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CONFERENCE PROCEEDINGS 48

Financing Surface Transportation in the United States

Forging a Sustainable Future—Now!

Summary of the Fourth International Conference

BENJAMIN PEREZ, Parsons Brinckerhoff
Rapporteur

May 19–21, 2010
New Orleans, Louisiana

Sponsored by
Louisiana Department of Transportation and Development
Federal Highway Administration
American Association of State Highway and Transportation Officials
American Public Transportation Association
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This report has been reviewed by a group other than the authors according to the procedures approved by a Report Review Committee consisting of members of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine.

This project was sponsored by the Louisiana Department of Transportation and Development; the Federal Highway Administration; the American Association of State Highway and Transportation Officials; the American Public Transportation Association; the Galvin Mobility Project; the National Transportation Center, Morgan State University; and the Transportation Research Board.

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Preface

The Transportation Research Board (TRB) convened the Fourth International Conference on Transportation Finance, Financing Surface Transportation in the United States: Forging a Sustainable Future—Now! on May 19–21, 2010, in New Orleans, Louisiana. The conference continued a series that began in 1997. As techniques have evolved, each conference has addressed the latest economic and funding trends and has looked toward the future of transportation revenue generation and finance. The conference attracted some 150 transportation finance specialists from the public and private sectors. They gathered to share the latest developments in innovative funding techniques and to explore options for securing continued revenue to support national infrastructure and mobility needs.

The contributions of the following organizations enabled the conduct of this important and timely conference: TRB and the standing Committees on Revenue and Finance, Congestion Pricing, and Economics; the Louisiana Department of Transportation and Development; the Federal Highway Administration; the American Association of State Highway and Transportation Officials; the American Public Transportation Association; the Galvin Mobility Project; Morgan State University's National Transportation Center; and the University of Iowa's Public Policy Center.

BACKGROUND

In 1997 in Dallas, Texas, TRB initiated a series of conferences addressing the evolution of transportation finance

and funding. Subsequent conferences were held in 2000, 2002, and 2010 in Scottsdale, Arizona; Chicago, Illinois; and New Orleans, Louisiana, respectively. Each conference's program was designed to reflect current trends and address emerging issues.

The first TRB Conference on Transportation Finance, Transportation Finance for the 21st Century, focused on a variety of new tools and techniques known collectively as innovative finance. The 2000 conference revolved around the new funding categories and finance opportunities provided with the passage of the Transportation Equity Act for the 21st Century (TEA-21). In 2002, transportation professionals discussed the reauthorization of TEA-21 and new methods to enhance and expedite project delivery. The 2010 conference generated discussion of alternative finance mechanisms and sustainable approaches to support infrastructure and mobility needs amid economic uncertainties.

CONFERENCE PLANNING

TRB assembled a conference planning committee appointed by the National Research Council to design and develop the conference program. Kay McKinley of PBS&J served as the committee chair and was joined by the eight members listed on page ii. The range of expertise represented by the organizing committee's membership included financial management; innovative project and program delivery; federal, state, and local government policy development; academia; and research.

The conference's primary objective was to provide information on emerging issues and to explore and stimu-

late discussion of new approaches and alternative revenue-generating mechanisms. In addition, the committee wished the program to increase awareness of the role of public education to better articulate the importance of infrastructure needs and to engage the next generation of policy leaders and decision makers in the transportation finance debate.

The committee incorporated innovative approaches into the conference planning effort through inclusion of a student video competition to explore public awareness of how transportation is funded and through the award of travel scholarships to facilitate graduate students' participation in the conference. After rigorous evaluation, two videos received awards and were featured during the conference, and seven graduate students received travel scholarships to attend. Two students associated with the winning videos also attended.

Two preconference workshops describing the state of the practice for performing benefit–cost analysis, providing techniques for financing projects in challenging times, and discussing emerging trends for raising capital were offered. The workshops were followed by an evening poster display with 20 peer-reviewed presentations that addressed a wide range of transportation funding approaches and programmatic options in use around the world.

The 2-day conference program featured an opening session with two keynote speakers completed by five additional plenary sessions, each with its own three corresponding breakout sessions; a second poster session conducted during breakfast on the second day; an informal brown bag lunch discussion session; and a formal luncheon with a keynote speaker.

A compendium of PowerPoint presentations featured at this conference is available at <http://onlinepubs.trb.org/onlinepubs/conferences/2010/finance/program.pdf>.

PLENARY SESSIONS

The conference's opening plenary session featured keynote presentations by Victor Mendez, Federal Highway Administrator, and Jane Garvey, North American Chair for Meridian Infrastructure, who highlighted transportation priorities and future opportunities. The five subsequent plenary sessions each explored a different issue, as follows: the policy dynamics of future surface transportation finance, international project finance, emerging issues, sustainable transportation finance, and creation of a research road map for the future.

BREAKOUT SESSIONS

After each plenary session, participants were offered a choice of three breakout sessions, each of which included three to four presentations. The format provided an

environment conducive to delving into the concepts presented in the plenary sessions and to learning about real-world applications of those concepts, drawing from project managers' and others' experience.

POSTER SESSIONS

The conference included two poster sessions. The first was conducted after the preconference workshops and featured 20 peer-reviewed poster presentations addressing a wide range of transportation funding approaches and programmatic options in use around the world. The second was conducted during breakfast on the second day of the conference and featured six peer-reviewed poster presentations.

CONFERENCE SUMMARY FORMAT

The conference summary was prepared by Benjamin Perez of Parsons Brinckerhoff as a factual summary of what occurred at the conference. The views presented reflect the opinions of the individual participants and are not necessarily the views of all conference participants, the planning committee, TRB, or the National Research Council.

This report was reviewed in draft form by individuals chosen for their technical expertise and diverse perspectives, in accordance with procedures approved by the National Research Council's Report Review Committee. The purposes of this independent review are to provide candid and critical comments to assist the institution in making the published report as sound as possible and to ensure that the summary meets institutional standards for clarity, objectivity, and responsiveness to the project charge. The review comments and draft manuscript remain confidential to protect the integrity of the process.

TRB thanks the following individuals for their review of this report: Z. Andrew Farkas, Morgan State University; Tamar Henkin, High Street Consulting Group, LLC; Lowell Clary, Clary Consulting, LLC; and Steven Gayle, Gayle Consult, LLC, Gilbertsville, New York. Suzanne B. Schneider, TRB Associate Executive Director, managed the review process. The review of this conference summary was overseen by C. Michael Walton, Ernest H. Cockrell Centennial Chair in Engineering, University of Texas at Austin. Appointed by the National Research Council, he was responsible for ensuring that an independent examination of this report was carried out in accordance with institutional procedures and that all review comments were carefully considered.

The contributions of the chair and members of the conference planning committee were innumerable and led to the success of the conference. The dedication and

efforts by the chair and topic leaders ensured the quality and creativity of the conference program.

Additional support was provided by the conference liaisons, Harold (Skip) Paul, Louisiana Department of Transportation and Development; Suzanne Sale, Federal Highway Administration; Z. Andrew Farkas,

National Transportation Center, Morgan State University; Adrian Moore, Reason Foundation; Jack Basso and Joung Lee, American Association of State Highway and Transportation Officials; Art Guzzetti, American Public Transportation Association; and conference rapporteur Benjamin Perez, Parsons Brinckerhoff.

Introduction

Benjamin Perez, *Parsons Brinckerhoff, Rapporteur*

CONFERENCE HISTORY

The Transportation Research Board (TRB) has conducted a series of four conferences addressing the evolution of transportation finance and funding. The first TRB conference on transportation finance, *Transportation Finance for the 21st Century*, was held in Dallas, Texas, in 1997. It focused on a variety of new tools and techniques known collectively as innovative finance. These approaches encompassed diverse public- and private-sector actions that moved beyond the traditional federal-aid and state-aid funding processes to include private activity bonds, state infrastructure banks, and public-private partnerships, among others. All were considered cutting-edge approaches in their formative stages. The proceedings of the 1997 conference led to acknowledgment of the need for providing federal, state, and local governments with a resource that could facilitate understanding and increase utilization of the new funding and project delivery options. This suggestion ultimately evolved into a research project undertaken by TRB's National Cooperative Highway Research Program [20-24(13)], which created a clearinghouse for innovative finance information. The project's products were incorporated into the Center for Excellence in Project Delivery website now maintained by the American Association of State Highway and Transportation Officials.

In 2000, transportation professionals gathered in Scottsdale, Arizona, to discuss the new finance opportunities stimulated by the Transportation Equity Act for the 21st Century (TEA-21). Funded at \$198 billion,

this bill constituted a significant increase of \$77 billion in funding over its predecessor, the Intermodal Surface Transportation Efficiency Act of 1991. At TRB's third transportation finance conference, *Meeting the Funding Challenge Today, Shaping Policies for Tomorrow*, held in 2002 in Chicago, Illinois, transportation professionals focused on the reauthorization of TEA-21 and the exchange of information on tools and techniques designed to enhance and expedite project delivery.

The 2010 conference in New Orleans, Louisiana, titled *Forging a Sustainable Future—Now!* was conducted at a critical crossroad for transportation finance amid a global economic downturn and the uncertainties that lay ahead. With Congress having had to transfer money from the general fund into the Highway Trust Fund for the first time in its history and with the reauthorization of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users still pending, transportation professionals gathered to participate in thought-provoking discussions, to explore revenue generation alternatives, and to help identify research topics to advance the knowledge and understanding of infrastructure needs.

WORKSHOP SESSIONS

Suzanne Sale of the Transportation Infrastructure Finance and Innovation Act (TIFIA) Joint Program Office in the Federal Highway Administration's (FHWA's) Office of Innovative Program Delivery opened the work-

shop sessions by welcoming workshop participants. She explained the role that the preconference workshops have played in previous TRB transportation finance conferences as being less formal in nature and more intensive explorations of specific topics of interest that provide time for questions and interaction. She indicated that the objective of these interactive workshops is to assemble subject matter experts and practitioners who will offer their professional perspectives and personal insights on tools and techniques to enhance the financial decision-making process for transportation investments.

Workshop 1: Benefit–Cost Analysis— Advancing the State of the Art

Mark Burris of the Texas Transportation Institute (TTI) moderated the first workshop that explored the role of benefit–cost analysis in the transportation project decision-making process, addressing both financial and non-financial criteria that can be used to evaluate projects. The workshop was designed to provide attendees with economic theory, an analytical framework, and tools to evaluate infrastructure investment beyond the one-dimensional financial feasibility aspect of a given project. Dr. Burris mentioned that a workshop on the same topic had been conducted in Washington, D.C., on May 17, 2010, and that the presentations from that earlier session were available on the TTI website at http://tti.tamu.edu/conferences/benefit_cost10/. He also identified a number of studies and ongoing research efforts on the application of benefit–cost analysis to the transportation decision-making process.

Role of Benefit–Cost Analysis in U.S. Department of Transportation Infrastructure Investment Programs

Darren Timothy of FHWA’s Office of Innovative Program Delivery made a presentation on the U.S. Department of Transportation’s (DOT’s) perspective on benefit–cost analysis, which is to foster long-term economic growth, encourage accountability, and introduce rigor and discipline into the transportation planning and decision-making processes. The federal focus on benefit–cost analysis began with the Federal Transit Administration’s New Starts Program’s cost-effectiveness criteria and the Federal Aviation Administration’s Airport Improvement Program. In the late 1990s, benefit–cost analysis was addressed in FHWA’s *Conditions and Performance Report* to Congress. The FHWA Office of Asset Management developed a number of benefit–cost analysis tools including the Highway Economic Requirements System, the National Bridge Investment Analy-

sis System, and the Transit Economic Requirements Model. Benefit–cost analysis procedures were included in a 2009 notice of proposed rulemaking for the TIFIA credit program that was subsequently withdrawn, and most recently they have been integrated as a component of the Transportation Investment Generating Economic Recovery grant program.

Dr. Timothy stated that benefit–cost analysis involves a number of key steps. The first is to establish a baseline against which the economic effects of a transportation investment will be compared. The level of detail of the analysis should be commensurate with the value of the improvement, and the inputs for the analysis should be obtained from the studies used to develop the project. If the majority of inputs needed for the benefit–cost analysis have not been prepared for the planning, design, and engineering studies efforts to develop a given project, there is cause for concern. The credibility of a benefit–cost analysis is enhanced by limiting and focusing the scope of the effort, by avoiding optimism or overestimating bias, and by considering a range of actions since a single build case may lead to over- or underinvestment.

Dr. Timothy suggested that benefit–cost analysis is broader than financial analysis in that it calculates benefits to society. Benefit–cost analysis calculations are done in constant dollars. Good benefit–cost analyses can be used to support funding decisions and the finalizing of project options. While benefit–cost analysis does not deal with risk assignment issues, it can be designed to capture nontraditional issues such as livable communities, economies of agglomeration and densification, health and lifestyle choices, and spatial and social distribution. Livability is often challenging to quantify, but it should not be overlooked in a benefit–cost analysis. There are ways to capture the value of increased real estate development as a benefit associated with livability. U.S. DOT is working to develop better definitions of concepts that should be included in benefit–cost analyses.

Dr. Timothy was asked about how benefit–cost analysis should address user charges as the preponderance of toll projects increases. He replied that user charges are treated as both costs and benefits. In response to a question on discount rates, Dr. Timothy stated that U.S. DOT uses a standard rate of 7 percent, but that 3 percent may be a good alternative when non–U.S. DOT funding is used on a project.

California Case Study: An Overview of the Application of NET_BC Software for the California Department of Transportation District 5 System Analysis Study

Dean Munn of the Corradino Group described the NET_BC cost–benefit software package that was devel-

oped to assess four highway projects in the San Luis Obispo region of California. The projects are located in the southern end of Santa Clara County, where there is tension between demand for new housing and preservation of the region's agricultural uses. The California Department of Transportation (Caltrans) was interested in capturing multiple issues in the development of the cost-benefit analysis (CBA) software, including commuter travel times, farmland preservation, environmental issues, and tourism. The NET_BC model was based in part on outputs from the Association of Monterey Bay Area Governments (AMBAG) travel demand models used to assess the highway improvements, as well as construction and ongoing operations and maintenance costs for the projects. The model was built to be attached to the AMBAG model and took advantage of information on the location of traffic signals and vertical grades in the model to calculate fuel use.

The NET_BC model has four primary variables: discount rates, the analysis period, construction assumptions, and costs. A number of underlying assumptions were also adjusted to be consistent with Caltrans standards. The NET_BC model calculates mobility benefits and looks at the value of time by time of day, mode, and trip purpose. The model accounts for vehicle operating costs and is sensitive to traffic flow characteristics. Other issues such as environmental effects are not quantified monetarily but are included in the overall analysis. The NET_BC model produced effective results that helped decision makers focus on quantitative effects of real issues and helped them arrive at consensus by identifying clear winners among the alternatives considered. The outcome of the NET_BC model was one of a number of factors that was used in informing decisions.

In a response to a question on the relationship between the transportation alternatives assessed and land use growth, Mr. Munn stated that if the resources were available to do so, the model could be expanded to address changes in land use and noted that the state of California has been effective in controlling where growth takes place.

Evolution of the Use of CBA in the United Kingdom

Andrew Price of Halcrow Group provided an overview of the development of CBA procedures used in the United Kingdom. The population density of the United Kingdom is 12 times greater than that of the United States. The United Kingdom also has a strongly centralized government and has developed standard appraisal guidelines for CBA. Roads are largely publicly funded, and there is little use of tolling. The primary mode of travel is the automobile, which accounts for 95 percent of trips.

As the United Kingdom developed its motorway network from 0 miles in 1959 to more than 2,000 miles in 1995, the CBA approaches were refined. Simple cost-benefit approaches were developed in the 1960s by using a limited range of monetized economic impacts such as time savings, accidents, operating costs, and capital costs. CBA methods codified further in the 1970s standard values were set for travel times. The government also established national values and set assumptions on appraisal periods and discount rates.

In the 1980s under the Conservative government, motorway development was at its peak, and there was pressure to include environmental issues in CBA assessments. At that time the government established the Standing Advisory Committee on Trunk Road Assessment (SACTRA) to establish norms and procedures for completing reviews of proposed motorway improvements. SACTRA examined issues including induced traffic, environmental impact projections, and wider assessments of the economic impacts of motorway improvement projects. In the mid-1990s under the Major government, the Transport White Paper recognized the limitations of continuous motorway expansion, and later in 1998 the Blair government introduced important new goals for transport appraisals, including more rigorous assessments of the economy, safety, environment, accessibility, and integration.

CBA was codified further in 1998 when the Department for Transport issued its New Approach to Appraisal (NATA) model to be used in the review of 66 motorway projects. NATA included standard worksheets to assess benefits and costs, all of which feed into a summary table. Information is available at <http://www.dft.gov.uk/webtag/>. The NATA procedures include both monetized and qualitative assessments, and they established a structured seven-point scale for qualitative assessments with clear and consistent definitions.

The NATA approach is proven and has informed CBA practices established by the World Bank. NATA has been successful because it has a policy focus; is objective; uses standard and comprehensive metrics; measures variability; is multimodal, succinct, and scalable; and provides a transparent audit trail. The level of detail of a NATA analysis is challenging, and the model has a clear focus on highway improvements and is not as strong when applied to rail or transit projects.

The Eddington Transport Study, conducted from 2004 to 2006, was a major assessment of the link between transport and productivity. The conclusions were that transport needs to be greener to support economic growth; that U.K. appraisal methods, although well developed, could be improved to take account of wider economic impacts; and that smaller projects tended to have higher benefit-cost ratios. The Eddington study recommended that transport policy should be evidence

based, ensure fair pricing of all transport modes, and focus on making better use of existing networks before investing in new projects. The Department for Transport has responded to the Eddington study in a number of ways. It has been reorganized into Eddington priority areas to address interurban, urban, and international gateway transport issues.

