Key Issues in Transportation Programming (2008)

DETAILS

74 pages | 8.5 x 11 | PAPERBACK
ISBN 978-0-309-11344-1 | DOI 10.17226/23220

CONTRIBUTORS

SUGGESTED CITATION

National Academies of Sciences, Engineering, and Medicine 2008. *Key Issues in Transportation Programming*. Washington, DC: The National Academies Press. https://doi.org/10.17226/23220.

CONFERENCE PROCEEDINGS 43

Key Issues in Transportation Programming

Summary of a Conference

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Rapporteur

November 12–14, 2006
Seattle, Washington

Sponsored by
Transportation Research Board
Federal Highway Administration
Federal Transit Administration
Washington State Department of Transportation
Florida Department of Transportation
Parsons Brinckerhoff Quade & Douglas, Inc.
HDR Engineering, Inc.

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES
Washington, D.C.
2008
www.TRB.org

Transportation Research Board Conference Proceedings 43
ISSN 1073-1652
ISBN 978-0-309-11344-1

Subscriber Category
IA planning and administration

This project was sponsored by the Transportation Research Board, the Federal Highway Administration, the Federal Transit Administration, the Washington State Department of Transportation, the Florida Department of Transportation, Parsons Brinckerhoff Quade & Douglas, Inc., and HDR Engineering, Inc.

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Preface

On November 12–14, 2006, TRB convened the Key Issues in Transportation Programming Conference in Seattle, Washington. Approximately 150 individuals from across the transportation community—transportation agency staff (at national, state, regional, and local levels) and representatives from the private sectors and academia—participated in the conference and shared ideas and experiences.

The conference was sponsored by TRB, FHWA, FTA, the Washington State Department of Transportation, the Florida Department of Transportation, Parsons Brinckerhoff Quade & Douglas, Inc., and HDR Engineering, Inc.

Background

It has been more than 10 years since the last transportation programming conference was held in Irvine, California, in 1995. That conference (published as *Transportation Research Circular 456: Conference on Transportation Programming Methods and Issues*, in December 1996) focused on

- Goal and objective setting,
- Programming methods,
- Multimodal programming processes, and
- Program implementation and communication.

Since then, many agencies have developed processes to link transportation improvement programs to planning, performance measures, or an asset management system. Other agencies have developed ranking or scoring processes to evaluate candidate projects and to program the higher-scoring projects on a priority basis. In addition, the Intermodal Surface Transportation Efficiency Act of 1991, the Transportation Equity Act for the 21st Century, and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)—the last three federal reauthorizations of surface transportation programs—have all required a more intermodal approach to transportation planning and programming. This conference highlighted successful approaches to multimodal programming and its links to planning and performance measures to support the core objectives of SAFETEA-LU and the general objective of effective use of transportation funds.

Conference Planning

To plan the conference, TRB assembled a committee, appointed by the National Research Council, to organize and develop the conference program. The event brought together individuals from state, regional, and local transportation agencies and from the consulting and academic communities with experience in developing and employing programming processes, linking long-range plans to the programming process, and evaluating the success of the process through application of performance measures. The conference was designed to help state, regional, and local transportation agencies improve programming practice and thereby the effectiveness of transportation investment. The conference explored many aspects of the programming process, including

- The current state of the practice and long-term implementation experience,
- Successful practices in linking planning and programming,
- The linking of programming processes to the development of performance measures and asset management systems,
- Programming and politics, including examples of programming processes that have successfully dealt with political challenges,
- Data requirements and data manageability in the consideration and evaluation of a large number of candidate projects and in the management of the program of projects over time, and
- Effective approaches to public involvement for programming.

The conference provided real-world experiences to assist state, regional, and local transportation agencies in improving programming practice and thereby the effectiveness of transportation investment.

Conference Format

The conference opened with four workshops: Tools, Data, and Methods; Cash Forecasting and Management Processes and Their Relationship to Programming; Linking Planning and Programming; and Implications of SAFETEA-LU for Programming. The conference was organized around a series of plenary sessions and breakout sessions that focused on the following issues:

- Institutions and organizations,
- Program development,
- Program delivery,
- Ballot box programming,
- Dealing with uncertainty, and
- The planning and programming connection.

This report contains summaries of the plenary and breakout sessions. The conference summary was prepared by Katherine F. Turnbull of the Texas Transportation Institute. The appendix contains a list of all conference participants.

Acknowledgments

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

TRB thanks the following individuals for their review of this report: Tamar Henkin, TransTech Management, Inc., Washington, D.C.; Paul F. Maxwell, Contra Costa Transportation Authority, Pleasant Hill, California; Mark L. Stout, New Jersey Department of Transportation, Trenton, New Jersey; and Thomas L. Thomson, Chatham County–Savannah Metropolitan Planning Commission, Savannah, Georgia.

Although the reviewers listed above provided many constructive comments and suggestions, they did not see the final draft of the report before its release. The review of this report was overseen by C. Michael Walton, University of Texas at Austin. Appointed by the National Research Council, he was responsible for making certain that an independent examination of this report was carried out in accordance with institutional procedures and that all review comments were carefully considered.

Opening Plenary Session

Gregory Selstead, *Washington State Department of Transportation*
Thomas Brigham, *HDR Alaska, Inc., Conference Chair*
Dan Mathis, *Federal Highway Administration*
Brigid Hynes-Cherin, *Federal Transit Administration*
Gail Achterman, *Oregon Transportation Commission*
Charlie Howard, *Puget Sound Regional Council*

Welcome from the Washington State Department of Transportation

Gregory Selstead

Many of you are probably wondering, "Why hold a conference in Seattle in the month of November?" In spite of the weather, we believe that Washington State is an excellent backdrop to discuss the transportation programming process. Since the late 1990s, we have experienced both the highs and lows of transportation funding, including a citizen's initiative that cut one-third of the state's transportation funding and then two subsequent statewide gasoline tax increases in 2003 and 2005. Within this environment, the transportation programming process has become a major focus at the Washington State Department of Transportation (WSDOT).

The Conference Planning Committee has organized very informative sessions around key topics. We have also planned this conference to provide you with opportunities to network with your peers and colleagues and to exchange your "programming war stories."

Welcome from the Conference Planning Committee

Thomas Brigham

This second national conference on transportation programming, Key Issues in Transportation Programming, is the result of many months of hard work by many people.

I would like to thank Gloria Shepherd of the FHWA and Charlie Goodman of the FTA. Their early interest and support made this conference possible. I also thank WSDOT, the Florida Department of Transportation, Parsons Brinckerhoff Quade & Douglas, Inc., and HDR Engineering, Inc., who have also provided support.

A heartfelt thanks also goes to Kim Fisher, Freda Morgan, and other staff at TRB who have supported this conference and worked so hard to make it happen. I would especially like to thank the members of the Conference Planning Committee. This group has worked diligently over the past 9 months to make this conference one to remember.

The TRB Committee on Programming, Planning, and Systems Evaluation had a number of reasons for sponsoring this conference. Principal among them was the understanding that there is much less time and attention paid to improving the practice of transportation programming than there is to planning. There is, however, no lack of attention and interest in programming on the part of the public, legislators, and community officials.

This conference is intended to take a step in redressing the lack of attention given to good programming practices. It will address a variety of key issues related to institutions and organizations, program development, program delivery, ballot box programming, dealing with uncertainty, and the planning and programming connection.

The Federal Highway Administration Perspective

Dan Mathis

You may remember a song from an old television program associated with the City of Seattle. I have rephrased the song to fit this conference.

> The bluest skies you've ever seen are in Seattle,
> And the hill's the greenest green in Seattle.
> Talking programming from the west to the east
> With MPOs and FTA,
> State DOTs, and FHWA,
> Sharing good practices during your stay—
> In Seattle, in Seattle.

I am filling in this afternoon for Gloria Shepherd from the FHWA Headquarters Office of Planning. FHWA is pleased to be participating in this important conference and is committed to supporting state departments of transportation and metropolitan planning organizations (MPOs) in helping them advance best practices in statewide and metropolitan transportation planning. These efforts also include close coordination with FTA.

From FHWA and FTA's perspective, the transportation programming process is very important. It is the outgrowth of the planning process and leads to the implementation of a project. As the FHWA division administrator here in Washington State, project and program delivery is critical to me and to the division.

Individual projects and project phases included in the transportation improvement plan (TIP) and the State Transportation Improvement Program (STIP) reflect a commitment to transportation investments. Project and program priorities need to flow from a continuous, comprehensive planning process that considers all modes of transportation and the linkage among modes. Establishing these priorities is an inclusive process involving the MPO, the state department of transportation, public transit agencies and providers, tribal governments, other nonmetropolitan local officials, federal land management agencies, and interested parties as defined in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Coordinating the involvement of representatives from all of these agencies and groups is challenging. Developing and using processes and practices to effectively manage the participation of all of these parties is paramount to good program development.

Transportation needs will likely continue to exceed available funding from traditional federal, state, and local sources. Approaches such as tolling, pricing, and private financing will play a much greater role in future transportation planning and programming efforts. State departments of transportation and MPOs will need to address the challenges that these new financing options add to the planning and programming processes.

Fiscal constraint, based on both credible revenue and good cost estimates, will continue to be an area of emphasis for FHWA and FTA. Big picture thinking is important in defining transportation priorities, and transportation investments go well beyond serving just a transportation need. Transportation planning, programming, and decision making strike a balance among numerous, and sometimes conflicting and competing, interests. Our partners, customers, and stakeholders expect us to meet this challenge.

There are numerous examples of linkage opportunities in transportation planning and programming. The first example focuses on linking the transportation planning and National Environmental Protection Act (NEPA) processes. This approach to transportation decision making considers the environment, community, and economic goals early in the planning stage and carries them on through project development, design, and construction. This approach can lead to a seamless transportation decision-making process that minimizes duplication of efforts, promotes environmental stewardship, and reduces delays with project implementation.

Over the past 2½ years, FHWA and FTA have convened 25 workshops around the country on linking planning and NEPA. I was fortunate to participate in one of the first workshops held here in Seattle. The workshops allow the different planning and environmental agencies to strengthen their working relationships through the development of action plans outlining specific steps and activities for strengthening the linkages between planning, NEPA, and project development.

My second example focuses on safety. Ongoing collaboration among transportation planners, safety engineers, and other stakeholders in the safety area is critical for ensuring that safety issues and safety considerations are accounted for in the goals and objectives supporting the development of the long-range transportation plan, as well as specific projects and project phases included in the TIP and STIP. Transportation safety planning, formerly known as safety-conscious planning, is intended to identify road safety improvements. The development of the strategic highway safety plan should result in projects to be included in the TIP and the STIP.

In April 2006, FHWA, in conjunction with NHTSA, FRA, FMCSA, and FTA, issued the guidance document, *Strategic Highway Safety Plan: A Champion's Guide to Saving Lives*. The document provides an overview of the strategic highway safety plan as established in SAFETEA-LU and promotes understanding of the rela-

tionships between the strategic highway safety plan and the existing planning and programming processes.

My third example focuses on transportation system management and operation, which is receiving a great deal of emphasis within FHWA and numerous state departments of transportation. Transportation system management and operation play a major role in the secretary of the U.S. Department of Transportation's congestion initiative. We know we cannot build our way out of congestion. As a result, better management and operation of the existing transportation system is critical.

An effective transportation system requires not only the highway and transit infrastructure, but also the efficient and coordinated operation of the regional transportation network. Together, these elements lead to improved system efficiency, reliability, and safety. This linkage can be strengthened by including planning-level goals and objectives related to system management and operation in the long-range transportation plan. It is also important to reflect this linkage in project-level planning. FHWA has been working over the past year to increase the knowledge and the use of available analytical tools, such as the Intelligent Transportation System (ITS) development analysis system and the screening analysis tool for ITS, through workshops held throughout the country. These sketch planning tools allow for the estimation of the benefits resulting from individual or combinations of ITS and operation strategies. FHWA conducted three operations workshops earlier this year in Oregon, Pennsylvania, and Texas.

SAFETEA-LU contains a new requirement that metropolitan transportation plans include operational and management strategies to improve the performance of existing transportation facilities, to relieve congestion, and to maximize the mobility and safety of people and goods. FHWA and FTA, working with key stakeholder groups, are undertaking an effort to develop reference materials on possible approaches for addressing these SAFETEA-LU provisions. These reference materials should be available in early 2007.

The next generation of congestion management systems, renamed "congestion management processes" in SAFETEA-LU, should have a better connection to the development of metropolitan transportation plans and TIPs in transportation management areas. FHWA and FTA, along with key stakeholders, are developing reference materials on possible approaches for developing and implementing congestion management processes. These reference materials also should be available in early 2007.

My next example focuses on freight considerations. Freight is an important component of the metropolitan and statewide transportation planning and programming processes. Outreach to freight shippers, providers of freight services, private providers of transportation, and other private sector groups is an important part of these processes. Identifying opportunities to effectively engage all of these private sector groups in the development of long-range transportation plans, TIPs, and STIPs is a challenge. FHWA sponsors monthly Internet-based conferences, as part of the Talking Freight Seminars series, to provide a convenient and no-cost method for transportation practitioners to broaden their knowledge of freight issues and to network with other practitioners. FHWA's Office of Planning, Office of Freight Management and Operations, and Resources Centers are developing presentation materials to help engage freight sector representatives in the planning and programming processes. These materials, which include facts sheets and handouts, should be available early in 2007.

Consultation with Native American tribal governments and federal land management agencies in the development of long-range transportation plans, TIPs, and STIPs represents another key feature of effective transportation decision making. Approximately 2 years ago, FHWA's Office of Planning, in coordination with the Federal Land Office, FTA, and the Bureau of Indian Affairs, began developing a comprehensive resource document comprised of modules covering different aspects of transportation planning geared to tribal governments.

Here are my concluding thoughts. First and foremost, we must preserve public trust and confidence in transportation planning, programming, and decision making. Accountability to the public is extremely important. Program priorities should flow from good planning. Specific projects and project phases included in the TIP and the STIP must be connected to the goals and objectives of the long-range transportation plan. Developing credible revenue and cost estimates is also important. Developing fiscally constrained TIPs and STIPs is largely predicated on the use of credible revenue and cost information.

Washington State has been using a cost estimation validation process to obtain more accurate project costs over the past few years. This process includes consideration of the potential risks that may affect a project, and thus, project costs. Potential risks include environmental issues, availability of contractors, material costs, and other issues that may increase the costs of projects or delay projects. A computer model is used and risk factors are assigned to different issues. The model produces cost estimate ranges for projects that include these risk factors.

Program development and delivery are equally important. Including a project or project phase in a TIP or a STIP is only the beginning of the process. Ensuring the timely delivery of program phases is critical, especially because project delays typically result in increases in project costs. Here in Washington State, project delivery and accountability are major priorities.

The Federal Transit Administration Perspective

Brigid Hynes-Cherin

The topic of this conference is of great importance. I have spent a good deal of my career trying to ensure that programming is an inclusive and meaningful process that results in the funding of priority transportation needs in an area.

I served as the executive director of the San Francisco Transportation Authority for 7 years. During that time, I had the privilege of working with partners at the Bay Area Metropolitan Transportation Commission and other agencies in developing and applying the criteria for programming in the Bay Area. I also developed and taught the first National Transit Institute course on state and metropolitan programming. So, programming is of great interest to me. A good programming process is a key element of the overall transportation planning process.

I represent FTA's Office of Planning and Environment. FTA partners with FHWA and other organizations to improve the state-of-the-practice in statewide and metropolitan transportation planning and programming. Transit agencies need to be an equal partner in these processes, along with state departments of transportation and MPOs.

Dan did an excellent job of presenting an overview of the general components of effective programming. I want to endorse his comments. Rather than repeating many of his points, my comments focus on a few additional concepts associated with effective planning and programming processes and some of the unique elements of concern to transit agencies and transit providers.

I think one of the most important principles to remember is that programming is only a means to an end. Too often, the focus of the process becomes getting a project in the TIP rather than getting a project implemented. Ensuring that the necessary resources are available to deliver a project is important. The programming process is the forum for project sponsors to have their needs considered in the regional context. While it is appropriate for sponsors to advocate for their projects, sponsors must also be open to shaping or reshaping projects to meet regional goals and objectives.

One of the important elements in the San Francisco Bay Area process was to establish regional programming criteria. Potential project sponsors knew what the criteria were and promoted projects that met the regional programming criteria. Ensuring that all groups have access to and involvement in the transportation planning and programming processes is not easy. SAFETEA-LU expands the topics MPOs must address as part of these processes. SAFETEA-LU includes new partners in the consultation process, more robust public involvement, early consideration of environmental issues during system planning, and better coordination with land use planning. Participants at this conference can help identify the impact of these elements on the planning and programming processes. Increased participation and consultation by these nontraditional stakeholders will surely have an impact on transportation planning and programming.

Another challenge to the programming process is the change in funding sources for transportation projects. A recent study identified that federal funding for transportation represents a diminishing percentage of the total funding. The study examined funding for transportation in the 19 largest metropolitan areas in the country. The average share of federal funding was 28%. The federal planning, environmental, and other requirements must be followed as long as there is any federal funding involved in a project. Some areas are fully funding projects out of nonfederal sources to avoid the federal requirements.

We are seeing more state and local ballot measures to provide funding for transportation. Many of these measures identify specific projects. These funds can be used to match federal funds or to totally finance projects. If this trend continues, the programming process may need to be reexamined, as currently the TIP and STIP requirements apply only to federally funded projects or to regionally significant projects funded with state or local funds. The base of projects in the TIPs and the STIPs may not reflect all the projects in a region.

From an FTA perspective, one of the key outcomes of SAFETEA-LU and subsequent federal regulations is increased integration and connection between planning and FTA's programs. For example, FTA's major Capital Investment Program, which was previously called the New Starts Program and now includes a small starts component, relies heavily on systems planning and corridor planning to justify a project and to allow it to be carried forward to NEPA. As Dan noted, linking NEPA and planning is a very important element of the proposed planning rule. At FTA, we are requiring scoping to occur before we approve a New Starts or Small Starts project for entry into preliminary engineering to ensure that there is consensus that the proposed project has the political and financial support to be funded. We are also requiring that data used to justify a New Starts project for federal purposes are included in the draft environmental impact statement (DEIS), the final EIS, the record of decision, and other required documents. These requirements provide a clear understanding of how funding decisions are made at the federal level. FTA is also requiring that if a project changes over time, these changes will be reflected in an updated plan and an updated TIP to ensure a clear connection between the project and FTA funding.

FTA also has an interest in the development and use of coordinated public transportation and human services transportation plans. These plans support FTA programs providing services to elderly and disabled individuals, the job access and reverse commute program, and the

new freedoms program. The requirement for coordinated public transportation and human services transportation plans is in federal law. The Notice of Proposed Rule Making for planning indicates that there must be coordination between the long-range transportation plan and this coordinated public transportation human services plan for an area to receive federal funding. It is left to public officials to determine the best approach for developing the plan and the lead agency, as well as ensuring ongoing coordination. There is no requirement that the MPO be the lead agency in developing the plan, although MPOs are taking the lead in many areas. The appropriate agencies should be involved in the development of the coordination plan. The TIP must reflect evidence of this coordination or projects will not be funded.

Based on provisions of SAFETEA-LU, FTA now has a new program for transit services in National Parks. The initial funding is $25 million a year, which is a modest amount. This program is expected to be very beneficial in addressing transportation needs in National Parks, and funding levels may increase in the future. Projects proposed for funding through this program must be included in the TIP and STIP.

Finally, the definition of FTA's formula grant programs and other programs has been expanded to include additional projects. The types of projects that are now eligible for funding include intercity bus terminals and security preparedness activities and projects. These projects must also be included in the TIP.

As Dan noted, the fiscal constraint requirement is one of the key challenges facing the programming process. Realistic assumptions related to project costs and available revenues must be used in determining fiscal constraints. These assumptions must be agreed to and applied consistently by the MPO, the state department of transportation, and transit operators. The use of private funding is becoming more widespread throughout the country. The determination of the availability of private funding must be part of the fiscal constraint process.

In conclusion, please remember that one of the key features of the programming process is the flexibility provided in most FTA and FHWA programs. Take advantage of this flexibility to identify and support the appropriate investments in transportation projects through open, collaborative, and transparent planning and programming processes in your area.

A State Perspective

Gail Achterman

My comments focus on transportation planning and programming from a policy board member's perspective. I serve on the five-member Oregon Transportation Commission. The commission is the transportation public policy governing board for the state. The commission is appointed by the governor and works closely with Oregon Department of Transportation staff, members of the legislature, and local government officials.

I have served on the commission for 6 years. Over the past 2 years, I have chaired the steering committee responsible for preparing the most recent 25-year transportation plan for the state. We are proud of the Oregon Transportation Plan and the approaches used to address our transportation needs.

The challenges related to the programming process need to be placed in the context of the organization and operation of state departments of transportation and local governments. Most states continue to face declining revenues for transportation, including the reduced purchasing power of the gasoline tax. At the same time, most states and communities continue to experience increasing demands on all transportation modes. Most areas are experiencing increases in population and vehicle miles traveled (VMT). Areas with stable populations are still experiencing growth in VMT.

Transportation agency staff responsible for planning and programming are at the forefront of addressing these issues. My comments focus on four specific issues. The first issue addresses the topic I just mentioned: declining revenues and increasing demands on the transportation system. The second issue focuses on strategic investments and what strategic investments in the transportation system mean today. The third issue is the need for new programming categories. I think the traditional project programming categories do not match with an outcome-based strategic investment approach. The final issue focuses on operations.

I have been involved in planning and public participation programs since 1975, when I went to work at the U.S. Department of the Interior. Transportation agencies have improved their public involvement processes over the years and do a better job of engaging the public in the discussion of key issues than do many other governmental agencies. I would suggest that improvements are still needed, however.

One of the problems transportation planners face in engaging the public and policy makers in a meaningful manner is the length and complexity of the transportation planning and programming process. I have served on numerous boards and committees, as well as working in the public sector for more than 30 years, and I find the transportation planning and programming process a challenge.

The public is very concerned about transportation. A vast majority of the public does not understand or care about TIPs, STIPs, and other acronyms that you use in transportation planning and programming. The public may not understand or care which agency is responsible for a project; what they care about is a transportation system that works and that meets their needs. The public

also does not understand why transportation projects take so long. I think it is embarrassing for the Oregon Transportation Commission that the average project delivery time is 9 years. In a time of rapid economic and social change, this timeline is unacceptable. By the time a project is finally completed, transportation needs have changed.

The West Eugene Parkway has been in the planning process for some 25 years. We recently dropped the project after spending approximately $12 million during the planning phase. While this amount is significant, conditions in the community and area changed significantly over the past 25 years, and the City of Eugene, the largest city affected by the Parkway, concluded that the project no longer met their needs. This example highlights the fact that the planning and project selection process for major transportation projects is too long.

We cannot run a civic engagement process, where we expect people to provide meaningful input to the transportation process, on that kind of timeline. We need new techniques and strategies to engage the public. The Area Commissions on Transportation in Oregon represents one approach for providing a new level of public involvement and engagement. The Area Commissions are involved in the development of the STIP and programming decisions at the local governmental level. This approach has provided a completely new level of ongoing public involvement and engagement.

My second point is the most important. As part of the programming process, it is critical to develop criteria that target strategic transportation investments. It is also important to apply these criteria consistently to ensure that projects are targeted toward strategic investments. In a time of limited resources, not all projects can be funded. Strategic investments focus on projects that add value across jurisdictions and across modes. Strategic investments make a real difference in the everyday lives of citizens in terms of providing mobility services. Citizens care about the outcome. They want to be able to get to work, to school, and to other activities.

Strategic investments support today's economy and the economy of the future. Strategic investments are targeted toward projects that make a difference and will continue to make a difference in the future. This approach is about making investments in the system of tomorrow, not the system of the past. The economy of this country has changed significantly in the past 20 years, and it will continue to change. Strategic transportation investments are critical to our being able to compete in the global economy of today and tomorrow.

We need to focus on defining strategic investments with declining revenues. We cannot afford to fund low-priority projects. Although no one likes to talk about it, we need to do triage on some parts of the transportation system. We have roads that the state should give up because they make no difference to Oregon's economy. It is like a family with four children that has a five-bedroom house. When the children go off to college, it does not make sense to continue to furnish, heat, and maintain the four bedrooms, because the children are no longer there. The transportation programming process too often does not ask the right questions, such as, "Are the children going to return on a permanent basis?"

I would suggest that new programming categories are needed. We focus primarily on the traditional categories of modernization, preservation, safety, and operations. Oregon created a new category called the Immediate Opportunity Fund. Attracting new businesses continues to be a top priority of state officials. Transportation improvements, such as a new interchange or access point for a plant or facility, are often key parts of a package used to attract companies to the state. It was difficult to fund these projects, however. The Immediate Opportunity Fund provides funding based on specific criteria to support economic development initiatives.

We need to think about other new categories. One suggestion for a category would focus on mega-projects. In Oregon, we use the term "projects of statewide significance." We do not do a good job of saving for these large projects. Another possible new category would address federal earmarked projects. I am sure that many of you face the same problem we do with federal earmarks. A local area talks to their congressperson, who earmarks funding for a local project. The problem is that the earmarked funds do not cover the full project costs, so the local area looks to the state for the remaining funding. The Transportation Commission has taken the position that it will not provide funding in these situations.

I think we need a new project category to deal with emergencies. Floods and glacial debris flows in the mountains are emergencies right now in Oregon. We never have adequate funding to deal with these emergencies, so we use funds from other projects. Establishing an emergency reserve would help address these situations. Funding could be set aside each year based on previous experiences. If there is no emergency during the year, the funding reserve would continue to build for use in the future.

In addressing strategic investments, it is important to focus on outcomes. Traffic congestion continues to be the major issue among all users of the roadway system. I was surprised when I learned that approximately half of the congestion on the system is caused by nonrecurring events. So, operations are critical to the efficient use of the system. We need to do a better job of coordinating emergency response and clearing incidents.

We need to focus on providing mobility services, rather than continuing to think of ourselves as a construction agency. Addressing the 50% of the congestion

problem that is operation-based is cheaper than building more freeway lanes. Maybe we should be investing in photo radar enforcement for speeding and tailgating, rather than capital projects.

In conclusion, it is important to consider what you are programming for, not just the process. Think about mobility services, people getting to work, and the movement of goods.

A Regional Perspective

Charlie Howard

Let me start by building on one of Gail's comments related to the needs of customers. Sometimes we lose sight of who we are working for. Transportation agencies serve the public. The traveling public is our customer.

I attended the TRB Future of the MPO Conference in August. One of the panel discussions focused on defining and serving customers. A representative from an MPO described a process used by the MPO for defining its customers, which had resulted in the identification of FHWA and FTA as the MPO's major customers. I would suggest that the customer of transportation agencies at the federal, state, regional, and local levels is the traveling public. We are in business to provide a service to the public, regardless of whether we work for an agency or a jurisdiction.

I was in England this summer as part of an international scan tour. The British have experienced an interesting transition in their thinking about delivering services to the public. They have a major focus on putting the customer first. This mindset supports the importance of operations and mobility services as the priority of transportation agencies. As a result, the day-to-day operations of the system became the focus of the programming process. The capital program also focuses on projects that will improve day-to-day operations.

My first point addresses expanding the participation of diverse groups in the transportation planning process. Including additional groups in the planning process began with ISTEA and has been continued in subsequent federal legislation. SAFETEA-LU adds additional emphasis on safety, security, environmental stewardship, coordinated health and human services transportation, and operations and management. We need new and better tools to help quantify and prioritize investments across these categories. As you discuss topics in the breakout sessions, think about how we bring these new groups into the transportation planning and programming processes.

It is important to remember that funding operations and management is different than funding capital projects. Operational activities are usually located within the operation budget of transportation agencies. Maintenance, traffic operations, planning, and the agency financial, accounting, and related activities are typically included in the operations budget. When financial resources are reduced or limited, operations, rather than capital projects, tend to be the first place budget cuts are made by the legislature or agency administrators. We need to think differently if we are really going to focus on operations as a customer service. The activities that focus on customer service need to be separated to allow for programming funds to these efforts.

The second point I want to address is the regionalization of funding. If you look around the country, regional funding mechanisms are being established in many states and areas. Examples of states and metropolitan areas with regional transportation funding mechanisms include California, Texas, southern Nevada, and the Phoenix area. This approach continues to be explored here in Washington. Voters in the area will be considering the establishment of a Regional Transportation Investment District.

This trend means that more transportation decisions will be made at the regional level. This trend raises questions concerning the role of the state when regions are raising and investing funds in transportation infrastructure and operations. It is important to remember that most regional funding mechanisms require voter approval. This link to voter approval appears to influence the programming of projects that the public is likely to approve. It also may result in a hybrid approach to the long-range transportation plan and the TIP. The TIP contains fairly defined projects, while the long-range plan includes more concept-level projects.

The investment program in this region is a very complicated process. The investment program is a 20-year set of projects matched to cash flow and year of expenditure dollars. It represents a much different and more detailed exercise than the development of a typical long-range transportation plan. We need a different set of tools and programming processes for this detailed level of analysis.

