PLANNING

Summary of Paper

The purpose of this paper is to establish a point of departure for the conference discussion on multimodal transportation planning. Because of the few examples of such planning in the United States, the paper necessarily focuses on background and on normative perspectives of what multimodal planning should be. Given that any planning process should be structured to reflect local institutional and political characteristics, this paper will not offer the approach to multimodal planning. Instead, it will explore characteristics of such planning and hopefully begin the discussion of how we develop and use a multimodal perspective in planning and decisionmaking.

Ever since the early 1960s, when the federal government first institutionalized the 3C transportation planning process, the transportation profession has been struggling with how to structure a process that clearly considered investment trade-offs in a "balanced" manner. If we define "balanced" as being decisions being approached from the perspective of truly comparing alternative modal options, we have not succeeded.

The reason for such apparent difficulty in developing and applying a multimodal planning approach in support of transportation investment decisions lies in both the institutional and finance history of the profession. Probably of most importance were the limitations placed on, and incentives provided to, local decisionmaking as it related to federally funded transportation projects. Historically, the categorical nature of federal funding did not allow funds in one category (e.g., highways) to be used for another purpose (e.g., transit). In fact, the limited use of such substitution for Interstate highways which occurred in the mid-70s did not happen without significant political resistance from highway groups.

To some extent, this limitation in the use of federal funds has been eliminated by the recently passed Intermodal Surface Transportation Efficiency Act (ISTEA). However, even without the funding constraints found within the federal aid program, there are still several significant barriers associated with developing a true multimodal planning process. These include:

1. The traditional modal orientation of the major transportation actors in a typical urban area or state will likely provide great difficulty in adopting a multimodal perspective in decisionmaking (as evidenced by many highway agencies still providing the highway component to the TIP and the transit agency providing the transit element).

2. State or local constraints on the use of revenues for highway or transit purposes, rather than for "transportation" purposes, can be important limitations on the use of the new, "flexible" federal funds.

3. The planning process and the supporting analysis framework have never been approached from the perspective of generic transportation investments. Because much of the technical profession has, for years, been modeling highway and transit networks separately, multimodal analysis is very difficult to do.

4. A multimodal planning process must necessarily include concern for the movement and transfer of goods. For such concerns to be addressed in a meaningful way, representatives from concerned carriers and shippers must be part of the planning process. These groups have traditionally not be an active participant, and it could possibly take a concerted effort to bring them into the process.

The Changing Environment of Transportation Planning There have been numerous conferences already this year that have highlighted the changing environment of planning, primarily caused by the Clean Air Act Amendments and the ISTEA. Both of these legislative initiatives have significantly changed the way we do business. Not only did the ISTEA mark the end of the Interstate Highway program begun in 1956, but it greatly loosened the institutional, financial, and thus political framework within which decisions on transportation investment had been made over the past 35 years. ISTEA now encourages states and localities to seek solutions to transportation problems appropriate to their needs and desires. It provides transportation funds to meet other societal goals, thus viewing transportation as a means of achieving some greater aim. It also encourages transportation decisions that are undertaken from a multimodal perspective, and better management and operational improvements of existing facilities.

The Clean Air Act Amendments also provide a strong basis for a changing transportation planning focus in those metropolitan areas in nonattainment of air quality goals. There are several areas where the most significant impacts will occur:

• Institutionalizing Flexibility—It has been estimated that if state and local officials chose to do so, \$103 billion of the \$151 billion provided by ISTEA could be spent on transit. A new partnership among the state, MPO, local officials, transit officials and other major participants must be developed to examine the most effective way of institutionalizing this new flexibility.

• Multimodal Transportation Planning—The ISTEA requires, for the first time, that state departments of transportation develop a statewide multimodal transportation plan. These plans are not simply to be a document which examines highway, transit, rail, aviation, and port issues separately, but rather a process and a plan that looks at transportation as an integrated system, related to multiple societal goals, and, in particular, emphasizing efficient and productive people and goods transfer from one mode to another.

• System Management—The ISTEA requires state departments of transportation to develop management systems in six areas—congestion, pavements, bridges, safety, intermodal activities, and public transit. Congress is clearly telling transportation officials to develop the capability to better manage the transportation facilities and systems that currently exist.

• Transportation Finance—One of the major barriers to a true, multimodal transportation policy was the way transportation funds were allocated for highways or transit, with little opportunity for substitution. The ISTEA has changed all of that, and the CAAA implicitly requires that a different approach to funding decision be made in nonattainment areas.

Definitions

Before discussing the characteristics of multimodal planning, it is first important to establish some working definitions. The primary reason for this is that the terms "multimodal" and "intermodal" are being used interchangeably in policy discussions and debates, when in fact they are not the same.

For purposes of this discussion, the two terms will be defined as follows:

Multimodal Planning. A process of:

1. Defining a transportation problem in a generic way (that is, in a non-mode-specific manner);

2. Identifying more than one modal option to solve this problem; and

3. Evaluating these modal options in a manner that

provides for an unbiased estimation of each mode's contribution, either individually or in combination, to solving the problem.

