MAJOR ISSUES IN TRAVEL DEMAND FORECASTING

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I believe that the planning community is at a fork in the road. Unless urban planning quickly becomes more relevant to the needs of decision-makers, it will increasingly be in danger of becoming unresponsive to the decision-making process and will eventually be phased out as a rational approach for analyzing and solving urban problems.

There are a number of reasons why urban transportation planning methodology has reached this point. But they can be summarized by saying that the methodological development has not kept pace with changing values in society and the increasing complexity and interdependence of urbanized and industrialized society.

It is ironical that this credibility gap has occurred with regard to planning. Planners, by the very nature of their work, should be the first group in society to perceive changes and to make recommendations to decision-makers and the community on how best to deal with those changes. The existence of this credibility gap implies that there probably are fundamental changes required in the planning process.

I will, however, proceed with the belief that the planning community can still play an important role in the decision-making process. In fact, it is the responsibility of planners to help policy-makers make intelligent decisions by informing them of the probable consequences of the choices confronting them. This is no small responsibility.

Making intelligent policy choices has become increasingly complex as society itself becomes more complex and as the consequences of various courses of action become more far reaching and intertwined. If one part of the social system is changed, other parts are affected. It is not infrequently that program decisions are made

1. On the presumption of knowledge where none actually exists, or
2. On the basis of a common-sense or intuitive expectation of results that prove to be wrong, or
3. With the aim of achieving a worthwhile objective in one area but with the result of producing quite undesirable results in another area.

More dams may not produce more flood control; more urban renewal may not increase the supply of low-income housing; more highways may not lead to more convenient travel; and more convenient travel may result in intolerable levels of air pollution. It is no longer enough for the policy-maker to choose only on the basis of a quick calculation of the immediate effects. Rather, he must concern himself with the second- and third-order consequences of a particular course of action and with the hidden or indirect policies implicit in any proposed solution. He must weigh immediate advantages in one area against long-term disadvantages in other areas. These cannot be snap calculations. They require a penetrating understanding of the process by which the consequences are brought about. They require sophisticated means of weighing the alternatives. They require new ways of measuring the competing values that have to be balanced. They require an understanding not only of what the trade-offs are but also of what they mean. Policy-makers must be not unlike the ascetic who, upon observing a large jet plane flying over his mountain-top place of contemplation, remarked to his neighbor, "They may have the know-how, but we have the know-why." I am suggesting that we need both.

In the transportation field, planning once consisted of someone sitting down with a map and a set of colored pencils and drawing preferred routes for a road or a railroad or an airline on a map. Although many transportation facilities were built that way, and built well, they were not always economical and frequently had unfortunate social and environmental consequences. Later we improved on the colored-pencil approach by the addition of existing traffic-flow data—cordon counts, tonnages over the line, and so forth. The addition of this information made the planning process for transportation routes and facilities much more precise. Unfortunately the traffic data and the essentially linear projections made from those data were largely static and incomplete and failed to show among other things true origins and destinations. They took little account of the impact on demand of future changes in the transportation system and even more rarely took account of the trade-offs among modes of transportation and between cost and benefits. Seldom, if ever, was consideration given to the possible impact of improvements in transportation facilities on system efficiency, community development, land use, environmental pollution, and utilization of energy. It is probably accurate to say that almost all transportation facilities—passengers and freight, intercity and intracity—were built on the basis of this incomplete information and fairly simplistic planning process.

Within the past 10 years or so, transportation planning has increasingly involved the use of models and systems analysis techniques. These urban transportation planning techniques were responsive to the questions that planners of the 1950s and early 1960s perceived to be relevant to the design of transportation facilities on a regional basis. Today, very different questions are seen to be relevant.

It has now become necessary to integrate into the planning process the environmental, energy, and social effects of transportation facility construction and operation. Also, transportation planning issues have become more numerous and involve a much wider range of alternatives that need to be considered. These include trade-offs between highway and public transit investments; between new construction and low- or non-capital alternatives, such as pricing schemes; between new technological systems and older, still workable systems; and between action programs and do-nothing alternatives. As a consequence of greater involvement by elected officials and citizens in the planning process, it is necessary that information on alternatives be produced expeditiously and in a manner that facilitates communication, particularly among nontechnical people.