The third point I would like to address is fiscal constraint. Prioritizing projects in the long-range plan is different than prioritizing projects in the TIP. It would be beneficial to examine this issue in the planning process. A project in the long-range plan is typically different from the project that is actually implemented due to project phasing, evolving project scopes, and other factors. How these issues are addressed in the plan and in the fiscal constraint analysis deserves additional discussion and attention.

The last point I would like to address builds on regional investments. The legislature here in Washington State recognizes that metropolitan regions are going to

have to fund and fix their own problems because the state does not have the needed funding. The legislature does not want to give up their decision-making role to regional governments, however. New legislation in the state allows for the creation of Regional Investment Districts. The legislation requires that 90% of the revenues raised by increases in taxes must be invested in state highways. While this approach helps the state highway system, it does not necessarily address local needs. The legislature is also examining Surface Transportation Program and Congestion Mitigation and Air Quality Program funding, which have traditionally been programmed at the regional level. While there are questions as to whether the state has the authority to program these funds, the issue is being examined.

There is a Regional Governance Commission in the region that is examining transportation governance. Prioritization, and who makes the investment decisions, is at the heart of most of the issues the Commission is examining. The question is how to better coordinate prioritization across all the different agencies involved in transportation.

Ed Mierzejewski, University of South Florida, moderated this session.

BREAKOUT SESSION

Policy and Politics in the Process

John Sweek, *Federal Transit Administration*
Scott Paine, *University of Tampa*
John Mason, *Science Applications International Corporation*

Evolution of the Transportation Planning and Programming Processes

John Sweek

John Sweek described the evolution of the transportation planning and programming processes over the past 40 years. He highlighted some of the major milestones in federal legislation and federal guidance, covering the following points in his presentation.

- In establishing the Highway Trust Fund, Congress provided a formula for allocating funds to the states. The funds were to be used on projects based on priorities established by the state highway departments. At the time, federal guidance required that the head of the state transportation agency be an engineer. The departments were very project-driven. Local politics were not really involved in planning and project development at the time.
- In the early 1960s, the highway projects in many urban areas throughout the country were very controversial and did not always reflect local interests. As a result, Congress approved legislation, declaring it was in the national interest to develop transportation systems, including various modes of transit, in a manner that would serve states and local communities efficiently and effectively. The legislation added that after July 1, 1965, all projects had to be based on a comprehensive, cooperative, and continuing process that involved local officials. Language was later added that the views of local officials must be considered and must be evaluated in the planning process. This legislation changed a purely technical process into one that considered the views of the local area.
- Before 1970, a professor at the University of Washington wrote an editorial on the politics of urban transportation. The editorial noted, "We are emerging from an era of domination of urban transportation by state highway lobbyists deemed unsympathetic to urban area interests to an era that may be dominated by special urban publics whose self-interest may or may not coincide with the public good."
- Legislation in 1973 designated metropolitan planning organizations (MPOs) as the recipients of planning funds and as the agency responsible for the planning process. Local officials were involved in selecting the routes on the urban system, but not the specific projects, which were still selected by the state. Further federal guidance in 1975 required that projects funded by the federal government had to be included in the transportation improvement plan (TIP), and that the TIP had to be endorsed by the MPO. States could not advance any project in an urban area that was not included in the TIP. There has been a gradual shift in authority from the states to local officials and MPOs over the years. San Diego provides an example of this change. The state provides the San Diego Association of Governments (SANDAG) with 75 percent of the federal funds for planning, constructing, and maintaining the highway system.
- The FTA New Starts Program provides discretionary funding for major transit capital projects. New Starts projects are selected by transit agency boards based on the results of an alternative analysis process.

The projects are endorsed by the MPO. Congress makes the final selection on project funding. Transit agency boards and MPOs include local officials and community representatives.

- Over the past few decades the transportation planning and programming process has changed. Early in the Interstate program, decisions were typically made at the state level based on technical analysis. Federal legislation has opened the processes to require involvement by local officials, the public, and other stakeholders. Also, more projects are earmarked at the federal level.

Local Official's Perspective—Tampa, Florida

Scott Paine

Scott Paine described his experience as an elected official and a member of an MPO policy board. He discussed serving on the Tampa City Council and the Tampa MPO Policy Board for 8 years in the 1990s. Scott covered the following points in his presentation.

- The political landscape in Florida is slightly different from that of other states. The Florida legislature has significant power, while the governor is less powerful than governors of other states because he or she shares responsibilities with an elected cabinet. The state's Transportation Commission is appointed by the governor and approved by the Senate. There are 26 MPOs statewide. Florida MPOs follow county boundaries rather than federally designated metropolitan boundaries. There is also a statewide MPO Advisory Council. The Florida Department of Transportation (FDOT) is responsible for the Interstate and state roadway system. There are also public transportation agencies throughout the state. There are 76 counties, some 410 cities, 11 regional planning councils, and more than 1,000 special districts in the state. Thus, transportation planning, programming, and operation in the state can be complicated.
- Florida continues to experience rapid growth in population, including an increasing tourist population. There is significant regional and statewide interest in the transportation planning process, as well as strong local involvement. These interests can sometimes be in conflict.
- There is a very professional and well-trained transportation planning and programming community in the state. In general, agencies and organizations at all levels are able to attract and retain qualified personnel. The MPO Advisory Council has both a staff director group and an elected officials group. The council provides a forum to discuss common issues and allows FDOT to present information to all MPOs simultaneously.
- Most Florida MPO policy boards are made up of elected officials. As a result, many MPO policy board members have parochial interests. Members of the state legislature tend to have more of a statewide perspective, although they are also concerned about the areas they represent. Thus, members of the legislature and MPO policy board members may have different perspectives on issues and projects.
- Under Florida law, local communities do not have home rule authority for finance. Local jurisdictions have limited sources for revenue generation based on state law. As a result, cities and counties are beholden to the state for funding. This situation may make it difficult for cities and counties to advance transportation projects. On controversial transportation projects that have political support, typically mayors, city council members, and county commissioners provide this support, not members of the legislature. Mayors, city council members, and county commissioners have close connections to an area and are able to address local opposition and explain the need for projects.
- Florida does not have one dominant major urban center, as do some other states. There are several significant metropolitan areas, including Miami, Orlando, and Tampa. A regional MPO covering three counties has been developed in the Orlando area. There are three main cities—Tampa, Clearwater, and St. Petersburg—in the Tampa Bay region. These cities are relatively similar in size and composition. However, there are two MPOs in the area based on the two counties.
- Term limits are in place for most elected officials in Florida, including members of the state legislature, mayors, city council members, and county commissioners. Because of these term limits, many elected officials leave office before projects they helped advance are completed. Term limits also result in a loss of knowledgeable officials. Because local officials serve on MPO policy boards, term limits result in turnover on MPO policy boards. Ongoing training and education is needed to accommodate this turnover in policy board members. Term limits also shift the power from elected officials to agency and community staff. Similar to other state departments of transportation, FDOT tends to be a convenient scapegoat for politicians at the state and local levels.
- Leadership development and training is especially important in light of the term limits for local and state officials. Training for Florida MPO policy board members has been developed and is being offered on a regular basis. Promoting collaborative decision making takes a long time and is difficult, but it results in projects that have a greater chance of being implemented. The Intermodal Surface Transportation Efficiency Act of 1991 changed the relationships among local governments, MPOs, state departments of transportation, and other groups in the transportation planning and programming processes.

Local Official's Perspective—Fairfax, Virginia

John Mason

John Mason described his experience as an elected official in Virginia and a member of an MPO policy board. He discussed serving on the Fairfax City Council, serving as mayor of Fairfax, and serving on the Transportation Planning Board (TPB), the MPO for the Washington, D.C., metropolitan area, the Transportation Coordinating Council of Northern Virginia, and the Northern Virginia Transportation Commission. John covered the following points in his presentation.

- Virginia is a "Dillon's Rule" state, which means that local jurisdictions only have powers granted to them by the General Assembly. There are 39 chartered cities in Virginia—the only state where all cities are independent and are not subordinate jurisdictions of the counties. This structure influences the MPO process.
- Politics and politicians are frequently viewed in a negative light in relationship to the transportation planning process. The political process and public policy have an important and legitimate role in transportation planning and programming, just as they do with land use, economic development, education, and other topics of public importance. The political process was important in many communities in raising awareness about the impacts the initial design of the Interstate system had on neighborhoods and inner-city areas. Senator Patrick Moynihan responded to these concerns and helped approve legislation with stronger public involvement requirements.
- Politics is partly defined in the dictionary as that which is "related to government or the conduct of government and the making of policy." The dictionary does not make politics a pejorative term. Over the past 40 years, federal legislation has focused on transportation decision making as part of the political process. Public participation and public involvement programs mean listening to the concerns, ideas, and opinions of the public on transportation projects and programs. Expanding the stakeholders involved in the transportation planning process is an example of the public policy nature of the process of making transportation decisions.
- Public and political discourse on a project, program, or topic provides an important balance to the technical analysis developed by agency staff or consultants. The discussion of transportation projects and programs is enhanced by multiple viewpoints and ideas, resulting in better decision making.
- For the most part, members of the TPB have a regional perspective. While members are concerned about the area they represent, most also maintain a focus on the region as a whole. Elected officials do have competing concerns, having been elected to serve the interest of their constituents. For example, the City of Fairfax has a population of approximately 22,000, but some 350,000 vehicle trips per day travel through the city. Synchronized traffic signals were considered and implemented in a number of corridors to help address traffic congestion. The synchronized signals provided longer green times for commuter traffic into and out of Washington, D.C., while requiring longer wait times for traffic on cross-streets. As a result, residents negatively impacted by the system voiced concerns and displeasure. This is one example of how elected officials on an MPO policy board face competing concerns.
- Serving as a local elected official is typically a part-time job. Most local officials have full-time jobs. Participating on an MPO policy board usually adds another monthly meeting to local officials' schedules. Technical staff at MPOs work full time as transportation planners, as engineers, and in other professions. While policy board members do not have the technical expertise of MPO staff, they do have a public policy orientation and an understanding of the needs and priorities of their constituents, citizens in the region, and other stakeholder groups. Both technical and public policy perspectives are needed for good decision making. Polities and public policy are part of the decision-making process at the local, metropolitan, state, and federal levels. Public policy and the involvement of local officials on MPO policy boards is part of the public-participation processes in transportation planning and programming. Elected officials bring a different skill set to the discussion of transportation projects, programs, and issues.
- Federal legislation outlines specific elements of the transportation planning and programming processes. MPOs, state departments of transportation, transit agencies, and other groups should consider methods to add value to these requirements and processes. Citizen advisory committees and mode-specific or topic-specific advisory committees are examples of possible approaches for adding value to the process. Involving diverse groups ensures that the process is open and will withstand lawsuits or other related actions, as it is often easier to stop projects or slow them down than it is to move them forward.

Tom Brigham, HDR Engineering, Inc., moderated this session.

BREAKOUT SESSION

Agency Relationships and Roles

Ned Conroy, *Federal Transit Administration*
Jeff Ottesen, *Alaska Department of Transportation and Public Facilities*
John Poorman, *Capital District Transportation Commission, Albany, New York*
Thera Black, *Thurston Regional Planning Council, Thurston County, Washington*

Federal Review of Transportation Improvement Plans

Ned Conroy

Ned Conroy described the elements he uses in reviewing transportation improvement plans (TIPs) submitted by metropolitan planning organizations (MPOs) in Region 10. He highlighted the review process, which includes ensuring that the basic federal requirements have been met. He described three other elements examined in the review process: a link to the long-range transportation plan; the cooperative development of the TIP based on established criteria; and the ability to implement the TIP. Ned covered the following points in his presentation.

- Region 10 includes four states: Alaska, Washington, Oregon, and Idaho. The four-state region has 24 MPOs. There is significant diversity in the size of the areas represented by the 24 MPOs, as well as the institutional arrangements, organizational structures, and staffing levels. As a result, there are also differences in the TIPs developed by the 24 MPOs.
- TIPs are first examined to ensure that all federal requirements are met. These requirements include the public involvement process, air quality conformity, and other related considerations. Links to long-range plan goals and objectives, involvement of other agencies in the cooperative development of the TIP, and the ability to implement the TIP are also examined.
- The first review element focuses on the link between the TIP and the long-range transportation plan. Items considered include the ability to identify the relationship between projects in the TIP and the goals and objectives in the long-range plan.
- The second review element considers the cooperative development of the TIP as reflected by the involvement of other agencies and groups. It also examines the use of a clearly defined process for incorporating projects into the TIP. Factors examined include the type and level of participation by personnel from other agencies and groups, the process and criteria for incorporating projects into the TIP, and consistency in the application of these criteria. The nature of participation by other groups should go beyond just reviewing and commenting on the TIP. Forums, meetings, and workshops may be used to promote the proactive involvement of other agencies and groups in the development of the criteria and in the project selection process. Ensuring consistency in the process is also important.
- The third review element focuses on the ability to implement the TIP. This step includes reviewing the validity and reasonableness of the financial assumptions. It includes a review of the process used to develop the assumptions and the involvement of other agencies in this process. The annual list of projects is also reviewed. The implementation of projects in previous TIPs provides a good measure of the ability to successfully implement future projects.

Alaska DOT–MPO–Transit Relationships: A State Apart

Jeff Ottesen

Jeff Ottesen discussed the relationship between the Alaska Department of Transportation and Public Facilities (ADOT&PF) and MPOs in the state. He provided an overview of the responsibilities of ADOT&PF, the characteristics of the two MPOs in the state, and some of the issues associated with transportation planning and programming in Alaska's two metropolitan areas. Jeff covered the following points in his presentation.

- There are a number of transportation-related challenges in Alaska. First, Alaska has 42 square miles of land per mile of highway, compared to the U.S. average of 1 square mile of land per mile of highway. Second, some 30% of Alaskans live in areas that are not connected to roads. Third, approximately 80% of Alaska's roads are unpaved. Fourth, while Alaska is twice as large as Texas, its population and road mileage compare more closely to those of Vermont.
- ADOT&PF has a number of responsibilities related to highways, the maritime highway or ferry system, and airports. ADOT&PF is responsible for 5,600 centerline miles of roads. Of this total, 2,100 centerline miles are part of the National Highway System (NHS), and 3,500 centerline miles are state and community roads. There are a total of 14,400 lane miles of roads in the state and 950 bridges.
- In Alaska, there are about 3.3 NHS miles per 1,000 population, compared with the U.S. average of 0.6 NHS miles per 1,000 population. ADOT&PF maintains 40% of the roads in the state, compared with the average state department of transportation maintaining 20% of the roads in the state.
- The ADOT&PF is also responsible for the state marine highway system. This system operates 24 h per day, seven days a week. It includes 10 vessels, 36 terminals, and 3,700 route miles. The system carries some 400,000 passengers and 100,000 vehicles annually. Both FHWA and FTA funds are used to support the system.
- ADOT&PF is also responsible for the 266 airports in the state. Two of these are international airports, 25 are certificated airports, and 239 are noncertificated airports. Alaska is home to the world's largest seaplane base and has a total of 102 seaplane bases. Alaska's global position is strategic for air cargo. The Ted Stevens Anchorage International Airport is the number-one freight airport in the United States by landed weight, the number-three freight airport in the world, and the number-one user of jet fuel in the United States.
- Alaska has some unique exceptions to the Title 23 laws. For example, the MPO Surface Transportation Program (STP) allocation is exempt from the STP formula. Any public road in the state is eligible for FHWA funds. Also, members of the legislature are permitted to serve on the MPO policy boards.
- There is much discussion in the state related to the transportation needs of urban versus rural areas and the allocation of funds for projects in these areas. MPOs promote the needs of the state's two major metropolitan areas. At the same time, the needs in the rural areas are the most basic—and expensive. The rural population is largely Native American, and many rural roadways focus on basic needs, such as access to sewage lagoons, landfills, and water access points. Boardwalks, which are built strong enough to accommodate pickup trucks, are used in many rural areas because of the wet conditions. Many rural communities are dependent on air and water access.
- A lawsuit was filed against the state arguing that the State Transportation Improvement Program (STIP) criteria were disguised racial preference. The suit was unsuccessful in the U.S. District Court and the 9th Circuit Appellate Court. The courts found that Alaska rural roads were eligible for federal aid and that an undeniable basic need results in a clear duty to address the need.
- Tribal consultation is important in Alaska. There are 231 federally recognized tribes in the state, with virtually one tribe in every community. All but one tribe is landless, however, which means that the sphere of influence of an individual tribe's is somewhat unclear. There are also 200 tribal corporations in the state. These corporations do have a land base and some U.S. Department of Transportation agencies consider these corporations to be tribal entities as well.
- There are two MPOs in the state—the Anchorage Metropolitan Area Transportation Solutions (AMATS) and the Fairbanks Metropolitan Area Transportation System (FMATS). The two MPOs differ in age, size, and organizational structure.
- AMATS, which was established in the 1960s, is a transportation management association (TMA). AMATS includes the City of Anchorage, which operates the public transit system and the port. ADOT&PF is responsible for operation of the Anchorage airport and the railroad in the area. AMATS has a five-member policy board. Members include ADOT&PF, the mayor of Anchorage, two assembly members, and a representative from the Alaska Department of Environmental Conservation. The ADOT&PF representative serves as chair of the policy board. The area is classified by the EPA as a carbon monoxide (CO) maintenance area.
- FMATS was established as an MPO based on the 2000 Census. FMATS includes the cities of Fairbanks

and North Pole, and the Fairbanks North Star Borough. Fairbanks operates the public transit service, while ADOT&PF is responsible for the airport and railroad. FMATS has a seven-member policy board. Members include ADOT&PF; the mayors of Fairbanks, North Pole, and the Fairbanks Northstar Borough; the Borough Assembly; and the Fairbanks City Council. The ADOT&PF representative serves as chair. The area is designated as a CO maintenance area but will be designated as a particulate matter (PM) 2.5 nonattainment area.

- The relationship between ADOT&PF and the two MPOs is cooperative, but there is tension on some issues. ADOT&PF has a good working relationship with staff at both MPOs. There was recently agreement on Connect Anchorage, a $1.2 billion program of transportation projects. The development of the long-range transportation plans represents good cooperative working relationships with the two MPOs. There have been conflicts between ADOT&PF and the MPOs, however. In the case of AMATS, there have been debates over funding and project prioritization. The mayor, ADOT&PF, and the assembly have not always been aligned. A proposed expensive trail project was contentious, with the environmental impact statement (EIS) resulting in a no-build decision. Recently, legislation was approved related to the MPO governance, which resulted in the MPO filing a lawsuit. A new policy board structure is being considered at FMATS with less reliance on ADOT&PF staff. Concerns over funding levels have also been expressed by FMATS personnel, including a feeling that funds have been lost as a result of the MPO designation. Congestion Mitigation and Air Quality (CMAQ) funding may be needed to address the PM 2.4 nonattainment designation.
- Because Alaska is exempt from the federal formula for distributing funds to MPOs, the state adopted a formula focused on five factors. These factors are total accidents, accident severity, percentage of population, percentage of centerline mileage, and road burden, which accounts for the miles of road per 1,000 population. AMATS filed a lawsuit arguing that the state cannot set an apportionment maximum or dictate the composition of the MPO policy board. The federal law was changed in 2005 to specifically note that members of the legislature are allowed on MPO policy boards in Alaska and Hawaii. The state argued that the funding cap does not limit project choices, only the type of funds. The state also argued that Title 23 clearly provides for state laws to establish policy board composition. The suit was dismissed in federal court, but was refiled in state court based on contract law theory.
- The state–MPO relationship raises questions related to state rights. The U.S. Constitution establishes that states are sovereign entities. Local agencies are subdivisions of each state with no inherent rights. The Title 23 MPO law has established hybrid entities with unclear legal status in view of constitutional protections.

Conflict or Confluence? MPO and State DOT Programming Responsibilities

John Poorman

John Poorman discussed the roles and relationships between state departments of transportation and MPOs related to programming transportation projects. He described two perspectives on the sometimes overlapping roles and suggested that the confluence view was the most appropriate and productive. John covered the following points in his presentation.

- Federal law establishes overlapping responsibilities for states and MPOs. The federal–state highway partnership has a 100-year history, but for the past 45 years, Congress has repeatedly reaffirmed and strengthened the MPO as the forum for planning and programming in metropolitan areas.
- All federal aid projects must be included in the STIP, which must also include the MPO's TIPs without modification. States have latitude regarding the geographic allocation of most federal transportation program funds, with the exception of the STP urban and the FTA programs. However, the MPO is the forum for balancing competing needs across jurisdictions, modes, and purposes.
- State departments of transportation are responsible for the statewide planning process and are jointly responsible for the metropolitan planning process. However, public accountability and federal oversight of the planning process focuses primarily on MPO practice. Federal legislation specifically states the following: "The metropolitan transportation planning process shall include development of a TIP for the metropolitan planning area by the MPO in cooperation with the State and public transit operators. The TIP must consider all projects or phases (including pedestrian walkways, bicycle transportation facilities, and transportation enhancement projects) within the metropolitan planning area proposed for funding under Title 23 of the United States Code, the Federal Highway Act, and Title 49 of the United States Code, the Federal Transit Act (with certain exceptions as specified in 450.324(f)(1)."
- Additional federal legislation language includes the following: "The financial plan shall be developed by the MPO in cooperation with the State and the transit operator. The State and the transit operator must provide MPOs with estimates of available Federal and State funds, which the MPOs shall utilize in developing finan-

cial plans. It is expected that the State would develop this information as part of the STIP development process and that the estimates would be refined through this process. Only projects for which construction and operating funds can reasonably be expected to be available may be included. In the case of new funding sources, strategies for ensuring their availability shall be identified. In developing the financial analysis, the MPO shall take into account all projects and strategies funded under Title 23, U.S.C., and the Federal Transit Act, other Federal funds, local sources, State assistance, and private participation. In nonattainment and maintenance areas, projects included for the first 2 years of the current TIP shall be limited to those for which funds are available or committed. Financial Constraint—23 USC."

- The overlapping responsibilities between states and MPOs can be viewed in two ways—as conflicts, or as confluence. The conflict perspective would suggest that the congressionally mandated MPO responsibilities are inconsistent with state responsibilities. It would further suggest that the overlap should be handled by separating responsibilities neatly into categories, such as "my money/your money."
- The following quote from a representative at a large MPO in the South provides an example of this perspective: "The MPO has programming authority, in conjunction with the state DOT, over CMAQ and urban-attributable STP funds. Agencies with direct programming authority of other federal sources, as well as any state and local funds, submit basic project information to the MPO for inclusion in the TIP."
- Here is another example of this approach from an MPO in the Midwest: "The state department of transportation typically develops a program for Interstate Maintenance, NHS, most STP, and bridge funds based on its own assessment of district needs and priorities. Last year the state department of transportation began developing a 7-year program that is submitted to the MPO for inclusion in the TIP. The first 4-year portion of the state department of transportation's program is proposed to be adopted by the MPO with few, if any, adjustments."
- The following is a final example from a state department of transportation in the East: "Information from state department of transportation management systems is not formally shared. The MPO TIPs contain areawide project category line items for system preservation activities such as resurfacing, bridge rehabilitation, and traffic control devices, and the department of transportation selects specific projects to implement."
- The result of the conflict perspective is that the MPO stature is diminished and the credibility of the state is reduced. Congressional intent is also not reflected in this practice.
- However, the confluence perspective views the overlap in responsibilities in a positive way by providing an improved product. Within the confluence perspective, overlapping responsibilities are not an either/or proposition.
- The following quotes provide examples of the confluence perspective: "The state department of transportation works out agreements on funding distributions with the MPOs as a group and submits its project proposals to compete head to head with those from other sponsors at the MPO table." "A joint state–MPO planning study is conducted to examine the 'domino' impacts on system design of alternative scopes of a bridge replacement—before the project is considered on the TIP." "The schedule and guidance for the state departments of transportation program update is shared simultaneously with the MPOs to ensure that internal state agency decisions are integrated with the broader TIP/STIP development." "All competitive fund sources are viewed as a pool as much as possible, and funding is directed to good projects that achieve the MPO plan without regard to mode or jurisdiction."
- With the confluence perspective, the state's practices are more fully integrated with the MPO process, and the MPO has greater influence. This perspective also provides greater potential for broad ownership of critical decisions, as represented in federal law. The quality and the impact of the products of the state and MPO processes are also greatly improved.
- A review of some of the activities at the Capital District Transportation Committee this past week provides an example of the confluence perspective; activities included the examination of alternative scenarios, a presentation by a state department of transportation representative, and discussions on CMAQ projects and safety issues. There was also a gubernatorial election last week.

Planning and Project Development at the Thurston Regional Planning Council

Thera Black

Thera Black discussed the planning and project development process at the Thurston Regional Planning Council (TRPC) in Thurston County, Washington. She described the characteristics of the area, the organizational structure, elements of the project development process, and potential future concerns. Thera covered the following points in her presentation.

- The TRPC covers a metropolitan area with a population of 143,000. The population of the entire Thurston County region is approximately 230,000. The MPO area includes portions of Thurston County. The

city of Olympia, the capital of Washington, is located in the county. TRPC is also the regional transportation planning organization (RTPO) for the area. RTPOs were created by state legislation. TRPC was established in 1967. The composition of TRPC and the Policy Board is diverse. In addition to the county and cities, members include Native American Tribes, three school districts, the transit agency, the economic development district, the public utility district, the regional library, the conservation district, and a state college.

- Since the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991, Washington State has been very proactive and progressive in incorporating changes into the planning and project selection process, including the flexible provisions of the act. A statewide steering committee was formed to help implement provisions of ISTEA. The steering committee included representatives from the governor's office, the state legislature, WSDOT, the Washington Association of Counties, the Washington Association of Cities, the state public transit association, the state port organization, and other groups. The steering committee reviewed the intent and the requirements of ISTEA and developed and agreed on an approach for distributing funding between the state and MPOs. This process included an active role for MPOs in the selection of CMAQ and some STP projects. The responsibility for selecting projects for funding in these categories represented a new role for MPOs in the state. Having funds to allocate changed the dynamics among agencies and governmental units. It took time to introduce and establish the new procedures, but by the end of ISTEA, the process was operating smoothly. Another steering committee was formed after the passage of the Transportation Equity Act for the 21st Century (TEA-21). It reaffirmed the basic roles, responsibilities, and processes established by the first committee; MPOs maintained a prominent role in the project selection process.
- Although there are differences in the project selection processes used by the various MPOs in the state and the amount of available funds, the approaches reflect local needs and priorities. TRPC's annual allocation is $2 million. Given this modest amount of funds, the decision was made to focus on projects addressing safety and efficiency rather than roadway capital projects. The process involves early public involvement and active participation by local agencies, organizations, and groups. The TRPC has reached out to nontraditional partners including tribes, school districts, nonprofit organizations, and advocacy groups. The school districts are the largest providers of transportation in the area. Numerous projects have been funded through this process that would not have been possible without the funding made available through TRPC.
- By the end of TEA-21 the process was clearly established and accepted. There have been some unsettling shifts since the passage of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Many people thought there would be another steering committee formed after SAFETEA-LU. A meeting was held that included many, but not all, of the agencies and groups represented on the two previous steering committees; for example, the state organizations representing public transit systems and the ports were not included. The meeting may be the start of a shift in focus to reflect more state priorities in the project selection process. A bill providing direction on the selection process for enhancement projects was introduced in the 2006 legislative session. The bill was not approved, but it may be reintroduced in the next legislative session. There is concern that the bill and other activities represent movement away from a coordinated and open process toward more of a state-directed program. The nickel gas tax increase is being used to fund projects specifically identified by the legislature. Many MPO representatives feel they need to be proactive to protect the current program, which focuses on local needs.

Doug Allen, Dallas Area Rapid Transit, moderated this session.

BREAKOUT SESSION

Stewardship and Role of the STIP and TIP

Sandy Straehl, *Montana Department of Transportation*
Lucy Ayers, *Hillsborough County Metropolitan Planning Organization*
Wayne McDaniel, *Parsons Brinckerhoff Quade & Douglas, Inc.*
Harlan Miller, *Federal Highway Administration*

State Perspective on the STIP: Theory, Law, and Reality

Sandy Straehl

Sandy Straehl described the theory and legislation relating to state transportation improvement programs (STIPs). She discussed some of the issues states are currently facing in transportation planning and programming, recent trends in congressional earmarking, and comments from AASHTO on the Notice of Proposed Rule Making (NPRM) on Planning. Sandy covered the following points in her presentation.