Workshop 2: Financing Projects in Challenging Times—Emerging Trends for Raising Capital

Moderator **David Seltzer** of Mercator Advisors began the second workshop by summarizing the multiple challenges in assembling financing for transportation projects in the current economic climate, which is characterized by declining revenues and the limited availability of bond insurance. He indicated that the purpose of the workshop was to explore emerging trends to help in overcoming difficulties in issuing debt for projects. Mr. Seltzer created a hypothetical case study for a \$300 million project in “Leverage Parish,” Louisiana, for a 10-mile toll road financed by publicly backed revenue bonds leveraging user charges on the facility. He stated that initially, the road would generate \$20 million in annual toll revenues. Revenues would increase by 2.5 percent annually, and the facility’s net income would double in 30 years. The panelists were asked to discuss options for financing the facility under the present market conditions. **Cherian George** discussed taxed-back debt options for the Leverage Parish facility. **Lisa Fenner** compared two new bond instruments: Build America Bonds (BABs) and tax credit bonds. **Jorianne Jernberg** discussed federal credit instruments that could be used to support the project, and **Michael Parker** discussed long-term public–private partnership arrangements backed by availability payments.

Financing Projects: The Tax-Backed Alternative

Cherian George of Fitch Ratings explained how a rating agency would consider a bond transaction leveraging a special tax, such as a gasoline tax. These types of transactions are not normally rated as an obligation of the state or municipality. Because they are levied at a fixed rate, the rating agencies focus on the economic fundamentals that would drive the level of revenue derived from special taxes. The rating agencies assess these dynamics with the additional bonds test (ABT), which is used to determine the amount of debt that can be leveraged from a particular dedicated revenue stream. The ABT is based on historical receipts, certified revenues from the most recent 12 to 24 months. To be classified as A to AA, bonds must usually have a coverage ratio of 1.20 to 4.00 times the amount of debt to be issued.

In the hypothetical case of Leverage Parish, Mr. George explained how the rating agencies would approach debt backed by a parishwide 1-cent gasoline tax increase. Various combinations of coverage ratios and interest rates implied by different credit rating levels were examined. Mr. George presented calculations showing that the revenue generated by the toll road would be insufficient to issue \$300 million in tax-backed bonds covering the entire cost of constructing the road. Instead, the debt would have to be resized and was found to be maximized at \$250 million if the bond received a BBB rating. With a rating of AA \$200 million could be raised, and with a rating of A \$225 million could be raised. Mr. George stated that the smaller amount of debt would likely cover construction costs but would not support ongoing maintenance needs on the basis of either a life-cycle cost or asset management approach. This fact could lead to higher long-term maintenance costs for the Leverage Parish toll road.

Mr. George concluded his presentation with a brief overview of the various aspects that rating agencies consider in assessing a transaction and an appraisal of the current bond market. He observed that spreads have recently reverted to more normal levels, so rating assessments are more narrowly focused on fundamental macroeconomic indicators. Such indicators include gross domestic product over the past 30 years, spending levels, trade volumes, retail trade, inflation, and employment. Mr. George commented on the uncertain prospects for employment recovering to levels seen before the current economic crisis. Other indicators include housing starts, corporate profits, oil prices, savings levels, household debt, net worth, and mortgage delinquencies.

With regard to the Leverage Parish case study, Mr. George indicated that the important message from his presentation was that considering only a typical municipal debt credit rating of A and the required coverage ratio would have limited the amount of money that could have been leveraged from the parish gasoline tax to only \$225 million. Thus, issuing special tax debt with lower ratings and lower coverage levels can be helpful and should be considered.

Emerging Trends for Raising Capital: New Forms of Tax-Preferred Debt

Lisa Fenner of KPMG Infrastructure Advisory reviewed two new federal debt tools that might allow the financing of the Leverage Parish toll road project: BABs and tax credit bonds. BABs were authorized by Congress as part of the American Recovery and Reinvestment Act (ARRA) of 2009. They have been well received by the markets and provided broad debt authority at a time when traditional municipal debt transactions could not

easily access the market. BABs have attracted a different investor base because the bonds are taxable. With a larger pool of investors, demand for BABs is up and yields are down. There is no limit on the amount of BAB debt that may be issued. However, all BABs must be executed by the close of 2011, when the program will expire, and the use of the proceeds is limited to capital projects.

BABs have been extremely popular and represented 40 percent of all municipal bond issues in 2009 and 2010. To compensate for the fact that BABs have higher costs to issuers than does traditional municipal debt, the U.S. Treasury provides either a subsidy of 35 percent of the financing costs to issuers of BABs or a similar tax credit to BAB investors. Nearly all BAB issuers have opted for the subsidy, which provides a significant savings in interest costs in the long term, and most BAB issues have been in the range of 20 to 40 years.

Today, BABs generally have a 10-year call, and rating agencies are examining the degree to which projects are dependent on the subsidy. There are also substantial reporting requirements with BABs. Because the program is temporary, there is uncertainty about whether it will be extended, which leads to concern over the ability to sell the bonds in the future. Less demand would result in higher yields. Subsidy rates may also be lowered from 35 to 28 percent, and changes in tax rates could affect BABs.

In terms of tax credit bonds, the ARRA and the Hiring Incentives to Restore Employment (HIRE) Act made changes to qualified tax credit bond programs and set volume caps for issuance. The HIRE Act also allowed direct pay subsidies to be provided to issuers in addition to traditional tax credits. The direct pay subsidy model can result in 0 percent interest rate loans to issuers. Structurally, qualified tax credit bonds feature bullet maturities, where sinking fund deposits accumulate over time in an amount sufficient to pay bonds at maturity. The U.S. Treasury makes monthly determinations on the maximum maturity of the bonds. As of May 2010, tax credit rates were at 5.47 percent, and the permitted sinking fund investment rate was at 4.33 percent. There are certain structural limitations on qualified tax credit bonds. The maximum permitted terms for the bonds vary and can affect bonding capacity, and there are costs associated with optional redemption flexibility. Volume caps are also creating competition for funding.

If BABs were used, the Leverage Parish hypothetical toll project's debt capacity would be \$255 million on the basis of a 35 percent subsidy, or \$241 million with a 28 percent subsidy, assuming an A-category bond rating, a 30-year maturity, and a debt service coverage ratio of 1.3. With qualified tax credit bonds, the debt capacity of the project would increase to \$307 million on the basis of a similar rating and debt service coverage ratio.

However, in this case the bond would have a 17-year maturity, an average interest rate of 0 percent net of 100 percent subsidy, and a sinking fund investment rate of 2 percent.

Ms. Fenner stated that in the end, issuers need to determine which type of debt will be the most appropriate for them and afford them with the flexibility they need. They will need to assess the relationship between revenues and existing bond covenants and consider to what extent their bonding capacity is constrained, the extent to which financing is dependent on receipt of a subsidy, and whether debt service payments can be made without subsidy. They need to consider whether they would have other uses for the money that could be leveraged or if they would lose the subsidy if they do not pursue a particular project or use. Many issuers have used a combination of traditional municipal bonds and BABs. One strategy would be for issuers to agree on a minimum savings threshold and then if possible retain flexibility to make the final decision at pricing, remembering that the cost of capital is only one component of project delivery.

New State Financing Mechanisms

John Muñoz of Texas DOT briefly discussed the pass-through program used in Texas, which is also commonly referred to as a "shadow toll" program. He summarized key features of Texas DOT's project, which includes pass-through tolls (a per vehicle or per vehicle mile fee paid by Texas DOT to a private partner). The value of the fee is determined by the number of vehicles using the facility. With pass-through tolls, the cost to users of the road is assumed by Texas DOT. To date, Texas DOT has executed a total of 17 pass-through toll agreements with a combined value of \$1.4 billion. It has plans to expand the program by more than \$400 million by 2011. Pass-through toll agreements are carefully negotiated and are management intensive, with local agency and private-sector partners required to optimize financial performance. For Texas DOT, pass-through tolls are an innovative off-book financing tool; the revenues pledged by the department are actually leveraged by other public agencies or private partners rather than by Texas DOT. Mr. Muñoz focused the remainder of his presentation on how the use of pass-through or shadow tolls could be helpful to Leverage Parish in increasing its debt capacity.

He also discussed transportation reinvestment zones, another innovative tool being used by Texas DOT that could be helpful to Leverage Parish. This mechanism is similar to tax increment financing, with an incremental property tax levied within a specified area that is used to take out additional debt to support capital construction costs of new transportation improvements.

Federal Credit: TIFIA and Proposed National Infrastructure Innovation and Finance Fund

Jorianne Jernberg of FHWA's TIFIA Joint Program Office discussed how federal credit programs could be used to increase the debt capacity of Leverage Parish. At the time of the conference, the TIFIA program had supported a total of 21 projects and \$110 million in budget authority to offer assistance in the form of direct loans, loan guarantees, and standby lines of credit. TIFIA credit assistance can only be used to support one-third of project costs. The use of TIFIA credit enhancements increases debt capacity because TIFIA accepts a lower debt coverage ratio than do the capital markets. The program also accepts a junior lien on future revenues and levies no penalties for prepayment.

In the hypothetical case of the \$300 million highway improvement project in Leverage Parish with \$20 million available for annual debt service, TIFIA assistance could be used to finance one-third of the capital cost. With that assistance, the project's debt capacity would range between \$346,395,639 and \$420,532,477, depending on the interest rate on senior debt and the following assumptions:

- TIFIA interest rate, 4.70 percent;
- Senior interest rate, 4.61 percent (BABs) or 7.00 percent (private activity bonds);
- Debt tenor, 30-year debt; and
- Debt service coverage requirement, 1.10×

Using TIFIA debt on the project expands debt capacity while reducing the interest rate exposure through a fixed interest rate on the TIFIA instrument.

Ms. Jernberg concluded her remarks by summarizing the advantages and disadvantages of the TIFIA credit program. The following are among the advantages:

- TIFIA is a patient source of capital for projects with ramp-up risk.
- TIFIA offers flexible payment structures, including deferrals, prepayments, and mandatory payment schedules.
- TIFIA provides fixed interest rates and more favorable rates than can generally be found in the capital markets for similar instruments in today's interest rate environment.
- Direct TIFIA loans strengthen senior bondholders' security by shifting up to 33 percent of borrowings to a junior position.
- Coinvestment by the federal government indicates public-sector commitment to and due diligence on the project.
- TIFIA facilitates large project financings with significant public benefits.

The TIFIA program presents the following disadvantages:

- The TIFIA program is oversubscribed and cannot finance all projects that might want to use federal credit assistance.
- TIFIA support is limited to 33 percent of project costs.
- TIFIA requires a dedicated revenue source to pledge for repayment.
- Direct TIFIA loans may not be as favorable for stronger (high-rated) projects with access to the tax-exempt market.
- TIFIA support makes the entire project subject to federal rules, including the National Environmental Policy Act of 1969.
- The "springing lien" may be viewed negatively by senior lenders.
- TIFIA assistance may displace rather than induce participation by capital markets in some instances.

Availability Payment–Based Concessions

Michael Parker of Jeffrey Parker & Associates, Inc., discussed the use of availability payment–based concessions in the United States and their possible application to the toll facility in Leverage Parish. To date, only two availability payment concessions had reached financial close in the United States: the Port of Miami Tunnel and the I-595 Improvements Project, including high-occupancy toll lanes in Fort Lauderdale, Florida. Two others were pending: the Denver Regional Transportation District Eagle project and the Long Beach Courthouse. Mr. Parker emphasized that raising the money for a project is distinct from actually delivering the project and that many risk factors are associated with that process, including cost overruns and delays.

Availability payment concessions remove traffic revenue risk for private investors. Payments are made to the concessionaire on the basis of its ability to meet a performance standard, with the payment stream normally beginning after construction has been completed. In return for the opportunity to earn availability payments, the concessionaire is responsible for designing, financing, building, operating, and maintaining (DFBOM) the facility for a specified concession period, which normally lasts between 20 and 40 years. Availability payment concessions work well on technically complex projects where the improvement is a high priority but does not have the ability to generate adequate cash flows to cover its capital and financing costs as a tolled facility. Availability payments are also appropriate in situations where revenue and demand are difficult to predict or influence, as well as in situations where service quality is a more important or applicable goal than revenue maximization. Availability payment concessions also lend themselves

well to innovation and deriving value over the life cycle of projects.

Mr. Parker concluded his presentation by comparing the pros and cons of DFBOM concessions, including availability arrangements. On the pro side, DFBOM concessions provide predictable, guaranteed life-cycle cost and performance levels as well as the opportunity to optimize risk allocation and encourage innovation. However, DFBOM concessions also involve the costs of financing and risk premiums, and they may require revisions of existing statutory frameworks. The procurement and change order process is also likely to be more complex and time-consuming than are traditional procurements, but they can bring value with the right projects.

Workshop 2 Comments, Questions, and Answers

Comment: Availability payments are likely to be more popular over time. The Bipartisan Policy Center recommends focusing on performance and long-term life-cycle performance. In the future, more money will be focused on maintenance activities, and life-cycle costs will need to be taken into consideration.

Comment: A value-for-money comparison analysis needs to consider the ramifications of having a project being “gold plated.” One tool is to use net present revenue value analysis to quantify the risk of cost overruns. There is much practical flexibility. Rather than examining single projects, it may be more advantageous to examine entire portfolios.

Comment: Over the past decade, some planners did not take long-term operation and maintenance requirements into consideration, especially with contractor-dominated concession groups. The market has since matured. Maintenance has become more important than most other issues.

Comment: Capital is relatively easy to obtain, but good operational and maintenance efficiency is difficult to achieve. It is helpful if operation and maintenance costs can be capitalized.

Question: You may or may not have the ability to dedicate a revenue stream to an individual project. If you combine revenue sources, how do the buckets flow?

Mr. Parker: With the Port of Miami tunnel, the TIFIA program found that the structure allowed risk to be shared, and this alleviated risk exposure in certain areas. Different revenue sources come with covenants and caveats and conditions, so this can make it complex to commingle tools. Some issues can be addressed by statute or covenant.

Question–comment: How do states and credit rating agencies take availability payments into account? Are they treated like debt? If a state treats availability payments like operating costs, then the rating agencies might do the same. Would an availability payment contract with a 30-year concession period be less risky than a 50-year contract? A 50-year debt term would concern the rating agencies.

OPENING PLENARY SESSION

Transportation Priorities

Mapping a Course for the Future

Kay McKinley, *PBS&J* (Moderator)

Sherri LeBas, *Louisiana Department of Transportation and Development*

Mark Norman, *Transportation Research Board*

Jane Garvey, *Meridiam Infrastructure*

Victor Mendez, *Federal Highway Administration*

WELCOME AND PERSPECTIVES

Kay McKinley, PBS&J, the conference chair, served as the moderator of the opening session. She welcomed participants to the Transportation Research Board's (TRB's) Fourth International Transportation Finance Conference and thanked the Federal Highway Administration (FHWA), the Federal Transit Administration, the Louisiana Department of Transportation and Development (DOTD), the American Association of State Highway and Transportation Officials, the American Public Transportation Association, the Galvin Mobility Project, the National Transportation Center at Morgan State University, and the University of Iowa's Public Policy Center for their patronage and support of the conference. Ms. McKinley recognized the contributions of the organizing committee in bringing this event to fruition. She noted the excellent workshops and the poster session that had taken place the previous day and acknowledged the participation of the experts from the public and private sectors who had assembled to discuss current developments and trends in the transportation finance sector. Ms. McKinley concluded her welcome remarks and invited Sherri LeBas of Louisiana DOTD to the podium.

Sherri LeBas, Interim Secretary of the Louisiana DOTD, welcomed conference participants to New Orleans and stated that her organization was proud of its history of innovative procurement, including the use of design-build contracts and the development of new materials. Ms. LeBas cited a number of DOTD's recent accomplishments, including creation of economic development zones and evacuation routes and the securing of

\$430 million in American Recovery and Reinvestment Act funding to support road safety. She indicated that DOTD's Transportation Infrastructure Model for Economic Development program has involved bonding a 4-cent sales tax to accelerate an aggressive 20-year program of highway widening and bridge and port access improvements. Since 2007, Louisiana has invested more than \$1.0 billion of its state surplus in transportation needs. DOTD's LA-1 improvement project is using innovative financing tools to improve roadway access to marine facilities servicing 18 percent of the U.S. petroleum supply, and the department is the possible user of public-private partnerships (P3s) on its I-10 Lake Charles and I-49 South improvement projects.

Mark Norman, Director of TRB's Technical Activities Division, welcomed conference participants to New Orleans. Looking back to 1997, when the first TRB transportation finance conference was held (Transportation Finance for the 21st Century), he recalled that transportation agencies were finishing up the last of their Intermodal Surface Transportation Efficiency Act (the federal surface transportation bill that was funded at \$121 billion) money. On the financial front, it was a roller coaster of a year. The Dow Jones Industrial Average closed above 7,000 points for the first time in U.S. history and by July had doubled in value over the previous 30 months. Just 3 months later, stock markets around the world crashed because of investors' fears of a global economic crisis. The Dow Jones Industrial Average followed suit and plummeted for a point loss exceeding that of 1987's Black Monday. For the first time, officials at the New York Stock Exchange invoked the "circuit breaker" rule to stop trading.

The TRB finance conference held that year focused on new techniques known collectively as innovative finance, which consisted of diverse public- and private-sector actions that moved beyond the traditional federal-aid and state-aid funding processes.

In 1997, financing terms and acronyms that are spoken of glibly today, such as private activity bonds (PABS), Build America Bonds, state infrastructure banks (SIBs), and P3s, were all cutting-edge approaches in their formative stages. A key innovator behind these new tools was Jane Garvey, who was then serving as Deputy Administrator of FHWA. As the originator of the Grant Anticipation Revenue Vehicle (GARVEE) bond, she blazed an important trail in the world of innovative finance.