Intermodal Planning. A process of:

1. Identifying the key interactions between one or more modes of transportation where affecting the performance or use of one mode of transportation will affect another;

2. Defining strategies for improving the effectiveness of these modal interactions, and;

3. Evaluating the effectiveness of these strategies from the perspective of enhancing the overall performance of the system affected by the intermodal connections.

There are four scales of application for multimodal planning that should be of interest to the transportation. profession. The first application is for interstate transportation strategies. Most recently these applications have included the consideration of new highway corridors serving entire regions of the country. The more traditional application of interstate transportation planning has been in the area of high-speed transportation studies which have looked at the options of high-speed rail, air travel, or freeway improvements. The federal legislative requirement for statewide multimodal plans, combined with a fairly aggressive trend over the past several years of increasing state involvement in public transportation, should provide an interesting opportunity for state-level multimodal planning activities. However, perhaps one of the most volatile environments for multimodal planning over the next two years will be the metropolitan level. The numerous modal options available in a metropolitan area, along with the interest groups that support each one will provide a strong political element to the normal planning process. In addition, the interrelationship between state level multimodal planning efforts and metropolitan level efforts needs to be developed, which will most likely create some concerns at both levels. The final level of multimodal planning activity is at the corridor level. This planning probably provides the most specific examples of problems associated with multimodal planning in that it is most related to problems of data bias, insufficient analytical tools, local politics, and funding constraints.

No matter at what level of application, the characteristics of multimodal planning should be the same. Two transportation planning studies that come close to what multimodal planning should be are discussed below. Illustrations of Close-As-You-Get Multimodal Planning The paper provides two examples of planning studies that exhibit characteristics of multimodal planning. Both studies are described briefly in the paper. They are:

1. Maryland's Commuter Assistance Study-The Maryland Department of Transportation completed a statewide commuter assistance study in 1990 which targeted 24 corridors in the state to identify transportation improvements "needed to ease commuter travel." As noted in the summary report, this effort was not intended to study simply one mode, but rather it was "a study of how best to move people given the varied nature of commuter problems statewide."

2. I-15 Alternatives Analysis—The I-15 corridor in Salt Lake City was designated in 1988 as one of the most urgent transportation problems facing the region. In response, state and local governments undertook an alternatives analysis which examined 12 alternatives, ranging from a no-build alternative to an extensive multimodal combination of transit and highway components.

Characteristics of Multimodal Planning

Multimodal transportation plans should clearly relate to the goals and problem definitions as defined previously. The elements of a plan should also be specific to the characteristics of the application and the financial capability of a state or region. Congress has specified several elements that must be considered in the "intermodal" development of state and MPO transportation plans, which are described in the paper. ISTEA outlines the 20 factors that must be considered in the transportation planning process. These factors include such things as the results of the management systems, energy goals, bicycle/pedestrian transportation, ports/airports access, metropolitan plans, connectivity between metropolitan areas, transportation system management, land use, innovative financing mechanisms, and the like.

For metropolitan planning, the ISTEA states that the long range plan shall "identify transportation facilities (including but not limited to major roadways, transit and intermodal and multimodal facilities) that should function as an integrated metropolitan transportation system, given emphasis to those facilities that serve important national and regional transportation functions. The ISTEA then lists 15 factors, similar to those for the States, that must be considered in the regional transportation planning process.

Looking at the list of considerations, it seems that Congress intends that true multimodal plans should include everything that could possibly relate to transportation. However, there are several characteristics and elements of such planning that merit attention. They are discussed in the paper, and include:

- 1. Policy Goals and Objectives;
- 2. Problem Definition;
- 3. The Criteria Used for Planning;
- 4. Analysis and Evaluation Tools;
- 5. Public Involvement;
- 6. Relationship Between Multimodals; and
- 7. Institutional Issues.

Conclusions

FHWA Administrator Tom Larson, at a recent conference on urban transportation, argued that the transportation profession is facing a "paradigm shift" and that what is needed is a new approach to doing things, in his terms, pliable paradigms.

In many ways, a multimodal perspective is a paradigm shift in the way we do planning. It will be a difficult step to take. However, it is a necessary step if we are to truly provide the most cost effective transportation investment to achieve the maximum levels of mobility in our States and urban areas.

Summary of Discussion and Major Conclusions

The first discussant was Duane Berentson. He complimented the author and the distinction that was between multimodal and made intermodal transportation. Washington State is in the process of developing a statewide transportation plan that includes all modes. Their emphasis is on moving people and goods, not on moving vehicles. So, for example, their planning includes an analysis of freight movement by highways and ferries in the Puget Sound area. They will be forced to look at system deficiencies, so that solutions may not be highway improvements alone. An expert review panel is looking over their shoulder as the plan is being developed. Also included are all three counties and the municipalities, as well as all the affected actors. In addition to incorporating an analysis of goods movement to balance freight modes, they are also including an analysis of the state growth management plan. A problem he anticipates is that since Congress has not provided the ISTEA funds promised, it will be difficult to implement many plans.

Scott Rutherford agreed with the author's conclusions. He reminded the audience that in the 1960s, we did start to do multimodal planning, but we stopped because of the constraints imposed by categorical grants. Consequently, our corporate memory may not remember this.

He stated that although some national guidance is needed, he is not in favor of prescriptive methods for doing so.

