

gram management, and project control. It also maintained the need to start using some existing techniques and methods that are not typically applied in public-sector transportation decisionmaking. These include the following:

1. Engineering economy comparisons of capital investments under alternative life-cycles, rehabilitation and maintenance schedules, labor-cost assumptions, and operating costs — all crucial now for both highway and transit;
2. Risk and uncertainty analyses of major investments or programs with uncertain funding streams, e.g., evaluation of costs of delay or abandonment;
3. The MIS and decision support systems for program management, budget and schedule control, and performance monitoring; and
4. Pricing analyses, including elasticity and direct and indirect impacts.

Some specific new methods and techniques need to be developed and applied including the following:

1. Financial forecasting models to project trends in tax revenues, user fees, costs and cash flows under various assumptions of changes in external variables (such as the economy) and policy variables (such as pricing, levels of service, rate of program expenditures, start-up and finish schedules of construction contracts, etc.);
2. Ways to plug into regional or national econometric models, where available, to better forecast local changes in CPI, construction cost index, labor costs and tax revenues (these then can serve as inputs to agency forecasts);
3. Improved methods to get reliable life-cycle cost data for pavements, bridges, transit rolling stock, and other capital facilities and equipment (needed for sound engineering economy decision analyses about investment, procurement, rehabilitation, and maintenance programs);
4. Innovative financing techniques, including private-sector participation in funding through mutual interest negotiations, borrowing and bonding, cash management, tax incentives, and leasebacks, etc.; and
5. Cost responsibility allocation models to better identify direct and indirect impacts of various new financing and tax or user charge alternatives under consideration (who pays and who gets, and how does it affect the regional economy or segments of it).

The group also noted an urgent need for simplified methods of doing the things listed above, both for existing tools and for needed new tools. In addition, research and development of these tools should be supported by federal assistance, but assigned to implementing agencies who will actually use them.

## Future of the Urban Transportation Planning Process

Joseph L. Schofer

The workshop on the future of the urban transportation planning process explored the general attributes of the urban transportation process as it is most likely to, and as it should

most desirably, evolve in the coming decades. Particular concern was devoted to the broad issues and problems associated with the process today. These include apparent mismatches between planning products and decisionmaker needs, deficiencies in planning methods and the uncertainty associated with future transportation system requirements and performance (and forecasts of that performance), characteristics of the emerging market for planning products, and appropriate styles and modes of behavior for transportation planners.

Because of the size of this workshop and the complexity of issues it faced, the group first met as a whole to refine its objectives and then reassembled into three smaller workshops with the following discussion topics: Future Institutional Responsibilities for Transportation Planning, Including the Federal Role (Robert E. Paaswell, Chairman); Emerging Clients, Markets, Strategies, Tactics, and Products of Transportation Planning (David F. Schulz, Chairman); and Role of Methods and Models in Future Urban Transportation Planning Activities (Joel Horowitz, Chairman). The small group discussions focused initially on matching clients with existing and future planning products as a function of the level and scale of planning; exploration of potential roles and styles for planning professionals; and assessment of the current and potential applications of quantitative models and other tools and methods in transportation planning. These discussions broadened in scope as the conference proceeded. The results of the small group deliberations were brought back to the entire workshop for discussion, refinement, and consensus. This report presents the integrated recommendations and observations of the full workshop.

### GENERAL FINDINGS

The workshop concluded that the environment of, and thus the market for, urban transportation planning is changing. The federal effort to regulate, and thus control, the detailed attributes of urban transportation planning has begun to be reduced. Non-federal decisionmakers are likely to play an increasingly important role in determining planning process and product requirements. Such decisionmakers will be more concerned with meeting their own, short-range perceived needs, rather than federally specified requirements. This suggests the demand for more diversity in planning activities among cities, but not the absolute decline in the demand for transportation services. Indeed, in the face of scarce resources and increasing costs, the need for careful planning will probably increase. Yet the issues and problems, as well as the clients, to which transportation planning responds are changing at the national scale and are increasingly varied among cities.