By the time of the third conference in 2002 (Meeting the Funding Challenge Today, Shaping Policies for Tomorrow), the Transportation Equity Act for the 21st Century was in its fourth year, and transportation professionals gathered in Chicago, Illinois, to focus on the reauthorization of the federal transportation bill and to exchange information on tools and techniques to deliver more projects faster.

Now, 8 years later, Mr. Norman stated that those gathered in New Orleans for the fourth TRB finance conference await the reauthorization of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users to set the course for national transportation funding.

To counter the aftereffects of a 2007 recession and downturns in manufacturing, retail trade, and the finance and insurance industries, new federal initiatives and economic stimuli have been created such as the Transportation Investment Generating Economic Recovery (TIGER) and upcoming TIGER II grant programs. Mr. Norman expressed his appreciation to FHWA Administrator Mendez and Ms. Jane Garvey of Meridian Infrastructure for agreeing to participate in the conference and for sharing information about the TIGER grants and insights on other initiatives.

Mr. Norman concluded his remarks by encouraging the conference attendees to continue to innovate, experiment, look toward the future, and participate in the thought-provoking discussions and formation of new ideas at the conference to help define unmet research needs that TRB can explore to keep us all moving forward.

KEYNOTE ADDRESSES

Industry Perspectives on Finance

Jane Garvey, the North American Chair of Meridian Infrastructure, suggested taking a step back to view transportation in the context of geopolitics and econom-

ics. Public officials operate in an environment that poses difficult and often conflicting choices. With a funding gap of \$142 billion, Ms. Garvey stated that the United States finds itself in unusual and sluggish economic times with a long climb ahead. Economists believe that financial stimulus is needed, but at the same time there is increased concern about the national debt. There are many conflicts, and the national debt will likely be a defining issue in the upcoming midterm elections in November. Two national commissions have addressed the issue of the national debt. They have worked separately, but they shared information and presented choices and options. Currently, more than half of the nation's debt is foreign owned. This is an unstable situation; if the United States does not change its ways, 95 percent of federal proceeds will be paid in interest by 2019.

Ms. Garvey observed that a situation as difficult and politically charged as the current one does not have a single solution. There is no question that the transportation sector will be affected. Things will change, and the unthinkable is possible. A number of tools are available, such as P3s and tolling the Interstates. While P3s have their detractors, successful P3s occur when the transportation program drives the solution. Arizona and Virginia have enacted statutes requiring that P3s be considered with state programs to address public needs. P3s usually require comprehensive, up-front analysis. Public-sector comparator analysis is one way to ensure that the right decisions are made. Good P3 contracts are also critical in protecting the public interest and aligning public and private interests. With a properly structured P3 arrangement, the public sector does not cede control, and there are consequences when a private partner does not perform appropriately.

In the 1990s, the initial ideas for important innovative finance tools including the Transportation Infrastructure Finance and Innovation Act (TIFIA), SIBs, and PABS came from the states as suggestions from the frontline practitioners. In the context of the current national challenge, Ms. Garvey believes that the United States will continue to need this kind of proactive and creative input from transportation agencies meeting needs in the face of reduced revenue and budgets. She noted that the political atmosphere today is polarized and poisoned, and she expressed the hope that the positive energies of real partnerships and rational voices will bring real solutions to real problems.

Federal Perspectives on Finance

Victor Mendez, FHWA Administrator, began his address by stating that he was encouraged to see so many young people and students participating in the conference and that it is the responsibility of more senior transporta-

tion professionals to share their experiences with the next generation of practitioners. Administrator Mendez reminded the attendees how important research is and to take advantage of the opportunity to learn from one another throughout the conference.

Administrator Mendez remarked that the public often expresses concern about the length of time required to deliver major infrastructure projects. Even though the public may not understand the process, he emphasized that transportation professionals still need to move forward in a timely and efficient manner. There is a need to find ways to use technological advances such as the Blackberry, YouTube, and the iPod to improve the delivery of transportation projects. The transportation sector does not appear to be moving as quickly as technology is advancing.

He stated that the U.S. Department of Transportation (DOT) is doing innovative work and currently has the opportunity to work with Congress to develop reauthorization legislation for the 21st century. The department has ideas of what the future of the transportation sector should look like, and it must always consider the needs and wants of the public, with an eye to the bottom line. It is important for the federal government to listen to the ideas coming out of this conference, which will serve as a catalyst for discussion and innovation. It is important to gain insight into public and private perspectives on solutions to the nation's transportation challenges.

Administrator Mendez noted that innovative finance tools such as TIFIA credit assistance will remain critical. This was true in 2009 when all P3 transportation projects that reached financial close received TIFIA support. However, in 2010, U.S. DOT has received 39 letters of interest for TIFIA support, with requests for TIFIA loans exceeding \$13 billion. These requests exceed the available resources by far. The TIFIA program is likely to be oversubscribed, and the federal government will likely be unable to provide assistance to all projects. U.S. DOT's new budget includes \$4 billion in seed money for a proposed infrastructure fund, with the goal of leveraging \$25 billion to capitalize this new tool, which is modeled in many ways after the TIFIA and TIGER programs.

He expressed his pleasure that FHWA had invested \$26.5 billion in more than 12,000 projects through the Recovery Act. This investment has created or sustained more than 4 million jobs during a period when the economy was losing 760,000 jobs per month. At the same time, the TIGER program has provided an additional \$1.5 billion to support 51 projects after having received applications for support of some 400 projects with a combined capital cost of \$60 billion. This resource imbalance may be a preview of where the nation is headed.

Administrator Mendez confirmed that Congress had authorized funding for the Highway Trust Fund

through the end of 2010. He noted that Congress has also recognized the value of the TIGER program and authorized an additional \$600 million to fund a second round of grants. He stated that the United States must find innovative solutions to meet its transportation needs and that tolling, congestion pricing, and P3s will all be part of the solution. He emphasized that tolling needs to pass the tests of political and public opinion. To do so, Administrator Mendez emphasized the importance of people receiving value for their expenditures. He noted that there is a need to look beyond the revenue stream to see what the ripple effects will be on other aspects of transportation policy. The decisions the United States makes today will affect how the nation travels tomorrow. Society needs solutions that reduce emissions and congestion, and it needs to encourage public interest to track this important agenda. The ideas and insight stemming from this conference will be invaluable in shaping the next generation of innovative finance tools.

Questions and Answers

Question: While many people support the use of P3s, the reality is that they do not create funding. One interesting aspect of the effort to implement tolls on I-80 in Pennsylvania was a local poll that found that 80 percent of the public would be willing to pay up to \$10 more per month to support transportation funding needs. The reality is that the average driver already pays \$18 per month in motor fuel taxes, so there appears to be a communication gap between public officials' concerns and their understanding of what the public would actually be willing to pay.

Administrator Mendez: Polls are polls. In Arizona, the state recently faced challenges in advancing a ballot initiative to approve a 1-cent addition to the state's \$0.18 per gallon motor fuel tax to pay for transportation improvements. The reality is that taxes on cell phones in Arizona are higher and do not generate the same kind of pushback. There are always different political and public filters for issues such as these.

Question: Tolling and vehicle miles traveled (VMT) fees are hopefully funding sources, but how can we fund high-speed rail and bike initiatives?

Administrator Mendez: U.S. DOT supports high-speed rail. The key question is whether it is sustainable. The underlying theme is to think much more holistically.

Ms. Garvey: We will need to raise the gasoline tax, so why not do so gradually? Debate on the debt will help to crystallize thinking on the need to increase the motor fuel tax. The reality is that 50 years after President Eisenhower established the Interstate Highway System,

it is clear that the Interstate has facilitated enormous economic benefits to the U.S. economy. Perhaps high-speed rail will do the same; if we do it right, it could be seminal. Under the current economic conditions, the administration will not raise the gasoline tax. TRB has plans to conduct a study on the long-term maintenance needs of high-speed rail together with potential funding sources.

Question: Would it be possible to establish interstate partnerships with information providers?

Administrator Mendez: Technology holds the solution to that question. The Research and Innovative Technology Administration has a program under development to establish technologies to communicate with infrastructure systems to help improve safety conditions, and concepts are under development to enable vehicles to communicate with pedestrians. There are many exciting technologies that could be used in this way.

Question: The theme of this conference is “Forging a Sustainable Future—Now!” If increases in the gasoline tax are not contemplated and if there is no support for VMT fees, what is the sustainable solution being offered by the administration or Congress that we as transportation professionals could comment on?

Administrator Mendez: The United States has a motor fuel tax in place, but it is not generating enough revenue to meet our needs. Greenhouse gas emissions are an issue that needs to be addressed from a policy perspective. There is a funding gap that we cannot figure out how to bridge. Funding for the TIGER program came from the general fund.

Ms. Garvey: The funding gap is there—we need to acknowledge this. It will take multiple strategies and a new mind-set to overcome the current funding gap.

OUTLINE OF CONFERENCE PROGRAM AND OBJECTIVES

Ms. McKinley reviewed the conference program and each of the objectives established by the organizing committee for the conference:

- Provide a forum for financial information exchange,
- Offer intellectual stimulation and exploration,
- Invest in America’s future transportation leaders,
- Engage the public and elected officials in the transportation finance debate,
- Provide practitioners with infrastructure financing tools, and
- Identify candidate topics for further research.

Ms. McKinley indicated that the committee’s choice to hold the conference in New Orleans was made to help support economic development and the post-Katrina recovery efforts in the region. She stated that the organizing committee had ensured that participants include distinguished experts representing the private sector, the public sector, and academia. In addition to the opening session’s keynote speakers, FHWA Administrator Mendez and Ms. Jane Garvey, Ms. McKinley confirmed that Michael Tidwell, the award-winning author of the 2003 book *Bayou Farewell*, would be providing a keynote address during the conference luncheon to provide insight into financial and sustainability challenges in the greater Bayou region of Louisiana.

Finally, Ms. McKinley emphasized the organizing committee’s focus on encouraging and facilitating students’ and young transportation professionals’ participation in the conference. She invited the nine recipients of the student travel scholarships awarded by the conference committee to stand and be acknowledged.

To involve students in the conference further, the conference planning committee and the Public Policy Center of the University of Iowa coordinated a student video competition. The objective of the competition was to illustrate the public’s understanding of how transportation is funded and to educate the public on the need for transportation funding to inform the policy debate. Ms. McKinley introduced the winners of the student video competition: Allison Reiter, a candidate for a BA in communication studies and journalism and mass communications at the University of Iowa, whose video is titled *Road Scholars*, and Alexandra Sweet and Benjamin Goldman from the University of Pennsylvania, whose video is titled *Fahrenheit I-95*.

PLENARY SESSION 2

Policy Provocateurs

Tough Questions, Tougher Answers?

David Seltzer, *Mercator Advisors, LLC* (Moderator)
 Nancy Richardson, *Iowa Department of Transportation*
 Steve Lockwood, *Parsons Brinckerhoff*
 William Ankner, *Transportation Solutions*

David Seltzer of Mercator Advisors, LLC, moderated a panel discussion of transportation industry leaders serving as provocateurs to debate the policy dynamics of future surface transportation finance. Mr. Seltzer stated that the panelists were there to elicit ideas and stimulate discussion and not represent any specific organizations or agendas. He canvassed the provocateurs' perspectives on the following issues: the Highway Trust Fund, other federal programs, federal statutes, and tolling of untolled highways.

The provocateurs included

- Nancy Richardson, Director of the Iowa Department of Transportation;
- Steve Lockwood of Parsons Brinckerhoff; and
- William Ankner of Transportation Solutions.

The moderator posed a series of questions to the panelists to solicit their perspectives and opinions.

Moderator Seltzer: The Highway Trust Fund is half a century old and has been used to fund the construction of more than 42,000 miles of the Interstate highway system. Policy makers are unwilling or unable to raise taxes to meet system preservation needs. Given the lack of a current common vision, is the notion of having a Highway Trust Fund still relevant?

Mr. Lockwood: Compared with what? The fund is important for purposes of predictability for legislative planning and procedures. However, the revenue-generating potential of the trust fund is eroding because of improvements in vehicle efficiency and the use of alter-

native energy sources. The real question for the future is where the fund is going to get its money. In addition, what should it be funding? If it is going to be limited, should it refocus and fund 100 percent of something critical to national needs? Should it fund programs rather than projects?

Mr. Ankner: The trust fund is dead. We should create a new way to fund our transportation needs. The trust fund has silos—that should not be continued.

Mr. Lockwood: On one hand, there are national needs and investments that are hard to implement locally. What if the fund focuses on national interest investments and then lets the rest of the national program end to be taken up locally? Nonrenewable consumption is what is currently funding our Highway Trust Fund, and now we are locked into a death spiral. We should use the general fund with a performance standard driving it to set up a new funding program that is based on performance.

Ms. Richardson: Regardless of which fund is used and what it is called, we still need revenue. The United States is better served with the trust fund because it is dedicated to transportation and not available for other needs. Citizens understand the concept of the Highway Trust Fund. There are five or six proposals on the table to bundle a new structural federal-aid program. These could include (a) a \$0.40 per gallon federal gasoline tax, (b) continuing the existing gasoline tax and indexing it to inflation, (c) present choice extended with the general fund enhancing the Highway Trust Fund (which is probably the most likely outcome), (d) instituting a carbon tax on fuel, (e) instigating a European-style open fuel tax on all modes, and (f) going into debt to fund

the trust fund so that future generations can make the choice to raise taxes.

Moderator Seltzer: Why have states and local governments failed to step up and take care of local needs?

Ms. Richardson: The United States needs to look at what should be funded nationally. From a research perspective, we need to determine what needs our current revenues could actually cover.

Moderator Seltzer: Why not implement a vehicle miles traveled (VMT) tax? Would it be hugely complex to administer?

Mr. Lockwood: The United States has a tradition of a narrowly focused federal-aid approach. We do not have the congressional votes necessary to approve a VMT tax.

Moderator Seltzer: When will reauthorization occur?

Mr. Lockwood: December 2014.

Ms. Richardson: March 2013.

Mr. Ankner: May 2013.

When the audience was asked for its opinion on the same question, some suggested that it would not come until after the next presidential election when the resulting administration is in place.

Moderator Seltzer: Some of the money in the Transportation Investment Generating Economic Recovery (TIGER) program is being used to support transit projects. Are efforts to use grants to support livability consistent with other transportation goals?

Answer: Yes, there are small regions and megaregions. The concept of sustainability recognizes the need to develop projects for these different contexts. The general fund does not come with the same strings attached as dedicated programs like the TIGER grants.

There are many rural states with two major Interstate highways intersecting at some point. Under this scenario, how would the federal government promote livability, since the transportation needs they serve are not just within their own borders?

Mr. Lockwood: Livability issues are important, but they are at the fine-grained local level. Should not decisions about local issues be made at the local neighborhood scale? Most people would not want to see the federal government doing this. State departments of transportation do not want to be caught in this type of situation, either.

Comments: Federal involvement in the area of sustainability is disingenuous. The United States has underinvested in this area, but there is a need for good demonstration projects and research. This would be an appropriate role for the federal government. Some contend that it would

be risky to make many funding decisions on the basis of obscure definitions of livability and sustainability.

Mr. Lockwood: The federal definition of sustainability is incomplete. Moreover, it is not possible to develop a one-size-fits-all federal program for funding on the basis of livability. This type of approach would not be balanced.

Mr. Ankner: It is a matter of balance. How far down into the decision-making process should federal program rules apply?

Comment: The United States generally does not have people pounding down the door for bike lanes and pedestrian bridges. We have moved to suburbs. Sustainability is a cultural issue: we need to redefine the American dream.

Ms. Richardson: The problem is that land use decisions that are made at the local level do not necessarily support environmental sustainability. It would be inappropriate for federal funding decisions to be based on local policy.

Moderator Seltzer: Can tolling play a larger role in funding our transportation needs? Tolls currently represent 6 percent of transportation funding. What percentage of systemwide revenue could be generated by tolling?

Mr. Ankner: Tolling could generate 10 to 13 percent of transportation revenue. The United States needs a regional approach for the use of tolling rather than having states attempt it alone.

Ms. Richardson: Iowa has no non-Interstate facilities that could generate enough toll revenue to be self-financing. An interesting piece of research would be to examine how much of the Interstate system is currently not tolled and identify parts that could be.

Mr. Lockwood: Parsons Brinckerhoff recently surveyed all toll activity undertaken since the implementation of the Intermodal Surface Transportation Efficiency Act in 1992 for the Federal Highway Administration. While the 6 percent of transportation funding currently generated by toll proceeds does not seem to be a large number, when one considers the high-growth Sunbelt states that are dependent on tolls for new construction, anywhere from 25 to 50 percent of new-capacity projects are funded with tolls. In terms of private investment in road development and finance, the current contribution is small and involves one or two projects a year. Nevertheless, there is a need for tolling to be unleashed as a revenue source. Generating 10 to 11 percent of all transportation funding by tolling is feasible, but that really needs to be doubled to roughly 20 percent.

Ms. Richardson: States should be permitted to toll existing Interstate highway capacity and allowed to use any excess toll revenues for other Title 23 purposes.

All three provocateurs agreed with these last two points. The audience was polled, and a large majority agreed with both points.

Moderator Seltzer: To what extent do you believe that long-term concessions represent a long-term solution?

Ms. Richardson: Public–private partnerships (P3s) are not relevant to Iowa. They are not a major part of the solution. Perhaps they could be used as a mechanism to increase tolls.

Mr. Ankner: P3s are an important tool with several caveats. They are a way to get important projects advanced sooner than they would have been otherwise.

Mr. Lockwood: There is a need for education. The ability of owners to deal with P3s has been solved by some recent projects that have developed standardized procedures to reduce the soft costs of one-off approaches. Long-term P3 arrangements of 99 years are troublesome, though. One cannot know what highways will look like 99 years from now. There should be more opportunities for recompetition with long-term concessions.