- In theory, the long-range transportation plan provides the vision and policy direction for a state or a metropolitan area. The STIP and transportation improvement plan (TIP) are based on the respective long-range transportation plans. The STIP and TIP also serve as resource planning and public disclosure documents, which are essential for good public policy. This structure, which was stressed in the Intermodal Surface Transportation Efficiency Act (ISTEA), moves away from a wish list planning approach that was used in many areas in the past.
- The specifications that address these elements are fairly general. Based on the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), 23 USC 135(g)(4)(D)(i) notes that each project in the STIP shall be consistent with the statewide transportation plan. Federal legislation further requires that the TIP and STIP be fiscally constrained. In addition, 23 USC 135(g)(4)(E) states the STIP shall include a project or project phase only if full funding can be reasonably expected to be available for the project within the time period contemplated for completion of the project.
- In reality, the STIP and TIP are becoming detailed accounting documents as they become less about public disclosure and more about financial planning. Fiscal constraint has a life of its own. Plans and programs are frequently playing catch-up to political processes. The funds available for prioritization through the traditional planning process are shrinking. Other pressures are also undercutting the STIP and TIP, including hyperinflated cost estimates.
- Financial fault lines in the process include earmarking of projects in federal legislation, federal aid funding trends, and cost estimation. The AASHTO Transportation Futures Policy Committee recently reviewed trends in earmarking in federal legislation and appropriations bills. The National Surface Transportation Policy and Revenue Study Commission has held hearings and receives input from AASHTO. The commission's goal is to develop a future vision for the national transportation system, including the network and funding. AASHTO is providing input to the commission.
- Earmarks in highway reauthorization bills grew from 10 projects in 1982 to some 6,371 projects in 2005. Earmarks have also grown as a percentage of the federal highway program. In ISTEA, earmarks accounted for some $6.1 billion, or 5% of the highway program over a 6-year period. In the Transportation Equity Act for the

21st Century (TEA-21), earmarks represented $9.4 billion, or 6% of the highway program. In SAFETEA-LU, earmarks represented $21.9 billion over 5 years, or almost 11% of the highway program.

- The earmarking process can cause problems for state and local agencies. Typically, the earmarked funds are inadequate to complete the project. As a result, other sources of funds must be found to complete the project. Completing the earmarked project may reduce funds for other priority projects. The earmarked projects may not come from transportation planning processes, and some projects are not even transportation-related. Recipients of earmarked projects often have inaccurate expectations regarding the federal aid requirements and funding. Administrative overburden may also be a problem, as projects may require more nonfederal match than sponsors anticipated.
- At the same time that more federal requirements are being placed on the programs, a smaller percentage of federal funding is going to core programs. In 1990, 100% of available funding was designated to core programs. In 1991, this figure declined to approximately 95%, with the remaining funds designated for Congestion Mitigation and Air Quality (CMAQ), recreation trails, and enhancement set-asides. By 1998, core programs received only 86% of the available funds, with additional projects in the special eligibility category. In 2006, core programs represented 82% of the total funding, with expanded special programs.
- According to AASHTO, there are federal funding risks associated with Highway Trust Fund revenues. Projected revenues will be $11.2 billion under SAFETEA-LU levels in 2009. The equivalent of a 3-cent fuel tax increase will be needed in 2009 to support SAFETEA-LU levels. One question might be whether STIPs should be revised and reduced to reflect this federal funding issue.
- Transportation agencies also face a significant loss of purchasing power. The construction program is experiencing hyperinflation. There was a 21% increase in construction costs from 2004 to 2005. As examples, the cost of diesel fuel increased by some 47%, the cost of crushed stone increased by almost 7%, the cost of concrete increased by 10%, the cost of asphalt increased by 12%, and the cost of steel increased by a little more than 10%. Real growth under SAFETEA-LU is some 0.3% annually, compared to the 6% annual growth under TEA-21. It is difficult for states to respond to these conditions. If inflation estimates are too high, nothing is fundable. If inflation estimates are too low, the STIP is overprogrammed.
- AASHTO has developed policy positions to address some of these concerns. The focus has been on using a three-tiered program that includes the Interstate, National Highway System (NHS), and other program categories. This approach provides broad flexibility and reduces the number of programs. Another position is returning to the percentage of the program in the core elements under ISTEA. There is also support for increasing funding for the next generation of the Interstate and NHS. Another position would be requiring earmarked projects to be derived from state or metropolitan long-range transportation plans, STIPs, and TIPs. One more position would be increasing apportioned dollars to all states and letting the planning process work rather than funding projects of national significance through congressional earmarks. Restoring the purchasing power of the gasoline tax is also noted as important.
- States and local areas can also take actions to reduce earmarking and to protect the STIP and TIP. Possible actions include adopting state-level policies against directed funds and working with congressional delegations to ensure that any earmarks are part of the planning and programming processes. Pursuing cradle-to-closeout cost estimation, educating decision makers on the loss of purchasing power, and returning to the original intent of fiscal constraint represent other approaches.
- One example is the Montana Transportation Commission Policy Number 5 on Earmarks, which has been in place since 1991. The policy urges the Montana congressional delegation to maximize core funding. If the delegation must earmark funds, the policy recommends the projects should come from the approved STIP. Furthermore, the state will not provide matching funds to projects not in the STIP. For projects in the STIP, if the match is more than normal, the requestor of the project must provide the extra funding. The requestor must also provide funds if the project costs more than the earmark.
- Related to cradle-to-closeout cost estimation, in 2005 the U.S. Government Accountability Office noted that delaying good estimates until a project is ready to move to construction is too late, as public investment decisions have already been made based on inaccurate cost–benefit expectations.
- Planning level cost estimation is important for a number of reasons. First, as project costs mature, they typically increase. The only STIP and TIP response is to move another project to future years or delay the delivery of the project. Without good cost estimation, the STIP and TIP return to being a wish list. Too much is spent on project development for projects that are not deliverable. Dropping projects from the STIP or TIP may result in negative political reaction.
- The recent NCHRP 20-24 project suggested it was best if the final closeout cost of a project was within 4% of cost at letting. Better cost estimation is needed. NCHRP Project 8-49 has developed a guidebook, *Procedures for Cost Estimation and Management for Highway Projects During Planning, Programming, and Preconstruction*, on the topic of cost estimation. And

several states are pursuing comprehensive project cost estimating, including Montana, Washington, and Virginia. Every state and agency is different, so the guidebook will need to be adjusted to meet specific needs.

- AASHTO has also provided comments on the NPRM on Planning. The AASHTO comments noted: "The proposed regulations escalate the recent trend toward an increasingly bureaucratic, prescriptive, and inflexible approach to fiscal constraint. This approach could convert fiscal constraint requirements from an effective planning tool into a duplicative, counterproductive budgeting and cash management exercise, which is not what Congress intended."
- The fiscal constraint elements in the NPRM move from guidance toward regulation. For example, all costs and revenues for maintaining the entire transportation system need to be addressed, including private elements of the system, such as rail. These requirements raise numerous questions related to defining adequate maintenance, public agencies defining private-sector needs, the level of detail, and balancing and rebalancing cost and project changes. The level of information integration that the regulations assume is available is not present in most states and MPOs.
- Challenges that states and MPOs continue to face include reduced funding and trends that undermine performance-based programs. Work is needed within agencies to improve project cost and schedule estimations. There is a need to reverse the trend that is turning fiscal constraint into a cash management exercise.

Programming for Transportation: One MPO's Experience

Lucy Ayers

Lucy Ayers described programming at the Hillsborough County MPO in Florida. She discussed the organization of the MPO policy board, the planning and programming processes, and examples of innovative project financing. Lucy covered the following points in her presentation.

- The Hillsborough County MPO Policy Board includes 13 voting members. The voting members include representatives from Hillsborough County, the City of Tampa, the City of Plant City, the City of Temple Terrace, the Hillsborough County Aviation Authority, the Tampa Port Authority, the Expressway Authority, and Hillsborough Area Regional Transit (HART). Hillsborough County has four representatives on the policy board, and the City of Tampa has three representatives. All other members have one voting representative. There are also two nonvoting members representing the Florida Department of Transportation (FDOT) and the Hillsborough County–City County Planning Commission.
- The STP program allocates some $60 million to projects annually. Priorities of the STP program include improving safety, enhancing congestion relief and prevention, preserving the system, supporting intermodal and multimodal transportation, supporting efficient land use, encouraging community support, and ensuring consistency with the 2025 long-range transportation plan.
- The Transportation Enhancement Program allocates approximately $10 million to projects annually. Transportation Enhancement Program priorities include supporting bike and pedestrian trips, enhancing scenic resources, and enhancing historic, cultural, and archeological resources. Other Transportation Enhancement Program priorities include environmental mitigation, educational activities, and consistency with the 2025 long-range transportation plan.
- The CMAQ program category includes some $46 million in annual funding. CMAQ priorities focus on removing vehicles from roadways, reducing travel delay, and changing driving behavior. CMAQ projects must have efficient cost–benefit ratios with benefits realized within 3 years. CMAQ projects must also be consistent with the 2025 long-range transportation plan.
- The historic TECO Line Streetcar System in Tampa provides an example of a project supported by many nontraditional partners. The project had strong support from the City of Tampa and took advantage of flexible funding provisions and innovative public–private partnerships. Cooperation from FDOT was critical to the success of the project. The MPO was able to flex federal STP funds in combination with state funding. Funding also came from the private sector and other sources. In addition, the MPO assisted HART with CMAQ applications.
- The metropolitan area received approximately $46 million in SAFETEA-LU priority projects. These projects included widening Cross Creek Boulevard, making safety improvements on Kennedy Boulevard, modifying the Platt Street Bridge, modifying the Temple Terrace Highway, and replacing the Columbus Street Bridge. Other earmarked projects include the Plant City Traffic Management Center, the I-4/Crosstown Connector, and the Busch Boulevard Corridor. Public transportation projects receiving earmarks include bus purchases and facilities, transit emphasis corridors, and bus rapid transit.
- The programming process at the MPO is similar to the process used at other MPOs, and includes the following steps. First, the MPO adopts the TIP priorities. Second, FDOT develops a tentative program based on funding availability. Third, the MPO adopts the TIP including the FDOT statewide priorities. Finally, the STIP is approved by the state legislature.

- There are issues associated with the programming process. These issues are not unique to the Tampa metropolitan area. First, there is a discrepancy between the state and the federal fiscal years. Another issue is the lengthy TIP development process. In addition, funding estimates are not typically available during the MPO prioritization process. STIP programming focuses on state priorities rather than metropolitan priorities. The lag in programming projects deferred because of cost increases is also an ongoing issue. Projects must then be rescoped, which can result in more delays.
- There are also programming issues related to public transportation projects. The transit agency applies for federal funds, with the actual funding amount determined at the federal level. The TIP and STIP are often amended after the decisions have been made on the transit projects at the federal level.
- There are opportunities for improving the programming process at the MPO. One opportunity relates to closer coordination and participation at the local level in project management and programming of funds. Another opportunity would be to focus on coordinating FDOT programming processes for FHWA and FTA funds.

Integrating Asset Management into the Metropolitan Planning Process

Wayne McDaniel

Wayne McDaniel discussed asset management and the metropolitan transportation planning process. He described a recent peer exchange on the topic sponsored by FHWA. Wayne covered the following points in his presentation.

- An FHWA peer exchange on integrating asset management into the metropolitan planning process was conducted July 18–19, 2006, in Traverse City, Michigan. The peer exchange was sponsored by the FHWA Office of Planning and the Office Asset Management, in support of the AASHTO Standing Committee on Planning Capacity Building Task Force.
- A number of transportation agencies participated in the peer exchange. State departments of transportation from Colorado, Maryland, Michigan, New York, Ohio, Oregon, and Washington participated. MPOs participating included the Baltimore Metropolitan Council, the Capital District Regional Planning Commission, the Houston–Galveston Area Council, the Lane Council of Governments, the Northeast Ohio Areawide Coordinating Agency, the Pike's Peak Area Council of Governments, and the Southeast Michigan Council of Governments. The states and MPOs participating in the peer exchange represented a cross section of experience with the use of asset management.
- Asset management can be defined as a strategic approach to managing infrastructure. Asset management is primarily oriented to the preservation and maintenance of existing assets. It is strategic, taking a longer, policy-related view, and is tied to the goals and objectives in the long-range transportation plan or other document. Asset management is systematic and analytical, representing a shift from a reliance on anecdotal evidence. At its core, asset management is about resource allocation.
- Participants in the peer exchange identified a number of benefits from asset management. Information on technology improvements has allowed investment decisions to be more data driven. Asset management can help to depoliticize resource allocation and to obtain support for preservation. Asset management can be used to set and meet performance targets and agency goals. Measurable results are being documented from the use of asset management in many areas. For example, in Michigan, the percentage of roadway pavements in poor condition went from 36% to 9% over a 10-year period, using an asset management program and additional funding.
- The use of asset management is most advanced in pavement and bridge management. Many states have good databases on the condition of pavements and bridges. Techniques for allocating funds and prioritizing projects are most advanced within an asset category rather than across asset categories. Many state departments of transportation use asset management to emphasize a preservation-first approach. Asset management applications with other modes are more limited.
- MPOs play varying roles in asset management. Some MPOs are primarily involved in capacity expansion and have limited involvement in preservation and maintenance. Other MPOs address preservation and maintenance, but only at the program level. Still others MPOs take an active role in preservation and maintenance, as well as new capacity.
- A number of trends in MPO involvement in asset management were identified during the workshop and through other methods. First, there is increasing interest by MPOs in asset management. Second, the initial step is often the collection of data on system conditions. For example, the Southeast Michigan Council of Governments in the Detroit area and the Capital District Transportation Committee (CDTC) in the Albany area use condition data to assess long-term funding needs for system preservation.
- Potential future roles for MPOs in asset management were also discussed during the peer exchange. These roles include developing asset management programs similar to those at state departments of transportation, sharing information through web-based data transfer with state departments of transportation, and

acting as the asset management champion or facilitator for local governments.

- Participants identified a number of challenges in integrating asset management into the MPO process. The first challenge relates to staffing. Data collection and analysis requires extensive training and experience for MPO staff, and many MPOs continue to experience staff turnover. Selectivity in data collection was also identified as a challenge. Many participants stressed the importance of collecting only key data that will be needed and used. The lack of uniformity in information technology systems was noted as hampering data transfer between MPOs and state and local governments. Also, the lack of integrated resource allocation processes with capacity expansion and safety projects and programs was also noted as a challenge.
- Examples of follow-up activities after the peer exchange include conducting a survey of MPOs on the use of asset management, defining the role of MPOs in asset management, and promoting best practices of MPOs in asset management. The survey would obtain information from MPOs on awareness and interest in asset management, current and planned activities, the current level of involvement in preservation, and existing organizational structures for asset management programs.
- Possible research topics related to asset management were identified at the peer exchange; these included refining methods for cross-asset analysis, techniques for integrating capital and safety projects into asset management, including nonfinancial goals in asset management, incorporating replacement needs into asset management, refining performance measures, and developing economic justification.

Revenue, Fiscal Constraint, and Finance in Transportation Planning

Harlan Miller

Harlan Miller discussed financial aspects of the metropolitan transportation planning process, including fiscal constraint. He described revenue forecasting and cost-estimation approaches, transportation systems operation and management, innovative finance mechanisms, and big-ticket or mega-transportation projects and financing plans. Harlan covered the following points in his presentation.

- Revenue forecasts in the TIP and STIP are developed cooperatively between state departments of transportation, MPOs, and public transportation operators. The forecasts include public and private sources of proposed revenues. Funding sources included are those that are reasonably anticipated to be available. Funding sources that are available or committed are included for the first 2 years of the TIP and STIP in the areas of air quality nonattainment and maintenance. The forecasts may also include estimates of future federal revenues outside existing federal authorizing legislation.
- Cost estimating is a major issue in demonstrating fiscal constraint. Several different resources are available for use in developing cost estimates. NCHRP Project 08-49, *Procedures for Cost Estimation and Management for Highway Projects During Planning, Programming, and Preconstruction*, presents a number of good practice examples and techniques. NCHRP Project 08-49(2), *Right-of-Way Methods and Tools to Control Project Cost Escalation*, also presents approaches for examining and containing cost escalation with projects. Cost ranges are acceptable for financial plans that support the metropolitan long-range transportation plan, particularly beyond the first 10 years.
- SAFETEA-LU contains requirements for metropolitan long-range transportation plans to include operational and management strategies to improve the performance of existing transportation facilities, as well as capital investments and other strategies to preserve the existing and projected future transportation infrastructure. Regarding fiscal constraint related to highway and transit operations and maintenance, FHWA and FTA defer to states and local agencies to define appropriate levels of operations and maintenance.
- Examples of innovative finance mechanisms include tolling, Grant Anticipated Revenue Vehicles (i.e., GARVEE bonds), and state infrastructure banks. Other approaches include the Transportation Infrastructure Finance and Innovation Act, advanced construction, and public–private partnerships. These approaches are being used in various states and metropolitan areas.
- There are additional requirements for big-ticket or mega-infrastructure projects, including finance plans and project management plans. FHWA Major Highway Projects and FTA Capital Investment Grant or New Starts projects require specific cash-flow schedule information. These project-specific finance plans can be a valuable resource for information on annual needs and sources of revenues for developing metropolitan long-range transportation plans, TIPs, and STIPs.

Jay Kline, Dallas Area Rapid Transit, moderated this session.

PLENARY SESSION PANEL

Institutional and Organizational Issues

Thomas Brigham, *HDR Engineering, Inc.*
Scott Paine, *University of Tampa*
Jay Kline, *Dallas Area Rapid Transit*
Doug Allen, *Dallas Area Rapid Transit*
John Poorman, *Capital District Transportation Commission*

Report on the Policy and Politics in the Process Panel

Thomas Brigham

The panel discussed policy and politics in the transportation planning and programming process, and the relationship between the technical aspects and the policy aspects of the processes. Two of our speakers talked about their experiences serving as local elected officials.

John Sweek from FTA began the session with an overview of the evolution of the federal transportation planning and programming requirements over the past 40 years. He noted that what began primarily as a state-driven construction program has slowly evolved into a broader process involving MPOs, state departments of transportation, transit agencies, and other groups. More active and extensive public involvement elements have also evolved over the years.

Scott Paine from the University of Tampa and John Mason from SAIC provided perspectives on their experiences as local officials. Scott served on the Tampa City Council and was a member of the Tampa Metropolitan Planning Organization (MPO) Policy Board. John served on the Fairfax, Virginia, City Council, was the mayor of Fairfax, and was a member of the MPO policy board in the Washington, D.C., region and of other transportation advisory groups. Both Scott and John emphasized that public policy and politics are a natural and positive part of the transportation planning and programming processes. They also agreed that local officials can have a regional perspective when serving on MPO policy boards, while maintaining an interest in their local area. They also noted that the public policy orientation provided by policy board members is an important balance to the technical expertise of MPO staff.

Scott and John also discussed the effects term limits have on MPO policy boards. Areas with term limits for local offices experience turnover in the MPO policy boards. This turnover reinforces the need for ongoing education and training for policy board members. They were in agreement that transportation plans developed with the involvement of local policy makers and the public are more likely to be successful than plans imposed by technical staff.

Tampa Local Official's Perspective

Scott Paine

As Tom mentioned, I served on the Tampa City Council and on the Tampa MPO Policy Board, including serving as chair of the Policy Board. I will add a few additional comments to the points Tom noted about the session on policy and politics in the transportation planning and programming processes.

There is an expectation that local elected officials who become involved in transportation issues need to become familiar with the planning and programming processes and procedures. An understanding of the processes, requirements, and procedures is indeed critical for becoming an effective participant. The reverse is also true, however. Technical staff involved in transportation also must have an understanding of the political process,

public policy, and how decisions are made at the local and state levels.

Fairfax Local Official's Perspective

Jay Kline

We also had a very good session, focused on stewardship and the role of the State Transportation Improvement Program (STIP) and transportation improvement plan (TIP). The four speakers in the session provided different perspectives on key elements of the STIP and TIP processes. Three general themes emerged from the presentations: federal earmarking of projects, asset management, and fiscal constraint.

Sandy Straehl from the Montana Department of Transportation began the session with a discussion of the basic requirements relating to the STIP and TIP. She highlighted recent information from AASHTO on the increase in project earmarking at the federal level. She provided ideas on what states, MPOs, and local communities can do to discourage earmarks or to ensure that earmarked projects are in the STIP and TIP. She described the potential for financial fault lines in developing the STIP resulting from federal earmarking and changes in the Federal Aid Program. She also discussed the need for improved project cost estimates.

Lucy Ayers from the Hillsborough County MPO in Florida provided an overview of the transportation planning and programming processes in the Hillsborough metropolitan area, which includes the City of Tampa. She noted that federal earmarks have been used to address priority needs in the area. She also described examples of innovative funding for the TECO Line Streetcar System and other projects in the area.

Wayne McDaniel from Parsons Brinckerhoff Quade & Douglas, Inc., discussed the major topics covered in a recent FHWA-sponsored asset management peer exchange. He described the key elements of asset management, the possible roles of MPOs and state departments of transportation, and the benefits of using asset management.

Harlan Miller from FHWA discussed the financial aspects of transportation planning, including the fiscal constraint requirements. He described available guidebooks and tools on project cost-estimating techniques.

Report on the Agency Relationships and Roles Panel

Doug Allen

I will highlight a few of the key points from the four speakers and the topics discussed. The speakers focused on the different roles of agencies at the different levels.

Ned Conroy from FTA Region 10 outlined the three major elements he examines in reviewing TIPs, after ensuring that all the federal requirements have been addressed. These three elements are a link to the long-range transportation plan, the cooperative development of the TIP with the involvement of other agencies and groups, and the ability to implement the TIP. Ned's comments reflected the perspective from a federal agency.

Jeff Ottesen from the Alaska Department of Transportation and Public Facilities (ADOT&PF) described the unique challenges related to transportation planning and programming in Alaska. He talked about the size of Alaska—which you know is large when it can humble someone from Texas. Based on the size and basic needs of many areas, it appears that the transportation planning and programming processes have been more of a state-driven exercise. Jeff described some of the recent issues between ADOT&PF and the MPOs in the Fairbanks metropolitan area and the Anchorage metropolitan area. One of the points his presentation highlighted for me was how the transportation planning and programming processes can be adapted in a large state with significant basic needs in rural areas.

John Poorman from the Capital District Transportation Commission in Albany, New York, provided a provocative presentation on the roles and relationships between state departments of transportation and MPOs. He described two perspectives on the sometimes overlapping roles—conflict and confluence—and suggested that the confluence view was more appropriate and productive. His comments highlighted how the confluence approach in the Albany area has resulted in a collaborative and cooperative planning and programming effort.

Thera Black from the Thurston Regional Planning Council described the key elements of the transportation planning and programming processes in Thurston County, which includes the Olympia, Washington, area. She noted the diverse nature of the agencies, organizations, and groups represented on the MPO policy board. This diversity enhances the transportation planning and programming processes and helps promote consensus.

Summary Report on MPO and State DOT Programming Responsibilities

John Poorman

A number of common themes emerged from the presentations and discussions during the first breakout sessions. Beginning with the opening plenary session, I think we heard agreement among the panelists on the key issues we are facing in transportation planning and programming. However, there seemed to be diverse reactions to how we should address those issues.

The comments from federal agency representatives focused on the current process and requirements. The speakers representing state and local agencies suggested that changes are needed in the existing process to better address key issues and opportunities and to better complement the existing federal process.

The discussion in the sessions today focused primarily on the federally controlled process, including the TIP and the STIP. The sessions tomorrow will provide an opportunity to discuss more of the technical elements of the various processes.

John Poorman moderated this session.

PLENARY SESSION

Program Development

Steve Heminger, *Metropolitan Transportation Commission, San Francisco*
Jacob Snow, *Regional Transportation Commission of Southern Nevada*
Aaron Butters, *Washington State Department of Transportation*

National Surface Transportation Policy and Review Study Commission

Steve Heminger

My comments focus on the National Surface Transportation Policy and Revenue Study Commission, which was established in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). I was appointed to serve on the commission by the House Democratic Majority Leader, who later became the first woman elected Speaker of the U.S. House of Representatives.

The chairman of the commission is established by SAFETEA-LU to be the secretary of the U.S. Department of Transportation. We have had three chairmen so far. Norman Mineta served as the chair until he resigned as secretary of Transportation. The deputy administrator served as chair until Mary Peters was named as the new secretary of the Department of Transportation. The members of the commission have very diverse backgrounds, experience, and expertise. There is good representation across modes.

The statutory mandate for the commission is very broad. It will be a challenge to narrow the commission scope to a key set of issues to address the main mandate of redefining the federal interest for a national transportation program. I think we would all agree that a national focus has been missing recently.

The federal transportation program had a clear vision when it was created in the 1950s. That vision was to build the Interstate system, which has been accomplished. I do not think the commission will identify a national transportation vision as clear and as unified as the Interstate system again. Our challenge, instead, is to identify an appropriate mission to help restructure the federal program and to maintain an important funding stream to finance the program.

The commission is holding a series of field hearings throughout the country to provide opportunities for input from stakeholders. The first field hearing was held in Dallas, with additional hearings in New York City, Memphis, Los Angeles, Atlanta, Chicago, and Minneapolis. The commission's final report, scheduled for release in December 2007, can be found at www.transportationfortomorrow.org/.

I will highlight a few of the topics that appear to be candidates for stronger, more visible, and more direct federal interest. These are my own thoughts and views; the commission has yet to develop a consensus on any priorities or recommendations.

The first topic is system maintenance, one of the few areas where we have actually seen improvement over the past few decades. For example, the pavement ride quality on the National Highway System improved from 39% "good" in 1997 to 52% "good" in 2004. Bridge deficiencies have declined over a similar time period. Both trends are good news and reflect a federal priority on maintenance and system preservation.

Traffic congestion does not reflect the same positive trend. The percentage of vehicle miles traveled (VMT) under congested conditions has increased from some 26% in 1995 to approximately 32% in 2004. In 1982, only commuters in the Los Angeles area averaged at least

40 h in congestion annually. By 2003, commuters in 24 urban areas experienced at least 40 h of congestion on an annual basis. Traffic congestion is a national problem, and we do not have a consensus on how we should address the situation. In many areas, the consensus appears to be that nothing can be done to improve the current situation.

Transit ridership has grown over the past decade. From 1995 to 2004, there was a 23% growth in total transit ridership. This growth has not had a significant impact on reducing traffic congestion, however. We need to be careful not to overpromise the benefit of transit. We are adding major transit investments in corridors and areas where we lack the means to add highway capacity.

To be blunt, safety is a national disgrace. While federal officials promote safety as a priority and recent federal legislation has safety in the title, 40,000 people a year are still killed on the roadway system. This figure has been constant since the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA); no real progress has been made. Annual fatality rates per 100 million VMT had been declining since 1986 but increased in 2005. Transit is a relatively safe mode, with only 248 transit fatalities in 2004.

Freight and goods movement are key areas for the economic vitality of this country. A significant element of the recent transportation bond election in California is devoted to goods movement and international trade, as well as mitigating some of the impacts on air quality from freight shipments. In my view, a strong federal role is critical for addressing freight, goods movement, and international trade issues. The projected growth in freight volumes is going to overwhelm many metropolitan areas and states. The Port of Long Beach is forecast to experience the largest increase in maritime trade, but significant growth is also anticipated at other ports. All regions of the country will experience more freight movement as a result of the growth in maritime trade. Railroads, trucking, and roadways and highways will all be affected.

These forecasts reinforce the need for national leadership in the freight arena. Currently, there is no national freight policy and no policy related to the movement of goods. Trucking currently dominates domestic freight movement. Rail is important for the movement of bulky, lower-value commodities and heavy shipments moving long distances. The rail network has been rationalized and downsized to a core network that is descended from 19th-century design. The decline in track-miles of Class 1 railroads has been driven by business decisions of the railroads. The loss of active rail lines limits future options and reduces the ability to meet increasing freight demands.

The final topic area I will discuss is finance, which is core to the commission's charge. The commission made a conscious decision to examine policies first—"policy" being part of the commission's title—before addressing revenues, the second part of the commission's title. After there is agreement on needs and appropriate policies, the funding methods and mechanisms can be identified.

There is a short-term funding problem with the Highway Trust Fund. The Trust Fund cannot support the level of highway expenditures enacted in SAFETEA-LU. You may hear the comment that the Trust Fund is going broke. That is not really the case. When the Trust Fund balance reaches a negative level, we cannot spend as much. It will not be able to support the level of expenditures that have been authorized. It appears the Highway Trust Fund will reach a negative balance in 2008 or 2009, depending on revenues. The transit program is in slightly better shape; it is projected to maintain a positive balance through 2013.

The Trust Fund problem pales in comparison with the longer-term problem related to the decades of underinvestment in the transportation system. The U.S. Chamber of Commerce has estimated that the funding gap to maintain the current system is $50 billion a year through 2015 and the funding gap to improve the system is $107 billion a year. A 50-cent increase in the fuel tax would be needed to address this gap. The fuel tax has lost significant purchasing power because it has not been adjusted at the federal level and in most states. At the same time, street and highway construction costs have increased dramatically over the past few years. Historically, construction costs have closely tracked inflation. Since 2004, however, construction costs have been increasing rapidly.