He is doing an NCHRP synthesis on this topic. He suggested that we need a "Manhattan" type project to develop new analysis techniques to help us understand impacts, benefits, etc. We also need a better modeling process, because what was started in 60s and 70s, was not funded in the 80s and 90s. We also need to extend analysis to land use and growth management techniques. and to develop evaluation methods, criteria and methods of effectiveness.

He then commented that multimodal mobility measures are not yet available. Although we may deal with highway and transit measures, they are analyzed separately.

He suggested that multimodal modeling must do four things:

- Provide traditional analysis;
- Establish measures of demand;

• Provide measures of the "means" to accomplish objectives; and

• Establish the choices that are available.

Larry Dahms commented that the paper covered many important issues. However, the objective of transportation planning cannot be to simply look at multimodal evaluation. Given current problems, especially, inadequate funds-our profession is in despair. We are viewed like economists; ISTEA can revitalize planning if we establish a broad, bold vision.

He felt the paper moved from one technical approach to just another technical approach. It is not the definition of a paradigm shift. It is true that the ISTEA mandate brings us to the management era; but to be responsible to societal goals we must go beyond just management. There is a need to shift from highway to transit funding. But there are many other choices as well. The distinction between intermodal and multimodal is appropriate, but we should move beyond multimodal to integration of transportation systems. Goals and objectives must be formulated to reflect community objectives-not necessarily multimodal objectives. Community involvement, air quality and business groups are not the only participants in the process; we must go well beyond them.

The paper's conclusions are good, but let us not limit our vision to simply go beyond incremental changes.

Audience Participation

The first participant asked how bicycle and pedestrian modes should be considered in planning. Dahms gave two examples in California. State dollars are earmarked for bicycle programs, and in the Bay Area, bike trail programs are funded. Further, in scoring projects for the TIP, their process does not give adequate weight to small projects. So, they put them at the top of the list. A second observation was made:

"Come the revolution, you will all eat strawberries and cream." But, the question must be raised:

What if the customers do not like strawberries? We have heard many suggestions, but all the solutions discussed do not cover market solutions. In transportation, we do not use market solutions. For example, the toll for the Lincoln Tunnel is \$4 roundtrip. The real cost is \$30 to \$50 in marginal short-run social costs. Proper pricing will deal with congestion.

A third participant commented that he sees a movement from engineering to more planning and management. His concern is that there are not enough professionals to do the job. It was noted that universities are attracting more students now than in recent years. It is believed that graduate programs are larger than ever throughout U.S., and that the interest in transportation as a career has been positively influenced by ISTEA. But, if there are dollar reductions, that could have a negative impact.

FINANCE

Summary of Paper

The purpose of this paper is to describe the need for strategic financial planning, which is mandated by both ISTEA and the Clean Air Act Amendments. We must undertake financial planning in order to:

• Improve resource allocation in the face of scarcity and competition;

• Expose the need for increased funding and new sources beyond federal appropriations;

• Commit to projects supporting conformance, preservation, and congestion management;

• Improve cooperative decisionmaking in the context of greater flexibility, new resource options; and

• Introduce budgetary, cash-flow, life-cycle disciplines in place of traditional methods.

ISTEA requires the following financial planning elements at the state level:

• Statewide Transportation Plan (STP) that is intermodal and covers both rural and urbanized areas • Statewide Transportation Improvement Program (STIP) for which funding can reasonably be anticipated within the time period contemplated for completion of the project, and which is consistent with the STP and Metro TIPS.

ISTEA requires the following financial planning at the metropolitan level:

• (Metropolitan) Long-Range Plan (LRP), which includes a financial plan which reflects expected funding. It must emphasize preservation, efficiency and enhancement, and have a 20-year horizon.

• Metropolitan Transportation Improvement Program (TIP). This also requires a financial plan, with priority projects for each of 3 years. It must be consistent with the LRP.

The paper goes on to say that ISTEA and the CAAA introduce the need to balance congestion relief, air quality and financial feasibility by considering both conformity and concurrency.

A new kind of financial planning process that must be required and goes beyond accrual accounting includes:

• Forecast existing revenue and proceeds by funding source;

• Estimate funding requirements: capital, operating and maintenance—on a life-cycle basis;

• Analyze and manage cash flow;

Identify and analyze new revenue sources;

• Develop financing alternatives and test their adequacy.

New methods must be developed that include forecasting, risk/uncertainty analysis, cash flow modeling, investment optimization, flow rates, tax base, participation rates, inflation, receivables, scheduling, etc.

New funding sources must also be identified, such as tolls, commingling federal aid and state funds with tolls, private investment and credit enhancement, local option taxes, and special districts and impact fees.

In developing financial planning approaches, the following key technical issues must be addressed:

• Longer time frame (life cycle);

Resource availability;

• Coping with cross-modal/multimodal funding sources;

• Revenue uncertainty – sources, inflation, ceilings, diversion;

• Budget versus planning/program versus conformity cycle schedule;

• Resource commitments to conformity, preservation and management; and

• Capital/operating requirements mix, timing.

But in attempting to meet the challenges presented, we must establish a method to make the transition from existing to new ways of thinking. That must consider an already crowded change agenda. It must mesh with the reoriented planning/programming process and fit into the political process.

