would have to transfer substantial control of its infrastructure assets. We need to ask: What impact will that have on transportation planning? How do we assure integrated technology? How do we plan for the future to improve Massachusetts' competitiveness? How do we plan for the long-term transportation needs of the Commonwealth, to control housing costs around Boston?

In the last chapter of Joe's book, "The Case for Intellectual Dishonesty," I understand Joe to be saying that if you really showed the cost of transportation, you would never get anything done. Our burden is to come up with the right strategy. Privatization is not the strategy, but a tactic to implement the strategy. I actually think it is a very efficient and usable tactic, but it isn't the bullet that is going to save us. Privatization is not capital—it is just a good way to get at it.

TRENT VICHIE: I'd like to give you Macquarie's perspective on concessions and public-private partnerships. Over the last couple of years I've had the great privilege of working on both the Skyway deals and the advisory team for the Indiana Toll Road transaction. It's been an exciting time in the transport market.

Macquarie is a specialist investor in the infrastructure sector. We have over 30 toll roads around the world. If you include Indiana, we have five roads in the U.S. at the moment, and we are looking to put more capital to work. I'd like to talk about the concession model, some of the key provisions in place, and how it works.

Let's walk through from the first principle: a concession is a lease of an asset to the private sector, where the private sector assumes responsibility for the operation and the maintenance of the asset.

For that obligation, the private sector has the right to collect tolls. The concession contract governs where tolls are set and where they are going in the future. In the case of Skyway and Indiana, the government basically told us, "Here is the toll schedule. You tell us how much you think it is worth." And we lined up against other bidders and we put the most competitive price on the table.

Where you want tolls to be is a public policy matter. The private sector represents a tool that can be used by the public sector to deliver either a new asset or a capital sum, which can then be invested in other assets. In the case of Indiana, they took a slightly different tack than what they did in Chicago in terms of the use of the funds. Of the $3.8 billion that we pay them, at least $2.8 billion will go into a ten-year road investment program for the state. That is a great opportunity for the state in terms of jobs, as well as increased efficiencies in the economy from having a better transportation network.

What happens if the private sector does not perform under the concession contract? In an extreme circumstance, where there is a default, we run a huge financial risk—we risk losing the concession in its entirety. In Chicago we could lose $1.8 billion, while in Indiana $3.8 billion could be gone.

Obviously that provides a great incentive to make sure that we are actually performing under the contract. The contracts provide very strict operating and safety and maintenance standards. In the case of Chicago and Indiana, they had a pile of manuals that were prepared by the state's engineers and consultants. The government drafted a very prescriptive document covering

things like removal of graffiti, repainting lines, road surface condition—it even covered details of the amount of time we had to remove road kill. They effectively said, "This is how we want you to run the road." And we priced that into our bid. They are going to get the service that they requested; if they don't, we run the risk of losing the contract.

Under these concessionary agreements, we are required to be transparent. We report frequently on accidents, traffic and the like. The government retains the right to come in and audit us on a wide variety of matters. We have to deliver our financial statements to the government. They hardly relinquish control; rather, the government retains significant control through focusing on contract performance.

The concession moves government from being responsible for delivering a particular service to a position where they are effectively regulating the delivery of that same service, through enforcement of the contract. The other point worth noting is that it is a lease with a fixed term. And at the end of that contract, we have to hand the asset back in a certain condition.

Before the end of the contract in both Chicago and Indiana, we are required to post a large letter of credit. If we haven't maintained the road to a certain standard, the government can pull that letter of credit, so they have significant protection. At the end of the day it remains a government asset. Our role is to deliver service to the customers.

So why engage the private sector? I think every speaker has touched on this. My favorite statistic is that in the last 20 years, from 1982 to 2000, you've had a 71% increase in vehicle miles traveled. In that same period of time, you've had a 4% increase in total lane miles. That has resulted in congestion. There simply has not been the funding available for governments to expand or, in many cases, to even maintain the system. The private sector can provide an alternate source of capital.

Why is equity financing so powerful? What we are doing, really, is investing money at risk. In a typical tax-exempt financing, you have operating costs and debt service. In the case of equity financing, there is surplus cash flow being generated after the payment of debt service.

Those cash flows occur over an extended period of time. The private sector's role is to effectively put a value on them today. The other thing we do that is helpful is related to how we forecast. Take traffic, for example. If you are doing a debt issuance of tax-exempt debt, obviously, the bias is for a somewhat conservative view because you want to make sure it gets paid back.