To survive, and to be effective in supporting transportation management and investment choices, planners must not only recognize the changing market for their products, they must also adapt their efforts in important ways. In general terms, this adaptation must take the form of modifying products, processes, and tools to meet the issues of today and tomorrow. These issues include rehabilitation and cutback management in older cities, and managing continued growth in newer cities. Serving the market, however, does not mean abandoning our more traditional products that no longer seem to be of interest to some decisionmakers (e.g., 3-C long-range planning).

Where the essence of such products is still of importance, transportation planners must find ways of re-orienting them so that they once again become salient to the clients and context. To accomplish this, the planners themselves must take a strong initiative, and federal government must provide support in the form of both resources and a relaxed regulatory environment to encourage locally appropriate planning functions.

Not only is there a need for a diversity of planning products across cities, but there is also a need for increased diversity in the tools, methods, and skills used by transportation planners. This calls both for increased personal flexibility and a willingness to innovate and adapt and for additional inservice training and research and development support to make such adaptation possible. The following specific recommendations reinforce these general findings.

## SPECIFIC FINDINGS AND RECOMMENDATIONS

There is a continuing need for systematic urban transportation planning in the major urban regions of the United States. This need should be met through the application of federal, state, regional, and local resources to several important activity components of transportation planning. Such planning should continue to be conducted in a multijurisdictional framework where appropriate because of the nature of facilities and services, their impacts, and the sources of funding applied to them.

The nature and scope of urban transportation planning must be allowed and encouraged to vary with the characteristics and needs of the local context. In particular, there appear to be important reasons to conduct planning differently in low or no-growth areas than in more rapidly growing regions.

The federal government should continue to support urban transportation planning, while facilitating local variation in the specific attributes of the process, in at least the following ways:

1. Mandating a generalized transportation planning process in urbanized areas larger than some threshold size—a size greater than 50,000 but smaller than 250,000;
2. Establishing and applying regulations and requirements to encourage locally responsive urban transportation planning (regulations should focus on products and processes that are truly significant to all urban regions larger than the established threshold size);
3. Establishing guidelines—as opposed to more strict regulations—for products and process components that

need to be produced only at local option (these guidelines should not become de facto regulations—for example, guidelines should suggest how specific tasks might best be approached if local agencies accept the need for these activities); and

4. Continuing to distribute PL and UMTA funds to support planning, technical assistance, training, and research and development focusing on tools and methods.

The focus of urban transportation planning should be some kind of regional forum, like the current MPOs. This regional orientation is important because many components of the urban transportation system have regional significance, impacts, and costs. However, other agencies should be actively involved in the process, and should hold differing responsibilities as a function of the issues and projects considered. In particular, the leadership role in planning should be closely related to responsibilities for implementation. A more specific set of suggestions for the sharing of planning tasks is given in Table 1, which recognizes six types (levels) of planning and six levels of public agencies.

The transportation improvement program continues to be a viable mechanism for achieving intergovernmental agreement on project priorities in support of federal funding requests. Although the setting of priorities is generally a regional function, budgeting for specific, local projects should originate with local jurisdictions. This should reflect a “bottom-up” approach to priority setting.

Some planning activities and products that are now defined as federal requirements should become recommendations (supported by procedural guidelines). These tasks are those that become significant only if they are strongly linked to locally defined goals. Specific examples of such tasks include air quality planning and special planning efforts to meet the needs of the elderly and the handicapped. This will help assure that the planning accomplished is most responsive to local needs and interests.

### Planning Model

Considerable discussion was devoted to a revised, and more responsive, model for the urban transportation planning process—a model that reflects the evolving market for planning and the special needs of different cities. The elements of this process are described below.

There was general agreement that it is highly desirable to pursue some form of ongoing, long-range planning. Consider-

**TABLE 1. Suggested responsibilities for components of the urban transportation planning process.**

Agency	Strategic and Policy Planning	Long-Range System Planning	Subarea and Corridor Planning	Short-Range and Project Planning	Programming		Project Development
					Priority Coordination	Budgeting	
Federal	F	F	F	F	F	F	F
State	P	P	L/P	L/P	P	L	L
Region	L	L	P/L	P/L	L	P	S
County	P	P	P/L	L/P	P	L	L
City	P	P	P/L	L/P	P	L	L
Operating agency	P	P	L/P	L/P	P	L	L

Note: L = lead role; P = participant role, and F = financial support.

able discussion went into selecting an appropriate name for this component of the planning process because members of the workshop were concerned about the increasingly negative image of the current form of long-range planning. Consensus was achieved on the term "strategic planning process" to denote an activity that looks ahead in a time frame of 10-30 years and that has attributes that may vary considerably among regions as a function of local needs and characteristics. Once again, this variability is likely to be related to the recent and expected growth rate of each region. Strategic planning should not be federally required but it should be strongly supported by the federal government with both technical guidance and financial assistance.