In conclusion, we must work to accomplish the following:

• Establish a new transparent and flexible planning and resource allocation process:

• Improve the recognition of real costs and shortfalls;

• Give increased attention to new resources, pricing and benefit assessment;

• Increase the pressure for funding stability to meet program commitments;

• Invite new players to participate in new forms of cooperation; and

• Establish a strategic perspective within life-cycle asset management.

Summary of Discussion and Major Conclusions

Suzanne Sale was the first discussant. She commented that although ISTEA and the CAAA create very complex requirements, the institutional complexities existing at the state and local government level are more difficult to deal with. Lockwood's discussion of the need for strategic financial planning represents an important tool to link planning, programming and budgeting. The process must meet all the federal requirements, but it must now be viewed as a credible process among state and local political leaders as well.

Sale went on to describe the ADOT process that has been developed. It formally integrates planning, programming and budgeting, and it is supported by a number of analytical tools and models. It allows for sophisticated forecasting and cash management, and the entire process is continually enhanced.

She outlined ADOT's assumptions that drive their financial plan:

- It is conservative, yet realistic;
- No growth is assumed by ADOT budget; and
- A balanced program results.

Models have been developed to optimize bond sales and include:

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- Econometric analysis;
- Cash flow analysis;
- · Bond optimization; and
- Risk analysis.

Two new enhancements are critical:

- Risk analysis; and
- Life cycle costs.

Risk analysis is used as an effective means to deal with uncertainty. It relies on probability analysis. She then discussed how they use risk analysis and life cycle cost analysis for freeway systems.

Ann Canby stated that ISTEA is here just in time. We need to develop realistic programs. We also need to become accountable for what we do. Perhaps we need to better define what needs to be accomplished, and we might want to measure what we do differently. This also means we need to measure the impacts of all other things states must do.

A transition to implementing the new requirements may require that we look at what we do differently, for example:

- What are we willing to pay for?
- What are we trying to achieve?
- Do we need a new approach?

We should look at today's way of doing things and decide on new ways. We should look to an investment strategy and not a political wish list. This may require that we stop thinking about categories of funding, but look at policy goals and objectives. For example, the cost of operating and managing transportation systems are greater than the cost of building new facilities. This must be factored into planning and programming decisions.

Tom Bradshaw stated that Arizona is the only state in the nation having an CAAA bond rating. Consequently, he can safely assume that Suzanne Sale's approach to financial management is very sound.

He agrees with Canby's statement that accountability and credibility are essential in dealing with elected officials and among all levels of government.

He commented that the financial responsibilities of states are more important then ever before. Transportation bonding is a very big, multi-billion dollar annual program. New revenue sources are being examined carefully. Toll road funding will probably increase and could become a cash cow for other transportation activities.

PROGRAMMING

Summary of Paper

This paper reviews the objectives and methods of transportation programming, and identifies directions which programming practice needs to move towards in order to function effectively in the present environment. Increased attention must be given to maintenance and preservation, demand management strategies, operational improvements, multimodal solutions and land use planning. Few public agencies have been able to develop integrated planning and programming methods which successfully consider these requirements.

The changing environment in which program decisions will be made during the next decade will require changes both in how the overall programming process is structured and in the data and technical methods used to support it. The following three programming objectives must be addressed to deal with a new set of issues and meet the challenges of the next decade.

• Resources must be allocated effectively to address policy objectives. Specific projects must be funded in the most cost-effective way possible.

• The programming process requires a consensus between engineers and planners in order to facilitate trade-offs. The process should not be judged by the end results alone, but by its ability to assist both technical and policy decisionmakers by presenting options and clarifying cost/benefit trade-offs among options.

• The process must support effective project delivery and be constructed in a way as to realize efficiencies by coordinating projects and scheduling of available resources.

The paper describes the following issues and challenges that must be addressed:

• Broad policy statements that are vague and conflicting should be backed-up by specific, non-conflicting strategies and objectives.

• An effective programming process depends on the support of a strong multimodal planning process.

• A systematic evaluation of alternatives must be undertaken within a sound technical framework.

• Uncertainties in schedules, budgets and funding sources are a fact of life.

• Programming must be recognized as being part of the political process which incorporates many institutional issues. • Priority must be given to the appropriate selection, timing and extent of preservation and maintenance projects.

• Increased attention must be given to management, operational and multimodal solutions.

• The mission of the agency may have to be defined clearly to recognize that building new highway and transit systems is no longer its primary function. Transportation is increasingly tied to economic and environmental objectives.

• The requirements for congestion management, system management, pavement management, bridge management, transit, and intermodal programs require interagency, interjurisdictional and intermodal coordination.

• The ISTEA requirements for implementing several management systems have the potential for improving the technical basis for programming decisions.

The paper goes on to describe the complexity of the programming process currently underway. Although surveys of agency approaches found a diversity in the manner of doing so, there are certain elements and activities that are commonly found. They are described and include:

1. Key inputs, including policy, system conditions, plans and resources;

2. Program category structure;

3. Procedures for identifying needs and candidate projects;

4. Methods for evaluating projects and priority setting;

5. A process for program evaluation and making trade-offs;

6. A process for the final allocation of funds; and

7. A system for monitoring the progress of program implementation and the results of the program in terms of systems performance, costs and benefits.