It is also important to consider the impact of energy independence or energy security on transportation financing. As Tom Friedman noted in the *New York Times,* we are financing both sides of the war on terror. We are fighting a war, but we are also purchasing oil, providing revenues that can be used to fight against us. At the same time, we have not developed an alternative fuel industry or developed new supplies. Examining the fuel economy for new light-duty vehicles for model years 1975 to 2004 identifies an interesting trend. Fuel efficiency was improving during the 1970s and 1980s. During the 1990s and 2000s, however, automobile manufacturers traded efficiency gains for performance.

California and other states have approved legislation with higher fuel-efficiency standards. These measures are being litigated in federal court. California recently approved legislation to regulate climate change on a statewide systematic basis. The technology is available to address these concerns; it is just not being deployed.

I think this issue may be one of the more significant topics the commission examines. I am promoting the adoption of a performance-based approach. For example, performance targets would be set for reducing fatalities and congestion levels, increasing fuel efficiency, and

other measures. This type of performance-based approach is appropriate across modes and across conditions.

More information on the commission is available at www.transportationfortomorrow.org.

Transit Programming Challenges

Jacob Snow

I appreciate the opportunity to provide a perspective from a metropolitan planning organization. The Regional Transportation Commission (RTC) of Southern Nevada is somewhat unique in that we are also an operating agency. The RTC is responsible for operating transit service in the area, as well as the coordinated traffic signal system.

I think that many people in the transportation arena—including myself and many policy makers and members of the public—are skeptical about the interest of private toll road consortiums in leasing existing facilities and building new projects. You are all familiar with the recent long-term leases of the Chicago Skyway Toll Bridge and the Indiana Toll Road. I think public toll road agencies are capable of developing, financing, and operating toll projects. I think there are opportunities for transit systems to work with public toll agencies to develop and operate needed projects.

Public transportation agencies around the world are developing and operating toll facilities and congestion pricing programs. London Transport implemented the congestion pricing program in the central area of London a few years ago and successfully reduced traffic volumes in the central area of the city.

It is important to remember that the different modes have different strengths and weaknesses. A strength of the automobile is the ability to serve diverse origins and destinations. Transit works best in serving major travel corridors, where large numbers of people are traveling from similar origins to the same destination. Both automobile and transit are essential to different types of mobility. Effective transportation plans can take advantage of the different strengths of each mode and clarify the land uses that best match them. The automobile better serves low-density development, whereas transit better serves high-density development.

A number of challenges face FTA's New Starts Program. It is important to prudently select projects with the most merit. It is also important to ensure a transparent selection process. Weeding out ineffective projects is key. There are numerous areas pursuing projects, so selecting the most effective ones is not an easy process. New Starts projects can help with congestion relief by adding new capacity, but they are unlikely to significantly reduce congestion. I think we will continue to see a New Starts Program at the federal level, but I think it will be much more competitive.

Transit agencies and operators also need to continue to look for opportunities to improve services through coordination with managed lanes projects and toll roads. These facilities can provide the infrastructure needed for bus rapid transit (BRT). In effect, managed lanes provide a virtual fixed guideway for BRT. The dedicated bus lanes in New York City are an example of this approach.

Key elements of BRT include providing frequent service using comfortable buses. Making fare payment easy is also important. All these elements improve the image of transit. When we started using double-decker buses for service along the Strip in Las Vegas (we call a double-decker a "Deuce") ridership increased by 50%. There has also been a $650 million private investment in a monorail in Las Vegas, but the monorail is losing money because it is not located along the Strip. This experience reinforces the importance of central access to transit.

The RTC's future plans focus on BRT. The first BRT line has been implemented along Las Vegas Boulevard North. Called "MAX," the BRT system includes new articulated buses, specially designed shelters, bus-only lanes in specific areas, and other service enhancements. BRT will be implemented in additional corridors in the future. The private sector has participated in funding stations and other system components and has also expressed a willingness to fund the local match for a dedicated bus lane along the Strip.

In conclusion, I think that transit agencies and operations need to seek increased private-sector participation. The New Starts Program will need to favor fewer capital-intensive programs, including BRT and virtual fixed guideway systems, to be sustainable. It is important to focus on the strength of transit. I think we also need to count on more local funding, including tolls.

Programming Challenges Within Washington State

Aaron Butters

My comments focus on some of the transportation programming challenges we are facing here in Washington State.

I would like to first highlight the organization of the planning and programming functions at the Washington State Department of Transportation (WSDOT). The Headquarters System Analysis and Program Development Office is part of the Strategic Planning and Programming Division. There is a separate Planning and Policy Office in the division that works in parallel with

us. Each WSDOT region has a Planning Office and a Program Management Office. We work with all these offices in developing the plan and the biannual program.

Programming decisions in the state are guided by the Washington Transportation Plan (WTP). State law, regional policy, and commission policy are all part of the WTP. The legislature, commission, governor, and WSDOT secretary provide policy direction. Data on system conditions and use, deficiencies, and conceptual solutions provide input to the WTP. One output of the WTP is the investment plan, which is a 10-year decision-making tool. It includes a narrative of the unfunded needs, concepts, and solutions, as well as state projects and statewide programs. A state law requires system plans for highways, aviation, transit, rail, ferries, marine ports and navigation, and regions.

Both state and federal law contain guidance on specific areas of consideration or emphasis. Broad categories of emphasis include preserving the existing system, increasing safety and security, increasing mobility, and protecting the environment. Other emphasis areas include increasing connectivity and integration, promoting efficient management and operation, and addressing land use and transportation consistency. As noted, state law also directs the preparation of certain modal plans. The state highway system plan includes elements related to preservation, maintenance, capacity improvement, scenic and recreational areas, and paths and trails. Other required plans include the ferry system plan, aviation plan, marine ports and navigation plan, freight rail plan, intercity passenger rail plan, bicycle and walkways plan, and public transportation plan.

Projects in the highway capital program represent implementation of WTP policies. The WTP goals may relate to multiple strategies in the Highway System Plan. There is a ranking and prioritization process in different categories. There are 27 categories in the Highway Capital Program. The program of projects represents the outcome of this process.

There are specific legal requirements for prioritization. For example, state law requires that preservation program projects must consider the lowest life-cycle costing. The preservation program must require use of the most cost-effective pavement surfaces, considering life-cycle cost analysis, traffic volume, subgrade soil conditions, environmental and weather conditions, materials available, and construction factors. Ensuring the structural ability to carry loads imposed upon highways and bridges is also required, as is minimizing life-cycle costs. A 2-year detailed plan of projects and an investment plan for the remaining 8 years is required.

The 10-year investment program for improvements must identify projects for 2 years and major deficiencies proposed to be addressed in the 10-year period, giving consideration to relative benefits and life-cycle costing. Priority programming for the improvement program must be based primarily on traffic congestion, delay, and accidents; location within a heavily traveled transportation corridor; and synchronization with other potential transportation projects, including transit and multimodal projects, within the heavily traveled corridor. A cost–benefit analysis is used to assess the value of proposed projects. Higher priority is given for correcting identified deficiencies on facilities of statewide significance.

Priority programming for the improvement program may also consider a number of factors, including support for the state's economy, such as job creation, job preservation, and the cost-effective movement of people and goods. Other factors include accident and accident risk reduction, protection of the state's natural environment, and continuity and systematic development of the highway transportation network. Additional factors address consistency with local comprehensive plans, consistency with regional transportation plans, public views concerning proposed improvements, and conservation of energy resources. Still other factors are feasibility of financing the full proposed improvement, commitments established in previous legislative sessions, and relative costs and benefits of candidate programs. These factors make it more difficult to have a manageable, robust prioritization process for new capacity projects.

In 1990, the 5-cent gasoline tax increase provided needed revenues for projects. In 1998, the legislature approved Referendum 49, which was a ballot measure to commit the motor vehicle excise tax revenues to support a bonding program for the Highway Capital Program. The referendum was approved by voters in the state. WSDOT started work on projects, but a voter initiative was approved to repeal the motor vehicle excise tax. The initiative was overturned in state court because it addressed two separate subjects, which is prohibited in the state constitution. In 2000, however, the legislature did repeal the motor vehicle excise tax. Bonds continued to be sold to keep the capital program moving. A one-time increase in the Federal Aid Program was implemented to advance construction. It takes a long time to recover from the use of the advance construction approach.

In 2002, the legislature approved Referendum 51, which was a 9-cent increase in the state gasoline tax. Referendum 51 was not approved by the voters, however. In 2003, the legislature approved a 5-cent increase in the state gasoline tax. Called the Nickel Tax, it was tied to specific projects. In 2005, the legislature approved a 9.5-cent increase in the gasoline tax, which was also tied to specific projects.

There are a number of challenges in programming in the state. These challenges include revenue decisions tied

to specific projects, large project commitments that limit the availability of future funding, and increasing project costs. There is little funding available for new investment decisions, yet expectations for new projects remain high. Managing the sources of funds to specific projects represents another challenge. The proposed regional investment plans and constraining new commitments also present challenges.

Lance Neumann, Cambridge Systematics, Inc., moderated this session.

BREAKOUT SESSION

Untangling the Purse Strings
Funding, Distribution, and Allocation

Stevan Gorcester, *Washington State Transportation Improvement Board*
Ashby Johnson, *Houston–Galveston Area Council*
Rachel Falsetti, *California Department of Transportation*

Washington State Transportation Improvement Board

Stevan Gorcester

Stevan Gorcester discussed the mission, role, and grant programs of the Washington State Transportation Improvement Board. He described the development and use of the board's performance management system and covered the following points in his presentation.

- The Washington State Transportation Improvement Board receives 3 cents of the state gasoline tax per gallon. This revenue is distributed to local agencies through a series of grant programs. The Washington State Transportation Improvement Board is a small, separate state agency with 12 staff members. The board awards and manages state investments in local street and sidewalk programs.
- The tax structure in Washington State is somewhat unique. Washington is one of the few states in the country without a state income tax. The state legislature controls all tax fields, so local governments have little power to raise revenues. As a result, local agencies, especially small agencies, are not able to generate the revenues needed for local streets and sidewalks. The board's grant programs provide an important source of funds for local agencies. This role also makes the board a major partner in the federal and the state transportation programs.
- The board is currently funding approximately 400 projects; some 250 of those also have state funding. The board's programs focus almost exclusively on capital projects, with 98.5% of the funding allocated to capital projects. The board's role in these projects focuses on fiscal management and problem solving. The board is not the owner or operator of any transportation element. That role is the responsibility of the Washington State Department of Transportation, local governments, and other agencies. The board's overall goal is to achieve fully funded and completed projects.
- The board administers six funding programs. The Urban Corridors Program focuses on meeting economic development objectives. It is a growth management investment program. The Urban Arterial Program and the Small City Arterial Program are two subprograms under the Safety and Preservation Investment Program. There is also a separate Sidewalk Program. In 2005, the state legislature approved a 9.5-cent increase in the state gasoline tax. This legislation created a new program for the board called the Small City Preservation Program. Currently, the board is a major source of funding for small agencies with respect to implementing their capital improvement programs and maintaining their street systems.
- The board has a sophisticated performance management system that uses software developed in house. The software accesses the project database and produces performance statistics on projects. The results are displayed graphically and in tables on the agencies' intranet site. The first page, called the "Bell Weather," displays project data in real time. The system has helped ensure that the board does not overcommit on funding, which has happened in the past. Previously, it took 2 to 3 days to manually generate summary information on active projects.

- Developing and implementing a performance management system does not happen overnight. It took about 2 years to develop, test, and fully integrate the current performance management system. The system provides data by project phases, financial status, and other measures. The system provides alerts on high project balances and low project balances. The board uses the balanced scorecard strategic planning method developed at Harvard University, which is required by the state. This method produces a summary chart that shows the status of all the strategies in the strategic plan. The system identifies whether the performance targets are or are not being met, including on-time payments and meeting project budgets. The project inventory can be mapped by county. Projects not meeting performance targets are displayed in yellow or red. Detailed information on each project, including a map, can also be displayed.
- To better identify the economic outcome of a project, a new database was developed. Data on the assessed valuation of property served directly by a project are obtained before and after the project is completed. Similar data are collected for the community as a whole. The system examines whether the assessed valuation of the property served increased at a faster rate than for the community as a whole. The results of this monitoring program show that investments in the projects do provide an economic return to a community.

Transportation Programming in the Houston–Galveston Region

Ashby Johnson

Ashby Johnson discussed the transportation improvement plan (TIP) and project programming process at the Houston–Galveston Area Council (H-GAC). He described the characteristics of the metropolitan area, the TIP development process, and recent activities related to toll facilities and hurricane evacuation planning. Ashby covered the following points in his presentation.

- The metropolitan transportation planning area covers an eight-county region. The eight counties include Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller. Houston, which is located in Harris County, is the largest city in the metropolitan area. The eight-county region covers approximately 8,300 square miles. The current population is about 5.2 million. The population is forecast to increase to 8 million by 2025.
- The H-GAC long-range regional transportation plan is a $77 billion multimodal plan. Approximately $12 million is allocated for ports and airports, $46.7 billion for roadways, $17.9 billion for transit, and $0.4 billion for bike and pedestrian facilities. Approximately 60% of the funding is local, with state and federal programs accounting for approximately 40%.
- The 2006–2008 TIP includes $4.0 billion in projects. Roadway projects account for $2.5 billion, and transit projects for $1.0 billion. A total of $0.5 billion is provided in local matching funds. The process used to develop the TIP is similar to the process used at many other metropolitan planning organizations (MPOs). A subcommittee of the H-GAC Technical Activities Committee develops the criteria to be used in evaluating and ranking projects. Historically, the key criteria addressed safety and congestion. This approach resulted in roadway projects being ranked the highest, with few transit, bicycle, and pedestrian projects. A new approach was implemented, with projects evaluated and ranked by categories. This approach provides a better mix of selected projects.
- Safety, and more recently, emergency evacuation, are also important criteria. Harris County has one of the highest crash rates and driving-under-the-influence rates of any county in the country. H-GAC established a Regional Safety Council, as a subcommittee of the Policy Board, to address these issues. Available crash data were geocoded and mapped. Local agencies are now requesting crash data from H-GAC, along with technical assistance to analyze high-crash locations. The Safety Council has also made a number of recommendations for improving safety in the region.
- Hurricanes Katrina and Rita brought a renewed focus on emergency management and evacuation planning in the region. H-GAC and other transportation agencies in the region have addressed numerous issues related to evacuation planning and operations. Freeway and roadway bottlenecks have been identified, and improvements programmed and constructed.
- One recent issue facing H-GAC and transportation agencies is increases in project costs. In the past, these increases have been absorbed in future TIPs. The cost increase on a few recent projects has been significant, however, including the expansion of the I-10 West (Katy) Freeway, which increased from $650 million to $1.2 billion. New policies have been proposed in reaction to project cost increases.
- The proposed policies for the 2008 TIP include a 5% per year project cost increase. Sponsors must request the 5% increase and provide a justification for it. Projects are not eligible for the adjustment if the cost increase is the result of a scope change or if a project in a previous TIP has not advanced. Other proposed policies for the 2008 TIP include recompeting any project that has not advanced by the third time it is in the TIP. A final proposed policy would make cost overruns the responsibility of the project sponsor.

- Toll projects are somewhat outside of the programming process, as toll authorities are not using federal funds. Toll roads have been in operation in Houston since the early 1980s. Currently, there are some 530 lane miles of toll roads in the area. By 2025, the region is forecast to have almost 2,300 lane miles of toll facilities. The area cannot meet air quality conformity or fiscal constraint requirements without the toll facilities. Tolls roads may be formed in the H-GAC area at the county level. The Harris County Toll Road Authority (HCTRA) is the oldest and the largest toll authority in the area. Fort Bend County also formed a toll road authority in the late 1990s. Finally, the Texas Department of Transportation (TxDOT) has a toll road division, the Texas Turnpike Authority Division, which also has the ability to develop, own, and operate toll facilities. TxDOT is pursuing toll roads in other parts of the state using a variety of approaches, including comprehensive development agreements. There are still a number of questions concerning how excess revenues will be used, the relationship with the MPO process, and the relationship between TxDOT and the toll authorities. Air quality conformity is the primary link to the MPO planning process. The development of a regional toll policy is under way, but it has been difficult to gain consensus among the public agencies and the toll authorities.
- The potential sale or long-term lease of the HCTRA toll network was considered in 2006. H-GAC currently generates approximately $225 million per year in excess revenues. The Harris County judge, who is the county administrator, advocated sale of the toll network. The estimated net present value of the toll system was $6 billion to $8 billion. The county conducted a study, which indicated that the excess revenues will continue to increase. The county commissioners recently decided not to sell the toll roads by a unanimous vote.

California Department of Transportation Funding

Rachel Falsetti

Rachel Falsetti described elements of the programming process at the California Department of Transportation (Caltrans). She discussed the funding estimation process, the programming process, the allocation of funds, and the approach used with inactive obligations. Rachel covered the following points in her presentation.

- California uses a Fund Estimate in the programming process. The Fund Estimate is an estimate, in annual increments, of all federal and state funds reasonably expected to be available for programming over a specified 5-year period. As required by state statute, every 2 years Caltrans produces a Fund Estimate that incorporates long-term projections. The Fund Estimate forecasts resources for the next 5 years. There is a 3-year overlap between consecutive Fund Estimates. The Fund Estimate also accounts for cash flow for current program commitments and determines the amount of resources available for programming.
- A number of revenue sources are used to fund transportation in California. The State Highway Account includes revenues from the motor vehicle fuel license tax, the use fuel tax, truck weight fees, the federal trust fund, the general fund, and the sales tax on fuels. The State Highway Account funds local streets and roads, the state highway system, and state and local public transportation. The Transportation Investment Fund is supported by the state general fund. The governor has discretion authority over the Transportation Investment Fund. If there is a fiscal crisis in the state, the governor can decide to withhold the funds in this account from Caltrans. The Transportation Deferred Investment Account is generated in this situation and contains the funds from the state. Revenues from the sales tax on fuels go both to the General Fund and to the Public Transportation Account. The Public Transportation Account is used to fund transit systems in the state.
- The Fund Estimate is prepared and adopted by the California Transportation Commission (CTC) every 2 years, in the odd years. The Fund Estimate allocates resources for Caltrans maintenance, administration, and operation of the State Highway Operations Protection Plan (SHOPP), which operates projects; and local Assistance Funding. The remaining funds, which are primarily state funds, go into the State Transportation Improvement Program (STIP). Funding in the STIP is split 25% to the Interregional TIP (ITIP) and 15% to the Regional TIPS (RTIPS). The CTC holds hearings on the recommended STIP, which is adopted by the CTC in even years. A bond measure, Proposition 1B, was recently approved by voters in the state. The CTC will be going through a similar process for the STIP augmentation to include projects funded by Proposition 1B.
- The Federal Statewide TIP is a rollup of the STIP funds, the SHOPP funds, all the other federal funds, and the other state funds. The federal funds are filtered through the Fund Estimation vehicle and are not identified by program category until the allocation process.
- Caltrans projects revenues and expenditures of existing commitments to determine cash available for projects on a monthly basis. Allocation capacities are developed based on the cash flow of proposed projects. To operate, Caltrans requires approximately $2 million a month.
- Caltrans uses innovative management of federal funds. This includes advance construction, partial con-

version of advance construction, tapered match, and flexible match. Advance construction allows a state or local agency to begin a project even if the agency does not currently have sufficient obligation authority to cover the federal share of project costs. Partial conversion of advance construction allows a state or local agency to convert an advance construction project to a federal-aid project in stages rather than all at once. Tapered match is the nonfederal matching requirement applied to the aggregate cost of the project rather than on a payment-by-payment basis. Flexible match allows a state or local agency to substitute private and other donations of funds, materials, land, and services for the nonfederal share of funding for transportation projects.

- Addressing inactive obligations is an important area for Caltrans, based on new federal regulations. Caltrans has been using quarterly monitoring to identify and respond to inactive obligations. There are still areas of the new regulations to be worked through.
- The process flows from the Fund Estimate to the STIP programming capacity to the programming of projects. Based on the annual budget authority, the cash forecast is developed. The allocation capacity is determined based on the cash forecast. The programming and allocations are finalized and program expenditures are made. The process begins again with the Fund Estimate.

Stevan Gorcester moderated this session.

BREAKOUT SESSION

The Tightrope Act
Striking a Balance Among Transportation Needs

Steve Heminger, *Metropolitan Transportation Commission*
José Luis Moscovich, *San Francisco County Transportation Authority*
Ian McAvoy, *San Mateo County Transit District*
Dianne Steinhauser, *Transportation Authority for Marin County*

San Francisco Bay Area Case Study

Steve Heminger

Steve Heminger discussed transportation planning and programming in the San Francisco Bay Area. He described the key elements of Transportation 2030—Mobility for the Next Generation, which is the long-range plan for the metropolitan area. Steve covered the following points in his presentation.

- Transportation 2030—Mobility for the Next Generation is the 25-year long-range plan for the San Francisco Bay Area. It guides transportation policies and investments in the nine-county region. The plan was adopted by the Metropolitan Transportation Commission (MTC) in February 2004. An update of the plan is required every 4 years.
- Approximately 7 million people live in the 7,100-square-mile San Francisco Bay Area. There are some 4.5 million cars and 4,300 transit vehicles in the region. There are 19,600 mi of local streets, 1,400 mi of highways, 300 mi of carpool lanes, and eight toll bridges in the area. The region has the second worst traffic congestion in the United States and faces growing safety concerns, especially related to pedestrian fatalities.
- Traffic congestion is a major problem in the area. In 2000, drivers in the metropolitan area made an estimated 21 million trips on an average weekday. The length of the average trip increased from 25.6 min in 1990 to 29.4 min in 2000. A recent decline in traffic congestion is related to the recession.
- The use of public transit in the area is increasing. Furthermore, a growth in the share of work trips by transit, although small in percentage terms, represents a significant increase in the number of additional people taking transit. A forecast net increase for 2030 represents an additional 108 million transit riders each year, while drive-alone trips are forecast to decline by 3%.
- The transportation 2030 plan includes both a financially constrained element based on currently available revenues and existing authority, and a vision element featuring potential new revenue sources and innovative policies to improve mobility.
- The project's 25-year revenues for the financially constrained element include local, regional, state, and federal sources. Approximately 64% of the $118 billion budget comes from local funding sources. The $118 billion spending plan is primarily focused on maintaining and operating the existing transportation system.
- The Transportation 2030 vision investments and calls to action focus on the three areas of adequate maintenance, system efficiency, and strategic expansion. The subcategories in the adequate maintenance category include More Potholes Ahead, More Local Road Dollars Needed, Keeping Trains and Buses Humming, and State Highways Showing Their Age. Elements in the system efficiency category include Squeezing Better Mileage from the Existing Network, Walk and Roll, Clean Air in Motion, Broadening Access to Mobility, A Seamless Transit Trip, Enhancing Livability by Connecting Transportation and Land Use, and Getting There Safe and Sound. Elements in the strategic expansion category are High-Occupancy Toll (HOT) Network Delivers Carpool

Lanes and Congestion Insurance, MTC Resolution 3434: The Bay Area's Vision for Transit Expansion, and Moving Goods to Market.

- The More Potholes Ahead element in the adequate maintenance category includes $16.7 billion in roadway maintenance costs and $10.6 billion in revenues available as a downpayment, which will result in a $6.1 billion shortfall. The call to action includes strengthening Proposition 42 to ensure gasoline tax revenues are directed to transportation as well as conditioning maintenance funds to set maximum efficiency measures and rewarding cities and counties investing local dollars in local roadways.
- The Keeping Trains and Buses Humming element projects $16.7 billion in transit capital costs and $13.4 billion in revenues available as a downpayment, resulting in a $2.8 billion shortfall. The call to action focuses on the use of capital replacement funds based on ridership and revenue generation and the development of a "state of ideal repair" report to inventory and track transit capital needs.
- The State Highways Showing Their Age element projects $14 billion in state highway maintenance costs and $7 billion in revenues available as a downpayment, leaving a $7 billion shortfall. The call to action focuses on trimming the State Transportation Improvement Program (STIP) to support the State Highway Operations Protection Plan (SHOPP). It notes that delays in maintenance will increase the cost of roadway repairs. Directing more funding to SHOPP will address repair needs but leave less state funding for expansion projects. The 2006 STIP and SHOPP estimates show a growth in highway maintenance funding, however.
- The Squeezing Better Mileage from the Existing Network element in the system efficiency category projects $742 million needed to deploy the regional operations program and $329 million in revenues available as a downpayment, resulting in a $413 million shortfall. The call to action focuses on implementing freeway ramp metering, which effectively reduces freeway delays. There are local concerns about spillover traffic, however. The MTC, the California Department of Transportation (Caltrans), and local governments have completed ramp metering studies for the I-580 corridor in San Mateo, and implementation of projects is under way.
- The Walk and Roll element focuses on the significant need for pedestrian and bicycle facilities in the Bay Area. A total of $1 billion is estimated for bicycle needs, and $200 million in revenues has been committed by the Commission as a downpayment. The call to action supports pedestrian- and bicycle-friendly transportation sales tax measures. In 2004, Marin, Sonoma, Contra Costa, and San Mateo counties approved sales tax measures with a total of $160 million in earmarks for pedestrian and bicycle facilities. Napa and Solano counties may have future sales tax measures with the same goal.
- Another element in the system efficiency category focuses on Enhancing Livability by Connecting Transportation and Land Use. Nearly 2 million people and 1.4 million jobs are forecast to be added to the Bay Area by 2020. Partnerships among regional and local agencies are needed to facilitate integration of transportation and land use. A joint policy committee was formed to coordinate regional planning efforts and to pursue implementation of the Bay Area's Smart Growth Vision, adopted in 2002. The call to action focuses on providing more land use planning funds to partners. The MTC provides local planning funds through the Transportation Planning and Land Use Solutions (T-PLUS) program. As an example, San Mateo County uses T-PLUS funds to augment its transit-oriented development (TOD) program.
- Clean Air in Motion is the element in the system efficiency category that addresses air quality issues. Cleaner motor vehicles and fuels have helped to improve air quality in the Bay Area. The number of days when the region exceeds ozone levels has fallen dramatically over the past 40 years. The call to action focuses on reducing particulate matter from buses and heavy-duty vehicles. EPA's emission standards for 1994 buses have reduced particulate matter by 90%. The MTC funded a $14 million program to retrofit 1,700 diesel transit buses with emissions control devices to reduce particulate matter. Another $20 million has been committed to fund free morning commutes on transit on Spare the Air days, older car buy-back programs, and other clean air demonstration projects.
- The Broadening Access to Mobility element in the system efficiency category considers the need to ensure equitable distribution of mobility benefits. Many low-income Bay Area residents do not own cars and rely on transit. The challenge is how to respond to lifeline mobility needs. The call to action focuses on targeting new lifeline funding. MTC's low-income flexibility transportation (LIFT) program supports a wide range of transportation needs. For example, LIFT funds help support the San Leandro LINKS shuttle program.
- The HOT Network Delivers Carpool Lanes and Congestion Insurance is one element in the strategic expansion category. The high-occupancy vehicle (HOV) lanes in the area shave 15 to 20 min off peak commutes, offering commuters a way to beat congestion. Express buses use the HOV lanes to bypass traffic congestion and provide faster, more reliable service. HOT lanes introduce a pricing element into highway use by giving solo drivers an option to pay to bypass congestion. The call to action focuses on developing additional HOT projects. The I-680 Smart Carpool Lane implementation is set for a 2009 start-up. MTC and Caltrans are leading a regional HOT lane analysis.
- Another element in the system expansion category addresses Resolution 3434: The Bay Area's Vision for

Transit Expansion. This resolution identifies nine new rail extensions, express buses, ferry service, and enhancements to existing rail and bus corridors. The success of these transit investments depends on many factors, including supportive land uses. The call to action focuses on transit expansion based on appropriate land uses. The MTC adopted a TOD policy in July 2005. The MTC also committed $2.5 million to support its partners in station area planning efforts.

- The final element in the strategic expansion category focuses on Moving Goods to Market. Over 37% of the Bay Area's economic output comes from manufacturing, freight transportation, and warehouse and distribution businesses. Some 80% of freight movement occurs on freeway corridors, especially the I-880, US-101, and I-80 corridors. Rail and air cargo are also important in the region. The Port of Oakland facilitates maritime freight movement but is increasingly constrained by congestion problems. The call to action focuses on improvements in the I-880 corridor. The MTC and local and federal partners are working to deploy intelligent transportation system strategies to improve incident management, fund ramp metering, reduce operational difficulties, and provide alternative truck routes.

Regional Versus County Investments

José Luis Moscovich

José Luis Moscovich discussed transportation planning and programming in the San Francisco Bay Area from a county perspective. He described the difficulties of addressing transportation needs in a large metropolitan area that includes older, denser cities, suburban developments, and rural areas. He highlighted some of the approaches being used in the area to address transportation issues. José Luis covered the following points in his presentation.