When equity is looking at these investments, we take a much more balanced view, potentially a more optimistic view than what debt financing would do and, again, we place a present value on that. It definitely provides greater comfort to lenders when somebody else takes losses before they do.

We also bring a real management focus. We own 30 roads around the world and we actually implement ideas and strategies from around the world. We bring that technology to each of our individual roads, and we have a lot of expertise to rely on.

Finally, concession arrangements allow for risk transfer. The most significant one, perhaps, is in terms of construction costs. If the state is procuring a road under a public/private partnership (PPP)—for example, the SR-125 out in California—the private entity must deliver to the state a product under a fixed price and time contract. If there are overruns in terms of cost and time, that is our risk—not the government's. We have all seen projects go over time and over cost. Why not transfer that risk to the private sector and let us manage that for you?

A report delivered to Congress in December 2004 suggested that a PPP contract can save anywhere between 6% and 40% of construction costs. If you've got limited funds, those savings can help you deliver more projects.

The House Committee on Transport has quantified the impact of investing in highways, noting that you get four dollars of economic benefits for each dollar invested. For every billion dollars

invested in highways, 47,000 jobs are created. In the case of Indiana, that is going to represent over 100,000 jobs. So there is a direct economic and labor impact from the work of PPPs.

Allow me to address, finally, a few misconceptions about concessions. The first is that the private sector won't maintain the road. The fact is we have to maintain the road according to strict standards. Our standards for Skyway and Indiana are actually stricter than what previous management was required to deliver. Another misconception is that the private sector won't work with unions. The SR-125 in California is being delivered with more than 95% union labor. We have another investment in Toronto, the 407 electronic toll road. Most of the staff are customer service representatives, and all 400 are union members.

Then there's a concern about what happens if the private sector becomes bankrupt. Under the Skyway and Indiana contracts, if we go bankrupt and can't deliver on the contract, the state gets the asset back. It is actually a windfall for them because they could re-lease that contract out. We bear any risks associated with bankruptcy.

There's also the misconception that the private sector will be able to charge whatever tolls they like. Again, not true. Tolls are governed by the contract. The state tells us what the tolls are going to be, and we factor that into our bid for the lease of the government asset. The government retains oversight and some control.

Finally, some believe that tax-exempt debt is cheaper. In fact, equity financing actually values more of the available cash stream. There is also a program that is being put forward for private activity bonds, which would allow the private sector to borrow tax-exempt in order for it to build new greenfield assets. Some of the playing field has been leveled between the public and the private sector.

In summary, the key benefits are cost-effective delivery, stringent operational and maintenance standards, strict government oversight, the ability to leverage existing constrained capital, economic benefits and benefits for labor, and wide experience across the world with the model that is becoming common in the United States. This is not an experiment.

FRED SALVUCCI: Joe Giglio has placed some provocative ideas on the table. In particular, he has pointed out that efficiency alone is not enough to repair the transportation infrastructure. Efficiency only matters if you are effective. We do not build bridges to save money but to reach the other side of the river.

Some have suggested that private debt may be better than public debt, because the ability to depreciate allows a private party to finance projects more cheaply than a public authority with tax-exempt financing. However, while that may apply to a state that substitutes private funding for declining federal support, it does not apply for the nation as a whole, because then it is only taking money out of one pocket and putting in the other. We need to deal with public and private financing in a more fundamental way.

Trent Vichie was right in much that he said, but I have a different slant. I think that it takes more, not less, competency and integrity on both sides to make public-private partnerships work. I gained that slant through experience. I participated in a project in Buenos Aires with many of the features we have been talking about. The government owned and ran a railroad and transit system, but it was only collecting half its fares and only one out of three of its employees bothered to show up on an average day. The other two sent their wives down to pick up the check because they had a different job.

The World Bank floated a loan to buy out the two-thirds of the labor that was not coming to work. However, not only did the concessionaires no longer have to pay those who did not show up for work, but they immediately erected barriers to force customers to pay for their rides. Since ridership is measured by the number of fares collected, it increased immediately and dramatically. You may, in fact, have come across accounts of how this privatization supposedly increased ridership by 400 percent the first year.

The money collected was invested in rebuilding the assets, which had been allowed to deteriorate. The contract stipulated specific investments that the concessionaire had to make in a certain timetable. The government, on the other hand, had to maintain its subsidy. The idea was that instead of pouring all this money into a system that was falling apart and not providing service, they would get a rebuilt and improved asset for the same investment.