A general framework is then established and discussed for developing a more effective programming process. The important elements are:

• Explicit linkage with policy objectives and system planning to ensure the program is responsive to the full range of policy objectives.

• A simplified overall program structure that can facilitate relating policy objectives to program categories (maintenance, preservation, improvement) and make it easier to integrate management systems into the programming process. • Use of bridge, pavement and transit facility management systems to guide the maintenance and preservation program needs analysis, target funding analysis (i.e., trade-offs of different funding levels and facility conditions), project identification and evaluation, and program evaluation.

• Use of a broad range of transportation criteria together with congestion, safety and intermodal management systems to guide development and evaluation of service improvement programs.

• Explicit program evaluation and trade-off analysis examining the implications of alternative program funding levels.

• Program and system performance monitoring to establish better accountability for program decisions and to provide feedback to policymakers and an ongoing long-range system planning process.

The environment for programming is changing and traditional approaches to program decisionmaking must also change to confront the challenges of:

• A diverse and conflicting set of policy goals and objectives concerning mobility, economic growth and the environment.

• New and significant funding flexibility that removes a key barrier to considering a wide range of program choices and trade-offs.

• Increased emphasis on multi-jurisdictional and multimodal coordination.

To address these challenges the programming process will need to:

• Strengthen the ties to planning at all levels of government.

• Explicitly consider a wide range of program options and trade-offs including multimodal choices.

• Broaden the concept of need and the evaluation criteria used throughout the planning and programming process.

• Improve the accountability for program decisions by establishing a program and system performance monitoring function.

Accomplishing these objectives will require new institutional arrangements, programming procedures and technical support tools and data. The choices are complex, but the opportunities for innovation are tremendous and the profession must respond if effective resource allocation decisions are to be made in the future.

Summary of Discussion and Major Conclusions

Roger Schrantz complimented the authors on the excellent quality of the paper. He did feel, however, that the current requirement for multimodalism was not given enough attention and that the programming process must be strengthened to incorporate multimodal issues.

He went on to say that based upon his experience and because of what he has learned during this conference, he can heartily endorse the author's comment that "... an effective programming process depends on the support of a strong planning process"... Short- and long-range planning efforts are where much of the work of defining objectives, assessing alternatives, evaluating options, and defining consensus solutions to specific problems take place."

This suggests that the road (or bus or train or ferry) to multimodal programming leads from comprehensive multimodal planning. Meyer's paper commented that multimodal planning could be considered "a process and a plan that looks at transportation as an integrated system, related to multiple societal goals...emphasizing efficient and productive people and goods transfer from one mode to another." However, Meyer's paper and a recent NCHRP synthesis project found that you could count the number of real multimodal planning efforts on one hand, and have a few fingers left over.

He observed that the AASHTO SCOP Task Force on multimodalism found-that in general, multimodal planing in state DOTs is non-existent; that DOTs are not well organized for multimodal planning; that staff training for true multimodal planning is inadequate; that databases are unequal and generally inadequate; that customer identification and customer involvement are problematic; and that in spite of ISTEA, many categorical finance barriers still abound.

Schrantz agreed with co-chairmen Meyer and Neumann, that we need to jumpstart multimodalism. He suggested this conference call upon TRB, U.S. DOT, AASHTO SCOP, NARC and APTA, and any other organization of immediate interest, to promptly assemble a working group to define the steps needed for a workable multimodal planing model and practice in all its elements—organization, process, criteria, information, goals orientation, training for current staff, and very important, research and graduate training in our universities to help make multimodalism an ingrained reality in future decades.

Hank Dittmar presented an MPO perspective. He applauded the resource paper in its clear statements that the new challenge for programming has been posed by both the Clean Air Act Amendments of 1990 and ISTEA. He stated that we have entered a new era in transportation—the era of managing better with limited resources.

For forty years, the programming imperative has been set by the need to complete the Interstate Highway System. ISTEA now reinforces the new emphasis on efficiency by according priority in capital investment, ensuring system preservation, operational improvements and the efficient use of existing facilities. The resource paper is entirely consistent with the changed context for programming.

The San Francisco Bay Area MPO has been engaged in the redefinition of the programming process to incorporate ISTEA mandates. A new partnership has been established with CALTRANS and local transportation agencies. This includes the creation of an Ad Hoc Multimodal Committee of staff comprised of Caltrans, transit operators, public works organizations, congestion management agencies, air quality agencies, ports and airports to develop a process and criteria for programming. His experience in attempting to develop a new programming framework provided the opportunity to comment in-depth on the issues identified in the resource paper. He then went on to discuss his practical experience in dealing with each.

Carol Lavoritano provided the perspective of a transit operator in a large metropolitan area. She also praised the context and substance of the resource paper. She felt that transit programming must be considered as an integral part of multimodal programs in metropolitan areas. The programming process must be considered as an open, public process and an integral part of the political process. This makes it essential that highway and transit interests start to meet and to talk to each other. In most instances, this has not been the case in the past. The new requirements of ISTEA for cooperation and the flexibility for modal trade-offs will be controversial and present major challenges.