- There are differences between San Francisco County and the San Francisco Bay Area. There are a wide range of values regarding urban core versus suburban settlement patterns, car-dependent versus diversified mobility, and local versus regional economic viability. There is also fragmented control over, or coordination of, local land use decisions, infrastructure investment priorities, local funding match, and advocacy for federal and state transportation funds. In general, these issues mirror metropolitan area realities around the country. Local land use decisions determine transportation needs. Local sales taxes are the largest source of local funding for transportation in the region.
- A number of coping mechanisms have been used to address these issues. These include devolution of flexibility to the county level, tactical rather than strategic agreements, and regional initiatives that are smaller in scale.
- Devolution of flexibility to the county level is one coping mechanism. Funding distribution formulas reflect political rather than technical consensus. This approach uses county-by-county priority setting, rather than regional priority setting. Cost versus benefit assessment may not be an absolute measure. Funding for infrastructure tends to reflect need (e.g., the most congested areas) rather than performance (i.e., the most efficient projects). Less efficient land use choices need to be subsidized by the entire county or region.
- Tactical agreements represent a second coping mechanism. One tactical agreement is for counties to cooperate to ensure the region obtains state and federal funds, while retaining maximum flexibility at the local level to prioritize the funds obtained.
- A third coping mechanism is smaller-scale, regional initiatives. Examples of this approach in the San Francisco Bay Area include the lifeline transportation program, the regional bike and pedestrian program, and the transportation for livable communities program.
- The lifeline transportation program is funded at $18 million over 3 years from 2005 to 2008. It is funded with Surface Transportation Policy, Congestion Mitigation and Air Quality, Job Access and Reverse Commute, and state transit assistance dollars. There is a 20% local match requirement. The fund distribution is roughly by a percentage of minority and low-income residents in a county. The funds are programmed by each county's Congestion Management Agency. Capital and operating projects are eligible to address transportation gaps and barriers identified through community-based transportation plans and other plans. Examples of approaches used by counties include vans to connect senior centers to transit stations, marketing of the San Francisco Municipal Railway (i.e., Muni) FastPass to minority populations, and guaranteed ride-home programs. Other examples include pedestrian and bicycle safety improvements and the restoration of previously discontinued transit service.
- The transportation for livable communities program will allocate $283 million over a 25-year period. There are two components to the program. The first component is a formula-based county program. San Francisco County will receive approximately $700,000 a year through this component. The second component funds regional discretionary projects. Funding can be used for transportation infrastructure improvements to pedestrian, bicycle, and transit facilities. Funds can be used for planning, preliminary design and environmental engineering, right-of-way acquisition, or construction. The objectives of the program are to encourage pedestrian, bicycle, and transit trips; support a community's

larger infill development or revitalization efforts; and provide a wider range of transportation choices, improved internal mobility, and stronger sense of place. Examples of projects funded through the Transportation for Livable Communities program include new and improved pedestrian facilities, bicycle facilities, transit access improvements, pedestrian plazas, and landscaping of medians and streetscapes.

Expansion Versus Rehabilitation Programming in the San Francisco Bay Area: A View from Transit

Ian McAvoy

Ian McAvoy discussed transit expansion and rehabilitation programming needs in the San Francisco Bay Area. He described some of the issues associated with considering expansion versus rehabilitation needs in the regional planning and project selection process and possible approaches to addressing these concerns. Ian covered the following points in his presentation.

- There are a number of issues associated with programming for public transportation and roadway expansion and rehabilitation needs. A first issue relates to the priority placed on expansion projects versus rehabilitation projects and which groups influence the decision-making process. The needs of urban versus suburban areas are typically an issue. Urban needs tend to focus on rehabilitation, whereas suburban needs usually focus on expansion projects. There may be issues related to large agency versus small agency needs and rail versus bus needs. Rail is more expensive, and there may be ongoing environmental justice issues related to the provision of rail service to suburban areas and bus service to central city areas. Finally, there is never enough funding to meet all needs.
- The approach taken in the San Francisco Bay Area is to try to address both expansion and rehabilitation needs. MTC Resolution 3434 focuses on expansion needs. It includes multiyear expansion program priorities based on the RTP. The program is politically influenced, although there is funding for the program from a local sales tax and FTA's New Starts Program. The transit capital priorities focus on replacement needs. It is a multiyear rehabilitation and replacement program based on demonstrated need and replacement cycles. Federal 5309 and 5307 program funding are used to support the program. Only high-priority projects are funded.
- The strategic dilemma in funding public transportation expansion and rehabilitation needs can be thought of as a triangle. Issues related to need, equity, and entitlement form the three points on the triangle. Transit funding in the triangle is trying to address all three issues.
- A number of additional issues further complicate the discussion of funding public transit expansion versus rehabilitation needs. First, many transit agencies either do not prioritize programs or have a difficult time establishing priorities. The new requirement to develop comprehensive capital improvement programs to qualify for funding may help address this issue. Second, the metropolitan transportation planning and project selection process is highly competitive. Transit competes against highway, bicycle, and pedestrian projects for limited flexible funding. Finally, all agencies need more funding. The underlying issue is that there is not enough funding to meet the identified needs.
- The reality of the planning and project selection process is that larger agencies are typically more successful in advancing projects than are smaller agencies, especially when it comes to project earmarking and discretionary programs. Larger agencies frequently have more resources available to develop plans and project proposals.
- A number of approaches can be used to address these issues. Enhancing long-range regional planning can better help identify critical needs in all areas. The MTC revised programming strategies use 5309 and 5307 funds for rehabilitation and replacement. Requiring project sponsors to program locator or other matching funds for expansion projects would help increase available funding. Balancing the needs for both expansion and rehabilitation projects is important. It is also important to fix current facilities before expanding and developing new ones. Finding additional funding sources and using innovative financing to meet needs is another strategy. It is also important to monitor and address equity issues to maintain regional partnerships involving all agencies and groups.

The Unique Challenges of Meeting Transportation Needs in Marin County

Dianne Steinhauser

Dianne Steinhauser discussed transportation planning and programming in Marin County. She summarized the population and travel trends in the county and described approaches to addressing short- and long-term transportation needs. Dianne covered the following points in her presentation.

- Demand for travel in Marin County is outpacing growth. From 1990 to 1998, the number of households in the county grew by 3%, employment grew by almost 9%, and the number of trips increased by 10%. Conges-

tion has both a local component and a regional component. Approximately 50% of work trips generated by Marin County residents stay within the county. Approximately 28% of the trips generated within the county have a destination in San Francisco. As a crossroads for regional traffic and a northern California gateway, Marin County experiences more congestion than what is generated by its 257,000 residents. Since 1990, traffic coming into Marin County from the East Bay has increased by more than 300%. Marin County is also a center of regional recreational travel. The scenic beauty of the area attracts an increasing number of recreational trips.

- It is important to remember that mobility involves more than the highways. Marin is a graying county. By 2020, more than 35% of the population is expected to be over 65 years old. The fastest-growing age groups are individuals 65 to 85 years of age and those over 85. Recreational trips outside the peak period continue to cause significant congestion. The Sunday afternoon traffic southbound on the Golden Gate Bridge is heavier than that found during a typical weekday peak period.
- There are limited transportation options for trips to schools. Yellow school bus service is extremely limited, and parents feel the need to drive and park when dropping students off, creating congestion and neighborhood disruptions. The lack of parallel routes and streets causes gridlock in many areas. Limiting geography results in Highway 101 serving as the main street for the area. Routes attempting to enter the freeway are congested, hampering local trips.
- The higher costs of bus transit have limited the Marin County Transit District's ability to expand transit service. With labor and fuel prices, as well as capital construction, driving up costs, transit expansion and its sustainability remain a challenge. The local street and road network has not received sufficient attention and continues to deteriorate. Marin County's local roads have over $300 million in unmet rehabilitation needs. Finally, continued storm damage diverts human and financial resources.
- Marin County's 25-year transportation vision plan focuses on a multimodal approach. The five goals in the plan are to (*a*) create a multimodal transportation system, emphasizing alternatives to single-occupant driving; (*b*) reduce overall congestion, not just on Highway 101, but also on the roads that provide connections and alternatives to freeway travel; (*c*) maximize mobility for all residents of Marin County, including seniors, youth, and disadvantaged residents; (*d*) maintain the quality of life enjoyed in Marin County and cherished by visitors; and (*e*) maintain flexibility to allow for different needs in different parts of the county and to respond to changing conditions, including changes in funding.
- Existing revenue sources cannot keep pace with Marin County's increasing transportation needs. With 250,000 residents, Marin County's share of traditional funds based on population does not meet its needs. The time it takes to deliver projects, coupled with construction material cost increases, has hampered delivery, with costs increasing faster than the general rate of inflation. Furthermore, most funding is already allocated by statute or an adopted plan.
- The county's 25-year transportation vision plan addresses filling the transportation funding gap through opportunities to generate transportation revenue. The existing revenue generates about $367 million, compared with the total cost of the vision plan of at least $1.6 billion. There is a $1.2 billion funding gap. In November 2004, voters in Marin County approved a local transportation sales tax, Measure A, that provides a ½-cent sales tax for 20 years. The expenditure plan components of Measure A include four major implementation strategies.
- The first strategy is to develop a seamless local bus transit system that improves mobility and serves community needs, including special transit for seniors and the disabled. It is allocated 55% of Measure A funds, which is estimated to generate $182.38 million in funding over 20 years. The second strategy is to fully fund and ensure the accelerated completion of the Highway 101 carpool lane gap closure project through San Rafael. This strategy is allocated 7.5% of Measure A funds, which is anticipated to generate $24.87 million over 20 years. The third strategy is to maintain, improve, and manage Marin County's local transportation infrastructure, including roads, bikeways, sidewalks, and pathways. A total of 26.5% of Measure A funds are allocated to this strategy, which is estimated to generate $87.87 million over 20 years. The fourth strategy is to reduce school-related congestion and provide safer access to schools. This strategy is allocated 11% of Measure A funds, which is anticipated to generate $36.48 million over 20 years.
- Marin County faced several challenges in gaining public acceptance of a local sales tax. First, the tax needed to be dedicated to a broad range of local needs to gain the necessary super-majority voter approval. Second, it was important that the tax be dedicated to priority local transportation needs, downplaying local funds dedicated to the regional traffic needs on Highway 101. Third, it was important that the tax address the needs of dedicated advocacy groups, particularly the needs of the transit-dependent community and the bicycle and pedestrian community. A number of challenges remain to addressing needs on Highway 101.
- Balancing transportation needs and available funds is an ongoing challenge. Funding solutions must continue to have the flexibility to address a variety of trans-

portation needs. Collaboration regionally or sub- regionally can focus both public and legislative support. Using local funds to leverage federal and state funds is important. No transportation need should go unaddressed, and a balance of addressing needs must be maintained. Enabling additional locally controlled funds, such as vehicle license fee increases approved by voters, is important to help address local transportation needs. It is also important to be aware of funding opportunities and to cultivate more private funding investment.

Alix Bockelman, Metropolitan Transportation Commission, moderated this session.

BREAKOUT SESSION

Getting the Most Bang out of a Buck
Project Prioritization

Jonathan Davis, *Massachusetts Bay Transportation Authority*
Patricia Bugas-Schramm, *City of Portland*
Omar Smadi, *Iowa State University*

State of Good Repair "Fix It First" Policy

Jonathan Davis

Jonathan Davis discussed capital programming at the Massachusetts Bay Transportation Authority (MBTA). He described the services operated by the MBTA, the 25-year Program for Mass Transportation, the Capital Investment Program (CIP), the State-of-Good-Repair (SGR) database, and the Fix-it-First program. Jonathan covered the following points in his presentation.

- The MBTA is the fifth-largest transit property in the country. It is an independent public authority that provides service to 175 communities in the Boston metropolitan area. The MBTA serves some 1.1 million passengers each day. Services and modes operated by the MBTA include bus, rapid transit, streetcars, trackless trolleys, commuter rail, ferry service, and paratransit. Approximately 42% of trips to downtown Boston and some 55% of all work trips to Boston are made by transit. The MBTA is key to the regional economy. The MBTA serves a population of 4.7 million people over a 3,200-square-mile area. Three-quarters of all Massachusetts residents live within the MBTA service area.
- The MBTA operates a variety of public transportation services, including three heavy rail lines, one bus rapid transit line, one light rail transit (LRT) line, and 200 bus routes. The MBTA also operates 11 commuter rail lines, one high-speed trolley line, four trackless trolley lines, a ferry service, and the paratransit system known as "THE RIDE."
- The Forward Funding Blue Ribbon Committee was established in 2000. Forward funding replaced a system of unlimited state funding that was paid in arrears. The MBTA must now budget and operate within its own sources of revenue. Operating funding sources include a dedicated sales tax, fare revenues, local assessments, and nonfare revenues. The dedicated sales tax is the greater of 1.0% of a statewide sales tax or a base revenue amount. Capital funding includes revenue bonds, federal grants, a capital maintenance fund, and specific project financing.
- The Program for Mass Transportation (PMT) is a 25-year master plan for the MBTA. It defines a vision for regional mass transportation and sets priorities for infrastructure investments. The PMT is updated every 5 years and is financially unconstrained. The MBTA partners with other agencies and groups to develop and carry out the PMT. A working committee includes members representing the City of Boston, state agencies, regional agencies, and community groups who assist with the development and updating of the PMT. The MBTA Advisory Board is actively involved, as are metropolitan planning organizations, interest groups, and the public. The MBTA uses workshops, public hearings, and other methods to involve the public.
- The CIP is a rolling 5-year capital program that implements the 25-year PMT. The CIP is financially constrained, and the draft CIP includes the current fiscal year (FY). The CIP includes some $470 million each year in SGR investments.
- The CIP's statutorily mandated criteria address the effectiveness of the state's transportation system, service

quality, the environment, and health and safety. Other criteria address operating costs, SGR, and debt service.

- The MBTA's infrastructure is extensive and has major capital needs. The existing MBTA infrastructure includes more than 2,500 revenue vehicles, 275 stations, and 885 mi of track. It also includes 496 bridges, 20 mi of tunnels, and 19 maintenance shops.
- In 2002, the Massachusetts Taxpayers' Foundation, with contributors from the Pioneer Institute for Public Policy Research, issued a report on the MBTA capital spending. The report suggested that fiscal constraints change the way capital projects are evaluated and that the existing debt burden limits the ability of the MBTA to fund the capital program. The report further suggests that the reliance on debt financing and limited "pay–go" capital further exacerbates the issue and that capital needs of the antiquated system are growing faster than revenues. The report recommends that maintenance and modernization of the current system be the top priorities.
- The MBTA's 2003 capital spending and infrastructure report addresses some of these issues. The MBA must operate within well-defined limits to fund the capital program. The SGR study assessed the condition of the MBTA's capital assets. The SGR database provides a uniform and equitable system for identifying and prioritizing capital needs. The backlog of capital investments needed to achieve SGR is estimated at $2.7 billion. The SGR is defined as the ideal operating condition. It represents a perfect capital replacement policy.
- The MBTA has used the SGR database for internal management, discussions with policy makers, and planning and analyses. The initiative focuses on a "fix-it-first" strategy. It assessed the current state of capital assets and developed a system to identify and prioritize capital renewal and replacement needs. The backlog of needed projects was estimated at $2.7 billion. An annual capital spending rate of $570 million is needed to eliminate the backlog in 20 years. The SGR investment rate would represent 73% of the FY 2006–2010 CIP.
- In the 2003–2004 period, the governor supported the Fix-It-First program at the MBTA. Under this program, the MBTA prioritizes its limited capital resources for SGR first and for expansion second. This approach is consistent with the new statewide long-range transportation plan. The state has made a commitment to pay capital costs for system expansion, but no similar commitment has been made to address increased operating costs. The MBTA's SGR spending is consistent with the governor's policy and the long-range transportation plan.
- There are two objectives for the SGR database. These objectives are to demonstrate ongoing funding needs and consequences based on an engineering assessment of current assets and to develop a long-range capital-planning model through project programming under constrained funding. The SGR database is a tool to assist the MBTA in identifying and prioritizing renewal and replacement actions needed to bring existing capital assets to an SGR and to sustain this level. The SGR database analyzes more than 2,400 individual capital asset records.
- The SGR database requirements focus on high-cost MBTA assets. It is not a maintenance database of all assets, nor is it a static database; it requires periodic updates. The SGR database supports objective analysis and runs scenarios in reasonable time frames of fewer than 5 min. The SGR database organizes, stores, and facilitates various types of queries on the capital asset information. It can be used to identify asset renewal and replacement activities and the costs necessary to bring and maintain the MBTA system to an SGR. The database can be used to score and rank candidate actions subject to MBTA capital budge criteria. It can also create, analyze, and compare capital budget and policy scenarios, including those related to asset useful lives, renewal cycles, and capital budget allocation priorities.
- In the Fix-It-First SGR program, all new capital needs are ranked by five factors, each equally weighted at 20%: safety and environment, SGR, cost–benefit, operational impact, and legal commitments. The first factor is further divided into safety (10%), health (5%), and environment (5%). The existing infrastructure and service receive 80% of the weight in capital funding criteria for the future. The MBTA's policy is that a minimum of 70% of capital spending is on system preservation in the PMT. The MBTA's FY 2007 operating budget is $1.34 billion.
- Other facts about the MBTA include the following items. MBTA vehicles travel the equivalent of four trips around the world each day. The only cemetery in North America traversed by an LRT line is the Cedar Grove Cemetery in Dorchester on the Red Line. Each day, the bus fleet carries the equivalent of 10 times the capacity of Fenway Park. The Red Line reflects Harvard University Crimson. The Orange Line initially ran on Washington Street, formerly known as Orange Place or Orange Way. The Blue Line reflects the color of the waters of the Atlantic. The Green Line serves Frederick Law Olmsted's Emerald Necklace, a 6-mi linear park in Boston and Brookline. The Purple Line reflects European monarchs' use of the color on their private trains. The Silver Line symbolizes speed and high performance.

Transportation and Decision Making in Portland

Patricia Bugas-Schramm

Patricia Bugas-Schramm discussed transportation decision making and project programming at the City of

Portland. She described different elements of the city's project selection and capital programming processes. She also highlighted approaches to transportation project programming in New Zealand and Canada identified during a recent international scan tour. Patricia covered the following points in her presentation.

- The Portland metropolitan area has a population of approximately 1.6 million. If the communities in the Washington State portion of the greater metropolitan area are included, the population increases to some 2 million. The area continues to experience rapid growth. The population of the area is projected to increase by 1 million over the next 20 years.
- The transportation system in the city represents a large portion of the city's assets, some $5.8 billion of the city's total $15.2 billion asset replacement value. The transportation infrastructure in the city also represents a growing number and type of assets, including roadways, bridges, streetlights, parking signs, sidewalks, traffic control signs, and traffic signals. Other transportation assets include bike lanes, parking meters, stairways, retaining walls, and harbor walls. There are 32 asset categories.
- The Portland Office of Transportation (PDOT) monitors the status and condition of transportation assets. A recent report examined trends over the 20-year period from 1986 to 2006. The report identified a $249 million gap in asset funding needs. This funding gap resulted from increasing costs and flat revenues. The last increase in the state gasoline tax was approved by the legislature in 1991 and implemented in 1993. Revenues generated by some elements of the transportation network are deposited into the General Fund, but there has been no long-term General Fund support to maintain transportation assets.
- The street preservation program asset management integration represents one approach to addressing these issues. The vision of the program is to provide a smooth, safe, and affordable street network and to build and operate the system to last. Service-level targets have been set for maintaining street smoothness, a citizen rating of neighborhood street smoothness, overall street maintenance, and maintaining a backlog at the 2004 level of 586 mi. Service-level indicators include street condition, perceived overall street maintenance, perceived neighborhood street smoothness, and backlog. A service-response standard is to fill potholes within 2 h in an emergency and within 48 h for routine maintenance.
- Scenario planning is conducted to identify the consequences of different levels of investments in maintaining various assets. This information is shared with policy makers and the public. Information on the perception of the public is also collected and shared with decision makers.
- As an example, the asset database includes extensive information on traffic signals. The database can be used to evaluate different replacement rates and service levels. This type of analysis clearly shows predicted good, fair, and poor values based on various replacement rates. For example, if additional funding is not programmed for traffic signal hardware replacements between 2006 and 2015, the percent of signals in the poor category exceeds the percentage of signals in the good category.
- Funding needs were examined by the five general asset categories of pavements, street lights, traffic signals, bridges, and sidewalks. A strategy focused on preventing further deterioration and a strategy focused on providing a sustainable level of service were evaluated. The annual investment needed to achieve the sustainable level of service was identified.
- A new mayor, who had made transportation one of his campaign issues, took office in 2005. The mayor stressed the need to focus on maintaining the transportation infrastructure. The mayor and the transportation commission have taken very active and visible roles on transportation matters. The city adopted the goal of operating and maintaining an effective and safe transportation system. The city council priorities for the 2007 fiscal year include investing in and maintaining the city's infrastructure, making the city family friendly, and encouraging sustainable economic development. Other priorities focus on ensuring public safety and emergency preparedness, and seeking and using alternative energy sources. The city transportation commissioner's vision is for an accessible, safe, well-maintained transportation system that provides travel options, supports a family-friendly city, and supports economic development.
- The transportation commissioner identified five strategic change measures: (*a*) repair and replace infrastructure on the most cost-effective schedule; (*b*) accurately price transportation trips and services; (*c*) reduce the number of single-occupancy vehicle trips where realistic transportation alternatives exist; (*d*) reduce the number and duration of unexpected, nonrepeating transportation delays; and (*e*) prevent crashes, especially at intersections, focusing on the 20 most dangerous intersections in the city. These measures and other related topics are part of the commissioner's weekly meetings.
- PDOT's goal is to build and operate the transportation system to last. The performance target is to budget the resources necessary to eliminate the growth in the maintenance backlog. Specific targets are to keep the paving backlog at or below 586 mi, keep the paving ratings at or above 55% good and 22% fair each year (FY2004–2005 levels), keep the signal hardware condition rating at or above 29% good and 35% fair (FY2004–2005 levels), and achieve a citizens' overall perception of street condition at or above 55% good and 22% fair. The department also communicates exten-

sively with city employees and managers, the city council, and the public. The information is also used to help with budget discussions.

- There is also an asset management users group that focuses on balancing risk. The risk criteria include links to council goals, the effects on customers, the effects on asset life, and the effects on level of service. Other criteria include the risk of service failure, the effects on revenue, the effects on other divisions, and the impacts on staff. The impacts of these criteria can be examined. Investments that have the highest value can be identified as well as areas where limited investments will have the least impact.
- The information is used in the project selection process. The council priorities focus on deferred maintenance; economic vitality, environment, and sustainability efforts; a family-friendly city; and inclusive and efficient government. The commissioner's priorities focus on safety, maintenance, and geographic equity.
- An analysis was conducted examining the top 40 crash intersections from 2001 to 2004. The social cost of the crashes, including fatalities and injuries, was estimated and compared with the costs of addressing the problems at the 40 intersections.
- It is important to remember that trust is based on accountability. The well-being of a community is closely linked to the adequacy of its infrastructure. It is important to understand what citizens want, to define ways of measuring delivery to meet these expectations, to identify means of improving system performance, and to continually monitor whether citizen expectations are being met.

Project Prioritization: How to Communicate?

Omar Smadi

Omar Smadi discussed research at the Center for Transportation Research and Education at Iowa State University conducted for the Iowa Department of Transportation related to asset management. He described the development and use of a roadway infrastructure management and operations system and highlighted the need to communicate the results with policy makers. Omar covered the following points in his presentation.

- Asset management represents the backbone of any management system. The first step in developing an asset management system is identifying each asset, the location of the asset, and the condition of the asset. Approaches to maintaining assets and the cost associated with different approaches can then be identified and analyzed.
- Different prioritization schemes can be used to maintain assets in good condition. Possible schemes include focusing on condition and addressing the worst problems first, focusing on condition and functional classification, and focusing on economics by using benefit–cost ratios or cost-effectiveness criteria. Still another approach is to use an optimization process such as linear programming or integer programming.
- A number of tools are available for use with asset management systems. The roadway infrastructure management and operations system was developed to assist with asset management in Iowa. It can be used to analyze asset management prioritization schemes. For example, the "worst-first" approach in pavement management is not as cost-effective as other approaches. Under the worst-first approach, roadways in fair and good condition continue to deteriorate while funds are spent to reconstruct the worst roadways. Also, because reconstruction is more expensive than maintenance, fewer miles of roadways can be addressed. A second approach is to allocate funds based on the percentage of roadways in each category. A third approach is to address roadways in the best conditions first to keep them in good condition. Simulation results indicate that this approach is the best method for keeping roadways in good condition.
- A variety of transportation-related assets may be included in asset management plans. Examples of highway and roadway assets include pavements, concrete railings, pavement markings, bridges, signs, and other fixed facilities. Asset management systems provide the ability to examine different strategies based on available funding to maintain facilities.
- It is important to present the results of prioritization schemes and other analyses to policy makers. Communicating the costs and benefits of different approaches can assist in the decision-making process. The analysis conducted in Iowa illustrates the benefits of a pavement management system. Although a number of techniques can be used for the technical analysis, communicating with decision makers is a key element in the process. It is also important to document the process used and to keep all groups informed. Policy makers realize the benefits of asset management analysis tools. They become more engaged in the process, asking questions and identifying other possible schemes for testing using different analytical tools and techniques.

Glen Tepke, Metropolitan Transportation Commission, moderated this session.

PLENARY SESSION

Program Delivery and Management

John Reilly, *John Reilly Associates*
Hal Kassoff, *Parsons Brinckerhoff Quade & Douglas, Inc.*
Joseph G. Jones, *Missouri Department of Transportation*

Management: Scope, Schedule, Budget, and Risk

John Reilly

My comments focus on managing scope, schedule, budget, and risk for large transportation projects. I will address dealing with risk and uncertainty, provide examples of risk models to better estimate cost, and describe examples of innovative contracting and delivery methods.

As you are well aware, many large, complex transportation projects have substantially exceeded their budgets and schedules. Megaprojects that have received significant attention include the Channel Tunnel, the London Jubilee Rail Line, and the Boston Central Artery and Tunnel. Many other medium- and large-sized projects have experienced similar problems but have not received the publicity of the megaprojects.

Transportation project cost estimates have been misleading over many years, and as a result, a wide range of projects have wound up over budget and over schedule. Consequently, there is renewed interest in addressing these issues. My comments focus on some of the key issues and relevant tools associated with these problems.

A variety of factors contribute to major cost and schedule overruns. These factors include poor management, a lack of expertise, agency policies, and political changes. Other influencing factors include poor procurement and contracting procedures, inadequate agreements, and a lack of understanding and control of external events.

Meeting key goals is essential for public transportation agencies. However, a project's final cost and schedule are difficult to estimate at the beginning because of the significant uncertainties involved. To better manage projects and budgets, management needs information about the uncertainties that can increase costs and schedules. There is also a need for better cost estimation techniques, including consideration of risks.

There are a number of different types of risks. Technical risks might include geological uncertainty and environmental requirements. Other risks include funding uncertainty, strategic issues, contractual conditions, staff capabilities, available resources, and political and public acceptance. All of these risks may increase project costs or delay project completion.

Risk management can address several of these issues. Risk can be managed, minimized, shared, transferred, or simply accepted, but it cannot be ignored. Not all risks associated with complex construction projects can be avoided or mitigated—however, their effect on the project or its objectives, measured in terms of safety, cost, schedule delay, quality of construction, and other requirements, can be identified, characterized, and minimized.

The use of simulation models to predict the impacts of potential risks can give us information that can help us reduce uncertainty, improve performance, and guide management in dealing with uncertainty and managing project scope.

Regarding cost estimating, a key concept to consider is the "range of probable cost." In the planning stage, there is a large potential range for a project's ultimate

cost, depending on events that may occur. A single cost number represents only one possible result, depending on circumstances and risk events that affect cost. These circumstances and risk events are not directly controllable or absolutely quantifiable. The risk events, if they occur, produce impacts that add cost or time to the project. Therefore, cost estimation must include consideration of risk using a logical, structured process.

There is a need for better cost estimation techniques and approaches. We helped the Washington State Department of Transportation (WSDOT) with the development of its Cost Estimate Validation Process (CEVP). CEVP examines cost assumptions using independent experts to validate the base cost estimate. It includes uncertainty using statistical risk and decision analysis methods. A more detailed presentation on CEVP will be provided in one of the breakout sessions. Explicit risks identified in CEVP can be mitigated, thus allowing management to work to reduce the range of possible cost.

There are different approaches for estimating project costs. Different techniques require different input data and provide different levels of detail. A good cost estimation process integrates planning, environmental, engineering, and construction factors. It is also important to consider historical trends and local circumstances. Identifying key factors and characterizing the risk and opportunity associated with a project is important. Quantifying elements that may have a major effect, including policy changes, environmental factors, right-of-way costs, cost escalation, schedules, and price phasing, is important in working with uncertainty, variability, and risk in projects.

It is possible to better manage projects with more strategic approaches. Examples of other contracting processes include using a general contract construction manager, alliancing, and using integrated project teams. There are also management tools, including partnering, dispute reviews, and risk identification and mitigation that can be used. These approaches must be implemented at the beginning of a project to obtain the maximum benefit.