PLENARY SESSION 3

Public and Political Acceptance Issues Posed by Alternative Financing Methods

Kay McKinley, *PBS&J* (Moderator)

Brian Taylor, *University of California, Los Angeles*

Frank Wilson, *Frank Wilson and Associates*

Kathy Ruffalo, *Kathy Ruffalo and Associates*

As transportation agencies at all levels of government grapple with finding a long-term, sustainable funding solution, a key challenge is effectively engaging the public, elected officials, and the media in the debate. In this session, moderated by Kay McKinley, leading experts in the fields of transportation policy making, public relations, and academic research addressed these four questions: Does the public even perceive that there is a transportation crisis? Is there an understanding of how transportation projects are funded today and what the user pays? What strategies can be employed to communicate the message about funding options effectively? What is the risk of inaction?

OVERCOMING EQUITY OBJECTIONS IN IMPLEMENTING RECENT ROAD PRICING PROJECTS

Brian Taylor noted that there are a growing number of road pricing projects both in the United States and in Europe. However, many road pricing proposals have failed to make it to implementation because of political objections that often involve the issue of equity. While there is substantial literature on public attitudes toward road pricing, less research has focused on how equity concerns have been raised and addressed in political debates over projects.

Dr. Taylor stated that there is a need to engage the public and elected officials in long- and short-term dialogue to overcome equity objections in implementing toll projects. In the short term, project proponents should develop an information campaign that provides something for all

stakeholders. In the long term, there are major challenges to overcome. Partisan debate is often abstract. In addition, there is no longer consensus on the benefits of transportation investment. There is a need to educate stakeholders about the reasons why more funding is needed. Federal transportation programs are disintegrating, and there is a widespread belief in the inelasticity of demand. Ultimately, transportation funding is poorly understood. Important questions about what an optimum motor fuel tax level would be or how tolls and sales taxes could be used to maximize mobility benefits go unanswered.

The following are among the lessons learned: addressing equity early in the process, securing broad-based support among the public and interest groups, building trust between elected officials and transportation agencies, and organizing constituencies for the toll revenues.

WASHINGTON STATE TOLLING STUDY

Frank Wilson pointed out that after Washington State passed a gasoline tax initiative, additional mechanisms for raising new sources of revenue were considered. The Washington State Transportation Commission (WSTC) was tasked by the legislature to develop recommendations for a comprehensive tolling policy for the state. WSTC wanted to present the state with a strategy that was actionable, so it embarked on a statewide tolling study to identify the opportunities that tolling would facilitate. As part of this effort, the commission reached out to key opinion leaders, the media, and the general public throughout the state and asked for input. The effort involved execu-

tive interviews with people who were perceived to have influence, focus groups, a statewide public opinion survey, roundtable discussions with local leaders, and open houses for the public in four areas of the state.

Historically, most state governments have received a lukewarm public reception for the way they handle transportation issues. In Washington, there had been extensive education on the gasoline tax. As a result, a slight majority of the people surveyed believed that additional funds were needed to support transportation. As part of its research, WSTC identified three commonly held beliefs that pose obstacles to increasing transportation funding:

- The economy, education, crime, and health care were more important issues than transportation and traffic congestion.
- The gasoline tax would be adequate to meet transportation challenges if only government was more efficient.
- Alternative sources of funding are unnecessary.

While the public generally understands the problem of deteriorating transportation infrastructure, it is skeptical about the state's ability to deliver improvements, and the skepticism impedes the discussion of solutions. This situation is exacerbated by the lack of information on solutions and funding alternatives.

Dr. Taylor observed that if the choice is either to keep things the way they are or to institute a change, the status quo will always prevail. Therefore, public communications efforts should paint a picture of what will happen if changes are not made to the way transportation revenue is generated or traffic is managed, or both. The public's support is based on the benefits that the public believes it will receive. Tolling is merely a tool. To generate support for tolling, we should not focus on the tool but rather on the consequences of a failure to act.

CURRENT LANDSCAPE: OBSTACLES AND OPPORTUNITIES

Kathy Ruffalo emphasized that the priority of Congress in 2010 is on job creation and the deficit. All issues are viewed through these prisms. It is an election year, and this may limit the opportunity to implement meaningful policy during the lame duck session after November. Other priorities competing with transportation needs include tax extenders, budget resolution, appropriations bills, climate legislation, energy legislation, and immigration. There is little interest in the next transportation authorization act, and there is a need to engage the public to make it a priority.

Ms. Ruffalo stated that while there is no consensus on how to pay for the programs funded through the next authorization bill, the options are clear. The program requires revenue that can be raised from motor fuel taxes, a carbon tax or pollution charge, heavy vehicle use taxes, fees on imported oil, a financial transaction tax, and, in the longer term, vehicle miles traveled (VMT) fees. The program will also rely on financing techniques to leverage revenues and provide capital funding needed up front to implement projects. Financing options may include short-term borrowing from Treasury, expansion of the Transportation Infrastructure Finance and Innovation Act program, and possibly a national infrastructure bank or a national infrastructure innovation fund.

Ms. Ruffalo observed that no one on the Hill is considering a VMT tax at the moment, and the transportation community has not done an adequate job of explaining the benefit of increasing the motor fuel tax. Instead, the administration is focused on “shiny new stuff.” Transportation professionals need to stop talking with only one another about these issues. There is a need to engage the public, elected officials, and other stakeholders from the ground up rather than the top down. The extreme partisan divisions in Congress allow the House and Senate to ignore us. Transportation professionals need to cultivate consensus among our stakeholders. We can prevail by developing a coherent message explaining the benefits of increased funding and the consequences of not having money for transportation needs.

QUESTIONS AND ANSWERS

Question: Are there suggestions from Washington State that can be applied at the federal level?

Answer: Innovation has to come from the local level until Congress can resolve our national issues, which have all become wedge issues. There has been a resurgence of innovation in states like Texas, North Carolina, Florida, and Washington. One challenge is that state departments of transportation (DOTs) are perceived as inefficient, but many are implementing cutting-edge projects. DOTs need to communicate a clear mission and public purpose. The fact that many regions have multiple transportation agencies blurs the issues.

Question: What do you expect will be the fate of the Kerry–Lieberman climate bill?

Ms. Ruffalo: The bill includes a pollution charge that would generate \$6 billion in revenue that would be directed to transportation needs. There is little in the bill that addresses transportation emissions.

Question: How can we engage the public and gain support for pricing?

Answer: Pricing is a new area for most DOTs. It can also be a generational issue where DOTs are afraid of losing control. Social media offer potential for DOT commissioners and agency officials to get the message out to the public. To communicate effectively with the public, elected officials need to use information that people can readily understand.

Question: The health care debate was shallow and led to division because it did not address the real issues. How can we avoid this with reauthorization?

Ms. Ruffalo: The issue is more about how people feel about taxes than anything else. Researchers are not in favor in the media. Most of the heavy discussion these days is taking place in blogs.

Question: What are the odds that the Waxman–Markey American Clean Energy bill will pass?

Ms. Ruffalo: The chances this year appear slim. It would move more quickly if it had the support of 60 senators.

Question: Could more support for increased transportation funding be generated by making people aware of what they are already paying?

Ms. Ruffalo: The way to gain support for transportation funding is to provide simple information about funding gaps and advise the public on how they will benefit if new funding is made available. We need to be specific in identifying improvements. Information on VMT is too abstract and complicated for most people to understand. Information should be project-specific. Tolling has a chance, but public–private partnerships are complicated. The transportation sector has done a poor job of selling itself. We talk about the value of what we have done rather than focusing on needs and gaps. If you talk too much about what you have done, people will ask why more money is required.

Question: Whose job is it to do the marketing work needed to gain support for transportation funding?

Answer: Industry organizations and universities need to teach communication techniques to enable the transportation community to deliver a compelling and consistent message to the general public.

BREAKOUT SESSION 1

Delivering Transportation Programs Through Public–Private Partnerships

Suzanne Sale, *Federal Highway Administration* (Moderator)

Geoffrey S. Yarema, *Nossaman, LLP*

Bovin Kumar, *Halcrow Consulting India Private Limited*

Kevin Longenbach, *Transurban*

Sasha Page, *Infrastructure Management Group, Inc.*

Suzanne Sale of the Transportation Infrastructure Finance and Innovation Act (TIFIA) Joint Program Office in the Federal Highway Administration moderated the session. In her opening remarks, she commented that public–private partnerships (P3s) are not only a method of financing transportation infrastructure but also an innovative method of program delivery—lowering costs, accelerating project delivery, and reducing public-sector risk. She stated that there has been significant progress in advancing projects through P3s over the past 10 to 15 years. Lessons have been learned both at home and abroad, and insight has been gained into important issues such as the balance between the roles of the federal and state governments. She indicated that the session was designed to delve into these issues and experiences from both a national and an international perspective.

TRANSITIONING TO A PROGRAMMATIC SELECTION APPROACH FOR P3s

Geoffrey S. Yarema of Nossaman, LLP, discussed the evolution of P3s in the United States and how to select projects for P3 delivery. There have been three generations of approaches to this issue over its 25-year history: private-sector identification, public-sector identification on a one-off basis, and public-sector identification on a programmatic basis.

Transportation planning requires decisions on many aspects germane to P3s. Most agencies assume that they will use design–bid–build delivery without conducting

any analysis. Several projects are deferred and incur the losses associated with delay. Now that there are multiple delivery options, including design–build, availability payment and toll concessions, and predevelopment agreements, the challenge is to match the right projects with the right delivery tools.

Early P3 initiatives relied on the private sector to identify projects. There was friction between these choices and the programmatic decision-making process. The National Environmental Policy Act (NEPA) was also a sticking point since it involved project definition. The private-sector solutions often required backtracking with NEPA if they were advanced. Projects advanced by using this approach include the following:

- Virginia Department of Transportation (late 1980s): unsolicited proposal, Dulles Greenway;
- California Department of Transportation (1989): Assembly Bill 680 call for project nominations, SR-91 and SR-125;
- Washington Department of Transportation (1993): call for project nominations, Tacoma Narrows Bridge;
- Minnesota Department of Transportation (1995): call for project nominations, Trunk Highway 212 (city council veto); and
- Virginia Department of Transportation (1994–present): Public–Private Transportation Act unsolicited proposals processed per guidelines, Pocahontas Parkway, Dulles Rail.

Over time, there has been a trend away from private identification of projects, with more states now identifying

potential P3 projects during the NEPA process itself. This approach requires the public sector to develop expertise such as analyzing individual projects for P3 suitability; completing preliminary engineering sufficient to secure priced bids; and issuing project-specific, competitive requests for proposals. Key examples of this approach include the North Tarrant Express and I-635 LBJ managed lanes in Texas and the Port of Miami Tunnel and the I-595 Improvement Project (including high-occupancy toll lanes) in Florida.

While this approach moves away from qualifications-based selections and sole-source negotiations to capture some private innovation and create a true competition among multiple bidders, project selection decisions are still made on an episodic basis after significant investments on the basis of conventional delivery.

With the third generation of P3 projects, sponsors are thinking about how to deliver a whole suite of projects. This programmatic approach has included the following initiatives: Texas Department of Transportation's P3 review of the statewide capital program; Georgia Department of Transportation's biannual P3 screening of the State Transportation Improvement Program, LA Metro's P3 analysis of the Measure R Capital Program, and the Metropolitan Transportation Commission's (San Francisco Bay Area) P3 screening of the Express Lanes Network Master Plan. Making determinations on the use of P3s early in the process helps to optimize the use of conventional and alternative delivery methods, avoid overengineering, and reprogram engineering and construction funds away from projects and accelerate them at the same time. The components of the programmatic approach include establishing screening criteria reflecting the public sponsor's key goals, identifying projects that are suitable for alternative delivery, and creating a dedicated team to guide and direct the process.

OVERVIEW OF P3S IN THE ROAD SECTOR IN INDIA: THE LARGEST P3 PROGRAM IN THE WORLD

Bovin Kumar of Halcrow Consulting India Pvt., Ltd., discussed the use of P3s in developing new highway infrastructure in India. India's national highway system is highly underdeveloped, and much of it is made up of two-lane roads. In the face of exponential traffic growth—passenger traffic is growing at 12 to 15 percent annually, while cargo traffic is growing at 15 to 18 percent annually—the need for new roadway capacity outstrips the public resources available to build them. Highway investment needs are \$70 billion in the next 3 years alone.

To address its highway expansion needs, the government of India has established a seven-phase National Highways Development Program. The first two phases

of the program will be funded by a combination of the government, toll revenue, support from multilateral agencies, market borrowings, and private investment. The latter four phases will be contracted on a build–operate–transfer basis leveraging toll proceeds, annuities, and government support. To promote the use of P3 procurements and attract private investment, the government of India has established a framework for implementing the program. All preparatory work will be the responsibility of the government, which will also provide capital grants covering up to 40 percent of project costs. In addition, the government is providing private investors with 100 percent tax exemption for 5 years and 30 percent relief for the next 5 years, which may be spread over 20 years. Concession periods of up to 30 years are allowed. Private partners have the right to collect tolls on the highways and may import construction equipment duty free. The government has developed a model concession agreement that standardizes government approvals and allows bidders to identify up-front payments for the concessions.

The program has received an excellent response from the private sector, with 44 P3 projects awarded between 2008 and 2010 to develop a total of 3,890 kilometers of highway with a construction value exceeding \$19 billion, some 60 percent of which has been raised by private investors. Nearly 2,200 kilometers of the program had been construction as of September 2009.

Moderator Sale commented that there are many parallels between the use of P3s in India and in the United States, in particular India's contribution of 40 percent of capital costs. In the United States, the initial expectation was that the private sector would be responsible for contributing 100 percent of project development costs. Now there is more of a collaborative approach with contributions from both sides, as reflected by a number of P3 transactions that reached financial closure over the past year. This approach is also envisioned in the recent P3 enabling legislation passed by the state of Arizona. Another parallel with India's approach is in the use of tax incentives. In the United States, we have also seen that tax incentives can enhance P3 programs.

P3S: LESSONS FROM AUSTRALIA

Kevin Longenbach of Transurban observed that Australia has been a pioneer in the P3 industry, with a history of delivering significant infrastructure in the education, health, social, and transportation sectors. Australia consists of seven states, each of which makes independent transport policies. The more populous states of New South Wales, Victoria, and more recently Queensland have been the most active users of this delivery method. Australia's first P3 roadway project was the Sydney Harbor Tunnel,

which opened to traffic in 1987. Other notable P3 projects include the M4 Motorway (1992), the M2 Motorway (1997), and the Melbourne City Link (2000). P3 projects in New South Wales are managed by the Roads and Traffic Authority (state department of transportation), while those in Victoria are managed by special authorities including the Melbourne City Link Authority and the South East Integrated Transport Authority.

Australia's P3 experience offers many examples of success. A study comparing 21 P3 projects with 33 traditionally procured transport improvements indicated a net cost overrun of \$58 million for the P3 projects versus \$673 million for the traditional projects. Of the P3 projects in the sample, 3.4 percent were completed ahead of schedule, while 24.5 percent of the traditionally procured projects opened behind schedule. The P3 projects were also more transparent than traditionally procured projects as measured by availability of public data for the study.

Not all of Australia's P3 projects have proved to be financially viable. Five recent projects have seen equity severely affected or destroyed. In these cases, projects were viewed more as financial transactions than as transportation projects. This can occur when the focus is on winning the project rather than delivering transportation outcomes. Interestingly, the five failed P3 projects were all awarded to consortia that did not include a long-term operator on their team. Three of the failed projects generated financing through initial public offerings, and the remaining two raised debt through private investment syndicates. Interestingly, a majority of toll roads in Australia have failed to meet revenue forecasts during the first year of operations.

One recent failure was the Lane Cove Tunnel, which is located on the Sydney Orbital Highway. This project went into receivership in the first quarter of 2010. Twin 2.3-mile tunnels were built in 2007 as a demand risk toll road facility by a concession company made up of financiers and constructors at a total cost of AUD\$1.6 billion, of which AUD\$1.14 billion had been leveraged. The facility was sold in May 2010 to Transurban for AUD\$630 million (US\$560 million), resulting in an AUD\$1 billion loss to debt and total loss of equity. This experience reflects poorly on state P3 practice and the ability to attract future private investment.

Despite this setback, the widespread recognition in Australia that P3s can deliver value led the National Council of Government to establish the National Public-Private Partnership Policy and Guidelines in November 2008. All Australian state and territory government agencies now apply the National Policy and Guidelines to their P3 projects. The Australian P3 sector remains healthy, with more than 50 projects under contract, 11 in the market, and 15 potential P3 projects as of December 2009.

Lessons learned from Australia's P3 experience demonstrate that with the right projects, P3s are effective and deliver value. However, they are not a means of delivering infeasible projects. They require a long-term commitment and the participation of private partners who are vested in delivering successful transportation outcomes. The potential for success of P3s can be enhanced by guidelines to shape them. When public agencies sponsor P3s, it is important to retain the services of specialists with experience in delivering successful P3 projects. As a result of the positive experience with P3s in Australia and elsewhere, interest in P3s among U.S. institutional investors is rising.

EVOLVING ROLE OF EQUITY IN TRANSPORTATION FINANCE

Sasha Page of Infrastructure Management Group, Inc., stated that experience over the past 5 years demonstrates that trends in the equity markets are changing. Equity is an important financing source, but it has become more conservative these days. Equity is important because it cushions debt and lets private investors leverage more money. Governments like equity because it indicates that they are still in the game.