The other half of the deal incorporated the radical notion that the government was to pay its bills every month on time. It worked extremely well. There wasn't a 400 percent increase in ridership, but the infrastructure investments came back amazingly fast. Ridership went up at least 30 percent that first year because of service quality improvements and more seats. The private side maintained the vehicles at night so they would be available for the rush hour in the morning, instead of, as had been the practice, maintaining them during the day so that 30 percent of the fleet was missing during peak use. Things went so well that the President said, "Since it is privatized, who needs all these government bureaucrats?"

They had a highly competent enforcement group in place to make sure the private parties did the investments they were supposed to do on time. Then they figured that they could fire all the bureaucrats and save plenty of money quickly. The private company probably thought that was a pretty good deal too. Then the other shoe dropped when the government stopped paying their bills on time.

Is it better than what was there before? Yeah. The asset didn't fall apart. It is carrying more people. It is in better shape than it was. However, a great opportunity to do it right was blown in about three years by getting rid of the competent people in the government who had put it together, and by the government not paying its bills. That is Argentina in a nutshell.

I participated in another project in San Juan, Puerto Rico. We did a design, build, operate, maintain project. I had the privilege of helping to structure it. The most important thing was to get accountability in one place. Everybody wanted to sell trains to Puerto Rico. The deal we structured was, if you sell trains, you've got to do the signal system and the power system. You have to operate it and maintain it for the first ten years. No supplier could say, "Our train is perfect. It's your incompetent contractor." You are the contractor. You install it. No finger pointing. You're accountable.

The trains were supposed to be capable of a two-minute frequency. Siemens won the bid. It generally worked out well because we had terrific leadership in Puerto Rico, which was willing to take on a new way of doing business. However, Siemens' subcontractor set the rail at the wrong gauge. If there were no government employees watching, who knows how far that would have gone? You can't assume that these things work on automatic pilot. There has to be a responsible public party, monitoring the process.

In Puerto Rico, like Argentina, the government failed to have sufficient enforcement personnel. So the trains that are supposed to be capable of running a two-minute frequency have, at best, an eight-minute frequency. It's a totally integrated system. It's a Siemens car. It's a Siemens signal. They haven't delivered and the government hasn't held their feet to the fire to make them deliver. It's a great model, but only if the two parties both work at it.

I have projected a [potential results of privatization] matrix with 16 possibilities, and only one is where we want to be. I am not suggesting that the probability of getting there is only one out of 16, but I am insisting that it is not easy. I believe in public-private partnerships. But they require much more competency and focus than the normal way of doing business.

Although I am a vegetarian and do not frequent McDonald's, I want to say something for one of its principles. I advised the Argentinean government during the restructuring that it should hold on to one of its eight lines, and run it itself. If the government did not do that, they would not retain the

competency to manage its relationship with the concessionaire. Good engineers want to be where the action is, building and fixing things. I was delighted to discover that McDonald's actually operates on this principle. While it franchises most of their restaurants, it insists on running some itself so that it knows what problems its franchisers face.

Eight or nine months ago I read in *The Economist* about a phenomenon called agoraphobia. Some economists now think that consumers tend to under-consume because they are afraid to purchase something and then feel that they made a mistake. You can do your supply and demand and figure out where people ought to be in terms of the utility, but people actually consume less than they theoretically should.

So you've got a sub-optimal performance in the private sector economy, assuming perfect competition. The perfect competition you guys all enjoyed: If you drove in from the west on Mass Pike, you will notice there was a perfect market out there, with 25 competing turnpikes that could have taken you in. This is a perfect market situation we operate within.

I think there is an interesting possible extrapolation. Given all the distrust, cynicism, and complexity of getting things right in the public sector, we shouldn't be surprised that we under-invest and under-purchase public goods. Now doing concessions can help us around that by making transactions smaller so they will look more like individual decisions. But there is still that agoraphobia. What I am saying here, to go back to agreeing with my friend Joe Giglio, is that there is a systematic reason for the under-maintenance and under-funding of infrastructure that we see in the public sector. And we need to examine that, since we can't fix it if we don't understand what is going on.

Another interesting point: the economist William Baumol claims that in first world economies public sector goods inflate much more rapidly than private sector goods. There are two reasons for the Baumol effect. The first is that the public sector does not invest enough in technology. The second is that public sector goods tend to depend on local labor, and local labor has to keep up with the standard of living. So, whether you are running the MBTA or teaching schools or hiring nurses at a hospital, those costs tend to inflate at more than the rate of inflation, unlike consumer goods that are produced in China. Since construction operates under the Baumol effect, investing today rather than tomorrow is almost always a smart strategy, as long as it's a good investment. Because you are going to pay a lot more tomorrow.