Partnering is one approach that has been used to better meet mutual business and functional goals for an agency and construction contractor. Partnering creates better understanding and communication between the agency and the contractor. It focuses the project team on the key goals of reducing cost, adhering to the schedule, improving quality, and increasing innovation and value for the agency. It develops an issue and conflict resolution process, and it monitors performance. Corrective action can be taken as needed. The benefits of partnering have been documented on a number of projects.

However, greater benefits and performance can be obtained by contractually defining the partnering process; for example, by using alliance contracting, also called relationship contracting. This approach was first applied to the offshore oil platforms in the North Sea and is now being applied to a variety of capital projects in the United Kingdom, Australia, and elsewhere.

Alliance contracting is a total process approach focused on an efficient work plan. An alliance contracting team consists of the agency, engineer, and contractor working closely together, with risk and reward (i.e., pain and gain) levels that are contractually defined. Performance is measured and evaluated continually by the integrated management team. Difficult decisions are made quickly in the best interest of the project, with costs allocated accordingly. Risk is shared equitably by the participants, and the most capable member leads the particular element of work or risk mitigation. WSDOT is considering adopting this approach, which has been used successfully on international projects.

In conclusion, significant improvements can be achieved in project cost management and schedule performance using these techniques. It is important that these approaches are implemented at the beginning of a project. Comprehensive strategic management and contracting processes can improve long-term results. The use of CEVP or other cost–risk processes provide for better identification of potential cost, the explicit definition of risk events, and risk management.

Program Management Support for State Departments of Transportation: "The Delivery System of Last Resort"

Hal Kassoff

My comments focus on a particular approach that state departments of transportation (DOT) and other transportation agencies are using to deal with significant increases in funding that can strain or exceed their project delivery resources. To acknowledge the extreme reluctance that accompanies decisions to employ this approach, I call it the "delivery system of last resort."

Capital programs for most state DOTs have grown significantly over the past decade. Accountability for achieving cost, schedule, and quality outcomes has intensified. At the same time, most state DOTs have been experiencing reductions in staff, with a disproportionate loss of highly experienced people resulting from retirements amplifying the problem. The bottom line is that with programs growing and performance expectations rising while staff capacity is declining, it is easy to see how in some situations, program delivery may be jeopardized.

When the political process provides increased funding, normally in conjunction with commitments made to deliver projects and services that had been languishing

for lack of financing, failure to deliver is simply not an option. As a result, a growing number of state DOTs have viewed program management as an alternative they must consider, distasteful as it might be to outsource management-level functions that had previously been performed by in-house staff.

Use consultants to manage the program delivery? Use consultants to oversee the work of other consultants? Few choices are as much an anathema to state DOTs, which is why we do not even try to present this as a first-choice option. It simply would not ring true. And so we candidly call it "the delivery system of last resort." I have to confess that in my 25 years of experience with the Maryland DOT, 12 as state highway administrator, I felt fortunate that when our program more than doubled in size between the early 1980s and the early 1990s, and we greatly expanded the use of consultants for technical- and production-level work, we managed to deliver the program on schedule and somehow avoided the need for outside program management assistance. Our ability to manage the peak program with our in-house resources was a source of pride to our management team. But I must confess that what we viewed as serious staff constraints back in the early 1990s pales in comparison with the sharp declines we have seen in recent years.

The intense distaste among state DOTs for outsourcing program management does not extend to many airport authorities, port authorities, toll authorities, and transit authorities, who view such an approach as an indispensable tool. Most of these public authorities have not had the long-term, large-scale capital programs that state DOTs have had, and they therefore have not built up their in-house capacity just to manage the occasional program spike that might arise when a new rail line, toll road, runway, or terminal is added. These types of agencies tend to welcome outside program managers as their only realistic option when they experience a significant (yet occasional) program expansion and subsequent contraction.

In contrast, state DOTs have sustained sizable capital programs for decades and have always sought to retain in-house core competencies in technical as well as management areas. Most state DOTs have some form of internal systems capability for project and program management, although many are quite dated and cumbersome, often requiring labor-intensive manual manipulation of data to communicate among systems and across the agency.

Over the years, a number of state DOTs have engaged private firms to provide program management services in connection with megaprojects. Examples include I-15 in Salt Lake City, Utah; the Woodrow Wilson Bridge in Washington, D.C.; H-3 in Oahu, Hawaii; the I-10 Katy Freeway in Houston, Texas; and the Fort Washington Way in Cincinnati, Ohio. Such choices were made when it became clear that attempting to manage the massive size, scope, and complexity of these huge projects in house would mean that other work throughout the organization would suffer. Outsourcing for megaproject program management is not new, as the H-3 outsourced program management in the 1960s showed.

What is relatively new is outsourcing the program management of multiple projects over a widespread geographic area. We are now seeing many state DOTs—including South Carolina, Louisiana, Oklahoma, Oregon, Arizona, Washington, and Idaho—using program management support for both megaprojects and multiproject programs.

Outsourcing program management for multiple projects is much different than for a megaproject in terms of its perception within the agency and its challenges to the private sector. There are three general approaches for multiproject program management services—delegation, integrated staff, and parallel staff.

The first approach, delegation, turns over management and staffing of program and project delivery functions to an outside party while the agency retains all or part of policy and funding responsibilities, as well as general oversight. Transit, toll, airport, and port authorities that do not have the internal core competencies needed to manage large capital programs typically use this approach.

Advantages of the delegation approach include shifting significant risk and responsibility for program and project delivery to the private sector program manager. It requires a minimum of agency staff capacity and represents the clearest separation of duties. A potential disadvantage of this approach is that the agency necessarily yields a high degree of control to the program manager, although it cannot shed ultimate accountability. Communication can also be a problem with this more "arm's length" approach.

The second approach, using integrated staff, involves the agency and consultant program manager blending staff for program and project delivery functions, with the agency typically retaining overall management responsibility. Integrated staffs are collocated and ideally work as a team, with distinctions between agency staff and the program manager kept to a bare minimum. In this situation, it is possible, indeed likely, that agency staff will report to a consultant program manager, with the reverse being sometimes true as well.

Advantages of the integrated staff approach include maximum communication between agency staff and the program manager and fewer potential conflicts, while at the highest levels of management the agency retains maximum control and responsibility. Disadvantages of this approach include greater challenges to achieving innovation, possible disruption during phase-out as integrated teams are dissolved, and the inherent inability to cleanly shift significant risk to a consultant team that cannot be

held as independently accountable as they can in other approaches.

The third approach, using parallel staff, involves a consultant program manager providing program and project delivery functions for a separately defined program. The program manager coordinates with the agency's processes and operates under the agency's guidance but is responsible for a separate set of projects and services. Advantages of the parallel staff approach include the ability to delegate a significant amount of responsibility, the ability to shift risk without loss of control, and the ability to dedicate separate staff resources for an extended period of time to a high-priority assignment that will be phasing out as the program winds down, while the agency's own in-house staff are utilized for ongoing programs. This approach usually invites innovation that can be transferred to the agency. It is also relatively easy to ramp up and phase out with a minimum degree of disruption to the host agency.

Possible disadvantages of this approach include the need to establish and sustain functional alignment between parallel agency and program manager functions to ensure that the owner is able to retain the consistency it needs across programs. There is also typically a degree of tension between pressure to innovate and pressure to adhere to established agency processes that are deemed to be working well.

Of the three approaches, the parallel staff approach has been used the most frequently by state DOTs; it has been used, for example, in South Carolina, Louisiana, Oregon, and Arizona. The integrated staff approach has been used by some state DOTs, including Oklahoma and Washington. There are no specific examples of the use of delegation by state DOTs.

The responsibilities of the program manager vary depending on the approach adopted and the in-house capacity of agency staff in relation to the size of the program to be delivered. The most commonly assigned functions include project controls, design management, and construction management services. Right-of-way acquisition, utility relocation, environmental assessments and permitting, as well as project-level public involvement are also common. Selecting consultants and serving as a political liaison are not commonly assigned. Fully utilizing the capacity of in-house agency staff within the DOT is a priority with any approach.

Relationship issues are critical to the success of any program management role. Typical concerns among staff at state DOTs are loss of control, job security, and costs of outsourcing. Typical concerns among private sector program managers include winning the trust and support of agency staff, maintaining a balance between management functions and being responsive to staff, and adhering to ingrained agency processes while offering innovations that are not always welcomed. Another challenge for consultant program managers is to fully grasp and appreciate client expectations, which often vary among geographic areas and functions and will often change over time. Outside program managers must understand that the burden is on them to adjust to and meet the needs of the client agency, no matter how much variation there may be in terms of approach, staff, processes, and reporting.

The South Carolina Department of Transportation (SCDOT) is the first example I will highlight. SCDOT was the first to employ the multiproject approach on a statewide basis and across multiple functions. In 1998, SCDOT issued a request for proposals to employ one or more firms to assist with the management of multiple, simultaneous projects in a billion-dollar, multiyear program. SCDOT had experienced a nearly threefold increase in funding from the Transportation Equity Act for the 21st Century and other sources. The department decided to focus internal staff on handling its core statewide program and use the program manager approach to take on projects for delivery to the metropolitan planning organizations and councils of government that blanket the entire state. The department selected two program managers, with each handling roughly half of the $1.5 billion statewide program. The process became known as "27 in 7," as SCDOT explained that without this approach, what was being accomplished in 7 years would have required 27 because of internal capacity constraints.

The major elements in the program managers' scope of services included financial management, such as tracking and accounting for expenditures, predicting cash flow requirements for bonding, and ensuring that funds were sufficient to cover costs. The scope of services also included project controls, including the monitoring, reporting, and intervention required to toe the line in meeting scope, schedule, budget, and quality requirements. Other elements included environmental assessments and permits, design management, utility coordination, right-of-way acquisition, contract documents, contract administration, and construction management.

The SCDOT contract included a number of special features such as holding alignment sessions at the outset of the project to initiate and sustain lines of communication and establishing functional teams comprised of agency and program management staff that handled common technical areas. These teams helped to ensure consistency in procedures and ensure that accepted innovations were carefully integrated into existing processes. Other features included the development of project and financial management systems that SCDOT could adopt, a design consultant selection process led by the program manager, and early, collaborative right-of-way input and constructability information to help guide design and

reduce construction costs. After 7 years in South Carolina, 72 construction contracts have been let, 58 are open to traffic, the remainder are under construction, and all projects should be completed by the end of 2007.

The second example, the Louisiana TIMED Program, represents a similar but even larger effort. The TIMED Program, which falls under the Louisiana Department of Transportation and Development (DOTD), includes nearly $5 billion in projects resulting from a dedicated revenue stream from a 4-cent increase in the fuel tax in the late 1980s. When the program fell behind schedule, the DOTD decided to retain a program manager. The scope of services for the program manager includes a number of work elements for highways across the state and for three large bridges. Additional modal projects under TIMED are being managed by others while the financial strategy and annual feasibility determination are being managed by a program manager comprised of three firms in a joint venture.

The TIMED program scope of work includes development of financial strategies, financial management including annual updates of costs and revenue projections to determine financial feasibility and bonding strategy, project controls, environmental documents and permits, design and design–build management, utility relocation, right-of-way acquisition, contract administration, construction management, and public outreach and communications. Hurricane Katrina made many of these elements challenging, especially when dealing with surges in costs as contractors and certain materials became scarce.

As of fall 2006, approximately 40% of the overall program has been completed. Some $2.6 billion has been invested to date in TIMED transportation projects, and $800 million in lettings are planned for fiscal year 2007. There is $1.1 billion in active TIMED construction under way. The hurricanes of 2005 increased costs by more than $700 million, but through quick intervention in adjusting financing parameters, the program is still feasible and on track.

WSDOT provides another very different example of the use of program management. The statewide program grew sharply as a result of a 5-cent increase in the gasoline tax in 2003 and a 9.5-cent increase in 2005. These increases, when combined with preexisting funds, are expected to generate some $16 billion over 16 years for projects, which represents a threefold increase in revenue. WSDOT is using a statewide program management approach to help deliver projects. Unlike most other state DOTs, which used the parallel staff approach, WSDOT opted to use the integrated approach, which is characterized by a strong WSDOT overall management role and the blending of staffs. The approach is being implemented across three WSDOT tiers—headquarters, regions, and projects—with staff augmentation at each tier.

At the same time, eight independently selected general engineering consultants are being used for delivery on six megaprojects and to supplement one region in the delivery of traditional projects in two geographical areas. One of the unique features of the WSDOT program management is the extraordinary accountability and oversight requirements by outside agencies as well as the advanced performance measurement process being used, developed from within the department and being led at the highest level. Performance reporting is recorded in the quarterly *Gray Notebook*, which graphically depicts a host of key measures and communicates results in an approach that has been labeled "performance journalism" because of its focus on communicating WSDOT results clearly and in an objective, open manner.

The WSDOT statewide program management process has two phases. The first phase developed a strategic plan to assess resources and define specific needs in program management, project reporting, and bottom-line delivery. The second phase involves blended staff support at the headquarters, regional, and project levels; baseline cost reviews; a national recruiting campaign; training; and developing and deploying integrated, commercially available off-the-shelf solutions for program and project controls and reporting, which were lacking among the regions as well as between the regions and headquarters.

A number of lessons can be learned from the recent surge in the use of multiproject program management approaches by state DOTs, including those highlighted as well as others under way in Arizona, Idaho, Oregon, and, to a more limited extent, Oklahoma. First, although these projects can be categorized into three broad classifications, no two approaches are exactly alike. No one method or approach can possibly make sense for all DOTs, whose internal structures, staffs, systems resources, and program delivery objectives are all different. Rather, program management must be tailored to the unique needs and characteristics of individual departments and the delivery challenges they face. Second, open communication and trust are essential to making program management work, no matter which general approach is used. Third, the program manager must adapt to the DOT's culture and recognize that the program manager is a "guest of the agency," performing some of the most sensitive internal functions over which the agency has ultimate responsibility and which, in the case of state DOTs, they normally perform for themselves. Fourth, balancing adaptation and innovation is challenging, demanding candid communication and a level of trust. Finally, significant opportunities for staff development and technology transfer exist in the long term, well after the program manager has departed. These benefits flow both ways, with the program management team also gaining valuable insights and experi-

ences in dealing with projects while walking in the shoes of the agency.

Ultimately, the greatest benefits accrue to the customers of the state DOT and other agencies. In response to the challenge of being overloaded and understaffed, these agencies had the vision and discipline to embrace an otherwise unappealing program management option by engaging outside support, placing their customers ahead of their own internal concerns as they turned to the delivery system of last resort.

Practical Design

Joseph G. Jones

I'd like to describe the Missouri Department of Transportation's (MoDOT) use of practical design. I will highlight the basic elements of practical design and provide a few examples of the application of practical design in the state.

MoDOT faces many of the same issues that other speakers have highlighted. These issues include declining revenues, increasing construction costs, project scope creep, and demands for increased accountability by the public and policy makers.

MoDOT's top priority is delivering committed projects to the public. The projected reduction in revenues, along with anticipated increases in construction costs, will make it very difficult to deliver planned and programmed projects in the future. The use of practical design is one approach to addressing these concerns.

Practical design provides a method to meet customers' needs through sound engineering judgment. It uses common-sense engineering and context-sensitive solutions, focusing on doing the right thing, in the right place, at the right time. Practical design is about not cutting corners or compromising safety. Practical design still meets the purpose and needs of a project. Practical design simply involves being more open to different approaches to accomplishing the desired result.

Practical design has been used on recent projects in the state. The Route US-54 realignment in the Lake of the Ozarks area provides one example. The existing five-lane facility is not adequate to meet current or projected demands in this major tourism area. The initial project cost was $136.5 million. Since right-of-way is very expensive in the area, a redesign effort was undertaken to examine alternatives that would narrow the cross-section. The redesign, which included compressing the median and using steeper stabilized retaining walls, reduced the project cost to $99 million. The redesign accounted for a savings of $37 million.

A second example highlights the benefits of practical design on a smaller scale. A deteriorating box culvert on a minor route was being replaced. The original scope included construction of a new bridge and 1,500 ft of road reconstruction. The cost estimate for the original project was $1.35 million. Based on the low vehicle volumes using the rural road, the project was redesigned, eliminating the bridge and road reconstruction. The redesigned project cost was $284,000, resulting in a cost savings of $1.06 million.

A third example of the use of practical design is the redesign of a planned upgrade on Route 36. The roadway template was redesigned based on the practical design approach, resulting in lower project costs.

The practical design approach was initiated in late 2004 when MoDOT's chief engineer challenged districts to trim costs in the 5-year STP by 10%. Data were gathered and analyzed over the 1st year on the use of the practical design approach. The department policy was rewritten in January 2006 to incorporate practical design. It is important to note that FHWA staff as well as staff from MoDOT's legal division were consulted and involved throughout the process.

Approximately $400 million has been saved in the 5-year state transportation improvement plan using the practical design approach. We anticipate continued savings as lower costs allow more projects to be constructed. The practical design approach has also helped to reduce project scope creep. Practical design provides increased flexibility and is becoming the engineering philosophy at the department.

Greg Selstead, Washington State Department of Transportation, moderated this session.

BREAKOUT SESSION

How to Manage Uncertainty and Risk

Bill Roberds, *Golder and Associates*
Mark Gabel, *Washington State Department of Transportation*

Project Cost and Schedule Risk Assessment

Bill Roberds

Bill Roberds described key elements of estimating costs, schedules, risk, and uncertainty with public sector transportation infrastructure projects. Bill covered the following points in his presentation.

- The typical process for public infrastructure development includes examining alternatives, assessing attributes, arriving at a decision, implementing the selected alternative, and completing the project. The costs and schedules associated with different alternatives are included in the attribute assessment. Budget, funding, procurement, and scheduling are key elements associated with implementation. The actual outcome is influenced by the final project cost and schedule. Poor cost and schedule estimates can result in poor decisions, poor implementation, and poor outcomes.
- The cost of a project can be influenced by numerous elements. These elements include right-of-way costs, internal agency costs, and contractor costs. Examples of internal agency costs include preliminary engineering, construction engineering, and project management. Contractor costs may include labor, materials, equipment, and perceived risk.
- The traditional approach to estimating cost focuses on single-value estimates. These are usually conservative base estimates. The cost estimate is based on quantities, unit costs, anticipated progress rates, escalation rates, and a lumped contingency to cover any problems. This approach is based on convenient, reasonable, but sometimes arbitrary assumptions related to various internal and external factors. These factors might include environmental conditions, technology, and policies.
- The traditional approach to dealing with uncertainty is often an ad hoc process. The process focuses on identifying uncertainty factors and assessing their possible range in values, determining the sensitivity of results to those factors, and selecting a level of conservatism for an uncertainty factor. The level of confidence in the results may not be known.
- Uncertainty can be better addressed by quantifying it in terms of probability. This process includes separating technical aspects of uncertainty from policy elements of uncertainty. Benefits of this approach can include reducing controversy and reaching a better understanding of possible impacts. Communicating the probability of uncertainty both internally and externally can create reasonable expectations among all groups.
- The variables typically associated with uncertainty can be defined. Variables may include the potential of certain events happening and the probability of different occurrences. Probability can be objectively derived, based on historical data such as escalation rates, or subjectively derived from careful assessments.
- The risk assessment process typically begins by describing the current project scope and plan as a sequence of comprehensive, nonintersecting sets of activities. The next step focuses on assessing the cost (in current dollars) and duration of each activity. The base cost, duration, and escalation rates, within assumptions

and not including risks, can be developed. Potential cost and schedule risks, including the likelihood of occurrences and uncertain impacts by activity, can be calculated. Computer models can be used to conduct this analysis.

- A project flow chart can be used to develop a comprehensive set of activities and their logical sequence, including major decisions points. Base factor assessments can examine uncertainty at a more detailed level. Specific cost estimate items are allocated to activities. Uncertainty in unit costs that are common to different activities can be examined and correlated among those activity costs. A comprehensive and nonintersecting set of risks, including opportunities and their characteristics, is needed. The results of a risk assessment may be presented in tables, graphs, and simulations. Assessed risks typically change as more information becomes available as a project approaches and moves through implementation.
- Risk management focuses on controlling risks and thus controlling project costs and schedules. Possible methods of reducing significant risks, focusing on the highest-ranked risks, can be identified. Risk prevention focuses on reducing the probability of an occurrence. Risk mitigation focuses on reducing impacts if an action occurs. Risks can be quantified, including considering combinations of risks. Implementation impacts may result in changes to the base costs, which can affect risk factors. The impacts can be analyzed using the same model, and the risk assessment can be updated.
- The results of risk management can be used for a number of purposes by both public agencies and contractors. One use is to compare alternatives on an equal basis. A second use is to establish appropriate budgets and schedules or evaluate the adequacy of existing budgets and schedules. Public agencies may use this information in developing bid documents, while contractors can use it in developing bids. The results can be of help in identifying possible risk-reduction activities and comparing their implementation costs with their risk-reduction benefits. The results can also be communicated to all appropriate groups to provide realistic expectations.
- Process teams may be used to conduct the risk assessments and risk management processes. This approach provides a collaborative and consensus-based process. Facilitated workshops and interviews can be used to obtain input from all groups. The process is flexible and can be scaled to meet the needs of specific projects, groups, and agencies. This approach has been used on a number of projects throughout the country.
- There are potential challenges in conducting risk assessments and risk management activities, especially for agencies using the process for the first time. These challenges are outweighed by the benefits, however. The process can improve project understanding, achieve consensus, ensure realistic expectations, and provide input for and evaluation of options. Ultimately, it can save project time and funding.

The Cost Estimate Validation Process and Risk-Based Estimating at WSDOT

Mark Gabel

Mark Gabel discussed incorporating risk into the cost estimation process for transportation projects. He described some of the issues to consider and the processes developed at WSDOT. Mark covered the following points in his presentation.

- In 2002, WSDOT began working on a new process to better estimate the costs of transportation projects. The results of this effort are the Cost Risk Assessment (CRA) and Cost Estimate Validation Process (CEVP). In 2003, CEVP was used on 12 megaprojects in the state. Cost risk assessment workshops were held for projects not large enough to warrant use of CEVP. The WSDOT Cost Risk Estimating and Management office was established in 2003. In 2004, CEVP was used to update the costs of major projects. In summer 2005, the Project Management On-Line Guide was completed, and a Statewide Policy for Cost Risk Assessment was established. In fall 2005, the Risk Management Plan (RMP) spreadsheet tool was developed. Since its development, its use has been increasing. Also in 2006, an estimate training class was developed, and the estimating process was posted. Work is under way on an expanded comprehensive workshop resource guide. Currently, methods to increase the efficiency and effectiveness of CEVP are being explored.
- It is important to understand some of the terms used in the process, which may not be widely used in the transportation planning and programming processes: "stochastic," "parametric," and "deterministic." "Stochastic" generally refers to the notion of probabilistic estimates that consider uncertainty and variability. "Parametric" estimating generally refers to the use of relationships between a project's known characteristics and known historical references for the same or similar projects and project elements. "Deterministic" estimating generally refers to "single-point" estimates that more or less directly measure the items being estimated.
- Washington State Transportation Secretary Doug MacDonald's edict is "Project delivery and accountability. On time and on budget." Secretary MacDonald also stresses that "what gets measured, gets managed." The development and use of CEVP helps WSDOT meet these goals.
- Transportation projects may be subject to many variables that cannot always be known during the planning process. Cost and schedule estimates represent the outcome of multiple variables that are not all directly

controllable or absolutely quantifiable. Therefore, cost and schedule estimating must consider probabilities in assessing estimates and schedules, using a recognized, logical, and tested process.

- It is important to remember that a cost estimate is still just an estimate. An estimate can be defined as "to judge tentatively or approximately, to determine roughly the size [or] extent and to produce a statement of the approximate cost." It implies a judgment, considered or casual, that precedes or takes the place of actual measuring. The use of the word "assess" implies a critical appraisal used for understanding or interpreting something, or a guide used in taking action.
- Transportation planning and the estimating process occur in an environment of uncertainty. The components of cost uncertainty may include unrecognized factors, known factors that cannot be quantified, and known factors that can be quantified. Cost uncertainties and the percentage of project cost diminish as a project moves through the various stages of planning, programming, preliminary design, advertisement and bid award, and construction.
- Project management has been defined as "the application of knowledge, skills, tools, and techniques to meet or exceed stakeholders' needs and expectations." Project risk management involves risk identification, qualitative risk analysis, quantitative risk analysis, development of a risk response strategy, and risk monitoring and control.
- Risk-based cost estimation at WSDOT uses the CRA and CEVP. The first principle is to use these two processes to review and validate estimates. The second principle is to improve communication among agency personnel responsible for project management. The third principle is to improve the ability of project managers to take action to avoid transfer and mitigate risks. Workshops are used on some projects to bring all the appropriate groups together.
- CEVP is based on a few simple management strategies. First, it is important to avoid single-number estimates. Remember, a strike zone in baseball is not a single point. Second, the process involves cause-intensive, peer-rich, collaborative scrutiny of project base-cost estimates and assumptions. Building budgets in ranges may be a good approach, along with obtaining input from decision makers on the confidence level to use. The process emphasizes common-sense notions of risk description and quantification.
- Qualitative results from the use of CRA and CEVP have been identified. These results include improving communication and improving the ability of project managers to take actions to avoid, transfer, or mitigate risk. Accepted risks are identified and known. Risk management plans can be developed and are integral components of project work plans. Potential response strategies, especially proactive measures, can be identified and used as needed. The first 10 projects to use CEVP involved a collaboration of WSDOT project teams and consultant teams. Project managers indicated that the one-page summaries provided by the process are very beneficial.
- There continue to be challenges with the process. Examples of ongoing challenges include quantifying and measuring the accuracy and performance of CEVP results and risk management efforts, tracking schedule and cost estimates as a project evolves and changes, and maintaining consistency in the workshop process while providing the flexibility required to deal with each project on an individual basis. A number of continuing activities are under way. These include developing risk management plans for all projects, developing risk databases, and improving the monitoring and quantification of results. Other steps include more fully developing performance measures, making the process even more scalable, investigating risk-based estimating for portfolios and programs, and exploring the use of risk reserves.

John Reilly, John Reilly Associates, moderated this session.

BREAKOUT SESSION

Accountability and Reports for the Public and Decision Makers

Daniela Bremmer, *Washington State Department of Transportation*
Greg Jones, *Parsons Brinckerhoff Quade & Douglas, Inc.*

Project Delivery Reporting in Washington State

Daniela Bremmer and Greg Jones

Daniela Bremmer and Greg Jones discussed project delivery reporting at the Washington State Department of Transportation (WSDOT). They described the responsibilities of WSDOT, the development of the quarterly performance reporting process, and ongoing enhancements, including the development of the project management and reporting system. Daniela and Greg covered the following points in their presentation.

- WSDOT has approximately 7,000 employees. The department owns, manages, and maintains some 20,000 mi of state highway lanes, 3,400 state bridges, 28 ferry vessels, and 20 ferry terminals. The state highway system carries some 86 million vehicle miles traveled per day. Approximately 24 million passengers a year ride the ferry system. WSDOT supports the Amtrak *Cascades* passenger rail service, which carries some 420,000 passengers a year. The state also operates the *Grain Train*, which includes 89 grain cars. WSDOT is currently delivering the largest infrastructure program in the state's history.
- WSDOT's accountability challenge is to be a high-performance organization that is credible with and accountable to the governor, the legislature, taxpayers, and transportation delivery partners across the state. In 2001, WSDOT was facing significant political and public pressures. In April 2001, Secretary Doug MacDonald was hired with the mandate to enhance accountability at WSDOT. He initiated a new strategic approach focusing on accountability and transparency, comprehensive performance analysis and reporting, and adaptive and dynamic performance measurement. This approach communicated two simple themes: accountability and project delivery. The main tool in this communication process is a quarterly performance report called *Measures, Markers, and Mileposts*, also referred to as the *Gray Notebook*.
- The initial response from the media and transportation partners to the use of the *Gray Notebook* was encouraging. There are tangible benefits to consistent performance management and reporting. The use of the *Gray Notebook* has enhanced WSDOT's credibility and accountability and has helped gain support for needed funding. The transportation revenue package, which was a 5-cent per gallon increase in the state gasoline tax, was approved in 2003. A second state gasoline tax increase was approved in 2005. The transportation revenue package, which was a 9.5-cent per gallon increase in the gasoline tax, to be phased in over 3 years, took effect July 1, 2005. In November 2005, through a simple majority vote, Washington State citizens had a choice to eliminate the 9.5-cent gasoline tax increase. A majority, 53%, voted not to eliminate it.
- A number of factors contributed to the support for the increases in the state gasoline tax. There is a history of transparency and accountability in Washington State. The governor and the legislature were supportive of the measures. Also, Hurricane Katrina illustrated the importance of a good transportation system. The continued on-

time and on-budget performance of WSDOT, communicated through use of the *Gray Notebook*, also helped.