In discussions of equity and P3s, it is important to recognize that there are two types of investors. On one side are strategic investors who are looking for project opportunities. They include project developers, contractors, operating concessionaires, and equipment and material suppliers who are interested in securing contracts to provide one or more of their services. On the other are financial investors who are looking for a match for their long-term needs. These investors may include private equity funds, publicly traded funds, banks and insurance companies, endowments and pension funds, and even sovereign wealth funds.

Equity is repaid at the bottom of the annual cash waterfall and involves greater risks than debt. The cascade of payments for P3 projects begins with debt and eventually involves repayment of equity. Sophisticated investors are prepared for the possible loss of equity.

Equity allows P3 developers to be rewarded for taking on additional risks. Nonrecourse debt is another key element. Equity can lose value, as has been seen with the stock market in the recent past. The same is true of the value of infrastructure companies and owners like Concesiones de Infraestructuras de Transporte, Transurban, Fluor, and Macquarie. Typical earning levels for other infrastructure sectors are 8 to 10 percent for brownfield projects and 10 to 16 percent for greenfield projects.

The pool of equity providers has evolved over the recent past. In 2005, there were five or six major providers, but more recently a number of new funds and

bank-based investors have entered the market. Some are interested in the water, energy, and telecommunication markets as well as transportation, and often they look for shorter investment periods of about 10 years. Mr. Page observed that this is not a good match for the U.S. private highway market and that many investors have stayed away.

Prospective investors are also requiring higher returns now, which makes implementation of greenfield P3 projects much harder. The monetization of existing assets also introduces political sensitivities. If investors have to increase the amount of equity they put into projects and their equity return expectations are higher, the number of potential P3 projects is reduced. Currently, to reduce risk, investors are focused on hybrid, availability payment, and some brownfield transactions. Over the past few years, pension funds and sovereign wealth funds have become investors in transportation P3 projects. Closed-end funds are preferred, with coinvestment a potentially rising option because of duration concerns, but institutions have been reluctant investors in the current marketplace. Investors such as the California Public Employees' Retirement System are interested in core projects with returns of 3 to 4 percent over the consumer price index, but some of their portfolio is open to riskier opportunities. Interestingly, some public toll authorities such as the North Texas Turnpike Authority (NTTA) are investing equity on a project basis. This year, NTTA announced that it will commit \$400 million of equity raised from its existing roads to fund new projects, including the last leg of SH-161 and potentially the Southwest and Chisholm Trail Parkways. This is similar to the approach that other toll authorities, including Florida's Turnpike Enterprise, have taken by investing system revenues in new projects on a nonrecourse basis. Time will tell if this is a trend. For now, other transport sectors, including high-speed rail and streetcars, have a poor track record of generating revenue and are not as likely to tempt private inves-

tors. Perhaps new tools can be developed to join credits with public grants.

QUESTIONS AND COMMENTS

Question: When investors look for financing, they always want to use robust revenue forecasts. How can we do a better job of weeding out bias in travel demand forecasts?

Comment: There is no optimism bias with revenue forecasts. There is a range of possible outcomes. The real issue involves risk factors that cannot be quantified. Negative outcomes arise when a preponderance of risk factors tend to be lower rather than higher. There is no offsetting force. We need to undertake sensitivity analysis to quantify the range of outcomes and structure debt financings around the low end of the range.

Moderator Sale commented that the TIFIA program does not rely on the initial forecasts prepared by project sponsors. Instead, as part of due diligence, a project's credit structure is analyzed on the basis of the more conservative forecasts prepared for the lenders. There have been instances where even the lower numbers have not been achieved in the early years of operations.

Comment: State pension funds have a lot of pressure to invest in their own states. In this way, pension fund investment could offset xenophobia risk. The North Tarrant Expressway and I-635 LBJ managed lane projects have involved direct pension fund investment.

Comment: In Denver, Colorado, sales tax-backed availability payments are a unique risk structure.

Comment: If failed deals like the Las Vegas Monorail and the Southern Connector had been backed by more equity, they might not have run into the problems that they did.

BREAKOUT SESSION 2

Financing Multimodal Projects, Rail, and Airport Access

Lowell Clary, *P3 Development Company* (Moderator)
Kate Miller, *Alameda–Contra Costa Transit District*
Marcella Rensi, *Santa Clara Valley Transportation Authority*
Nancy Whelan, *Nancy Whelan Consulting*
Cheryl Jones, *Federal Highway Administration*
Andrew Fremier, *Metropolitan Transportation Commission*
Tom Boast, *FirstSouthwest*
Jeff Ensor, *Parsons Brinckerhoff*
Geoffrey Gosling, *Aviation System Consulting, LLC*

MONEY, MOBILITY, AND POLITICS: FUNDING COMPETING PRIORITIES IN A COMPLICATED REGION

Kate Miller of the Alameda–Contra Costa Transit District and Marcella Rensi of the Santa Clara Valley Transportation Authority discussed the funding of competing priorities in the San Francisco, California, region, focusing on funding, institutional, and political complications. The complications are due to the many local governments and to the presence of three regional planning agencies and nine county congestion management agencies. The speakers provided an overview of the theory and reality of project prioritization and the key challenges. They shared strategies for success, noting that the same approach often does not work twice.

PARTNERSHIPS FOR PROGRESS: THE FINANCE PLAN FOR THE TRANSBAY TRANSIT CENTER

Nancy Whelan of Nancy Whelan Consulting, Cheryl Jones of the Transportation Infrastructure Finance and Innovation Act (TIFIA) Joint Program Office, Andrew Fremier of the Metropolitan Transportation Commission, and Tom Boast of FirstSouthwest made the second presentation of the session. Each discussed aspects of San Francisco’s multimodal Transbay Transit Center project. The project has been divided into two phases, with the first phase (a transit center) costing \$1.6 billion

and the second (incorporating an intercity passenger rail extension into the bottom of the center) costing \$3 billion. The project is receiving \$400 million in American Recovery and Reinvestment Act high-speed rail funds for constructing a “train box” below the terminal during Phase 1. There are more than 15 sources of funding in the first phase, and a TIFIA loan is the only debt for the project. The TIFIA loan relies on a tax increment and bus passenger facility charges (PFCs) for the loan repayment. Commercial and residential development is anticipated on the surrounding land; proceeds from the sale of these parcels will be used to fund a portion of the costs of constructing the transit center.

FINANCING RAIL STATIONS: INNOVATIVE APPROACHES AND ALTERNATIVE SOURCES

Jeff Ensor of Parsons Brinckerhoff discussed innovative financing approaches for rail stations. He began with an overview of several sources that can be used to attract additional dollars from non-surface transportation sources, including tools that can be used for generating private-sector contributions, such as Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users private activity bonds and historic preservation tax credits. He then discussed two types of new tax credit bonds, qualified energy conservation bonds and new clean renewable energy bonds, and how they could be used for elements of rail stations. He concluded with

a synopsis of a value capture study on the Potomac Yard Metrorail Station (located in Virginia) and discussed the innovative approach associated with that project.

COLLABORATIVE FUNDING TO FACILITATE AIRPORT GROUND ACCESS

Geoffrey Gosling of Aviation System Consulting, LLC, made the final presentation of the session. He discussed collaborative funding to facilitate ground airport access. He described the key funding sources that can be used for airport ground access projects, including the Airport Improvement Program, PFC revenue, and airport rev-

enue bonds and operating funds. He then presented five case studies on which funding sources were used or are planned for projects enhancing rail access to airports, including the Bay Area Rapid Transit extension to San Francisco International Airport; the Metropolitan Area Express light rail line to Portland (Oregon) International Airport; the Miami Intermodal Center at Miami (Florida) International Airport; the Airtrain People Mover at John F. Kennedy International Airport, New York; and the Oakland Airport Connector People Mover at Oakland (California) International Airport. The presentation was based on a study being performed by the Mineta Transportation Institute at San José State University, with a report anticipated for publication in early 2011.

BREAKOUT SESSION 3

Aligning Transportation Funding with Climate Change Strategies and Sustainable Planning

How Can It Be Done?

Asha Weinstein Agrawal, *Mineta Transportation Institute* (Moderator)

David L. Greene, *Oak Ridge National Laboratory*

Astrid Glynn, *TPRG*

Kendra Breiland, *Fehr and Peers*

Sarah McMillan Ross, *South Coast British Columbia Transportation Authority*

Peter Mills, *Perrin, Thorau & Associates*

WHAT IS GREENER THAN A VEHICLE MILES TRAVELED TAX?

David L. Greene of the Oak Ridge National Laboratory discussed an indexed energy user fee as an improvement over the current motor fuel tax. It would help to make the transportation sector more sustainable from the viewpoint of energy and climate change. The political feasibility of implementing a vehicle miles traveled (VMT) tax remains challenging, and the outcome is uncertain.

Inflation, fuel economy improvement, and increased use of alternative fuels and transit threaten the amount of revenue for road finance generated by the motor fuel tax. Use of motor fuel excise tax revenues for funding transit and subsidizing ethanol has eroded highway revenues to a lesser degree. Fuel economy improvements due to increased corporate average fuel economy standards and higher oil prices further the disconnect between VMT and fuel use, and future improvements will widen this gap.

While a VMT tax would link the distance traveled with vehicle use, a user fee on energy would be greener. The energy fee has an equivalent effect on vehicle use but promotes energy efficiency and encourages motorists to purchase more energy-efficient vehicles. This can be considered an indexed roadway user toll on energy.

To remain effective, an energy tax would need to be levied on all energy used to propel vehicles (electricity, biofuels, compressed natural gas, etc.), and it would need to be indexed to energy efficiency and inflation. Fleet fuel economy is easily predicted, and the average energy

efficiency of highway vehicles allows a calculation to be made from available information in a relatively straightforward manner.

Mr. Greene stated that the energy tax could have four to five times more impact on greenhouse gas emissions than a VMT tax, since drivers pay more attention to fuel economy when prices are high. On the basis of today's conditions, the energy tax would save approximately 50 million tons of carbon dioxide per year nationwide compared with a VMT tax.

By itself, the energy tax would be ineffective in reducing traffic congestion, but it could be combined with other measures including automated tolling to achieve that end. Similarly, it does not reflect environmental and congestion burdens created by trucks, but this could be addressed by implementing universal road pricing for heavy vehicles. Even with the energy tax, Mr. Greene noted, carbon would still need to be priced and emission standards enforced.

The energy tax would be practical, reliable, and predictable and would have a low implementation cost. It would generate important environmental benefits, accustomed motorists to paying by the mile, and really function as an enhanced version of a VMT tax.

Question: How would electricity use on the road be taxed?

Answer: Electric vehicles will remain a small segment for the vehicle fleet for a while, but the fee would be assessed on the utility company that generated the power. Eventually, there will have to be a smart grid.

FUNDING TRANSPORTATION IMPROVEMENTS FOR CLIMATE CHANGE: SHARED SUPPORT OR ZERO-SUM GAME

Astrid Glynn of TPRG discussed the conundrum that the transportation and climate change legislative agendas tend to be at odds with one another. The federal transportation authorization bill is overdue and intended to reinvent highway, transit, and rail programs and to fix the Highway Trust Fund, which is running on empty. The climate change bill lays plans for new fuel infrastructure for transportation, allocates some funds to transportation, and establishes goals for transportation emission reductions. But there is tension between the policy and pragmatic goals of traditional transportation funding, and climate change and the transportation system will not change without massive amounts of new money.

She stated that there are strategic choices as reauthorization approaches with regard to a proposed climate change bill that can build and maintain a transportation system to support the shared goal of sustainable mobility. Cross-modal choices can help inhibit the effects of traditional modal silos. The traditional funding approach has inhibited our ability to pick the “best” option to fulfill a mobility need. Forty percent of metropolitan trips that are made by car do not need to be, and this figure should be reduced. More freight and people should move on rail for trips exceeding 500 miles, and broader cost–benefit analysis should be incorporated into our funding decisions.

At the same time, Ms. Glynn added, communities should be reshaped to reduce sprawl and dependency on automobiles. We also need to use new revenue options that promote environmentally friendly and sustainable outcomes such as parking taxes and fees and dedicated local “green” taxes, and we need to seize opportunities to match and leverage federal livable communities grants. Rights-of-way should be used to generate green energy through wind farms and solar panels, regenerative braking systems with storage capacity, living snow fences, recycled bridges, and LED lighting and traffic signals.

Ms. Glynn suggested that to create a transportation system that will be both financially and environmentally sustainable, the United States needs to begin the transition away from today’s fuel and funding system and to bring energy policy and transportation funding into accord. Furthermore, the nation needs to invest new funds in cross-modal choices that align with policy goals and address mobility needs, and it needs to acknowledge that traditional funding will not suffice for the system to provide nonautomobile alternatives. Ms. Glynn believes that these actions will help harmonize transportation and energy policy and will generate both revenue and positive environmental and climate impacts.

Question: How can bus transit be made more attractive for livable communities?

Answer: One way to do that is integrating service into a complete bus system.

Question: How did New York State dedicate regional greenhouse gas initiative cap-and-trade revenue to the transportation sector?

Answer: Allocations were made following recommendations by the New York State Energy Office concerning elements that have some connection to the electric system, such as subways and traffic light LEDs.

FINANCING A SUSTAINABLE FUTURE: ALIGNING TRANSPORTATION FINANCE METHODS WITH CLIMATE CHANGE POLICY

Kendra Breiland of Fehr and Peers discussed how transportation financing methods can be aligned with climate change policy. Many states have passed greenhouse gas reduction targets. Washington State law now requires greenhouse gas emissions to be equivalent to 1990 levels by 2020, 25 percent below 1990 levels by 2035, and 50 percent below 1990 levels by 2050.

At 47 percent, the transportation sector is the largest source of greenhouse gases in Washington State. It is followed by power generation and buildings of all types, both of which generate 20 percent of the state’s greenhouse gas emissions. Farming, industrial processing, and waste generate between 3 and 6 percent of the state’s emissions. Managing transportation emissions is a four-legged stool involving VMT reduction, transportation system operations, vehicle efficiency and fuel technology, and the carbon content of fuel. Washington State is concentrating on reducing average daily VMT from 27 miles in 2020 to 13.5 miles in 2050, but this will have a negative impact on transportation funding, which is largely derived from gasoline taxes. Ms. Breiland believes that the United States will need revenue enhancements, including increased taxes on fuels and tolling, with the ultimate vision of migrating to a VMT tax. Land use–based utility fees with properties in lower-density areas paying a higher rate can also be tried. Revenue alternatives should be implemented in an integrated approach.

FEE TO FUND TRANSPORTATION IMPROVEMENTS AND REDUCE GREENHOUSE GAS EMISSIONS

Sarah McMillan Ross of the South Coast British Columbia Transportation Authority and **Peter Mills** of Perrin, Thorau & Associates discussed the possible use of a fee to fund transportation and reduce carbon dioxide emissions in Vancouver, British Columbia. TransLink, the

local transportation authority, has the power to levy taxes. The Vancouver region updates its long-range (30-year) plan every 5 years. The current goal is to reduce nonhighway trips by 50 percent, but this is without the benefit of a motor vehicle fee. The region also updates its 10-year fully funded plan on an annual basis and needs \$150 million per year to maintain its current infrastructure system without significant expansion. To upgrade the current system, the region needs to invest \$275 million per year, and to expand it, \$450 million per year would be required.

Currently, the region's \$2.00 per gallon motor fuel tax is its primary source of transportation funding. The region is examining a variety of revenue options for their ability both to generate new funding and to support greenhouse gas reductions. The goal of the British Columbia Climate Change Action Plan is to reduce greenhouse gas emissions by 33 percent by 2020; cap-and-trade will be the primary tool in achieving this reduction. The province is also exploring the feasibility of a new vehicle registration fee. It believes that it can make this option palatable to the public by showing tangible benefits that the option would facilitate.

Elected officials have a range of more or less palatable options in front of them. The province believes that vehicle registration is an efficient and moderately equitable source of revenue. At the same time there is little tolerance for added burdens outside transportation such as property taxes. British Columbia is not wedded to pay-as-you-drive but does want the ability to adapt to

the added costs and recognizes the virtue of including the costs of carbon dioxide emissions.

Question: How will the province generate electricity in the future?

Answer: The electricity sector has to be decarbonized. It is the largest source of greenhouse gas emissions.

Question: Does a vehicle fee make a car more likely to be used since cost is already incurred?

Answer: A flat fee just raises annual costs, but linking it to efficiency will make a difference when vehicles are replaced. Not many people will give up driving altogether.

Question: Has Washington State considered needs reduction through asset management?

Answer: Not yet, but Washington should look at how to reduce needs as well.

Question: Will linking and indexing the gasoline tax affect greenhouse gas emissions?

Answer: Yes.

Comment: Many of the strategies discussed today do not address rural areas.

Comment: Value capture is not necessarily the same as tax increment financing where the beneficiary pays rather than the user.

PLENARY SESSION 4

International Panel

Brian Howells, *Halcrow, Inc.* (Moderator)

Robert Bain, *RBconsult*

Ian Scholey, *Parsons Brinckerhoff*

Zongzhi Li, *Illinois Institute of Technology*

Brian Howells of Halcrow, Inc., moderated Plenary Session 4, in which experts from Europe and Asia shared their views on the potential transferability of successful international strategies to transportation infrastructure investment in the United States. The following were among the key questions for consideration: How should delivery and funding mechanisms be determined and used, and under what circumstances? What are the critical success factors? Specific issues related to project delivery methods and risk allocation were also addressed.

LESSONS LEARNED FROM EUROPEAN PUBLIC-PRIVATE PARTNERSHIP INFRASTRUCTURE PROJECTS

Robert Bain of RBconsult presented research prepared by the European Investment Bank (EIB), which is the largest lender to public-private partnership (P3) projects in the world. EIB was created in 1958 and is the European Union's (EU's) long-term lending institution. The bank is owned by the EU's member states and supports EU policies and priority objectives such as European integration through its financing operations.