She observed that in her view both the highway and transit lobby groups are giving too much attention to IVHS, MagLev and other glamour projects. We have too many current basic needs to address, so we should not divert scarce resources to future possibilities. We need to keep things in balance.

Although ISTEA allows us to make modal trade-offs, it still presents a situation that is like dealing with apples and oranges. Although there is potential, we must first learn how to collaborate in order to squeeze the most effective programs out of limited resources.

Tom Humphrey complimented the authors on the development of a timely, substantive and accurate assessment of the current situation and future opportunities. He suggested that more emphasis could be given to the following areas, covered relatively briefly in the paper.

The Role of Transportation Systems Operations

Transportation Systems Operations is defined as "the cooperative development and implementation of strategies to maximize the safe movement of people and goods by managing an integrated multimodal transportation system." TSO actions are designed to make the most efficient use of existing systems and they deal with issues of mobility, congestion, safety and the environment in urban and rural areas. They should include: measures to improve safety, incident management programs, traveller information systems, upgraded traffic signal systems, surveillance and control systems, demand management techniques, and improved commercial vehicle operations.

The benefits of TSO actions are enormous. But, we are not using them effectively. The major impediments that limit their consideration include funding, institutional barriers, a need to clarify the roles of the modes, and the need for more highly skilled technical people.

Role of Technology in Planning and Programming

IVHS is a comprehensive program that will eventually result in significant improvements in our transportation systems. But we cannot wait for the full deployment of only the most advanced technologies. We need to take advantage of technologies that are currently available, include them in our plans and then program their implementation. Generally speaking, they include: communications technology (such as traveller information systems), traffic control centers, traveller surveillance methods (for Incident Management), and incident management programs.

The Politics of Programming

Tom Bradshaw put it in stark terms the previous day: "It is a battlefield out there, folks."

No federal law is going to solve the need for more money and deal with the competition for funds between state-local government and among local jurisdictions. We may have a perfectly defined plan and program, but in the final analysis, the allocation of dollars is part of a political process. A perfect example of this phenomenon is ISTEA itself. It establishes specific guidelines on planning and programming, which we have been discussing for two days. But consider the number of specific, directed projects in that bill alone. There are hundreds of earmarked projects. The tendency on the part of Congress to designate projects and funding allocations in the appropriations process continues. In conclusion, Humphrey urged that we do not neglect our past experiences in dealing with these important topics. We can learn much, and hopefully, avoid repeating the same mistakes. He briefly summarized similar conferences that were held over the past nearly 20 years and related reports:

1974 Williamsburg Conference on Issues in Statewide Transportation Planning and Programming; 1975 Orlando Conference on Transportation Programming; 1979 Airlie House, Virginia, Second Conference on Statewide Planning and Programming; 1981 Synthesis Report #72: Transportation Needs and Financial Constraints; 1981 Synthesis #84: Evaluation Criteria and Priority Setting for State Highway Improvements; 1983 TRB Highway Programming Workshops in Washington, D.C. and Denver, Colorado.

The issues were very similar. Perhaps we should pause and see what lessons we can learn from the past.

Audience Participation

Several people commented during the following discussion period. The comments are summarized below.

Technicians often make the programming process too complicated. It must be simplified in order to allow citizens and state legislatures to better understand it. We need to develop better ways to communicate the process.

There is still much work to be done in establishing discussion and decision processes among state agencies, MPOs, citizens and other participants in the process.

A discussion of the potential use of congestion pricing as a planning and programming tool led to the conclusion that there is little, if any, potential support for congestion pricing in the U.S. It was suggested that since we do not use cost accounting methods in developing transportation programs, we have no data available to evaluate its potential value.

Discussion of the role of the MPO and how its priorities can become an effective part of the programming process concluded in the agreement that we must do a much more effective job of multimodal planning.

There was agreement on the major points made in the resource paper, with suggestions for some additional issues and priorities to be considered. This session can be summarized as follows:

• New federal requirements will have lasting impact on transportation programming issues over the next decade. However, financial realities at the state, regional and local levels are even more significant because of current fiscal constraints. • Multimodal planning and programming efforts must be established and implemented in order to make the most effective uses of all resources in maintaining and operating transportation systems.

• Political realities require that collaboration occurs among agencies, the public and the private sector.

• Better, more effective, more understandable technical tools and procedures must be developed and used to establish a higher level of credibility between engineers, planners and policy/decisionmakers.

INSTITUTIONAL

Summary of Paper

The institutional questions and intergovernmental relations issues posed by the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) are very formidable. They have the potential to:

• Reinvent metropolitan planning organizations (MPOs);

• Cause state departments of transportation (DOTs) to reformulate their planning processes and reach out well beyond their own resources within state government;

• Rebuild MPO planning capacities lost during the 1980s;

• Occasion another look at how non-metropolitan regional councils can fit in; and

• Dramatically reformulate relationships between MPOs and state DOTs.

These are not just technical issues. The governors and state legislatures have been written into this act, in addition to local political officials, local governments, transportation agencies, and many other "appropriate" agencies. At a number of points, renewed and expanded "involvement of the public" is called for.