- The *Gray Notebook* is organized into two main sections. The beige pages report on the delivery of projects funded in the 2003 Nickel Funding Package, the 2005 Transportation Funding Package, and the Pre-Existing Fund Package. The white pages describe key agency functions and provide regularly updated system and program performance information. The *Gray Notebook* includes both quantitative and narrative reporting.
- The beige pages present WSDOT's project delivery performance report. Information on the schedule, scope, and budget is provided in the executive summary. Information on completed projects includes the final schedule, scope, and budget. For projects under construction and in the pipeline, information on the advertisement, schedule, and budget is provided. Six milestones are used to measure performance. The narrative portion contains project delivery highlights, including any cost and schedule concerns, and cross-cutting management issues.
- WSDOT faces a number of challenges in project reporting. There are more than 1,000 projects that must be reported to the governor. One challenge is defining the scope of projects that get reported programmatically. More than 400 projects are reported about individually. Determining the appropriate level of detail and the reporting period are important. Quality control can be difficult, and the process takes time and resources. Presenting information to support a high-performance organization, credible with and accountable to the legislature, taxpayers, and transportation delivery partners across the state, continues to be a challenge.
- A number of approaches are being used to managing these challenges. Examples of these approaches include the development and use of a database to improve consistency, accuracy, and responsiveness. The database will improve consistency through providing one list of projects with all the necessary information on the six required milestones and other relevant data needed for reports.
- The database will also provide more accurate information and reporting. Currently, information is entered manually, which is labor intensive. The present system also relies on obtaining updated information from the WSDOT regions. The use of one database will improve quality control. The database will also enhance responsiveness by developing standard reporting queries. The database will allow for quick response to executive requests and will provide one source for the numerous reports provided to different groups. Even with these improvements, there is still a need to be able to manage the program at the project level.
- The statewide program management group (SPMG) is also examining longer-term improvements, including automating current manual features. This approach would further increase accuracy, efficiency, and reporting capability and accountability. A number of activities are under way to improve WSDOT's reporting in the future. These efforts include the SPMG, the strategic plan, the project management and reporting system (PMRS), the development of management and reporting tools, performance reporting enhancements, and an increase in accountability.
- The SPMG includes multiple consulting firms with experience in delivering projects for state departments of transportation. The group's role is to identify methods to enable WSDOT to deliver projects more efficiently. The SPMG is conducting a gap analysis and examining industry-standard best management practices. It is also conducting a systems analysis and is responsible for system development and implementation.
- The strategic plan focuses on implementing the best management practices to enable WSDOT to anticipate changes and manage them proactively. It will create a set of standard operating procedures to facilitate the use of best management practices and will provide a consistent status reporting environment. It is anticipated that commercial off-the-shelf software packages will be used. Other elements of the strategic plan include implementation of earned value cost management and a project management academy.
- The comprehensive management approach includes a number of elements. The best management practices will create a set of standard operating procedures to facilitate the use of these practices and will provide a consistent status reporting environment. The project management academy will focus on delivery and project management accountability. Other elements include PMRS system development and PMRS training.
- The system will result in increased accuracy and efficiency through a single source of data entry and an integrated system. Reporting capability and accountability will be increased by bringing management activities online, making reporting a byproduct of system use, and charging project management with responsibility for project delivery and reporting.
- The PMRS includes a number of project management tools. It is built on best management practices and business processes. The PMRS provides reporting access to all data. The development of management and reporting tools focuses on replacing project management functionality within existing WSDOT legacy systems. Issues to be addressed in the development process include establishing consistent processes, establishing consistent coding structures, migrating data on in-progress projects, maintaining legacy systems, and combating cultural resistance to change.
- Performance reporting enhancements include integrating data with a single point of entry, adding the ability to view multiple projects at one time and filter and

sort projects as needed, and adding earned value analysis capabilities and consistent cost-at-completion data. The improved process will increase accuracy and will provide a more efficient comparison of current and baseline schedules. A web-based portal will provide access to all pertinent data in one location.

- Earned value analysis integrates work, cost, and schedule metrics. It provides an early warning signal of political problems. It looks ahead for possible concerns, rather than looking backward after problems have arisen. Earned value analysis uses statistical projections to identify potential concerns. The schedule analysis provides the ability to compare the current schedule to multiple baselines. It can summarize, filter, sort, and group by different levels or by activity code for all capital projects at WSDOT.
- A number of approaches are needed to increase accountability. Project managers are accountable for project delivery. PMRS establishes consistent reporting requirements and provides monthly and quarterly reporting. Use of the system will be required. Funding and budget change approvals will be processed through the PMRS. The PMRS will improve consistency, accuracy, efficiency, and transparency.

Hal Kassoff, Parsons Brinckerhoff Quade & Douglas, Inc., moderated this session.

BREAKOUT SESSION

Cost Estimation and Management

Stuart Anderson, *Texas A&M University*
Ananth Prasad, *Florida Department of Transportation*

A New Strategy for Cost Estimating and Cost Estimating Management

Stuart Anderson

Stuart Anderson discussed NCHRP Project 8-49, Procedures for Cost Estimation and Management for Highway Projects During Planning, Programming, and Preconstruction. He summarized the issues associated with cost estimation for transportation projects, the activities conducted in the study, the project product, and future activities. Stuart covered the following topics in his presentation.

- State transportation agencies face a major challenge in controlling project budgets between the initiation and completion of a project. A number of factors contribute to this challenge. There may be difficulty in (*a*) describing solutions for all scope issues early in the project development phase, (*b*) evaluating the quality and completeness of early project cost estimates, (*c*) identifying major areas of variability and uncertainty in the scope and cost of a project, and (*d*) tracking the cost impact of scope development that occurs between major cost estimates.
- The objective of the project was to develop a guidebook on highway cost estimating management and project cost estimating procedures aimed at achieving greater consistency and accuracy between long-range transportation planning, priority programming, and preconstruction estimates. It is important to have both consistency and accuracy in the cost estimation and management process.
- The project was divided into two phases. A state-of-the-practice review was conducted in the first phase. Activities in this phase included a comprehensive literature review, detailed interviews with agency personnel, and the identification of potential strategies, methods, and tools. The second phase included development of the guidebook, testing and validation of the guidebook, and implementation planning.
- The guidebook includes 18 primary cost escalation factors and eight strategies to combat cost escalation. It outlines 30 implementation methods and 90 tool applications. Three generic process maps for project development phases are provided, along with one agency-level process map.
- Strategies address management, scope and schedule, off-prism approaches, and risk. Other strategies focus on project delivery and procurement, document quality, estimate quality, and integrity. One of the strategies presented for improving the quality of cost estimates is to use qualified personnel and uniform approaches. Good examples of programming methods are also presented, highlighting consistency, documentation of estimate assumptions, and the creation of a project baseline.
- Examples of programming tools for standardized estimating and cost management procedures, project estimate files, and methods for establishing project baselines are also provided in the guidebook. These baselines provide a cost–performance benchmark. Defining major project elements is a key element in developing these benchmarks. Tools for developing project baselines include cost containment tables and scope change forms.
- Project baselines in programming establish a basis for controlling costs. Cost management cannot be per-

formed effectively without a baseline budget. Project baseline programming provides management with a tool for making decisions when changes occur. Developing a baseline should occur when a project is programmed.

- The WSDOT scoping process provides one example of the use of project baselining in programming. One tip is to ensure an appropriate level of detail necessary to track changes. The book *Principle-Based Project Management* provides additional resources.
- The guidebook outlines elements of cost estimating and cost-estimate management during programming and preliminary design and presents methods for implementing different tools. It includes a discussion of the implementation of strategies through organizational change, implementation of methods through programmatic change, implementation of tools through project change, and integration of the system through the use of a strategic plan.
- Many of the techniques and tools contained in the guidebook are being implemented by state departments of transportation. Minnesota, Georgia, Montana, and Washington are all implementing comprehensive approaches or partial techniques. Other related initiatives include NCHRP Project 8-49, Right-of-Way Cost Estimating and Cost Estimating Management; NCHRP Project 8-60, Guidebook on Risk; and NCHRP Project 8-36(72), Implementation and a Capacity Building Workshop.
- The guidebook includes 10 key principles to cost estimating management and practice. These key principles include making estimating a priority by allocating time and staff resources, setting a project baseline cost estimate during programming or early in the preliminary design and managing it throughout project development, and creating cost containment mechanisms for timely decision making that indicate when projects deviate from the baseline. Other principles are creating estimate transparency with disciplined communication of the uncertainty and importance of an estimate and protecting estimators from internal and external pressures to provide low-cost estimation. Other key principles include completing every step in the cost-estimate process during all phases of project development, documenting the estimate basis, identifying project risks and uncertainties, anticipating external cost influences, and performing estimate reviews to confirm that the estimate is accurate and fully reflects the project scope.

Cost Estimation and Management

Ananth Prasad

Ananth Prasad discussed cost estimation and cost management at the Florida Department of Transportation (FDOT). He described the factors influencing cost increases in the construction of transportation projects in the state and strategies FDOT is using to address these increases. Ananth covered the following points in his presentation.

- FDOT is experiencing cost increases related to roadway construction. Costs have increased for earthwork, asphalt, structural concrete, structural steel, and reinforced steel. Factors influencing the increase in earthwork costs include borrow pit availability, hauling costs, and real estate pressure. Asphalt cost increases have been driven by increases in crude oil prices and in bitumen and aggregate prices, availability of supply, uncertainty in supply, and increases in transportation costs, as well as maintenance of traffic (MOT) considerations. Structural concrete cost increases are the result of the demand for concrete, MOT considerations, and the increased prices, uncertainty in supply, and transportation costs related to aggregate. Cost increases in structural and reinforcing steel are influenced by the global demand for steel, pressure on the fabrication process, and transportation costs.
- Earthwork increased from \$4.96/yd^3 in 2003 to \$8.64/yd^3 in 2006. Asphalt increased from \$53.93 per ton in 2003 to \$99.54 per ton in 2006. Structural concrete increased from \$549.82/yd^3 in 2003 to \$868.90/yd^3 in 2006.
- Florida has a robust economy. There has been significant population growth in the state. In 2004, the value of construction put in place per capita in Florida was double the national average and higher than in California. Approximately 70% of construction activity has been in the residential market, whereas highway and bridge construction accounts for only 10% of the market. The residential market appears to be cooling off, however. How long this trend will last is unclear. The extent to which it might benefit the transportation industry and whether FDOT will see any benefit is also unclear. There are also labor shortages in many parts of the state. Florida has a low unemployment rate and was less affected by the recent recession than were many other states. The rate of growth in construction employment, which accounts for 7% of total employment, is double that of overall employment levels in the state.
- Cost increases have also been influenced by reductions in bid competition caused by consolidations. The average number of bids received on FDOT construction contracts declined from 2002 to 2006, while the number of contracts with no bids and with only one bid increased. Further, the hurricane rebuilding efforts in Florida and the southeastern portion of the country have put a strain on supply chains.
- FDOT is pursuing a number of short- and long-term strategies to address these issues. Short-term strate-

gies include refining the awards criteria, revisiting inflation rates and contingency levels, and refining the department's estimating process. The department may reject more contracts if bids are too high or if there is only one bidder. FDOT is providing more periodic updates to the estimation process. Performance measures have also been established. Additional cost libraries that use historical unit prices and time durations from similar contracts were developed.

- Other short-term strategies include encouraging the use of bid options and bid alternates, implementing a bid maximum specification, and developing a comprehensive price index for construction contracts to manage risk. Optimizing night work is also being pursued. Finally, contract scope and length are being reviewed, as larger contracts are not necessarily better.
- The department is also examining long-term strategies, such as conducting a work force study focused primarily on unskilled workers and addressing conflicts in mobility and in freight. A statewide freight study will address key supply chain issues, with an emphasis on ports and rail infrastructure needs. The results of this study will be used to make investments in rail and port capacity that provide the greatest return on investment.
- Another long-term strategy is managing the risk associated with material availability. A statewide aggregate resource study is under way, and the department's procurement of aggregate to build redundancy in supply is being considered. The use of right-of-way for joint-use stormwater ponds and securing borrow pits is also being considered. Using flexible design and engineering and not requiring federal-aid standards on all projects represent other long-term strategies.
- Another long-term strategy is developing indicators to aid in establishing letting levels. Maintaining a moderately aggressive base level of lettings at all times is part of this strategy. The statewide construction database shows a total of $9.1 billion for highway and bridge work. FDOT's share of this total is only about $3 billion. Increasing competition continues to be an ongoing strategy. Even with volatility, contracts with three or more bids came in closer to the FDOT estimate than contracts with one or two bids. Waiving bonds on smaller contracts to help develop the next generation of prime contractors represents another approach, as do simplifying contract administration on smaller contracts and removing restrictions that do not add value.
- Procuring and permitting sites for temporary asphalt plants for contractors to use represents still another strategy. A final long-term strategy focuses on procuring permits for asphalt and concrete sources and plants. FDOT will participate in the dialogue on the permitting process and will provide information so that informed decisions can be made. It is important to remember that there is a fine line, however, between providing information and advocating for the permit or location of a temporary asphalt or concrete plant for a project.
- A number of strategies related to cost estimates are also being examined. Standardizing the estimating processes and more frequently updating cost estimates are two approaches. More attention is also being given to managing scope creep. Prior to bid solicitation, the estimates and funds programmed will be reviewed. Efforts will also be undertaken to "true up" the estimates, including reviewing bid prices on similar types of contracts of similar duration and reviewing bid prices for other agencies in the region. Prospective pricing, which involves contacting material supplies on trends and escalators, will also be considered.
- Unknown factors related to a project can be used to estimate the contingency amount appropriate for different phases of a project. The unknown factor percentages can also vary depending on the type of project. After a project is incorporated into the work program, construction cost estimates should be updated at specific milestones.
- Construction cost estimate performance measures have been developed. The first performance measure is the adopted versus the low bid, with a 15% absolute difference. The second performance measure is the official estimate versus the low bid, with a 10% absolute difference. The third performance measure is the initial cost estimate versus the Phase II cost estimate, with a 15% difference. The fourth performance measure is the initial cost estimate versus the adopted cost estimate, with a 25% difference.
- The right-of-way estimates focus on developing a system to identify projects for which the cost estimate has changed 15% and $1 million since the last programmed estimate. The frequency of updating cost estimates will also be increased. These updates will help capture and track the primary causes of changes in cost estimates on a project basis. Other enhancements focus on including phase-level real estate inflation factors in programming and providing a percentage for project unknowns in the project cost estimate.

Joseph G. Jones, Missouri Department of Transportation, moderated this session.

PLENARY SESSION

Planning and Programming
Ballot Box Programming

John Barna, *California Transportation Commission*
John Ristow, *Santa Clara Valley Transportation Authority*
Jim Gosnell, *Southern California Association of Governments*

Key Programming Issues in California

John Barna

In this presentation, I will describe some of the recent programming trends in California and highlight the recent voter-approved statewide funding measures. Like many other states, California historically relied on a gasoline tax to finance transportation. The revenues from the state and federal gasoline taxes provided a stable source of funding. At one point, a portion of revenues from the gasoline tax were provided to cities and counties.

The gas tax has waned as the primary source of funding for transportation capital expansion in the state. As a result, local sales tax measures have become the dominant source of capital expansion funding. In the 1990s, the state had to recover from two major earthquakes that severely damaged the transportation infrastructure. In the 2000s, general fund resources became the key source of capital expansion funding, resulting in annual budget decisions clashing with multiyear programming efforts. In 1999, the state legislature approved the Traffic Congestion Relief Act (TCRA), which specified approximately 160 projects and identified funding levels for each project. Up until this act, there had been an informal agreement that there would be no project-specific bills and no project-specific funding through the state budget process.

Funding for the projects in the TCRA was to come from the sales tax on gasoline. California has both a gasoline tax and a sales tax on gasoline. This funding change became Proposition 42, which voters in the state approved in 2002.

Both the TCRA and Proposition 42 included wording that in the case of a state budget crisis, the transfer of these funds from the general fund to transportation could be suspended. The state did experience a budget crisis soon after the passage of Proposition 42, which lasted 3 years. As a result, no transfer of funds occurred. Thus, the projects included in the legislation were not funded. The situation was more problematic due to the fact that, similar to earmarks at the federal level, legislation did not fully fund the projects. The projects represented commitments that had to be fulfilled, along with the programmed projects in the state transportation improvement program (STIP). The county sales tax measures helped to address this shortfall.

The gasoline tax in California also supports a robust State Highway Operations Protection Program (SHOPP). SHOPP, which is the responsibility of Caltrans, is also underfunded. Thus, there are demands on all parts of the system in the state.

Overall, annual revenue for transportation from state, regional, and local sources is approximately $20 billion. The same amount is spent on transportation annually. Local sales taxes and other local funding sources provide approximately $10.5 billion annually to support transportation in the state. Transit receives the largest share of these revenues, with local roadways second. The state highway system is last. The regional agencies have become the dominant entities funding transportation capital projects.

The current capital project allocation capacity is split approximately 55% to the SHOPP, the STIP, and TCRP;

and 45% to local measures and new local initiatives. If current trends continue, by 2014, needs in the SHOPP will increase, the TCRP will be completed, and the allocation will be closer to 50% for the SHOPP and STIP and 50% for local projects and initiatives. This change may influence state, regional, and local relationships. The STIP is funded primarily by Proposition 42, the sales tax on gasoline. The SHOPP is funded by the gasoline tax. The sales tax on gasoline is transferred from the general fund to the transportation account.

This situation means that the STIP, which by state law is a 5-year capital plan, is subject to annual budget decision making. The regional agencies, most of which have funding from sales tax measures, have annual expenditure plans that have been approved by the voters. It will be harder at the state level to make long-term budget commitments under this scenario.

Proposition 1B is a $19.9 billion general obligation transportation bond package that was approved by voters in the state. It includes $4.5 billion for congestion relief on freeways and roadways, $4.0 billion for transit and rail, and $3.1 billion for goods movement. It also includes $2.0 billion for STIP augmentation, $1.0 billion for state and local partnerships, and $1.0 billion specifically targeted for SR-99. Proposition 1B is an ambitious program and represents the first time the state has dedicated resources to goods movement.

Proposition 1B relies on annual budget decisions. Annual budget authorizations are required to allocate funds and issue bonds. While project-specific funding legislation is still rare in the state, the annual budget requirement puts programming commitments at risk. The potential exists for even greater reliance on local sales tax measures when the state budget yields insufficient funds.

In California, we have seen a transition from a reliance on the state gasoline tax to local sales taxes. We hope that Proposition 1B will provide needed revenues in the capital program. It will require continuing cooperative partnerships among agencies at all levels.

Ballot Measures in Santa Clara

John Ristow

To open this discussion of recent transportation measures in Santa Clara County, California, let me provide an overview of the region. Santa Clara County is home to the Silicon Valley and the Santa Clara Valley Transportation Authority (VTA). The county has a population of approximately 1.79 million, is home to some 1.1 million jobs, and has been averaging some 5,000 new high-tech companies each year. As a result, the county experiences a significant in-commute.

The VTA operates bus and light rail transit in the county and is a partner in the commuter rail system. The VTA is responsible for some highways and for some high-occupancy vehicle and high-occupancy toll projects. The VTA is also responsible for transportation planning and funding and is the county transportation sales tax authority.

Santa Clara County has had five transportation-related sales tax elections since 1984, which may be the largest number among counties in the state. Four of the five sales tax measures were approved by the voters, although one of the measures was overturned in court based on a lawsuit challenging the election. The sales tax measures vary in funding level, duration, and focus.

In 1984, Santa Clara County became the first county in the state with a voter-approved transportation sales tax election. In 1984, voters approved a 10-year, $1.2 billion measure. The transportation sales tax measure was initiated and championed by a state legislator who is now a congresswoman. She led the ballot effort, which focused on capital improvements to three major freeways. There was significant support from the business community for the measure.

The success of the 1984 measures led to a second election in 1992. Voters approved a 20-year, $3 billion multimodal measure that included highway and transit projects. The list of projects was developed through a fairly closed process of polling and surveys of selected groups. An antitransit/prohighway advocacy group filed a lawsuit challenging the election. The election result was overturned by the State Supreme Court, which held that a two-thirds majority, not a simple majority, was needed to approve the sales tax referendum, as it identified specific projects. In California, a general sales tax measure not targeted to specific projects requires only a simple majority vote, whereas one listing specific projects requires a two-thirds majority.

The groups supporting the sales tax measure developed a dual-measure strategy. Measure A was an advisory vote, requiring only a simple majority, and Measure B contained specific projects, requiring a two-thirds majority. Measure B projects were those identified as having significant support among voters. The Measure B projects provided geographic equity and included completion of some unfinished elements of the 1984 projects and reference to a connection with the Bay Area Rapid Transit (BART) system. Measure B, which the voters approved in 1996, included $1.8 billion in projects over a 9-year period.

In 2000, voters approved a 30-year, $5.4 billion measure. The list of projects included in the measure was developed through a countywide planning process and included a specific project linking San Jose to the BART system. A strong local politician championed the measure, which was also supported by all the city councils in the county.

The most recent measure, which was defeated by voters, was a 30-year general county services sales tax. There was no advisory measure and no specific list of projects. Not all of the city councils in the county supported the measure, which was portrayed as a potential transportation tax but without a committed tie to transportation.

A few elements associated with successful measures can be identified from the experience in Santa Clara County: having a popular local politician championing the measure, including projects with widespread support, and enjoying the absence of well-organized opposition. Elements associated with the unsuccessful measures included political discord, lack of signature projects, and lack of any identified projects.

Ballot Measures in Southern California

Jim Gosnell

My comments focus on transportation funding and local sales tax measures in the Southern California Association of Governments (SCAG) region. SCAG includes Los Angeles, Orange, Imperial, Riverside, San Bernardino, and Ventura counties. All of the six counties, except for Ventura County, have approved transportation sales tax measures. Los Angeles County has a permanent 1-cent sales tax. Imperial, Riverside, Orange, and San Bernardino counties all have ½-cent sales taxes that expire at different times. Voters in Orange County approved an extension of the current ½-cent sales tax through 2040 in 2006. The sales tax is anticipated to generate some $11 billion over 30 years. A total of 43% of the revenues are allocated to freeways, 32% to roadways and arterials, and 25% to transit.

Approximately 75% of SCAG's regional revenues originate from county sales taxes. There are advantages and limitations associated with the use of local sales tax measures to finance transportation. An advantage is the ability to finance transportation projects and the potential to link transportation and economic growth. To generate $1.1 billion in Los Angeles County would require a 1-cent sales tax or a 28-cent gasoline tax. Local sales tax measures may violate the "user pay" principle, however. Projects included in local sales tax measures may also bypass the metropolitan transportation planning and programming processes.

Most counties conduct planning processes, including public participation. A project requiring any federal action, including funding, environmental documentation, and permitting, must be consistent with and included in the regional transportation improvement plan. The regional transportation planning process focuses on coordination with regional priorities and local long-range plans, fiscal constraint, public involvement, and performance measures.

Work is under way to develop and implement a coordinated set of performance measures among the counties and SCAG. Performance measures focus on mobility, accessibility, reliability, safety, cost, and effectiveness. Other performance measures consider productivity, sustainability, preservation, environmental justice, and environmental protection.

Some projects included in approved sales tax measures have been later opposed by residents. A rail transit project included in an approved measure was opposed by community residents and neighborhood groups. Because the rail project was included in the air quality conformity plan, transportation control measures had to be identified and funded in the corridor. Working out this solution took extra time, but it showed that the planning process works.

In sum, Proposition 1B, in combination with local sales tax measures and traditional funding, will provide needed funding for key transportation projects in the state.

Paul Maxwell, Contra Costa Transportation Authority, moderated this session.

PLENARY SESSION

Planning and Programming
Dealing with Uncertainty

John Weaver, *Indiana Department of Transportation*
Ronald Kirby, *Metropolitan Washington Council of Governments*
Ashby Johnson, *Houston–Galveston Area Council*
Teresa Lemons, *Texas Department of Transportation*

Major Moves: 10-Year Construction Plan

John Weaver

My comments focus on the Indiana Department of Transportation's (INDOT) Major Moves program, which is a 10-year construction program. I will provide an overview of INDOT's responsibilities and the need for the Major Moves program, along with the major elements of the initiative.

INDOT has jurisdiction over some 11,200 centerline miles of roadways, including 1,100 mi of the Interstate system. The department's fiscal year (FY) 2006 construction budget was approximately $780 million. The anticipated FY 2007 construction budget is $825 million. The department has 3,800 employees.

The Division of Planning is responsible for traditional long-range transportation planning activities and feasibility studies. The division is also responsible for system management, which includes asset management functions. The division is further responsible for safety and mobility issues, primarily spot improvements and intersections, pavement engineering, research and highway statistics, traffic monitoring, and data collection.

The Major Moves program was initiated in spring 2005. The goal of the program was to establish a 10-year funded construction plan. The first step was to determine the gap between needed projects and available funding. There was also a need to develop a data-driven method to establish priorities and a project management system.

The gap analysis examined the funding needs for the 10-year highway program in the state and considered both preservation needs and the need for new construction projects. The unfunded new construction projects included in the long-range transportation plan were identified through this process. The long-range transportation plan is a project-specific 25-year plan. It includes detailed improvements on all corridors, with associated cost estimates and anticipated year of need. Needs were projected from the statewide travel demand model and other analytical tools, as well as from the public participation process.

The 10-year construction plan included a list of projects generated from the Production Schedule System, a database with project development milestones. It includes cost tracking and task management. Thus, both the immediate project needs and the needs of longer-term projects within the 10-year horizon of the long-range plan were examined.

An internal INDOT Planning Oversight Committee (IPOC) was established to help set construction priorities. The committee established priorities for major new capacity projects and developed a 10-year construction plan. The committee meets on a regular basis and publishes a project selection program based on data-driven project scores. IPOC helps keep the program in fiscal balance and provides for public input.

IPOC developed and applied a scoring system to identify project priorities. The scoring system assigns 50 points to transportation efficiency, 25 points to safety, 15 points to economic development, and 10 points to customer input. Up to 100 additional points may be

added for earmarks or funding from other sources, and 10 additional points may be added for projects that support urban revitalization.

A draft 10-year plan was published in September 2005 for public review. The plan included a prioritized list of projects by year, highlighting funded and unfunded projects. A survey was sent to all county officials to obtain input on project priorities. A total of 18 public meetings were held throughout the state, with some 3,000 individuals attending.

At the same time that these activities were under way, there was growing support among policy makers and the public for addressing the state's transportation needs. At least 30 different funding strategies, including a variety of public–private partnerships, were examined. Seminars were held throughout the state on public–private partnerships. The potential lease of the Indiana Toll Road to private groups as a method of raising revenues emerged at this time.

A bid package for lease of the toll road was developed. The bid package was a four-volume document that included detailed provisions for the toll road lease. The package was prereviewed by qualified bidders. The final lease package was advertised, and four bids were received. The awarded bid was a 75-year lease for $3.85 billion.

The toll road lease was supported by the governor. The state legislature approved the lease in March 2006, and the lease was signed and payment received in June 2006. The lease agreement includes detailed performance measures covering all aspects of the facility and outlines $1 billion in improvements to the toll road that the concessionaire will make.

The draft list of projects for the 10-year plan was finalized after the public participation process. The project costs were escalated for inflation, and a final plan was approved in May 2006. No changes were made from the draft plan. The name—Major Moves—became associated with the plan during discussions of the toll road lease. All of the projects included in the Major Moves program are fully funded based on lease proceeds and conventional funding. Annual funding grows from the current level of approximately $800 million in 2006 to $1.4 billion in 2025.

The Major Moves program will more than quadruple new construction. It will result in a record construction level every year of the program. Major Moves accelerates projects by some 70 years and accounts for a $12 billion highway construction program. Annual funding for construction increases from $789 million in FY 2006 to $1.1 billion in FY 2011, accounting for a 40% increase.

In summary, the key elements of the Major Moves process and program included identifying the gap needed to fund projects in the long-range transportation plan and providing a preliminary listing of priority projects for public and policy-maker review. The public involvement process included 1,300 surveys of county officials and 18 public meetings with some 3,000 attendees. A number of public–private partnership mechanisms were examined, and a process for leasing the Indiana Toll Road was developed. The process had support from the governor and the state legislature. The whole process was accomplished over a 1-year period. The Major Moves document and project list will continue to be updated.

Planning and Programming at the Metropolitan Washington Council of Governments

Ronald Kirby

My comments focus on approaches to planning, project development, and project financing being used at the Metropolitan Washington Council of Governments (WASHCOG).

The speakers from California in the first session this morning discussed the use of voter-approved dedicated local funding sources for transportation. This approach is not currently being used in Virginia, Maryland, or the District of Columbia. WASHCOG's existing federal and state-funded program focuses primarily on maintenance and rehabilitation of the existing roadway system, and some backlogged projects. There has not been a significant increase in revenues in the federal program. There have been attempts at the state and local levels to approve significant new dedicated funding sources for transportation, but none have been successful to date. As a result, local communities know they need to identify funding sources for new projects.

By way of background, the Transportation Planning Board (TPB), which is housed within WASHCOG, is the metropolitan planning organization (MPO) for the D.C. metropolitan area, which includes the District of Columbia, northern Virginia, and suburban Maryland. The population of the area is approximately 5 million, and there are some 3 million jobs in the region.