Mr. Bain interviewed senior staff at the bank, reviewed project documentation, and distilled lessons learned from recent P3 activity in Europe. EIB has supported more than 200 P3 projects. Highways, schools, hospitals, and rail developments are among them.

With schools, design-build procurement is often used, and risk allocation is evolving. This has been largely successful, but some issues, such as school closings, were not addressed in contract documents. These issues can

be resolved when a champion helps make things come together. Experience in Europe has shown that hospital P3s are not always affordable in a fast-paced sector with large capital costs. In some cases hospital projects may be gold plated. In the end, planning is driven by procurement, but most observers believe that with health care it should be the other way around. There is even more risk with rail projects because of their size and complexity. There is significant geological risk, and there are multiple intersections with their parties, who are not obliged to help. The P3 experience in these three sectors indicates that the most successful have involved stand-alone projects that are supported both operationally and institutionally.

The highway sector is a particularly good fit for P3 procurements. They are effective because they lock in future maintenance needs and obligations. A number of risks must be managed, including unforeseen ground conditions. Construction risks may be overemphasized, and operational risks are perhaps of greater concern to lenders. Highways are likely to remain at the forefront of P3 involvement in Europe.

Mr. Bain then turned to the subject of measuring the success of P3 highway performance. This often involves revisiting policy objectives. Many objectives may have been muddled and contradictory or justified retrospectively, and some may have evolved over time. Three key benefits of highway P3s are fixed-price asset delivery, the locking in of high-quality maintenance, and provision of value for money. P3s have also brought new technologies and commercial discipline to the highway sector.

In Europe as in the United States, there are two types of highway P3 arrangements: those based on user-paid

tolls and those using availability and performance-based payment mechanisms. Availability and performance-based projects are increasingly popular. However, they may be more of a financier-led solution than a policy solution, since they provide no new money and instead only reprofile government obligations. This raises the question of whether the availability and performance-based P3 approach is sustainable. In the United Kingdom, 20 percent of the Highways Agency budget pays for shadow toll projects, which represent 8 percent of the highway network. In Portugal, 125 percent of the budget is paying for 50 percent of the network. Mr. Bain believes that the M25 will be the last shadow toll project in the United Kingdom because the concept is unsustainable. This experience demonstrates that financing solutions should not be confused with funding solutions.

HIGH-SPEED RAIL AND M25 HIGHWAYS AGENCY DESIGN-BUILD-FINANCE-OPERATE

Ian Scholey of Parsons Brinckerhoff in the United Kingdom discussed his experience in working on highway and rail P3 projects in Europe. They include the Portuguese High-Speed Rail Project, which is part of a Trans-European Networks corridor that will link Portugal with Spain and France. The Portuguese have done a benchmarking assessment of how other rail projects in France, Spain, the Netherlands, and Brazil have been financed and procured. The model the Portuguese have used is to let individual P3 contracts for substructure, superstructure civil and track works, and “high-tech” control systems with values of between 1.4 billion and 2.0 billion, while retaining the overall management as a public rail function. The program is funded from multiple sources including EU grants (39 percent), state support (12 percent), and private finance (49 percent, of which 36 percent is from EIB). The cost of the program is 40 percent less than public-sector comparator. The public sector retains responsibility for traffic, political, and some planning and environmental risk, while the private sector assumes responsibility for all other risk areas. The Portuguese have had good experiences with P3s. They have managed P3s well and derived significant savings from the approach compared with the cost of advancing the projects on a traditional public-sector-led basis.

One of the largest P3 projects in the United Kingdom is the M25, an orbital highway around greater London with daily traffic levels exceeding 200,000 vehicles, which makes it one of the most heavily traveled highways in Europe. The Highways Agency has initiated a project to widen the remaining three-lane sections to four lanes and has let a 30-year P3 contract to operate, maintain, and widen the motorway. This is the Highways Agency’s 12th P3 contract, and at 30 years it is by far the longest.

A public-sector comparator analysis has shown that this approach provides significant efficiencies derived mainly from combining large on-line capital widening works with 30 years of operations and maintenance.

The scope of the P3 procurement involves operating and maintaining a 400-kilometer highway, including the Dartford Crossing over the Thames and three tunnels, and widening 100 kilometers of highway. Bids were received from five consortia in March 2006, with three groups shortlisted in October 2006 and final bids received in February 2008. The preferred bidder was selected in May 2008, when a separate competition to raise more than £1 billion in funding began. The Highways Agency worked closely with 19 banks, and the project reached financial close in May 2009 without the need for public subsidies. Credit was extended by a group of 16 private banks and EIB. The Highways Agency found that even in a time of financial turmoil, the P3 approach provided value for money. Mr. Scholey stated that the lessons learned from the M25 P3 initiative indicate that the scope should be fixed early in the process and stakeholders should be involved in the project.

EVOLUTION OF TRANSPORTATION FINANCE IN CHINA

Zongzhi Li of the Illinois Institute of Technology began by reviewing the current status of the surface transportation sector in China, which is seeing extensive investment and expansion. In 2009, the highway network included 2.4 million miles of highway and 40,000 miles of expressway, with more than 6,000 miles of expressway under construction for a total investment of \$150 billion. The rail network includes 54,000 miles of track, of which 4,071 miles can sustain high speeds of 155 to 220 mph, with 20,000 miles of new track under construction, involving a total investment of \$300 billion. There are also 9,000 miles of bus transit systems and 480 miles of fixed guideway transit lines. Plans call for investing \$350 billion in roads and \$700 billion in rail by 2020, when the country will have a high-speed rail network of some 10,000 miles connecting most capital cities to Beijing within 4 hours.

In 2008, the federal government provided 15 percent of all highway funding in China. Local governments provided 35 percent of highway funding, domestic banks provided 36 percent, and the remaining 14 percent came from other sources including foreign loans, domestic enterprise investments, and carryover funds from earlier years. The profile of rail funding is markedly different, with the central government contributing at least half of all funding. Rail funding also includes medium- and long-term domestic bank loans and railway bonds.

China is currently facing many highway financing and investment issues. Funding is insufficient, with the high-

way program facing huge gaps. Highway investment is not perceived as an appropriate activity for the central government. There are also many risks involved in highway financing, many of which are borne by state-owned enterprises. There is also inadequate private capital investment. Mr. Li believes that reform is needed in the highway financing and investment sector in China. Funding sources should be diversified, and raising funds from various sources is inevitable if the funding gaps are to be filled. Road pricing policies should also be rationalized, with revenues generated from tolls playing a pivotal role in highway financing. In western China the government wants to attract private capital, but it recognizes that it must invest public money to attract this investment.

Mr. Li stated that rail financing and investment issues in China include the need to diversify the sources of funding, which now comes mainly from investment companies established by the central or local governments and other large state-owned companies. These sources of financing are insufficient to meet the financing needs of large-scale railway construction. Management also needs to be improved to address the lack of internal investment control and fund development mechanisms. Joint development by central and local governments and domestic and foreign investors will become an important feature of construction. China should also establish a railway industry investment fund by using local savings and foreign investments, especially from pension and insurance funds.

QUESTIONS AND ANSWERS

Question: Has there been a comparison of EIB tools and programs and the Transportation Infrastructure Finance and Innovation Act credit program in the United States?

Answer: EIB does not take project risk. This is left to the banks, which provide guarantees. Banks are in a position of needing to take on construction risk.

Question: What is the impact of the high-speed rail program in China on the United States?

Answer: China may be rushing its high-speed rail program. The Ministry of Transport has more than 20 rail construction companies, which all take on loans. This may not be sustainable. As China makes clear, massive infrastructure improvements are under way outside the United States. If the United States cannot figure out how to build comparable programs, it will fall behind.

Question: Is Europe becoming overextended with shadow toll facilities? Would there be merit to a model under which governments sponsoring P3 projects maintain control over toll proceeds and toll rates?

Answer: Yes, there is a Canadian project where toll proceeds flow through the state, but that does not change the value of the revenues generated. The essential point is that availability payments and shadow tolls are tools for wealthy countries. They are not sources of free money.

BREAKOUT SESSION 4

Expecting the Unexpected

Assessing Project Risk and Its Impacts on Financing

Sharon Greene, *Sharon Greene and Associates* (Moderator)

Lowell Clary, *P3 Development Company*

Bill Van Meter, *Denver Regional Transportation District*

Kathleen Sanchez, *Los Angeles County Metropolitan Transportation Authority*

Alistair Sawers, *Consultant to Arup*

HIGHWAY—MANAGED LANES PROJECT: I-595 MANAGED LANES PROJECT, FLORIDA

Lowell Clary of P3 Development Company gave the first presentation of the breakout session and provided a comprehensive overview of the I-595 Corridor Roadway Improvements Project in Fort Lauderdale, Florida.

The express lanes are part of a 35-year term public-private partnership (P3) featuring a design-build-finance-operate-maintain (DBFOM) fixed-price contract. The project has a 5-year construction schedule, and completion is estimated for July 2014. Of the financing, \$1.2 billion has been allocated for construction and \$1.8 billion for operations and maintenance. The express lane project financing includes equity, a bank loan, and a Transportation Infrastructure Finance and Innovation Act loan. An availability payment of \$64 million (indexed to inflation) will be used. Mr. Clary emphasized that the payments must be earned by meeting performance metrics.

While a key feature of this project is reversible express lanes, additional safety, operational, aesthetic, infrastructure, and engineering enhancements are being undertaken over several years. They include congestion pricing; state-of-the-art emergency access and infrastructure; bus rapid transit providing peak-period service during the construction of the project; improvements to the New River section of the Greenways System providing a countywide network of safe and clean bicycle, pedestrian, and equestrian paths and nature trails, sidewalks, and waterways; ramp improvements; bypass bridges; auxiliary lanes; and sound barriers.

TRANSIT PROJECT: EAGLE P3 PROJECT, DENVER, COLORADO

Bill Van Meter of the Denver (Colorado) Regional Transportation District (RTD) discussed the innovative financing approach of the Eagle P3 Project. In 2008, RTD identified a \$2.7 billion funding gap for the FasTracks transit program. To address it, RTD decided to pursue the Eagle P3 project and successfully applied for entry into the New Starts Penta-P program, which recognized the risk transfer associated with these projects to streamline the Federal Transit Administration New Starts risk reviews. The Eagle P3 is a DBFOM of a new commuter rail system consisting of two new commuter rail lines, with a 46-year concession (40 years operating). RTD will retain ownership of all assets at all times, and all revenues generated by the project (fares, advertising, parking, etc.) will remain with RTD. RTD will also retain fare policy decisions. The total project cost is \$2.48 billion, and RTD is reviewing bids from two concessionaires. The concession is expected to finance up to 40 percent of the capital costs with a combination of private-sector equity and debt. Progress payments will be made during design and construction and availability payments during operations and maintenance, with all payments adjusted for performance. Mr. Van Meter also presented an illustrative table that shows which risks are shared, which are retained by RTD, and which will be transferred to the concessionaire.

**MULTIMODAL TRANSPORTATION PROGRAM:
LOS ANGELES COUNTY METRO P3 PROGRAM,
CALIFORNIA**

Kathleen Sanchez of the Los Angeles County Metropolitan Transportation Authority gave a presentation on LA County Metro's P3 (Alternative Project Delivery) Program. The agency is proceeding with a P3 program to accelerate delivery of projects. The public partner is assuming most of the project development risk, and the private partners will be asked to assume project implementation risks such as financing, design and construction, and facility operations and maintenance. A project selection process is being used to review 85 projects and determine which should be advanced for private-sector participation. Fourteen were selected as high P3 potential, and six were selected by the Metro Board for initial acceleration. Three are highway projects (I-710 South Corridor, SR-710 North Extension, and the High Desert Corridor), and three are transit projects (Crenshaw Cor-

ridor Light Rail, Metro Red Line Westside Extension, and the Regional Connector Light Rail).

The final presentation was given by **Alistair Sawers**, a consultant to Arup. He summarized his recommendations on the transfer of project risk, including when transferring risk makes sense and its impacts on financing. He presented a risk matrix and a value for money analysis. He discussed the differences in financing under AAA and BBB rating scenarios, cost contingencies, insurance and bonding, required funded risk reserves, contingent liabilities, cover ratios in project finance, and required equity returns for investors.

Mr. Sawers described a conventional risk matrix that is used more to allocate than to price risk and that could be used for fixed-price turnkey construction contracts, P3 concessions agreements, project finance loan agreements, and feasibility studies. He characterized revenue forecasting as an imprecise science and provided a table that demonstrated the high frequency of inaccurate demand forecasts in public works projects.

BREAKOUT SESSION 5

Vehicle Miles Traveled

The Next Funding Frontier?

Adrian Moore, *Reason Foundation* (Moderator)

Paul Hanley, *University of Iowa*

Jack Wells, *U.S. Department of Transportation*

Richard Baker, *Texas Transportation Institute*

Dick Mudge, *Delcan*

Adrian Moore of the Reason Foundation moderated Breakout Session 5 and observed that the National Surface Transportation Infrastructure Financing Commission concluded that the status quo for transportation funding in the United States is not sustainable. The most likely solution would be a shift away from the motor fuel tax to a vehicle miles traveled (VMT) fee as the primary source of surface transportation funding. The design and implementation of a VMT system will be driven by public perception and whether it is able to raise more money than the motor fuel tax. The following presentations address aspects of this change.

LESSONS LEARNED FROM THE NATIONAL VMT DEMONSTRATION PROJECT

Paul Hanley provided background information on the VMT pilot conducted by the University of Iowa. The program uses an onboard odometer unit that provides information on the vehicle's location as it moves between jurisdictions. Data are stored on the unit and transmitted over a cell phone connection once per month. The system was tested in two rural locations, two urban areas of moderate size, and two large urban areas. The first tests concluded in August 2009 are now being replicated. The study involved an aggressive recruiting campaign. More than 81,000 motorists volunteered to participate in the study. Of those volunteers, 1,207 were enrolled in the first year, with 1,152 ultimately completing the program. The second year of the study had 1,446 original participants, with 1,370 completing the program.

Between January 2009 and April 2010, the participants collectively drove a total of 20.5 million miles, or an average distance of 1,033 miles per month per driver.

The revenue generated by the test conducted from January to July 2009 at 2.3 cents per mile totaled \$229,691, which was approximately 12.2 percent less than the current motor fuel tax would have generated from federal and state taxes collected at the pump. The technology performed properly for 92.9 percent of the miles traveled. The system missed recording 1.4 million vehicle miles, which equated to 7.1 percent of all miles traveled. Outages often occurred with short trips, but the study was able to interpolate 6.6 percent of the miles traveled; 0.6 percent remained uninterpolated. The demonstration proved that the current technology is robust, and it is improving. With regard to ease of use of the system, 74 percent of users did not need technical support. Of the remaining 26 percent, 9 percent required extensive assistance, and 0.3 percent had to return multiple times to have equipment retrofitted.

Opinions of VMT trial participants shifted over time, with participants either liking the program more or less. Attitudinal surveys revealed that older, more educated, and higher-income participants were more likely to have a positive opinion of the trial. The trial used two types of invoices: one provided only the monthly total of miles traveled, and the other showed all vehicle movements. While participants got used to either system and began to trust it over time, there were trade-offs between preservation of privacy and the ability to audit, with opinions on both sides.

As part of the research, a national random digit telephone survey of 1,700 people was conducted concern-

ing knowledge and opinions on transportation funding. Fifty-one percent of the participants thought that the fuel tax should be increased, and 45 percent were in favor of instigating a VMT fee. However, support for a VMT fee dropped to only 26 percent if the technology used to collect the mileage traveled involved Global Positioning System (GPS) satellites.

IMPLEMENTATION COSTS FOR A VMT SYSTEM

Jack Wells of the U.S. Department of Transportation (DOT) indicated that road user charges are perceived to have significant advantages over fuel taxes as a financing mechanism, but there are concerns about the high cost of collecting the fees. U.S. DOT has investigated the costs of administering a VMT fee by using video tolling technology, automatic vehicle identification (AVI) transponder-based systems like E-ZPass, GPS technology, and variations within those technologies. The research found that different technologies performed better depending on the application.

There are strong economies of scale for systems of this size. For 10-mile corridors, GPS is the less costly solution, with costs totaling 4 to 5 percent of revenues. AVI collection technology would require 16 to 25 percent of revenues, and video tolling would be the most expensive, requiring 33 to 50 percent of revenues. For a longer corridor of 1,000 miles, the costs would vary on the basis of the number of exits and tolling locations. GPS and AVI technologies would require 2 to 3 percent of revenues, while video tolling would be more expensive at 3 to 5 percent of revenues. The cost of collecting cordon pricing fees was also investigated, but the findings were not expressed as a percentage of revenues. AVI and GPS technologies would both cost approximately \$2.1 million per year for 10 entry or exit points. Operation of a similar video tolling system would cost approximately \$4 million per year.

U.S. DOT's research concluded that AVI and video tolling technologies would be inappropriate for collecting a national VMT tax. The only solution for this type of application would use GPS technology, and the cost of collecting the fees would be largely dependent on the type of onboard unit used. While transaction costs would be low at 0.07 percent of revenues, capital costs would be comparatively high, ranging from 7.9 percent of revenues if less costly onboard units were used to 33.2 percent if more expensive units were deployed. The less expensive units cost \$195 each but introduce greater privacy concerns. These devices use mapping software with data off-loaded to a host computer and have higher data transmission costs. The more substantial units cost approximately \$650 each and generate fewer privacy concerns but require more complex mapping software.

The U.S. DOT study concluded that administrative costs would be feasible if the least expensive onboard

unit was used but that they would still be significantly higher than administering the fuel tax. The added costs could only be justified if there were significant benefits beyond revenue collection. Current GPS has imperfect in-location accuracy, especially in cities, but it will improve as new GPS signals become available. The key issues are privacy concerns and the cost of the onboard units, which could be greatly reduced if they were installed in cars during the manufacturing process.