Getting good things done well requires a smart public partner. The governments and people who get things done tend not to be shy about command and control, Singapore, for example. Notice that when Singapore instituted tolls it did not reduce its gas taxes. There's also Ken Livingstone in London, who successfully implemented congestion charging.

Remember that we need more money, not just different money. We don't want to give up the gas tax, especially in the world market for petroleum. The price of petroleum is about as much a market price as the price of bread in the former Soviet Union. Producers charge what the market will bear. And if the United States lowers its taxes, then the petroleum price is just going to suck the money in and the infrastructure will lose that money. So if you are serious about these models for adding money, then you do not reduce the gas tax. You add these new models on top of what's already in place. You have to be clear that you are adding funding, not just substituting, if you are serious about dealing with the problem.

I want to close by mentioning some good opportunities in Massachusetts.

The Mass Pike is a good place to try new things. A pet idea of mine is to work with the telephone company because they are used to changing technology frequently. I am a civil engineer, and so I do not know much about wires, just concrete. Our public infrastructure agencies tend to be dominated by civil engineers like me. It's difficult to decide on a new technology. The public sector

should be changing technology every five years, but we do not, because we will be criticized if whatever we invest in is not still running thirty years from now. We can learn a lot from the telephone company, which has a marketing division and a billing operation and is comfortable changing technology as often as it needs to be changed.

Secondly, automobile insurance costs you more than the fuel in your car if you live in this region. If your insurance cost was proportional to the amount of driving you do, some interesting things might happen. You could still have private insurance companies in a real market. There's potential in the socialization of the insurance process.

I think we need to take a hard look at congestion pricing on airplane runways. For one, it is a requirement of the court settlement on the new runway. However, Massport is ducking and doing as little as possible. Massport just raised the landing fees a couple of months ago, but in the same old way of pennies per pound. Congestion pricing makes sense. That is why the utilities, the energy companies, and the telephone companies do it. That is why the private sector does it. It ought to be happening at Massport. You guys ought to insist that Massport step up to the plate on this one.

Although he is a Republican, I want to say that Matt Amorello is doing a great job at the Mass Pike. Why is he getting beaten up and Christy Mihos canonized? Mihos was on the board when the leaks occurred, and now he no longer wants to honor the toll schedule he voted for? Matt is criticized because he wants to maintain the toll schedule that is necessary to meet the debt service payments. If we want creativity, our best chance to get it is on the Pike or at Massport. We need to support those who are willing to innovate, like Amorello.

And I like John Cogliano, who gave a terrific presentation this morning, and who saw through major innovations by implementing ITS for collection and snow-removal. We should be applauding him. The unwritten deal was that the legislature sets the budget in July and never appropriates funds for snow removal. Then, when the government calls the snow-removal contractors, they know they will not be paid until July, and so finish their private sector jobs first, like at the supermarket parking lot, and then they plow what they want, when they want. John made it so that they only get paid if they actually plow.

Thank you.

JIM STERGIOS is Executive Director at Pioneer Institute. Having previously served as Research Director, he rejoined Pioneer in September 2005, after three years in the Commonwealth's Executive Office of Environmental Affairs, where he served as the Chief of Staff and Undersecretary for Policy. Mr. Stergios graduated summa cum laude and holds a Ph.D. in political science from Boston University.

KEN WEINSTEIN serves as the CEO of Hudson Institute, a Washington-based think tank that produces innovative research on global security, prosperity and freedom. He holds a Ph.D. in political science from Harvard and has taught at Claremont McKenna College and Georgetown University. Ken has written on policy areas ranging from European and Middle Eastern politics to labor and education policy and the future of Japan. His articles and books on policy topics have appeared in over 100 publications, ranging from the Wall Street Journal to the Asia-Pacific Review to Le Figaro in France. Ken, again, thank you for you assistance in putting this together this morning. Take it away.