In the late 1990s, the TPB adopted a transportation vision that includes goals, objectives, and strategies related to the transportation system, the integration of transportation and land use, environmental concerns, and equity issues related to serving disadvantaged groups. I continue to be struck by how much of the vision focuses on transportation's relationship to land use and social issues. These topics are also the focus of much of the discussion at both the staff and the policy board levels.

The project development process is guided by the adopted financially constrained long-range plan (CLRP)

for transportation. The CLRP has become the focal point for the planning process and the discussion of possible projects and programs. The financial constraint requirement has resulted in a more realistic long-range plan. It has also influenced the planning process. Possible major projects begin as planning studies, and the recommended alternative moves forward in the programming process after realistic funding has been identified.

The transportation improvement plan (TIP) represents the 6-year portion of the CLRP. Previously, the TIP was formally updated every 3 years, based on federal requirements. Now the TIP will be updated every 4 years based on the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users. For local purposes, both the CLRP and the TIP are updated annually. These updates support the "continuous" element of the comprehensive, cooperative, and continuing (i.e., 3-C) transportation planning process.

Given limited funding available through the traditional process, major projects in the region have been financed through special congressional appropriations and other techniques. The Woodrow Wilson Bridge provides one example of a project funded primarily through a special congressional allocation. When I joined the TPB 20 years ago, there was no plan in place for reconstruction of the Woodrow Wilson Bridge, even though the six-lane bridge could not accommodate the vehicle volumes on the eight-lane approach roads at that time. It was in poor condition and in need of repairs 20 years ago. The planning process began prior to the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA). The Draft Environmental Impact Statement, which was completed and submitted after ISTEA, was not approved because of the lack of an adequate public participation program. A new planning process was initiated as a result of this decision.

Given the lack of available funding and the historical use of toll bridges in eastern cities, a toll bridge emerged as the recommended approach in the second study. There was significant opposition to the toll approach, however, and the governors of Maryland and Virginia, the mayor of the District of Columbia, and other top officials approached Congress for special funding for the bridge. These efforts were successful, and Congress appropriated the necessary funds to support this $2.6 billion project without requiring tolls. The first of two new bridge spans opened this past summer. The second span is scheduled to open in 2008.

The Inter-County Connector in Maryland represents a second example of funding new transportation infrastructure in the region. It is an 18-mi, six-lane freeway that will be tolled. A mix of funding is being used for this $2.4 billion project. These sources include tolls on the new facility that will vary to manage congestion, revenues from other toll facilities in the state, federal Grant Anticipated Revenue Vehicles (i.e., GARVEE bonds), and state funding. Construction is scheduled to begin in spring 2007.

The Metrorail line to Dulles Airport provides a third example of a different approach to funding major projects in the region. This project was studied for many years before passing the threshold to move forwarded as a funded project in the CLRP. Currently, $900 million of the $3.7 billion project is being sought from the FTA New Starts Program. Additional funding is coming from the development district in the area and toll revenues from the toll road in the corridor. When the project cost increased, the decision was made to raise tolls for a period of time. The CLRP was amended to reflect this change.

Another major project in the region is the purchase of additional rail cars and supporting facilities for the Metrorail system. Approximately $300 million per year is estimated to be needed for rehabilitation and new rail cars and buses to meet the forecast use of the Metrorail system. Because funding was not available, a cap was put on transit ridership in the travel forecasting model in 2000 as a temporary response. Funding was subsequently obtained from state and local governments for the purchase of the first phase of new rail cars to meet the financial requirements of the CLRP. Another $3 billion is still needed over the next 10 years for additional rail cars, buses, and associated infrastructure. There is an effort under way in Congress to obtain a 50% federal contribution to this funding need and to obtain 50% matching through dedicated state and local funding.

Although all of these projects must be in the CLRP and TIP, the shift away from traditional funding sources may result in projects with their own funding sources being constructed first and possible fragmentation of systemwide needs. These potential concerns will continue to be examined.

Tolling Projects in Houston

Ashby Johnson

I would like to highlight recent experiences in the Houston area with toll-related projects and describe some of the issues that may be encountered in planning and programming toll projects.

The Houston–Galveston Area Council (H-GAC) is the MPO for an eight-county region with a population of approximately 5.2 million. Houston, which is in Harris County, is the largest city in the region.

H-GAC's 20-year long-range transportation plan is developed cooperatively with the Texas Department of Transportation (TxDOT), the Metropolitan Transit Authority of Harris County (METRO), various cities and counties, the Houston Port Authority, county toll

authorities, and other groups. Approximately $65 billion is estimated to be needed to fund projects in the adopted 2025 long-range plan, including port and airport projects. Estimated toll revenues account for some $6 billion of estimated revenues. Toll revenues are projected to grow even more in the 2035 long-range plan. Currently, federal and state sources account for some 40% of total transportation funding in the plan.

The ability to establish toll agencies and toll facilities in Texas is addressed in different state legislation. Counties in the region can form toll authorities and issue bonds based on voter approval. The Harris County Toll Road Authority (HCTRA) was established in 1983 and operates some 500 lane miles. Voters in Fort Bend County approved the creation of the Fort Bend Toll Road Authority in 2000. Fort Bend, which relies on HCTRA for operations, developed the West Parkway Toll Road, which uses all-electronic toll collection. In addition, TxDOT's Texas Turnpike Authority (TTA) Division has the authority to plan, design, construct, and operate toll facilities in the state. How state and local toll road authorities will work together in the future to construct, operate, and maintain the toll network is still being worked out.

TxDOT also has the authority to use comprehensive development agreements (CDAs), public–private partnerships used in the development, funding, and operation of toll facilities. The development of the long-range transportation plan and the TIP follows a process similar to those described by other speakers at this conference. Toll facilities can raise a number of potential issues related to transportation planning and programming, including the long-range transportation plan and the TIP. For example, toll projects do not have to be included in the plan and TIP if no federal funds are being used. The only "hook" that we have at the moment is air quality conformity. In addition, there can be confidential elements associated with the use of CDAs to construct toll facilities. The private entity can claim that some financial data needed for the development of the long-range plan, such as future toll rates and operations and maintenance costs, are proprietary.

TxDOT and HCTRA are currently working together on the managed lanes component of the I-10 West (Katy) Freeway. TxDOT and HCTRA are exploring possible projects in other corridors, but the exact funding and operating responsibilities have not been worked out yet. In addition, METRO recently announced that it will convert high-occupancy vehicle lanes to high-occupancy toll lanes next year, though the group has not yet made any decisions about the use of excess revenues.

Establishing strong working relationships between MPOs and toll authorities may not be easy because of their different missions, roles, and responsibilities. Toll authorities tend to guard financial information. Recent MPO and toll authority discussions concerning future excess toll revenues and the creation of a regional toll strategy have been difficult. The excess toll revenues from HCTRA currently go into the county general fund. The revenues have historically been used to maintain and expand the toll road system. Recently, however, some funds were used to support an economic development project, which raises concerns about further nontransportation use of these funds. H-GAC would like to see a commitment to reinvest excess toll revenues in the transportation system. H-GAC is also working with TxDOT to ensure that any concession fees collected in the region as part of a CDA are used for transportation projects in the region as opposed to going into the state's general transportation fund.

H-GAC is working with all groups to develop a regional toll strategy. This process has not been easy given the different missions of the various agencies, toll authorities, and private sector groups. In closing, I would like to stress that coordination among MPOs, local governments, and other public–private entities is imperative if the MPO is to develop a meaningful, fiscally constrained long-range plan and a TIP that can withstand public scrutiny and potential legal challenges.

Public–Private Partnerships in Texas

Teresa Lemons

My comments focus on the recent experience in Texas with public–private partnerships. I will first describe the $86 billion funding gap for roadway needs in the state and the TTA Division at TxDOT. I will describe the goals, strategies, and structures of the CDA program, which is what we call public–private partnerships in the state. I will highlight examples of current procurements and discuss the Trans-Texas Corridor (TTC-35), concession fees, uses of tolls and concession fees, and techniques to safeguard the public interest with these approaches.

Texas is the 10th largest economy in the world. Over the past 25 years, the population of the state has increased by 57%, and road use has grown by 95%. Road capacity increased by only 8% over the same time period. The current population of the state is 22 million, and the population is expected to increase to 35 million by 2040. Nearly 45% of the 22 million Texans live within 50 mi of I-35. The state motor fuels sales tax, which is 20 cents per gallon, is not indexed to inflation and has not been increased since 1991. Infrastructure needs in the state are increasing, while real funds are declining. As a result, there is an $86 billion funding gap.

The authority to establish toll authorities and to plan, design, finance, and operate toll facilities is addressed in

five different pieces of legislation. In the 1950s, the state legislature established the TTA as a separate agency. In 1997, the Texas Legislature made the TTA a division of TxDOT to enhance the department's ability to meet the state's transportation challenges. Legislation approved since 1997 has continued to enhance TxDOT's ability to meet transportation demands. Recent legislation allows TxDOT to develop and operate toll roads, allows TxDOT to use CDAs, and allows counties to establish regional mobility authorities (RMAs). Legislation further gives RMAs the authority to finance, construct, and operate toll roads and a variety of other transportation, transit, bicycle, pedestrian, and rail facilities.

The Texas CDA program has a number of goals and strategies. The program focuses on consumer-driven decisions through toll user fees. It builds on private sector innovation and investment and shares risk with the private sector. The legislation allows many procurement and contract options. Decisions and control of revenues are devolved to regions for local and regional projects, while retaining corridor concepts for connectivity. It is a multimodal approach that includes roads, rail, and utilities.

State legislation provides flexibility in the application of CDAs. There are different laws for the use of CDAs on and off TTC-35. Two operating time periods—50 or 70 years—may be used. CDAs must include a minimum of design and build but may also include finance, operations, and maintenance. TxDOT may solicit CDA proposals and may also receive unsolicited proposals. Either process includes a two-step competitive selection process with a request for qualifications and short-listing of qualifying firms, followed by a request for proposals. Design–build, strategic partner, and concession models have been used with CDAs to date.

Approximately $10 billion in procurements for different toll projects are anticipated over the next few years. That figure doubles when potential near-term projects for TTC-35 are included. TTC-35 is envisioned to run from the Texas–Oklahoma border north of the Dallas–Fort Worth metropolitan area to the Texas–Mexico border. TxDOT entered into a strategic partnership with the Contra–Zachary Consortium to examine opportunities in the corridor. The Master Development Plan identifies near-term facilities and longer-term elements. Preliminary project costs and concession values have been identified.

Regional tolls and concession fees are retained at the regional level to be used for transportation. Regions provide input to the CDA program, including toll rate methodology and revenue sharing. In October 2006, the Transportation Commission developed a revenue-sharing agreement with the Regional Transportation Council in the Dallas–Fort Worth metropolitan area. Corridor tolls and fees may also be used for transportation connectivity between regions.

A number of steps have been taken to ensure the public interest is safeguarded with the use of CDAs and other related approaches. TxDOT is responsible for providing a safe and efficient transportation system in the state. TxDOT has very detailed contracts on current projects and will continue to ensure the public interest is protected in future projects. A mix of up-front payments and revenue sharing over time are being used. TxDOT is establishing long-term partnerships with private sector groups and is transferring risk to the private sector through detailed contracts and negotiations. Funds derived from projects are being used for other transportation projects. The improved transportation network that is being developed through the use of CDAs enhances economic productivity in the state. CDAs are one of many options to improve transportation in Texas. Other options include bonds to finance projects, as well as traditional federal, state, and local funding.

Paul Maxwell, Contra Costa Transportation Authority, moderated this session.

PLENARY SESSION PANEL

The Planning and Programming Connection

John Mason, *Science Applications International Corporation*
Ronald Kirby, *Metropolitan Washington Council of Governments*
John Poorman, *Capital District Transportation Committee*
Harlan Miller, *Federal Highway Administration*

Transportation Planning and Programming: Challenges and Implications

John Mason

My comments reflect my experience as mayor of Fairfax, Virginia, and as a member of the National Capital Region Transportation Planning Board, the metropolitan planning organization (MPO) for the Washington region, for 12 years. My observations and comments come primarily from the perspective of a decision maker, rather than a technical MPO staff member or a consultant, and they focus on three general areas. First, I will highlight six of the significant challenges I heard discussed at this conference related to programming. Second, I will touch on a few personal observations related to transportation planning and programming. I will close by outlining potential implications of the issues discussed during the conference.

Clearly, one of the key challenges we face is the lack of a coherent national transportation policy. Fundamentally, there is a failure to address transportation holistically and to provide some sense of a cohesive direction across modes. The lack of a national transportation policy does influence statewide and metropolitan transportation planning and programming. The National Surface Transportation Policy and Review Commission may help address this challenge.

The second challenge is the increasing demand on the transportation system. All modes are experiencing stress from too much demand. Capacity expansion is severely constrained by lack of funding and other issues.

The third challenge is that at the same time there are stresses on the system, there are increasing public expectations and demands for accountability.

The fourth challenge, which compounds all these issues, is the trend toward devolution of responsibilities, paired with increasing federal requirements.

The fifth challenge is that program delivery is jeopardized by the increases in U.S. Department of Transportation programs, including new requirements in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users; increased expectations; and reductions in department of transportation staffs.

Finally, the most important and overarching challenge is the funding shortfall, which is the root cause of many of the other challenges.

With these six challenges in mind, let me turn now to some comments on transportation planning and programming.

It is clear from the presentations and discussions at this conference that planning and programming vary widely across states and MPOs. I was amazed at the diversity in the approaches used in different areas.

Second, I was struck by the complexity of the planning and programming process as described by different participants involving states, MPOs, local jurisdictions, and sometimes independent authorities. The state level is heavily influenced by the culture at state departments of transportation and traditional approaches. I think the state processes are not as heavily influenced by public

participation as are those at MPOs. These processes are becoming more complex with the need to better understand private investment and financing.

Third, the organizational structures and processes many of us are accustomed to may not fit the tasks or challenges I just described. Our structures and policies will need to evolve. MPOs, for example, need staff with financial analysis capabilities and staff that understand systems operations.

Fourth, as some speakers have noted, traditional program categories may not fit the challenges we face today. Many state departments of transportation and local public works departments use the term "operations and maintenance," which is different from the "management and operations" or operating strategies discussed at this conference. These operating strategies focus on system efficiency and safety. Fifth, at the same time that emphasis is increasing on system performance and operations, the traditional operations portion of budgets is vulnerable, as this is the category that often includes administration or overhead activities.

I will conclude by discussing some of the implications related to these challenges and observations. I will highlight 10 possible implications of what we have discussed at the conference.

The first implication is that the traditional federal and state funding sources are evolving into a much broader mix of transportation financing. Funding is becoming increasingly dependent on regional and local initiatives and, significantly, private investment. New regional organizations are being established in many areas with broad authority to fund, construct, and operate multiple transportation modes using a variety of financing and operating techniques. This increasing dependence on local and regional institutional arrangements is a significant shift from the past that has important implications for the future.

The second implication is that as local jurisdictions become major revenue sources, the potential for fragmentation or balkanization of state and regional transportation systems increases. When funding is decentralized, it is important to not lose sight of the overall transportation system. States should not lose sight of what is important from a state perspective. MPOs will play an important role in keeping a focus on regional systems.

The third implication is that outcome-based performance measurement is essential, especially to reassure customers that investments matter. We need investment strategies that mean something to harried drivers that focus on outcome, not output. Regional performance measurement by MPOs makes sense—MPOs create the goals and objectives that are largely fulfilled by operating agencies. It makes sense for MPOs to measure whether these goals and objectives are being achieved.

The fourth implication focuses on the need for better tools and methodologies to help improve investment decision making. These tools are especially important for examining the complexities associated with evaluating private investment versus traditional public construction of infrastructure.

The fifth implication is that the importance and the role of MPOs are clearly increasing. This increase in responsibilities is driven by devolution of federal responsibilities and the recognition of the need for heightened collaboration at the regional level. Regional planning will be crucial to the future of our metropolitan areas. Ensuring that MPOs have adequate staff and financial resources will be important.

The sixth implication is that the challenges of today and tomorrow will require significantly higher degrees of collaboration between state departments of transportation, MPOs, local jurisdictions, federal agencies, independent authorities, and other groups. Historically, there has been tension between some state departments of transportation and MPOs. This tension has lessened as both agencies realize that a higher degree of collaboration is needed.

The seventh implication is that improved cost estimation is necessary to ensure credibility with the public. We need to do a better job of estimating project costs, including building in realistic cost escalation factors, to maintain the confidence of the public and policy makers.

The eighth implication is that risk assessments should be considered in both planning and programming to alert decision makers to potential cost increases and project changes.

The ninth implication is that semantics matter. We have to use words and terms that decision makers and the public understand. There is also a need for consistency of meaning across agencies.

The final implication, on a more personal note and harking back to earlier discussions, is that politics is not a dirty word. The reality of decision making is finding the right balance between technical correctness and the context within which decisions are made. Consensus must be developed across a range of constituency groups, including elected and appointed officials, to meet current and future needs.

Transportation Planning and Programming: Changing Conditions, Changing Priorities

Ronald Kirby

We are all facing changing roles and responsibilities, especially related to transportation funding. This change is having a dramatic impact on the transportation plan-

ning and programming processes, and is affecting different areas in different ways. Someone at the conference made the comment about the "golden rule"—that is, "he who has the gold, rules." In the Washington, D.C., region, the federal funding share has remained relatively stable, but we are seeing an increase in toll facilities in the long-range plan, a decline in traditional state funding as a percentage of overall revenues, and an increase in the use of local bonds.

These changes are altering the dynamics of the transportation planning and programming processes, with more project earmarking at the federal level and "ballot box programming" at the state and local levels. The question in my mind is where transportation planning and programming are headed in the future given these changes.

A key factor that will influence future directions is the federal program. The transportation planning and programming processes as currently practiced are largely dictated by federal funding and regulations, especially those related to public involvement, the process outlined in the National Environmental Policy Act of 1969, fiscally constrained transportation improvement plans, cost estimating, and other elements. These regulations have a significant impact on what state departments of transportation, MPOs, transit agencies, and other groups do on a daily basis. I sensed a lot of uneasiness during the discussions over the direction or lack of direction in the federal transportation program. Many people are uncomfortable with what happened during the last federal reauthorization process and would not like to see the same situation occur again with the next reauthorization. Clearly, if there is a major change at the federal level, transportation planning and programming processes will also change.

My guess is that the federal program will be continued, with gradually increased funding levels, including the numerous requirements the public has come to expect—although there may be some changes. The earlier federal goals of connecting the country, getting rural communities out of the mud, and rehabilitating declining public transportation systems have been accomplished. These goals were the initial drivers for the federal highway and transit programs. There are numerous new issues and opportunities for a federal program to address. I thought Steve Heminger's comments related to the National Surface Transportation Policy and Review Commission identified a number of priority concerns that could form the central focus for a new federal program or a shift in the current program. Safety, freight and global trade, energy, the gasoline tax, system preservation, major choke points on the national system, management and operations, and metropolitan congestion are concerns that need to be addressed at the federal level.

All these issues influence what we do on a daily basis at MPOs, state departments of transportation, transit agencies, and other organizations regarding planning and programming. We need to adapt the processes to these changing conditions. I do not see any change in our main responsibilities for ensuring public and stakeholder participation, considering environmental concerns, and other basic elements of the transportation planning and programming processes. While there are challenges, I think we can adapt to these changes if we continue to build a strong consensus on overall goals and needs through the state and MPO planning processes. This approach will also help generate needed funding from a wider range of sources.

Our Role as Planners and Programmers: A Positive Vision for the Future

John Poorman

My comments focus on a few bigger picture topics. All of us at this conference—whether we work at the MPO, state, or federal level—have been attracted to transportation planning and programming because we want to help society do the right thing and improve the transportation system for current and future generations.

My message is an upbeat and positive one, even though we face numerous challenges. I think we can be positive for a number of reasons. First, as Ron noted, there is a market for the services our agencies and organizations provide. The public and diverse stakeholders expect an open, honest, and inclusive transportation planning process. Policy makers value the expertise we provide.

Second, speakers and discussions at the conference highlight the diversity in metropolitan dynamics, politics, and culture found in urban areas throughout the country. These differences are evident even among metropolitan areas in the same state and are reflected in the variety of approaches being used in transportation planning, programming, and funding. What works in one area may not be logical in another area.

In the Albany area in New York State, we have the opportunity to foster a regional perspective because of the multicity, multicounty environment. Other parts of the state do not have this opportunity because of different development patterns and institutional arrangements.

Third, many comments have focused on the shift in transportation funding away from traditional sources to new approaches, including public–private partnerships, increased use of tolling, and ballot initiatives. I posed the question earlier in the conference of whether these approaches represented a condemnation of the traditional methods. The responses indicated that the current

situation represented a challenge, not a condemnation. The lofty idealism represented in the federally guided process is still valid.

I think we can forecast a few things, like the condition of pavement in 50 years. I do not think the public will settle for deteriorating pavement; therefore, in 50 years, I would suggest that the percentage of pavement in poor condition will be in the range from 0% to 20%. The public expects us to address transportation issues in this country, and we need to meet these challenges.

I think it is also important to remember that transportation planning and programming are not engineering disciplines. They are no more engineering disciplines than is the defense department or the entertainment industry. All of these sectors require some engineering, but engineering is not at the core of their mission. Transportation planning and programming is as much a social system process as it is an engineering process. The decisions in transportation planning and programming involve choices, trade-offs, and consensus building.

The New York Statewide MPO Association pools funds to conduct projects of statewide significance. In 2005, I had the privilege of chairing a colloquy that was funded by the association, FHWA, and the New York State Department of Transportation. The colloquy brought together an expert panel to examine current trends and future directions that will affect transportation and the MPO planning process.

The conclusions from the colloquy were similar to many of the comments made at this conference. One of the conclusions was that the MPOs that will remain relevant are those that have strong leadership, engage in collective collaborative visioning, break down the barriers between transportation and other social functions, and take a broad and long-term holistic view. These same statements could be made about state departments of transportation.

I think we are up to the challenges we are facing. We will be able to stay ahead of the waves that may crash upon us, and we will be ready for that "perfect storm" that seems to be appearing in numerous places. We will be able to make possible what we never thought was possible, like tolls in Texas.

MPOs and other agencies involved in the processes—including the planning process and the programming process—will continue to be sought out for their value-added capabilities. It is critical that the planning and programming processes are doable, credible, logical, principled, organic, and reflect political relativity and social values. For example, it is interesting that MPOs in the Dallas–Fort Worth area and in Houston, which established their credibility around the federal process many years ago, are being sought out for their contribution and participation in the discussions related to tolling.

From an MPO perspective, I do not find these changes and challenges threatening. We need to be sure we do not get stuck simply addressing federal requirements. We must continue to be responsible to the changing needs of the metropolitan areas we serve, and we must continue to add value to addressing critical transportation needs.

Transportation Planning and Programming: Dealing with a Changing Landscape

Harlan Miller

The nature of transportation planning and programming is constantly changing. We all know that transportation plans and programs are not static, but dynamic. Plans and programs need to be flexible to address changing conditions, while maintaining a focus on adopted goals and policies.

New elements influencing transportation planning and programming include performance measures, improved cost-estimating practices, increasing expectations for accountability, fiscal constraint, safety, security, operation and management, and the use of visualization techniques. In this conference, we have discussed the increase in earmarking at the federal level and the impact of earmarks on the planning and programming processes. Project cost increases and how to improve the cost estimation process were also discussed, as well as methods for tracking project costs. The changing nature of transportation funding and financing was touched on in many sessions.

I found the discussions on the roles of MPOs very interesting. I think the roles of MPOs and state departments of transportation are stronger than ever. Federal legislation addressing MPOs grew out of the need for coordination during the Interstate era. Although the Interstate system is complete, we face even more challenging issues in metropolitan areas today. Congestion is one of these issues. Another is the declining level of revenue for transportation when the effects of inflation are considered. MPOs and state departments of transportation provide solid foundations to build from to tackle these issues.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) contains additional requirements related to the transportation planning and programming processes. These requirements and other issues are making the processes more complex. For example, environmental mitigation must now be considered in the transportation planning process. The development of participation plans is now required, and there are new consultation requirements. Management and operation of the existing system are becoming key considerations in the plan-

ning process. Safety and security elements are more important. The requirements related to ensuring that the transportation process is consistent with economic development activities and growth plans are new. These requirements highlight the need to step outside traditional transportation activities and coordinate with other regional activities.

I think that enhancing communications is one of our biggest ongoing challenges. We also need to increase collaboration among MPOs, state departments of transportation, transit agencies, regional organizations, federal agencies, and other groups. We need to avoid duplication of efforts and to streamline the process as best we can. Each agency has unique capabilities. MPOs are typically responsible for data collection, maintaining and analyzing census data, conducting the travel forecasting process, and analyzing air quality issues. MPOs provide a strong link to elected officials, have a good understanding of stakeholder needs, and have close links to land use issues.

State departments of transportation have responsibilities for the highway and roadway system, as well as other modes. State departments of transportation are operating agencies. They have a broad understanding of funding and financing issues and approaches, and their representatives frequently have close relationships with the state legislature, state officials, and the state congressional delegation.

Transit agencies and operators have unique roles and responsibilities. Representatives from transit agencies have important roles to play in the transportation planning and programming process. They are also involved in the alternative analysis process and addressing congestion issues facing metropolitan areas. We need to maintain the early and ongoing participation of all agencies, including transit agencies, resource agencies, and other less traditional partners, as we consider these new issues and address the requirements of SAFETEA-LU.

Working cooperatively provides the opportunity to take advantage of the unique skills at the various agencies. Sharing information among agencies early in the planning process helps promote the active involvement of all groups. Estimating revenues, examining possible innovative funding sources, conducting planning studies, developing performance measures, establishing goals and objectives for statewide and metropolitan transportation plans, and addressing environmental mitigation needs all represent activities that should be conducted with the active participation of all agencies.

The development of performance measures provides a good example of an activity that should be conducted jointly among agencies. It is important to avoid having individual agencies develop performance measures that are not consistent with those of other agencies. Developing common performance measures related to congestion, project delivery, and other issues that involve multiple agencies is important. Developing solutions for transportation funding and solutions for congestion are other areas in which a cooperative approach is needed.

Thomas Brigham, HDR Engineering, Inc., moderated this session.

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Jimmy Moore, *Tennessee Department of Transportation*
Rachel Moriconi, *Santa Cruz County Regional Transportation Commission*
Pat Morin, *Washington State Department of Transportation*
José Luis Moscovich, *San Francisco County Transportation Authority*
Robin Naitove, *Florida Department of Transportation*
Lance Neumann, *Cambridge Systematics, Inc.*
Carmen Neveau, *Vermont Agency of Transportation*
Samson Okhade, *Sacramento Area Council of Governments*
Jeff Ottesen, *Alaska Department of Transportation and Public Facilities*
Scott Paine, *University of Tampa*
Mike Patterson, *Oklahoma Department of Transportation*
John Poorman, *Capital District Transportation Commission*
Ananth Prasad, *Florida Department of Transportation*
Lucia Ramirez, *Oregon Department of Transportation*
John Reilly, *John Reilly Associates*
Marcella Rensi, *Santa Clara Valley Transportation Authority*
Karen Richter, *Puget Sound Regional Council*
John Ristow, *Santa Clara Valley Transportation Authority*

James Ritzman, *Pennsylvania Department of Transportation*
Bill Roberds, *Golder and Associates*
Robert Rogers, *Georgia Department of Transportation*
Ronald Rolfer, *Washington State Department of Transportation*
Bob Romig, *Florida Department of Transportation*
Elizabeth Rushley, *Ohio Department of Transportation*
Page Scott, *Yakima Valley Conference of Governments*
Greg Selstead, *Washington State Department of Transportation*
Jamie Simpson, *Georgia Department of Transportation*
Kristen Simpson, *City of Seattle*
Nancy Slagle, *State of Alaska Department of Transportation and Public Facilities*
Omar Smadi, *Center for Transportation Research and Education (Iowa State University)*
Brian Smith, *Washington State Department of Transportation*
Helena Kennedy Smith, *Washington State Department of Transportation*
Rick Smith, *Washington State Department of Transportation*
Samuel Snead, *Boston Metropolitan Planning Organization*
Jacob Snow, *Regional Transportation Commission of Southern Nevada*
Michael Soscia, *New York State Department of Transportation*
Mike Stanley, *North Carolina Department of Transportation*
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Dianne Steinhauser, *Transportation Authority for Marin County*
Jeanne Stevens, *Tennessee Department of Transportation*
Sandy Straehl, *Montana Department of Transportation*
John Sweek, *Federal Transit Administration*
Glen Tepke, *Metropolitan Transportation Commission*
Toni Tisdale, *Compass*
Lorie Tudor, *Arkansas State Highway and Transportation Department*
Katherine Turnbull, *Texas Transportation Institute*
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John Weaver, *Indiana Department of Transportation*
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