The first hint we get that these are political issues comes from looking at the complex way many requirements are stated in the act. Boundaries are not set simply by census definitions, but are ultimately set by agreements between governors and local elected officials acting under a number of rules. Membership in the MPOs also is a matter of political negotiation within certain general guidelines. There is not just one type of MPO, but four types with different powers and means of funding. In addition, potential for mutual vetoes by the governor and MPO are built in. The bottom line from an institutional viewpoint is that ISTEA raises many more questions than it answers. The hope is that this part of our conference will help generate answers to some of these questions.

To accomplish this task, we first take a look at issues concerning metropolitan institutions, and then state institutions. Next we look at the relationships between the metropolitan and state transportation planning processes, and then relationships between the MPOs and states as institutions that reflect their diverse planning needs. Finally, we offer some brief conclusions about building planning capacities, developing productive partnerships, and avoiding the gridlock that could come about from the exercise of mutual vetoes.

Metropolitan Institutions

Metropolitan planning organizations (MPOs), recognized and certified by the U.S. Department of Transportation to meet the transportation planning requirements for continued federal highway and transit grants in metropolitan areas, have been around since the early 1960s. However, after every decennial census of population, new urbanized areas are recognized, existing areas grow beyond the 200,000 population mark that gives them extra planning responsibilities, and some urbanized areas grow together enough to require that their transportation plans be linked. In addition, for the first time, there are now air quality conditions that require amelioration through transportation measures applied across areas that sometimes are larger than the urbanized areas for which transportation plans have been prepared in the past. These factors occasion a new look at existing metropolitan transportation planning areas and planning organizations.

The paper goes on to examine the issues concerning:

• MPO boundaries, features of which vary considerably around the nation;

• MPO membership, which may remain unchanged, but could be altered by the governor or state legislature;

• MPO powers, which vary and will continue to vary depending upon size and political clout;

• MPO staffing, which began in the 1970s being attached to regional councils (75 percent), but which is no longer the case (44 percent);

• Interrelating multiple MPOs, which is the case in at least 13 MPOs which cover two or more states;

State Institutions

ISTEA will change state institutions in a number of ways. For example, it requires state transportation planning of a very broad type that considers such elements as energy conservation, land use and development policies, environmental protection, and all modes of transportation. No more than a handful of states do such planning now.

ISTEA also requires the governors' involvement in transportation planning in a number of ways. For example, the governor must get involved in:

• Establishing the 20-year growth area around the existing urbanized area;

• Making a determination about whether the transportation planning area should remain smaller than the air quality planning area;

• Making a finding that multiple MPOs are needed in large complex regions;

• Requesting that some MPOs in smaller areas be designated as transportation management areas (TMAs);

• Redesignating MPOs to change their area of jurisdiction and membership;

• Coordinating multiple MPOs within in-state and multi-state metropolitan areas; and

• Approving MPO transportation improvement programs (TIPs).

It is clear, furthermore, that transportation increasingly is becoming a means to reaching larger objectives. Both metropolitan and statewide transportation planning place the state DOT in partnership with programs for spurring economic competitiveness and growth, protecting the environment, conserving energy, managing growth, and organizing local governments. This partnership involves the governor, the legislature, independent state transportation regulatory agencies, state regulators of air and water quality, state energy agencies, state growth management agencies, and perhaps interstate commissions concerned with river basins and economic development.

The Metropolitan and State Planning Processes

The ISTEA builds on the long-term tradition of the "3C" planning process for metropolitan areas. One way it does that is to legislate many requirements that had been required only by regulation, including plan content, planning process, TIPs, and project selection activity. At the metropolitan level, fifteen specific, legislatively mandated factors must be addressed in developing longrange plans. State planning requirements, adopted for the first time at the federal level, spell out twenty specific factors that states must consider.

The State planning process is modeled after the metropolitan process conceptually; it includes a different but related list of factors. The differences include both additional planning elements and the scope of state responsibilities. In the latter instance, the state must assume responsibility for non-metropolitan areas and issues potentially beyond the scope of MPO capability such as economic development and innovative financing approaches.

While the content of state and MPO plans is spelled out in specific terms, the process of integrating these plans is not. The state must address the content of MPO plans within its planning effort, but the nature and extent of integration is ambiguous. The process of integration resides in the operational meaning of terms such as "coordination," "consultation" and "cooperation." Initial guidance issued jointly by FHWA and FTA calls for full compliance with the metropolitan planning requirements in nonattainment areas by October 1, 1993, and in attainment areas by December 18, 1994. Statewide plans are required by January 1, 1995.

The paper continues by discussing the need to build and rebuild the planning capacity at the state and MPO levels; developing more effective planning for rural and small urban areas; and focusing on dealing with difficulties and inconsistencies in the planning process.

MPO Relationships with the State

ISTEA makes "appropriate state officials" members of the MPO policy board and requires the board to prepare and adopt plans for its region. Then, ISTEA goes on to say that the state shall develop a long-range transportation plan for **all areas** of the state and only needs to "consider" coordination with the MPO plans. In addition, state air quality officials can veto state and metropolitan transportation plans and projects. Water quality regulators also must regulate the runoff from urban transportation corridors, and wetlands regulators must regulate the location of transportation construction projects. It is unclear how this will work.

ISTEA is full of requirements to consult with, cooperate with, be in conformance with, comply with, and coordinate. Yet, when it comes right down to it, even the carefully drawn DOT definitions give no clear indication of how all this should work.