Transportation problems in urbanized areas, moreover, are increasingly moving from the category of physical systems, where urban transportation planning methodology has its greatest strengths, to the realm of social and political problems, where that methodology has yet to distinguish itself.

Although significant amounts of money will probably be spent for new transportation facilities in urbanized areas in the future, the need now is to make better use of existing transportation facilities in order to provide quality of service at a cost that travelers and shippers desire, but without unfavorable impact on the environment or com-

munity. Plainly, we cannot optimize at the level of a particular mode of transportation nor even at the level of transportation itself. While striving to develop the most economically efficient through-service systems for travelers and shippers, we need to consider the potential impact of improvements in the system on the community, the city, and indeed the social system as a whole. Transportation questions, such as those regarding urban highway congestion and deterioration of local public passenger service, cannot be answered in isolation. They are intimately wound up with larger social, economic, and political considerations such as urban growth patterns. The story of center-city decay and suburban growth is well known. The trend toward urban sprawl has affected and will continue to affect heavily the transport demand of the people living there. If these demands are met only with further capital investments in transportation facilities, the trend toward urban sprawl may be reinforced by those investments. Public policy-makers, therefore, need first to decide whether urban sprawl should continue to occur, and then they can make wise transportation policy decisions.

Transportation planning is plainly needed to help develop the information base on which intelligent policy decisions can be made. And planning methodology has a very important role to play. But as in all things, there are problems, limitations, and risks involved.

For one thing, we must resist the temptation to let the models make the policy decisions. That would be tantamount to reaching a decision without really deciding. The policy leadership cannot delegate this responsibility—nor should the systems analyst attempt to acquire it.

Inadequate data are a persistent problem in transportation. A great deal of the required data of both a physical and an economic nature is simply not available—except perhaps at great cost. (A characteristic weakness of a civilization in which so much is known is that it becomes difficult to admit to ignorance and easy to assume the reliability of information that is anything but reliable.)

Another problem is that of the model itself. It is very difficult for the nonexpert policy-maker to follow the arguments among the mathematical model-makers. In transportation, we are frequently confronted by the argument that the other fellow's model is really unsophisticated, inaccurate, or simply worthless. The assumptions underlying the model need to be made clear to the user. The user should clearly understand those questions that the model can usefully treat and those that it cannot treat. All too often, users have been led to believe that a model can deal with all aspects of a complex problem when, in reality, there are only pieces of the problem that the model or any model could deal with effectively. We must also develop methods to test the utility and validity of various models and to make comparisons among them.

Still another problem is that of timing. Program decisions are being made all the time, and it does the decision-maker little good to be told that in 2 years a systems analyst will have a finished model that will be helpful to him. The decision-maker must have some sort of information today—even if it is of an interim nature. It is unrealistic to expect decision-making to stop until the model is perfected.

Finally, there is the inescapable fact that the design and implementation of a transportation system involve a large measure of political thought, motivation, and action that may multiply the variables. Any systems analysis risks divorce from reality unless it provides information that is useful in the context of day-to-day political decision-making.

Clearly, the forecasting of urban travel demand is a critical step in the planning process. The forecast travel is an input to the determination of benefits and cost and many external effects and the evaluation of transportation alternatives. These results are essential items on which major investment and policy decisions rest. In short, the forecast of urban travel drives the major technical portion of the urban transportation planning process. This is true at the federal, state, and local levels of government. It is therefore incumbent on the U.S. Department of Transportation and the transportation planning community to ensure that travel forecasts are sufficiently accurate and timely for decision-making, sensitive to the important issues facing the decision-makers and community, and communicated to nontechnical people in an understandable manner. And we must ensure that the forecasting methodology is adequate

to meet these needs.

Much of what I have said is not entirely new. Paul Cherington, a former Assistant Secretary for Transportation Policy and International Affairs, expressed much of the same sentiment before the Transportation Research Forum in October 1969 in a speech that was critical of the use of systems analysis in transportation policy-making. I cannot see that we have gained significantly on the problem since that time. It is significant that this conference was called and attended by such a group of competent professionals. What is required from the conference is a set of recommendations to plot the future in this critical area of transportation planning, that is, methodology for the forecasting of urban travel. This can be accomplished by making recommendations as to how existing forecasting techniques can be better used and how new research directions can be set for improving existing forecasting techniques and developing new ones.