Strategic planning may take several widely different forms. In rapidly growing regions, it may continue to deal with testing and evaluating alternative facilities and technology proposals. In other, more slowly growing regions, strategic planning may appropriately be non-modal, non-facility-oriented, and more oriented toward scanning the horizon and exploring alternative futures for the region to develop a strong understanding of emerging issues, problems, and needs. In some contexts, strategic planning may be conducted in a "comprehensive" way and may extend beyond transportation. In all cases where strategic planning is conducted, it should focus on major, emerging socioeconomic and land use development trends, particularly the kinds of changing population attributes, and their effects on travel requirements, as expressed in the keynote paper delivered by Martin Wachs. The principle behind this notion is that it is becoming increasingly important, as changes in fundamental social, economic, and transportation relationships occur, to capture such trends and make direct use of them in the preparation for more specific, facility- and project-oriented transportation planning to take place in other phases of the process.

Therefore, it becomes possible to understand the philosophy behind strategic planning as defined in this workshop by viewing it as a process for developing a background for facility and service planning. It should establish a relevant decision space for system planning, which is the next phase of the proposed overall transportation planning process.

System planning was defined as the next level in the planning process, and, again, a range of definitions, variable with the context, was established for this task. However, as differentiated from strategic planning, system planning was seen as an activity that should be federally mandated to serve at the very least as a process for systematically testing major actions that eventually would become candidates for entering the transportation improvement program.

System planning would serve as a more direct substitute for both the existing long-range planning process and transportation system management planning and the transit development plan. However, this new concept of system planning would be more closely tied to the product needs of the local decisionmakers—that is, it would focus more directly on potentially implementable solutions.

In understanding the concept of systems planning, it is useful to recognize the diversity of perspectives on this task developed within the workshop. Some, representing the views of developed, slow-growth communities, saw the process as being quite specific and focused on particular facilities, the solutions to current problems, treating rehabilitation needs, and acting to meet the transportation requirements of ex-

pected, near-term urban development and redevelopment in the region. From this perspective, the time horizon for system planning was seen as being variable between 5 and 15 years. Both problems and solutions considered in system planning would come largely from related subarea and corridor studies.

Other workshop participants, recognizing the perspectives of more rapidly growing regions, saw system planning as being more general, leaving open more options, not focused on specific facilities to the same degree as the first group desired, and having a somewhat longer time frame period. From this perspective, system planning would lead to, rather than be fed by, subarea and corridor studies.

Regarding the nature of system planning, workshop participants agreed that

1. There should be a federally mandated system planning process that serves as a test bed for major elements moving into the TIP.
2. System planning should have a flexible time frame, determined by local requirements, ranging from 5 to 20 years.
3. There should be a clearly specified option for pursuing more general and more open (i.e., non-facility-specific) system planning, especially within the time frame of 10-20 years.
4. System planning should interact in meaningful ways with corridor, subarea, and project planning.
5. System planning should have a multimodal orientation and should include consideration of TSM and 4-R options.
6. A "bottom-up" approach was viewed as the most appropriate way to conduct system planning, especially for the near-term part of the time horizon. That is, ideas, problems, and options from lower-level planning efforts should be fed into system planning for testing and evaluation at a regional scale.
7. System planning should be realistically financially constrained, which tends to differentiate it from strategic planning.
8. Particularly in slow-growth areas, system planning should be explicitly concerned with existing conditions and the implications of the remaining life of in-place components.

The need for subarea, corridor, and project planning continues to exist and should be met within the context of future urban transportation planning processes. This need should be supported by federal regulations, procedural guidelines, and funding.