Conclusions

Three things are needed, institutionally speaking, to make a success of ISTEA:

1. Building a lot of new planning and

decisionmaking capacity at both the regional and state levels;

2. Developing many new partnerships; and

3. Avoiding gridlock.

ISTEA clearly calls for a great deal of change in institutions and planing processes. Yet, battles already have broken out between the forces of "business as usual" and the forces of change. People are choosing sides. We are still waiting to see whether ISTEA will become the Planners Assistance Act of 1991 or the Lawyers Assistance Act of 1991. We hope it will be the former.

Summary of Discussion and Major Conclusions

Gloria Jeff was the first discussant. She observed that the institutional issues are structured around the current system—we are not dealing with a clean slate. The author proposed Regional Councils as the ideal institutional organizations for ISTEA. But, they have become less and less able to do the job. She also questioned why the federal government feels it must bring together the state agencies to deal with ISTEA.

We may need multiple agencies to deal with transportation and other programs. The MPOs have often not been able to do so, and making a transition from MPOs to Regional Councils does not necessarily solve our problems. She emphasized that investment decisions must be made by all elected officials, and that we need to establish an educational process to provide training in order to improve communication. The key to success is that we need to find ways for all of us to get along.

Ron Kirby commented that he doesn't think many of the concerns the authors raised are that serious. From a practitioner's view, he thinks we need to move ahead. He agrees with the observations concerning ISTEA. It does not prescribe an ideal, step-by-step process, but perhaps that is okay. He agrees with Gloria — we must just make it all work.

He believes the old processes and organizations can be modified to accommodate ISTEA. If we establish uniform technical processes, it will pull together the institutional issues.

He also believes all the various interest groups are working together more than ever before. Public involvement has been increased. The "battles" will be resolved because funds will otherwise be lost.

He praised U.S. DOT for the help and guidance being provided. He was confident that over the next year, there will be big improvements and greater reliability of funding.

The requirement to allocate flexible funding is starting to happen. He is quite optimistic about the formation of new positive institutional relationships.

The final discussant was Mr. Lesley White. In the Portland-Vancouver (Oregon-Washington) MPO, the kinds of organizational structures called for by ISTEA have been established. However, prior to their ability to establish the cooperation needed to get the job done, the MPO was irrelevant. That proved that it is essential to collaborate.

He talked about the need for cooperation and common goals. Stalemate is unacceptable. To accomplish this required a new process and education to help people feel part of the process. They clearly defined roles for those who set policy and those who impact/affect policy.

He also discussed the new Washington State concurrency law. The MPO says yes or no to all development, which must be consistent with land use plans.

CONCLUDING REMARKS

At the conclusion of the conference, co-chairmen Michael Meyer and Lance Neumann summarized some key conclusions.

Many of the observations, concerns, issues and suggestions for actions have been with us for decades. However, there are some significant new issues and challenges that we must address.

There are four new major challenges that the Clean Air Act Amendments and ISTEA have presented to the transportation profession that we are struggling with. All the conferences we have held this year and probably those that will be held next year, will recommend guidance and technical studies that are all going to be related in one way or another to these four issues.

The first one can be defined as performance-based planning. In the context of ISTEA, this is related to the management systems. In the comprehensive planning profession, there has been a strong trend towards performance-based planning. It requires that we do not just plan, but that we actually try to figure out what the desired performance level should be and then continue to monitor the results.

The second issue is related to the term "partnerships." We have been working with the business community, providing for citizen participation, and involving the environmental groups for many years. But the Clean Air Act Amendments and ISTEA now require that we institutionalize many things that were happening on an ad hoc basis. Whether that is good or bad depends on who you are; which MPO, or what state, or what is happening in that particular region. The new groups that are likely to be involved in transportation are numerous; we have discussed this extensively. How we deal with all these partners is very, very important. An important group that has been neglected is the shippers; the private goods movement carriers. Transit needs also must be considered more carefully, more extensively, more formally. Some of these groups will not necessarily jump into the fray voluntarily. How we include them is going to be very critical so that the new required partnerships will become an integral part of the process.

The third area has many different facets to it. It is the need for the expansion of the scope of planning. ISTEA has required the states to have a statewide plan that interrelates with all metropolitan areas. There certainly are institutional issues involved. We must also expand the scope with regard to the externalities of transportation. The obvious example is air quality, and how to relate air quality with some of the more traditional congestion issues with which we have been dealing.

The fourth area that is different from what we have had to deal with before is in the finance area. Financing must be flexible, but competitive. Many have argued for years that there should be flexibility in transportation funding. Let the decisions be made on the basis of merit. We now have some of that flexibility and all of a sudden everyone is wringing their hands and saying, what do we do now? Flexibility opened the door to doing some very interesting things; but as soon as we open one door, suddenly there are other doors shut. We have to be very careful about which doors we are going to try to open because there are institutional issues, there are political issues, and there certainly are technical issues. So the "flexibility yet competitive" phrase really sums up very nicely the financial environment.

In conclusion, the four issues summarized above are really new challenges with which we will struggle. They are, to some extent, new issues in our field and they are the reason why we have conferences like this and why there will probably be many more conferences like this over the next several years.