

RELATION OF NATIONAL TRANSPORTATION PLANNING AND STATE TRANSPORTATION PLANNING

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•IN RECENT years, there have been new developments in both national and state transportation planning. In particular, at both levels of government, new emphasis has been placed on the ability to consider all modes of transportation, if not through the same analytical technique, then at least through the same planning process and the same organizations. The nature of the process has similarities and differences at the 2 levels of government. These will be discussed in this paper as will the new National Transportation Study, which has been designed to relate the state and national transportation planning processes more closely and more formally. There has been no attempt to trace the historical development of transportation planning at either the state or the national levels. The paper is just a brief statement of where things stand at present and where they are headed with some comments on where they should be headed. The reader is cautioned that the views expressed in this paper are those of the author and do not necessarily represent the policy of the U.S. Department of Transportation.

DEFINITIONS

In this paper, national transportation planning includes those activities that are aimed at helping the federal government to decide what actions it should take to bring about or otherwise encourage transportation operations and investments that make a maximal improvement to the national welfare. For a number of reasons, this type of planning does not typically involve the search for one or even several "optimal" configurations of transportation and certainly does not involve very much detailed specification of those configurations. In this paper, we will not dwell on defining the national welfare. State transportation planning has more or less the same purpose, except that instead of the national welfare state planning tries to enlighten the decision-making process for improving the welfare of people or organizations that operate within state boundaries. Generally at some point in the planning process, it involves specifying in detail the nature of facilities to be built.

SIMILARITIES AND DIFFERENCES

Before we consider the ways in which these 2 activities can complement each other, it is interesting to reflect on how they are similar, how they differ, and why.

Reporting

Both processes require reports at regular periodic intervals not only for use in the executive branch of the government but also for use in developing legislative guidelines. Such reports are also necessary for the purpose of publicizing the recommendations in order to obtain the public's reaction and criticism. This is especially important in the legislative process, where considerable debate may take place and changes get made before the final provision is enacted. The reports in effect become reference documents and basic starting points leading to an eventual refinement of the proposals.

Continuing Nature

Besides the continuity of the regular reporting cycle, the planners at both levels of government must be prepared to respond at irregular times during the cycle. Proposals are made very often from outside the regular administrative channels, for example, by community organizations or individual legislators at the state level or by special interest groups at the federal level. These proposals must be evaluated and compared with those that are currently favored by the administration. Ideally this evaluation should take place in the same organizational framework as the one used to develop the administration proposal or official plan.

Time Horizons

Both processes involve long-range planning and short-range programming and budgeting. Perhaps one of the major shortcomings of both processes is that in most cases the long-range planning work and the programming are done by separate groups and are generally not coordinated. It is interesting moreover that, at least until recently, most of the planning energy at the federal level has been focused on the programming and budgeting process (essentially a short-range one), while at the state level and especially at the urban level emphasis has been placed on long-range planning and the technical description and evaluation of systems that should or would exist about 20 years in the future.

Hierarchical Structure

The national transportation planning process embodies, at least in theory, one additional degree of hierarchical complexity beyond that of the state process. The state process must consider the plans and programs of metropolitan-wide organizations as well as those of individual local city and county governments. The national process theoretically involves another level of hierarchy—that of the state. In practice, however, the complexity at the national level is somewhat lower because of the differing responsibilities of program and project control vis-à-vis the next level of government down. The state in most cases will actually build and operate transportation facilities (highways in particular) within the boundaries of its local governments or metropolitan planning bodies. In the case of the federal government, this is generally not true with respect to the state except for navigable waterway investments and the airway system. Thus, there is less activity devoted to coordinating transportation programs of direct investment or operations with those of the next lower governmental entity simply because there are very few projects of direct federal investment.

Relation to Other Government Activities

At both levels of government, transportation planning is expected to be in step with other government policies and plans in areas such as land use planning, regional economic development policy, and pollution control.

Private Sector Participation

The nature of private sector participation in the 2 processes reflects the differences in scale and organizational responsibility. At the state or local level, the activities and location plans of individual plants are of great interest to transportation planners as are the specific operations of individual carriers. At the federal level, transportation planners are interested in the industry's projection of new technology and its effects and the industry's views regarding investment plans, particularly for vehicles that might operate on routeways provided at public expense. Beyond this, large portions of the system are provided and operated entirely in the private sector, including pipelines and railroads. In these cases the federal government is interested in industry plans for investment or disinvestment in fixed facilities in a nationwide sense, while individual states are understandably more concerned about individual service abandonments within their boundaries and their impacts on usage of other facilities.