An integrated regional investment programming process, producing a TIP to cover a time frame of 1-5 years, also continues to be important and merits both federal mandate and financial support. This investment program should represent a regional agreement on priorities, with local governments taking the lead responsibility for setting their own priorities and budgeting for those projects that are entirely local in their attributes. Table 1 summarizes the various levels recognized as being important to future urban transportation planning processes, and indicates how responsibilities for these processes should be shared among various governments.

## Planning Tools

To conduct effective and efficient urban transportation planning within this structure, there is a continuing need to develop

and to implement more effective and responsive tools for planning. While discussions of tools in this workshop focused principally on quantitative models, it was clearly recognized that a wide variety of skills will be required of planners to meet the requirements likely to face them. These include skills related to communications, negotiations, design, brokerage, conflict resolution, consensus building, education, and coordination. Although it is likely to be the rare case that one individual will combine all of these skills and have an ability to manage the application of quantitative models, the presence of a broad skill mix such as this is likely to be essential to the success of planning efforts in larger metropolitan areas. This suggests the need for training a wider variety of professionals to enter the field of transportation planning, as well as the importance of providing in-serve training opportunities for practicing professionals.

It was recognized by participants in the workshop that a broad variety of analytic tools exist for dealing with transportation planning problems, ranging widely in sophistication and computational requirements. A serious concern was expressed that the rate of innovation in the development and use of analytic tools has decreased in the field, in part due to the ready availability of federally sponsored tools and the relatively strong guidance provided by the federal government regarding the use of specific tools and methods. Furthermore, there appear to be few rewards but many risks associated with attempting to develop and apply new tools. The result is an increasing degree of rigidity in the process of selecting tools to use in solving particular problems. There is a clear need to encourage diversity in both the planning process and the use of tools to assure that methods applied fit appropriately to the problems at hand, which clearly vary from community to community. The federal government has an important role to play in encouraging diversity and innovation, both by funding research and development efforts and by underwriting some of the risks involved in implementation of new tools.

Some examples of methodological problem areas meriting further research and development efforts include the following:

1. Efficient methods for subarea and subregional planning, including microscale modeling to estimate equilibrium flows in small areas recognizing the relationship of those areas to the surrounding region;
2. Methods for predicting non-work and off-peak-period travel, and the linkage between such trips and peak-period movements;
3. Efficient procedures for conducting inventories of system conditions and estimating "needs" in ways that are less subject to judgmental and political biases;
4. Methods to anticipate the intermediate and long-range implications of short-range actions;

5. Methods to estimate the effects of actions to increase the use of flexible work hours and other peak-spreading policies; and
6. Efficient methods for conducting financial planning and investment programming.

In general, the workshop agreed that there is an important federal mandate to support urban transportation planning by investing in such research not only for the purpose of developing new and more responsive tools, but also to retain the interest of researchers in the field and to help those researchers in academic environments train new professionals. Without a continuation of federal research funds, it appears highly likely that many of our most successful researchers will find other activities in which to engage, eventually cutting off the production of new and improved methods and ideas. Furthermore, it is important to recognize the strong relationship between support for research and the production of trained students, who receive both financial assistance and important opportunities for learning through the academic research process. Such training activities, of course, should also extend to practicing professionals so that they may find it easier to keep up to date with the most recent methodological innovations and thereby produce more responsive products in more efficient ways.

Perhaps the most important problem identified during the discussion of tools and methods within this workshop is the unmet need to support a more active technology transfer program to move the best available research tools into professional practice. This is a particularly challenging problem without an obvious solution. It was viewed as especially difficult because of the widening gap between researchers and practitioners. This gap makes it difficult for researchers to understand the practical needs and constraints of the profession, and for practitioners to understand the characteristics of newly developed methods. The federal government has a special role to play in dealing with this problem, which should focus first on providing practitioners with increased incentives and decreased risks associated with applying innovative techniques. This role must include continuing research support as well as providing forums and communications channels through which practitioners and researchers can interact on an ongoing basis.

More specifically, the participants in the workshop recommended more support for effective continuing education that serves to link the developers of new methods with potential users of those methods. It may also be useful to underwrite the development of frequently updated practitioners' guides to tools and methods, possibly in the form of "consumer reports" that may serve to help users make choices about new techniques appropriate to their specific problem.