TRANSITIONING TO MILEAGE-BASED USER FEES: AN ASSESSMENT OF INSTITUTIONAL ISSUES

Richard Baker reported on work that the Texas Transportation Institute (TTI) has undertaken on the institutional issues associated with implementing a VMT fee in lieu of the motor fuel tax. The research has involved the use of focus groups to explore framework issues and arrive at a workable approach. Implementing a VMT fee would involve navigating predevelopment issues including program goals, public acceptance, and definition of public and private roles, as well as the challenges of developing a system architecture and administrative procedures.

Mr. Baker stated that TTI's research has found that the biggest challenges are the lack of public awareness of how transportation is funded, the role of the existing motor fuel tax, and distrust of government. To implement the VMT fee, he believes that the public sector should establish goals and standards for system operations and privacy. The private sector should develop the technology for the onboard unit, enforcement systems, and data transmission systems as well as the data management and billing platforms and any other value-added services to be offered in conjunction with the VMT fee. According to Mr. Baker, policy goals need to be defined at the onset and will have an influence on technology choices. The primary program goal has to be revenue generation and the ability to increase the revenue base. Additional decisions will be needed concerning the pricing of various facilities, charges by vehicle type, and the distribution of fees once they are collected.

Three steps are involved in the assessment of the VMT fee. First, roadway use is determined by collecting odometer data, speed information, and time and location information from the GPS. Then the data are processed to determine the amount of the fee charged. Finally, the data are transmitted to the back office for billing purposes. Important administrative issues also need to be finalized, such as whether the program will be voluntary or mandatory, whether implementation will be immediate or gradual, whether cash payments will be used, and who will run the back office.

Mr. Baker observed that the VMT fee would also introduce important equity issues. Would rural drivers

who must travel longer distances be unduly burdened? Could this be mitigated by charging by facility type or level of congestion and allocating additional funding to rural transit? Would this remove the incentive for people to drive environmentally friendly vehicles? Could this be mitigated by pricing by vehicle weight or emission rates? Research conducted by TTI has focused on public opinion. The public appears to prefer basic odometer reading systems; charges would be paid at the gasoline pump, and there would be an option to migrate to more sophisticated technologies in the future. Mr. Baker stated that transparency is essential, as is the ability to audit the charges.

TRUCK VMT FEES: A PRACTICAL WAY TO GENERATE REVENUE, REDUCE TRAFFIC CONGESTION, AND IMPROVE FREIGHT MOBILITY

Dick Mudge of Delcan discussed the option of using truck VMT fees as a means of generating revenue and providing other opportunities. He stated that it may be easier from a public acceptance perspective to begin with truck-only VMT fees, given the lower installation costs and reduced privacy concerns. One approach would be to make the truck VMT fees revenue-neutral by removing or altering other fees levied on trucks. Simplicity is always desirable, but truck VMT fees could vary by class of truck, class of road, time of day, and congestion. Although truckers have limited flexibility with regard to delivery times, only 4 percent of truck VMT occurs in congested urban areas. It would also be helpful to develop a system by working with a small number of motor carriers with a variety of operations

and using their input to build support within the trucking industry.

Use of a truck VMT fee could result in a reduction in the fees collected from truckers. Half a dozen truck companies have expressed interest in participating in a voluntary demonstration program involving real money at risk, which could start as early as late 2010. The cost of implementing a pilot project is still being worked out. Truck companies already pay communication fees, and the VMT fee system could provide benefits by allowing companies to know where their trucks are at all times.

QUESTIONS AND ANSWERS

Question: How was the cost of the onboard units calculated?

Answer: It was amortized over 20 years.

Question: How can enforcement issues be best addressed with onboard units?

Answer: There are multiple ways of confirming whether onboard units are active. If they are part of the original equipment, vehicle owners could not easily disconnect or tamper with them.

Question: Is there a risk that VMT could diminish in the future as baby boomers drive less? What would be the revenue risk associated with VMT fees?

Answer: It does not matter because the gasoline tax would decrease even more. It would be easier to increase the VMT fee a fraction of a cent than it would be to generate a comparable boost in fees from the motor fuel tax, which would require an increase of 5 cents per gallon.

BREAKOUT SESSION 6

Practical Challenges to Putting New Financing Ideas into Place

Arthur Guzzetti, *American Public Transportation Association* (Moderator)

D. J. Mitchell, *BNSF*

Mario Espinoza, *Central Texas Regional Mobility Authority*

Wendy Franklin, *Mercator Advisors, LLC*

Jennifer Mayer, *Federal Highway Administration*

UNTANGLING FREIGHT BOTTLENECKS BY USING ALTERNATIVE FINANCING APPROACHES

D. J. Mitchell of BNSF discussed the Chicago (Illinois) Region Environmental and Transportation Efficiency (CREATE) program. Chicago is a rail hub for the nation and is located at the nexus of six major rail lines: BNSF, CN, Canadian Pacific, CSX, Norfolk Southern, and Union Pacific; 25 percent of all U.S. rail traffic passes through the Chicago region. The impetus for CREATE was a projected 89 percent increase in freight rail trade by 2035 (by value). The region is already experiencing delays to passenger and freight movement because of traffic congestion, and there is a desire to remove impediments to make transportation more efficient and to mitigate the environmental impacts of freight. The program's strategy has been to start with small projects that can be completed with known funds, and financing has come in increments and involves multiple sources.

The CREATE program includes 71 discrete projects:

- 25 road–rail grade separations,
- Six passenger–freight rail flyovers,
- Projects to improve rail infrastructure and upgrade technologies,
- A viaduct improvement program,
- Grade crossing safety enhancements, and
- Rail operations and visibility improvements.

Corridors will be created, and better coordination will occur. Ten projects have been completed, six are under construction, eight are in final design, and 17 are under environmental review. The remaining 30 projects

will require extensive environmental processes. In 2003, the cost estimate for the program was \$1.5 billion, with private freight railroads contributing \$212 million and Metra providing an additional \$20 million. Other funding will be provided from the federal government, the state of Illinois, and the city of Chicago.

The cost of the CREATE program was revisited in 2008. It escalated to \$3.05 billion, reflecting such issues as 4.5 percent inflation compounded annually to the year of construction, improved engineering estimates for grade separation projects, updated contingency costs, a 5.75 percent construction management cost, and increased right-of-way acquisition costs. Of the total remaining cost, \$1 billion has been secured, including \$286.5 million in pre-CREATE funding, \$1.9 million in federal rail line relocation funds, \$90.6 million from the federal Projects of National and Regional Significance program, \$116 million from railroad partners, \$10 million from the Illinois Department of Transportation (DOT), and \$4.2 million from Chicago DOT. The program has also benefited from a \$133 million high-speed rail grant and \$100 million in Transportation Investment Generating Economic Recovery grants. Next steps include seeking additional authorization funds and completing work in high-priority corridors.

ROLE OF TOLLING AND STATE-SPONSORED INITIATIVES IN ADDRESSING REGIONAL MOBILITY CHALLENGES

Mario Espinoza of the Central Texas Regional Mobility Authority (RMA) discussed the background of his

agency, which is a bicounty entity created in 2002. RMA works closely with the Capital Area Metropolitan Planning Organization as well as with transit agencies, local governments, and the Texas DOT.

With an aging roadway network, a growing population, and decreased gas tax revenue due to better fuel efficiency and the use of alternative-fuel vehicles, Texas is facing funding challenges. As a start-up agency with no project history, the Central Texas RMA has had to overcome a number of additional challenges, including the lack of a dedicated revenue stream, unknown capabilities, and a local population that originally demonstrated an “I already paid for that road” mentality.

The authority’s first project was the 183A Turnpike, an 11.6-mile north–south toll highway northwest of Austin constructed as a four-lane facility with the ability to expand to six lanes. It is being implemented in two sections. The first 6 miles opened for service in March 2007, and the remaining portion to the north is expected to be completed in 2012. The initial section was completed on time and below budget. Financing included \$167 million in senior bonds, \$66 million in Build America Bonds (BABs), a \$64 million contribution from Texas DOT, and an \$18 million local right-of-way contribution. Construction costs for the northern extension are estimated to be \$105 million. The project involves construction of a tolled roadway in the median of existing frontage roads, which were constructed at the same time as the initial section. It is being paid for out of financing provided by a \$140 million bond issue that includes \$95 million in senior lien toll revenue bonds and \$45 million in subordinate BABs directly placed with an Australian pension fund, of which \$35 million is at a fixed rate and \$10 million at a variable rate linked to the consumer price index with a floor and cap.

The Central Texas RMA plans to build the Manor Expressway, a 6.2-mile, six-lane toll facility extending from US-183 to SH-130 estimated to cost \$420 million. Environmental approval for the project was received in March 2009. Proposed sources of financing include toll revenue bonds, the Transportation Infrastructure Finance and Innovation Act (TIFIA), federal stimulus funding, support from the Texas State Infrastructure Bank, and a Texas DOT toll equity grant. A year ago, banks were not willing to extend interim financing to support transportation projects, but now they are assisting, and the project has received other commitments for financing.

NAVIGATING THE CAPITAL MARKETS: HOW MUCH CAN NEW CREDIT INSTRUMENTS HELP?

Wendy Franklin of Mercator Advisors, LLC, discussed the ways in which new credit instruments, including

private activity bonds (PABs) and BABs, can help state DOTs deliver new projects.

She acknowledged a large gap in what is required to fund a project. With transit projects, for example, the federal government typically provides 44 percent of the funding, 13 percent comes from the state, and 43 percent comes from local sources. One critical distinction is the difference between funding, which comes from revenue sources, and financing, which involves techniques to leverage funding. Transportation funding sources include the following: motor fuel taxes, vehicle registration fees, sales taxes, general fund money, tolls, transit fares, value capture, and even naming rights.

Ms. Franklin said that there is a long-established municipal bond market in the United States that has evolved over time. The market is made up primarily of general obligation bonds and revenue bonds, and BABs became a large presence in 2009. Today, there is an active refinancing market due to attractive interest rates. Tax-exempt bonds make up 79 percent of the market, and the remaining 21 percent involves taxable debt. Transportation represents 12 to 13 percent of the municipal bond market. Historically, interest rates on taxable bonds have been higher than tax-exempt facilities.

The municipal bond market is supplemented by a variety of debt instruments and credit tools. They include highway, toll road, and transit revenue bonds, Grant Anticipation Revenue Vehicle (GARVEE) bonds and Grant Anticipation Notes, TIFIA, PABs, BABs, and availability payments, which are to be provided by a government owner under agreement with a private entity. These payments can come from a variety of sources such as state funds, local funds, and toll revenues or other user fees.

BRIDGING THE GAP: THE ROLE OF FEDERAL AND STATE FINANCING PROGRAMS AND SUBSIDIES

Jennifer Mayer of the Federal Highway Administration discussed the role that public-sector financing programs and subsidies can play in implementing transportation improvements. The goal is to facilitate transportation investment from different investors by using programs such as PABs, BABs, and GARVEE bonds.

The problem is that the United States faces a revenue shortage for infrastructure investment. Many states do not have a finance problem: they have a revenue problem. Financing cannot create revenue, but financial tools can catalyze new sources of revenue by making it possible to tap into future revenue or into less predictable sources, such as tax increments or special taxing districts. Lowering the costs of financing lowers project costs, and more dollars go toward construction. In addition, some revenue tools (such as pricing) have incentive

effects that can generate greater efficiency, reduce the need for greater capacity, or even reduce emissions.

Challenges that need to be navigated to advance projects include jurisdictional issues, project-related risks, and revenue constraints. Projects need to compete for funding. Factors influencing the financial market include the availability of bond insurance, the performance of similar projects, and rating agency findings. Often, jurisdictional issues need to be managed, particularly when projects extend across multiple jurisdictions and have multiple sponsors, stakeholders, and beneficiaries. There are also project-related issues such as construction risk, ramp-up and traffic risks, revenue risk, and the risks of future regulations.

These issues have a variety of solutions. For example, when a project extends across many jurisdictions and no single entity wants to assume the debt, the debt can be held by a special-purpose entity. When governments are limited in borrowing capacity, federal tools can expand the amount of debt they are able to assume. If future rev-

enues are not predictable, federal tools like TIFIA provide flexibility, and they can be made available to private development partners.

Market factors may change many times during the life cycle of a long-range transportation plan. Part of the goal of U.S. DOT financing programs is to facilitate a variety of tools and enable credit enhancements that will allow state and local governments to finance projects even in the midst of market disruption.

Over the past two decades, the tools created by congressional and public-private partnership activity have enabled different kinds of capital to flow into transportation projects. Through BABs, taxable investors can invest in publicly procured projects that used to be the domain of tax-exempt investors. Through PABs, tax-exempt investors can invest in privately procured projects that used to be the domain of equity investors. Market- and project-related factors will determine which tools make sense in each case. The point is that the federal and state tools have opened up new pathways for investment.

PLENARY SESSION 5: LUNCHEON KEYNOTE SPEECH

Investment and Sustainability on the Bayou

Kay McKinley, *PBS&J* (Moderator)
Michael Tidwell, *Author of Bayou Farewell*

Conference chair Kay McKinley introduced keynote speaker Michael Tidwell, author of *Bayou Farewell*. She explained that the organizing committee had asked Mr. Tidwell to discuss the nexus between transportation investment and environmental sustainability.

Mr. Tidwell opened his remarks by noting that “forging a sustainable future now” was an excellent and timely theme for the conference, particularly given the recent occurrence of the *Deepwater Horizon* oil spill. Mr. Tidwell recounted his experiences along the bayou of southern Louisiana that serve as a marine transportation highway for crabbers and shrimpers.

Mr. Tidwell related that southern Louisiana is one of the fastest-disappearing land masses in the United States and that 50 acres of land are lost due to erosion every day. The levees block the natural flow of the Mississippi, which no longer deposits silt in the bayou. When the silt is not replenished, it compacts and sinks. Today, the bayou is starved for nutrients and sediments and is losing a land mass equivalent to the size of Manhattan every 10 months. The degradation of the bayou’s barrier islands is the main reason why Hurricane Katrina was so destructive. Mr. Tidwell urged the adoption of a systematic environmental preservation program to rebuild the wetlands and barrier islands of the bayou.

Mr. Tidwell stated that the oil and gas industry has dredged 10,000 miles of navigation channels in the interior of the bayou to provide access to these natural resources, with the width of these channels having doubled in recent years. Mr. Tidwell indicated that today

there are some 4,000 oil platforms serving 35,000 wells in the Gulf of Mexico stretching across a distance equivalent to that from Washington, D.C., to Philadelphia, Pennsylvania.

Mr. Tidwell cited National Academy of Sciences studies confirming the effects of climate change and provided heartening information about tools to combat climate change in the United States. He noted that transportation and policy professionals can support these efforts by creating livable and walkable communities to reduce greenhouse gas emissions. He indicated that if the culture, economy, and wetlands of southern Louisiana are to be preserved, we all need to move in a new direction. Mr. Tidwell thanked conference attendees for their contributions and invited questions from the audience.

Question: With all due respect to everything that has been said, is it not true that New Orleans would not exist today without its levee system?

Answer: There have been many unintended consequences of the levees. The Army Corps of Engineers has developed a levee system that has tamed the three longest rivers in the United States. The problem is that they are completely plugged and do not drain. The levees have an equal and opposite effect and are responsible for erasing a land mass the size of Delaware. The goals are to have the river and the culture at the same time. We need to create sediment diversions in the levee system allowing the water to flow out in the spring and deposit sediments in the shallow bays and rebuild the land mass. The goal is to mimic the natural function of the river.

PLENARY SESSION 6

Emerging Issues

Steve Van Beek, *Eno Transportation Foundation* (Moderator)

Craig Lentzsch, *National Surface Transportation Infrastructure Financing Commission*

Anne Canby, *Surface Transportation Policy Project*

The session synthesized the findings from preceding sessions in the conference, with forward-looking perspectives provided by a panel of leading policy practitioners. The discussions examined the achievement of true modal integration through funding and finance tools that help direct policy, identified an array of feasible revenue mechanisms to meet investment needs, and attempted to help participants understand the unpredictable funding and financing landscape for federal transportation reauthorization. The panel also examined short- and long-term implications of a transition to distance-based fees, a national infrastructure bank, the linking of the motor fuels tax with climate change efforts, and creative solutions to be considered in the surface transportation reauthorization process, among others.

MULTIMODAL POLICY INTEGRATION

Steve Van Beek expressed the opinion that transportation policy and funding are at a turning point and suggested that there are three contexts in which this can be viewed: funding and policy, modal challenges, and a framework for systems solutions. He indicated that the current juncture is a dynamic moment where greenhouse gas emissions, energy, and funding need to be addressed. Transportation policy must change, and the delays in advancing a new transportation act reflect today's challenges. The new administration has focused on transportation and supported a \$48 billion, 16-month stimulus bill outside the trust fund. From a short-term perspec-

tive, transportation investment has become a priority, but the longer term remains uncertain.

If current trends continue, he indicated that the limited revenues accruing in the Highway Trust Fund will result in a 50 percent reduction in highway funding after 2012 and a 40 percent reduction in transit funding in 2013. Mr. Van Beek stated that whether there will be a third infusion of taxpayer dollars into the trust fund is unknown. He stated that the economic recovery is unstable and that destimulus pressures could result in the loss of 1 million jobs. The aviation trust fund is also moving toward default, and modernization of air traffic control is going to require a massive investment in the next decade.

Mr. Van Beek stated that the current administration is emphasizing spending transportation funds “smarter,” through the use of less formulaic programs, more discretion, and performance measures. Several programs have been identified, but funding remains largely unidentified:

- High-speed rail: \$8 billion dedicated to date, with \$57 billion in requests and no identified funding source beyond taxpayer money;
- Transportation Investment Generating Economic Recovery grants: \$1.5 billion awarded out of \$57 billion in applications, with another \$600 million for FY 2010 with no identified funding source beyond taxpayer money; and
- National Infrastructure Innovation and Finance Fund: \$4 billion proposed in the FY 2011 budget to capitalize a bank providing support to high-value projects, toward an eventual goal of \$25 billion.