JOSEPH M. GIGLIO has served as a full-time faculty member at Northeastern's College of Business Administration since 1997. Previously, he was executive vice president at Smith Barney; president of Chase Municipal Securities; and senior managing director at Bear, Stearns & Co. He has also served as chairman of Apogee Research Inc. Professor Giglio has held a series of senior management positions with the Federal government and with both the City and State of New York. He served as chairman of President Reagan's National Council on Public Works Improvement, and has chaired the U.S. Senate Budget Commission on Innovative Financing of Infrastructure. Professor Giglio served as chairman of the board for the Intelligent Transportation Society of America (ITSA). He is also the vice chairman of the Hudson Institute, a leading public policy organization in Washington D.C.

DAVID LUBEROFF is the Executive Director of the Rappaport Institute for Greater Boston at Harvard University's Kennedy School of Government. Previously, he was Associate Director of the school's A. Alfred Taubman Center for State and Local Government and an adjunct lecturer at the Harvard Design School. He is the co-author (with Alan Altshuler) of Mega-Projects: The Changing Politics of Urban Public Investment (Brookings Institution Press, 2003), which was named that year's best book on urban politics by the American Political Science Association. Before joining the Center, Luberoff worked for the Boston Redevelopment Authority (where he edited the agency's landmark 1988 "Midtown/Cultural District Plan"), was the Boston bureau chief for The Middlesex News, and was the editor of the Tab.

MARTIN CAPPER joined Mark IV Transportation Technologies in 1993 and was appointed President of the IVHS Division in 2001. Previously, he served as Executive Vice President of the Division from 1997 until 2001. Additionally, he was appointed president of MARK IV's Transportation Technologies Group in 2004. Prior to joining Mark IV, Mr. Capper served as CFO of South Africa's largest independent insurer for five years, and pioneered the concept of electronic commerce between intermediaries and underwriters. In addition, he was responsible for strategic planning for South Africa's largest paper and packaging group, Nampak Ltd.

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JOHN COGLIANO heads the Executive Office of Transportation (EOT), an agency with $1.4 billion in annual operating expenditures, a $1.4 billion capital program, and purview over 8,600 employees. He serves as the Chair of the MBTA Board of Directors and has direct oversight of the Massachusetts Highway Department, the Registry of Motor Vehicles, and the Massachusetts Aeronautics Commission. Prior to his appointment, Cogliano served as Commissioner of the Massachusetts Highway Department. Secretary Cogliano also worked for five years at the Massachusetts Division of Capital Planning and Operations and at his family-owned business on the South Shore of Massachusetts.

DOUGLAS FOY served as the first secretary of the Office for Commonwealth Development from January 2003 to March 2006. As a cabinet secretary, Foy coordinated the Executive Office of Transportation, the Executive Office of Environmental Affairs, the Department of Housing and Community Development and the Department of Energy Resources. Prior to his service in the Romney administration, Foy served for 25 years as president of the Conservation Law Foundation, New England's premier environmental advocacy organization.

MARIA MATESANZ is Senior Vice President and Team Leader for the Infrastructure Finance Team at Moody's Investors Service. She manages a team of seven analysts who cover over 350 issuers with close to $300 billion in Moody's-rated debt in the U.S. infrastructure sectors. Ms. Matesanz is lead analyst for toll roads and airports and also covers a portfolio of high profile transportation sector issuers. Under Ms. Matesanz's direction, IFT conducts extensive issuer surveillance, investor outreach, and publishes sector-specific outlooks and special comments, as well as reports on individual transactions. Before joining Moody's, Maria was Director of Cash Management Systems for the Treasury Bureau of the New York City Department of Finance.

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TRENT VICHIE has worked on a wide range of both project finance and structured finance transactions, with a combined value in excess of $6 billion. Mr. Vichie secured debt financing for the Cintra-Macquarie Consortium, the winning bidder on the $1.83 billion Chicago Skyway transaction. He recently led the team that refinanced the bank acquisition financing with $1.4 billion bond issuance and $150 million of sub-ordinated debt. Mr. Vichie also led the financial advisory team for the $3.85 billion bid for the Indiana Toll Road, which has been selected as the preferred proponent.

FRED SALVUCCI is a Senior Lecturer at MIT's Center for Transportation and Logistics. Mr. Salvucci served as transportation advisor to Boston Mayor Kevin White between 1970 and 1974, and then as Secretary of Transportation of the Commonwealth of Massachusetts under Governor Michael Dukakis between 1975 and 1978 and again from 1983 to 1990. In those roles he has participated in much of the transportation planning and policy formulation in the Commonwealth over the past twenty years, with particular emphasis on the expansion of the transit system, the development of the financial and political support for the Central Artery/Tunnel Project, and the design of implementation strategies to comply with the Clean Air Act.

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