As these programs are being advanced, the administration's stance is that there will be no increase in the motor fuel tax, no surface transportation fees, no aviation user fees, and no tolling of existing Interstate highways. This leaves the following funding options: unprecedented and disproportionate taxpayer funding, a shift to new models of user fees, nonfederal funding options, or a combination of the above.

For the past 50 years, Mr. Van Beek noted, the United States has made transportation policy by mode rather than by national mobility goals. We have walled off trust funds and relied on a supply center system that is imploding. Since the passage of the Intermodal Surface Transportation Efficiency Act in 1991, we have tried to think multimodally, and today our modal and intermodal systems face the challenge of climate change. Europe is following a much different modality approach that uses different modes on their own and in combination with the aim of obtaining an optimal and sustainable utilization of resources. He commented that the United States needs to break out of its modal framework and develop transportation policy that is mode-neutral.

EVALUATING THE POTENTIAL OF AVAILABLE FUNDING—REVENUE OPTIONS

Craig Lentzsch discussed the findings of the report of the National Surface Transportation Infrastructure Financing Commission, which was released in February 2009. The commission was created by the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users to assess transportation investment needs and provide Congress with findings and recommendations. As a commissioner for the study, Mr. Lentzsch summarized our current problems in a single word: revenue. Today highway users pay only 60 percent of the cost of providing our highway infrastructure. Motorists pay 3 cents per vehicle mile traveled (VMT) in motor fuel taxes, and heavy vehicles pay proportionally less. Transit users pay anywhere from 20 to 70 percent of their costs. Regardless of mode of travel, Americans do not pay for their full transportation costs. The current debate hinges on whether the user should pay or whether transportation is a public good.

The commission adhered to six guiding principles in its approach to its work:

- Enhance mobility of all system users.
- Generate sufficient funding on a sustainable basis.
- Cause users to pay the full cost of system use to the greatest extent possible.
- Encourage efficient investment.
- Incorporate equity considerations.
- Support broader public policy goals (i.e., energy and environment).

Revenue options were evaluated primarily on the basis of their ability to fill the federal funding gap—which is \$54 billion—or facilitate state and local revenue options. One of the most obvious choices would be to raise the federal motor fuel tax. Increasing the motor fuel tax by 1 cent per gallon would raise \$1.8 billion in annual revenue. On the pro side, an increase in the motor fuel tax could generate significant revenue in the short term, but on the con side it is only an indirect user fee, it is regressive, it raises equity issues, and it lacks sustainability.

A VMT fee could also generate significant amounts of revenue. A per mile fee of 0.06 cents is equivalent to a 1-cent motor fuel tax. Many issues would need to be resolved. Would a federal VMT tax be charged for travel on all roads? Would there be different fee structures for different types of roads? Would trucks pay higher fees? If VMT fees were only charged on the Interstate highway system, they would have to be four times higher to generate the same levels of revenue as charging for travel on all roads, and diversions to local routes could prove problematic.

Vehicle registration fees have revenue potential, but the federal government should not obstruct the ability of states to use this revenue tool. This fee would be simple to impose. Together, vehicle registration fees of \$5.00 for cars and \$10.00 for trucks would generate as much revenue as a 1-cent gasoline tax. A national sales tax of 0.06 percent would be equivalent to a 1-cent gasoline tax. Developing a mechanism to levy a national tax together with state and local sales taxes would be complex, but it could be combined easily if there were a national value added tax. This would be a highly regressive approach and would support the notion that transportation is a public good, which is contrary to the commission's guiding principles.

Tolling the Interstate system could generate significant revenue levels but introduces the complex question of how much money would be raised, where it would be spent, and what would happen if money generated in one location or state were spent elsewhere. These issues tend to dictate that the money raised would need to be spent on the Interstate system only and would divert traffic to local routes, which would not be desirable.

A freight waybill tax could be used to replace the motor fuel tax for heavy-duty vehicles. A tax of 0.3 percent would generate revenue equivalent to a 1-cent gasoline tax, but the tax would have no relation to use or weight of trucks or the fact that half of all goods shipped in the United States travel on company-owned trucks. The freight sector does not currently pay its fair share of transportation, since axle weight comparisons alone suggest that trucks generate 5 to 10 times the maintenance demand of passenger vehicles.

Combinations of options can be used to mitigate the various issues that individual measures may trigger. According to Mr. Lentzsch, if an intelligent combina-

tion of revenue options is used, the result will be more sensible and sustainable. The commission recommended protecting the Highway Trust Fund. If a VMT tax is implemented nationwide, it would take a fee of 2 cents per mile to fund the current program. The United States will pay in the end, either by not having the infrastructure it needs or by paying to maintain what it has and putting the needed improvements in place. Financing is not the solution, it just affects the timing of the solutions. Funding is the issue.

CRYSTAL BALL CALCULUS

Anne Canby of the Surface Transportation Policy Project observed that the world is different today. Some envision a smaller federal role, and the conversation is focused on how much money needs to be raised rather than on how those resources should be allocated. There is a shift in the national interest with new priorities and new players at the table. The Kerry–Lieberman climate change discussion is a new paradigm throwing a wrench in the way the United States has traditionally approached transportation funding and policy. The emerging idea is that there may be new ways to pay for transportation. There has never been a connection between what we pay and what its costs to provide transportation. The motor fuel tax depends more on use rather than costs. The user system is mixed and contrary to transportation goals. We have not agreed on what we need more money for and at what level of government it should be paid.

Ms. Canby urged us to think more about managing demand and to consider how to pay for operations and maintenance costs once the infrastructure is built. Sprawl is not sustainable. She questioned whether the federal-aid system is still relevant and said that there is a need to develop a new relationship with private rail and aviation suppliers and tap into the value that can be captured in other modes. But doing so will not tap into money at the federal level. This raises the following question: Why should the federal level be involved in paying for bad local decisions?

Ms. Canby offered a number of interesting possibilities for guiding transportation finance and policy in the future:

- To the extent that there are user fees, the United States also needs a unified, broad-based trust fund, but perhaps it should be focused on issues such as new capacity or maintaining a state of good repair rather than on mode.
- The National Surface Transportation Policy and Revenue Study Commission suggested approaching transportation from the perspective of a utility.
 - By commingling demand management and revenue generation, congestion pricing should play a role.
 - The climate bill offers some interesting ideas, as do partnerships.

QUESTIONS AND ANSWERS

Question: If it is clear that the federal government will not be able to supply the same level of funding for transportation as in the past, should the states fill the void? If so, the federal government should allow states to toll the Interstate.

Answer: Voter understanding and support put state funding at risk.

Question: Was the commission charged with solving everyone's problems? Did it consider reducing the federal role in funding our transportation needs?

Answer: The majority of the members of the commission support a narrower federal role in funding the nation's transportation program, but this kind of recommendation was not within the commission's purview. The commission's role was to identify options that will allow us to generate revenue that will cover the cost of delivering the program the nation needs.

Question: Maintaining the economic competitiveness of the United States is critical. If responsibility for transportation funding were devolved to the states, how could we maintain competitiveness in the face of 50 independent policies?

Answer: Tolling the Interstate is not a suitable funding option for all of our transportation needs, but doing so is a viable and an appropriate way to maintain the Interstate system, which is integral to our economic competitiveness.

PLENARY SESSION 7

Creating a Research Road Map for the Future

Tamar Henkin, *High Street Consulting Group* (Moderator)
 Kay McKinley, *PBS&J*

This final session focused on summarizing the conference discussions and identifying areas for further research bearing on the future of transportation finance. The leaders of Thursday’s three mid-day discussion sessions reported on key issues raised and participated in a discussion with conference participants on research priorities and methods.

Tamar Henkin of High Street Consulting Group moderated the final session and noted the need to instill an understanding of the difference between funding and finance.

The following discussions summarize some topics and issues for further research that arose in the three discussion sessions held during the lunch hour on the first day of the conference.

DISCUSSION SESSION 1: ARE FINANCING SOLUTIONS CHASING A FUNDING PROBLEM? THE APPROPRIATE ROLE OF GOVERNMENTAL FINANCE PROGRAMS AND SUBSIDIES

There is a fundamental disconnect: most people in the United States do not understand the difference between funding and financing. Ms. Henkin reported that Discussion Session 1 had focused on the role that public funding and financial assistance can play in meeting our transportation needs, and participants in that session identified the following issues that may be worthy of further research.

- Communications on funding and finance issues: What messages and communication techniques resonate with the public?

- The catalyst effect at the national level: To what extent does the existence of federal credit requiring a revenue source lead to identification of new candidate projects and revenue sources that would not otherwise be advanced?

- The catalyst effect at the state and local level: How do states encourage local governments to bring alternative revenue sources to the table in their planning processes (Texas as an example)? What are the operative alternative sources of funding, and what incentives can encourage their use?

- The “but for” question: What happens when a candidate project is denied federal credit support? Do these projects disappear, are they financed with traditional funding sources, or are they advanced on a limited recourse basis by using other financing sources?

- Updated value capture research: How can the experience with value capture with transit projects be transferred to highway improvements? Have sponsors of highway projects been successful in leasing air rights located above highway rights-of-way?

- Public–private partnerships (P3s) for other than toll road projects: How should the benefits and costs of these less studied P3 transactions be quantified? Are there hidden costs and difficult-to-quantify benefits?

- Public equity in P3 projects: To what extent do state and local governments take an equity position in P3 projects in transportation, and what are the various models for doing so (e.g., subsidies, revenue sharing)?

DISCUSSION SESSION 2: FEDERAL, STATE, AND LOCAL RESPONSIBILITIES: FINDING THE RIGHT BALANCE

Discussion Session 2 focused on federal, state, and local responsibilities in meeting our transportation needs and how to find an optimal balance between the three. Key issues that may merit future research involve the role of the federal government and whether citizens of one state should be sending money to other states to pay for local improvements. Some participants noted that there appears to be a misalignment between our climate change control, energy, and transportation finance policies, which puts these areas at odds with one another. It was also observed that local funding initiatives are often more successful than others because localized cost and needs are more approachable.

Key concerns and questions that arose from the conference participants' discussion included the following:

- Ability of the federal government to play a role: There was concern about growing U.S. debt levels and reluctance to raise the federal fuel tax and even consider a vehicle miles traveled (VMT) tax.
- Level of federal role: Should the federal government only participate in the Interstates? What about the National Highway System, smaller roads, and transit? Local and regional areas and the nation benefit from many roads—how should the benefit be determined?
- Misaligned national policies: Reliance on foreign oil, greenhouse emissions, and the financing of transportation were discussed.
- Pricing to alter behavior: A VMT tax could play a role in making driving more expensive and in providing accessible alternatives.

DISCUSSION SESSION 3: CHALLENGES IN REFORMING CURRENT TRANSPORTATION FUNDING

Discussion Session 3 concerned whether people are willing to pay more than they do today for their transportation needs. Many participants noted that there is mistrust and a lack of understanding of the current transportation finance regime. Allocation and collection practices are confusing to elected officials as well as to the public. Some participants observed that our objectives often appear to be at odds: Is the United States seeking to generate revenue, manage greenhouse gas levels, or reduce congestion, or is the goal some combination of these objectives?

Individual participants in Discussion Session 3 identified the following issues and potential research topics:

Overarching Challenges

- Communicating current finance strategies and potential solutions to the public and elected officials: There is a general lack of understanding about how transportation is funded and financed and a need for better communication and education.
- Collection approaches, allocation of funds, size of program: Too many debates are occurring at once, which is confusing for the public and elected officials. Options, approaches, and potential next steps need to be simplified and streamlined.
- Lack of clear and consistent objectives of reform: Objectives (increase revenue, reduce greenhouse gas emissions, reduce congestion, etc.) need to be prioritized, and a clear road map for achieving them needs to be designed.
- Misinformation and lack of trust: The public is uncertain about the ability of federal government officials to enact positive reform.

Potential Research Areas

The following were given as potential areas of research:

- International assessment of approaches to finance,
- Consequences of underinvestment (loss of jobs, impact on economy, etc.),
- Ways to transfer the success of local finance referenda to the national level,
- Lessons from state departments of transportation and other local transportation agencies to enhance transparency and accountability to build trust, and
- Cost of implementing alternative approaches to revenue collection.

Ms. Henkin then opened the floor for general discussion. The following issues were discussed:

- There is a need to define how a national VMT fee might work. The fear is that it will always be treated as though it is 20 years off.
- A number of research efforts are under way. There is a need to tie the issues together and identify the steps that should come next.
- Perhaps there is a greater need to improve management of demand than to build supply. A VMT fee could be used to manage demand and align our broader policies. The VMT fee and tolling are elements of the solution, but perhaps the solution needs to be broader and make all alternatives available.
- Two concepts are in play: social engineering and pricing to alter behavior. There is also a political com-

ponent. Why is the United States in a morass? Excellent ideas abound, but none of them are going anywhere.

- Framing the issue is important and can create incentives on both sides. Take the issue of how money is distributed regionally. What performance measures are used to make those decisions and derive maximum benefits?
- Development of a neutral platform could assist in assessing regional transportation networks and in allocating funding where it is needed to optimize their performance.
- Demand management is not costless. There is a flood of new research on the measurable economic benefits derived from mobility. What wealth would be destroyed by demand management? What is the full economic cost of managing demand, and what are the benefits?

Conference chair **Kay McKinley** provided closing comments. She stated her belief that the diversity of the organizing committee resulted in a comprehensive program. People came to the conference for a learning experience, and this was clear even at Wednesday's poster session, when people lingered around the presentations rather than sampling the excellent New Orleans cuisine. For Ms. McKinley, the highlight of the conference was involving the next generation of transportation professionals in the policy discussion. In almost every session a constant theme kept arising: how transportation professionals can engage the public and elected officials in our issues. Ms. McKinley urged all in attendance to become engaged in their own communities to identify stakeholders that can make a difference in transportation finance.

CONCLUDING OBSERVATIONS

The conference attracted more than 150 experts from the public and private sectors, who explored current developments and trends in the transportation finance sector. The conference venue provided an opportunity to assess the current economic and geopolitical context in which transportation finance and policy decisions are made.

The Transportation Research Board (TRB) transportation finance conferences have illuminated developments in surface transportation policy and finance over the past decade and a half. In 1997, the first transportation finance conference focused on new financing and procurement techniques known collectively as innovative finance. They included state infrastructure banks, Grant Anticipation Revenue Vehicle bonds, and P3s, all of which were cutting-edge approaches in their formative stages that moved beyond the traditional federal-aid and state-aid funding processes.

The second and third TRB transportation finance conferences, held in Scottsdale, Arizona, in 2000 and in

Chicago, Illinois, in 2002, explored the use of innovative finance tools, as well as the Transportation Infrastructure Finance and Innovation Act credit program, which was established in 1998 and provided a variety of credit enhancements to support the nation's transportation needs. The Chicago conference also focused on the upcoming reauthorization of the federal transportation bill and the policies and tools that could be used to deliver projects more quickly.

Eight years later, the reauthorization of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users is awaited and will set the course for national transportation funding in the coming years. The fourth TRB transportation finance conference focused on the relationship between the revenues available to support transportation needs and the financing mechanisms used to leverage them. In 2009, for the first time, the Highway Trust Fund was replenished with money from the general fund. With the declining purchasing power of the motor fuel tax, policy makers are seeking new approaches to provide sustainable funding sources to support transportation investment. The 2010 New Orleans conference explored these options as well as the latest transportation finance instruments. Among them were Build America Bonds, private activity bonds, availability payments, and federal initiatives and economic stimuli, including the Transportation Investment Generating Economic Recovery discretionary grant programs.

The conference focused on the context in which the reauthorization debate is taking place, with a transportation funding gap of \$142 billion. While some economists believe that a financial stimulus is needed, there is concern about the national debt, and these discussions are taking place in an environment with increasing political polarization. The New Orleans conference provided a platform for discussion of creative solutions for meeting transportation needs in the face of reduced revenues and budgets, focusing on the federal programs, the Highway Trust Fund, the expanded use of tolling, and P3s.

One theme that recurred throughout the conference is the need for transportation providers to engage the public, elected officials, and the media in this discussion. Transportation and policy professionals have a challenging task in better educating stakeholders as to why additional funding is needed, in view of the current congressional priorities on job creation and deficit reduction.

Another focus of the conference was the possible migration from the motor fuel tax as the primary source of transportation funding to a VMT tax. Opportunities to align transportation finance with climate change policy and forge a more sustainable future for the United States were discussed. Author Michael Tidwell delivered a memorable keynote address on the final day of the con-

ference, reinforcing the relationship between transportation investment and sustainability and focusing on the local context in southern Louisiana in the aftermath of Hurricane Katrina and in the wake of the *Deepwater Horizon* oil spill.

The theme of sustainability was also reflected in the organizing committee's emphasis on engaging the next generation of transportation professionals in the conference. The conference included a student video competition exploring the public's general knowledge of the mechanics of transportation finance and a competition for scholarships enabling students to attend the conference in person.

As with prior TRB transportation finance conferences, one of the most important outcomes of the New Orleans conference was the identification of research

topics bearing on the future of transportation finance. Conference participants were asked to identify specific research needs ensuing from group discussion of the following issues:

- Are financing solutions chasing a funding problem? What is the appropriate role of governmental finance programs and subsidies?
- What is the right balance of federal, state, and local responsibilities in transportation finance?
- What are the challenges in reforming current transportation funding policies?

The research topics suggested in each of these areas, as well as others arising in the course of the discussion, are included in this report.

APPENDIX

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