Technical Methodologies

The states have been adapting some of the techniques of network analysis originally developed for use in the urban transportation planning process. At the same time, the federal government has developed nationwide networks similarly adapted for use in examining national passenger and freight issues; however, the application of these techniques seems to be more advanced at the state level. One problem of network analysis at the national level is the fact that travel on the highway system is predominantly local with respect to the national scale and is not easily represented on a coarse-grained network such as that required for computational feasibility in national models. This, of course, is less of a problem in statewide networks where one can usually afford a finer zone and link structure.

At the federal level, the Department of Transportation has become interested recently in models that express transportation supply and demand in aggregate, non-network, terms. These simpler relations enable very rapid calculations to be made regarding numerous system alternatives for numerous different geographic areas (such as urban areas). At the same time the need for such techniques at the state level and even the urban area level is being recognized for much the same reason. Despite the advances in computational speed and unit cost, the network analysis methods are still quite time-consuming for use in testing a multitude of alternatives; thus, the relative desirability of the aggregate techniques is increased.

Types of Analysis

Individual project analysis is less important at the federal level because most projects are not built directly by the federal government but are sponsored by states and local governments with federal aid. Moreover, the Department of Transportation Act, at least by one interpretation, appears to limit the authority of the executive branch of the federal government to even set criteria for performing investment analysis. In contrast, the states are, or at least should be, concerned about matters such as the analysis of alternative highway or public transportation route locations or decisions about whether one project should receive priority over others.

One type of analysis of special interest at the federal level but less at the state level is analysis in support of a decision to develop specific vehicles and their associated system components. Examples are the SST, high-speed rail technologies, vertical and short takeoff and landing aircraft systems, and components of the aviation system. Sometimes, individual project analyses are needed in support of these issues as concrete examples of where the vehicles might find use.

Also in a similar position with respect to state or federal interest are questions related to specific policies, such as increases in user taxes, economic regulation, safety regulation, and so forth, although there would appear to be more grounds for state interest here than in questions of vehicle development.

Analysis of the optimal extent of a system or of service offered appears to be of great interest at both levels of government since it has implications regarding future appropriation of funds. This common area of interest has become a focus of cooperative planning between federal and state governments, whether through "needs" studies or through the new National Transportation Studies, and will be discussed later.

Multilateral Viewpoints

In addition to the viewpoints of the various governmental entities, both levels of government must also take into account the views of and impacts on other identifiable groups within the population, such as poor people, local businesses, and citizen groups. Analysts at the national level are often called on to evaluate the impact of policy or program changes with respect to specific interest groups or geographic regions.

Evaluation of Progress With Regard to Objectives

An important part of the planning process at both state and federal levels is the identification of goals and objectives of public policy and programs, possibly in quanti-

tative fashion. As an adjunct to this, it becomes important to trace the actual performance of the transportation system through time with respect to the announced objectives and to forecast the anticipated performance in the future if alternative policies and programs were implemented. For this purpose, a set of indicators of system performance must be developed to make such evaluations.

This type of evaluation is an extremely valuable tool of public policy in a democratic society. The layman and the political decision-maker often have difficulty in accepting benefit-cost analysis when many intangible or incommensurable measures are involved, especially when programs in transportation are evaluated against programs in other areas such as health services. Moreover, attempts to establish investment "needs" based on specific idealized standards simply beg the question of the impact of alternative levels of expenditure and are somewhat difficult for the public to conceptualize and to compare with investment needs in other areas. At least the public has some feel for the current level of transportation service (or health service), so that attempts to express changes in performance with respect to current performance and to relate these changes to levels of expenditure are probably more useful for public policy making than benefit-cost or needs techniques at both federal and state levels of government.

MUTUAL SUPPORT OF STATE AND FEDERAL TRANSPORTATION PLANNING EFFORTS

The foregoing discussion has pointed out a number of similarities and differences between the planning activities that appropriately take place at the state and the national levels and has shown how these relate to the respective functions of the state and the federal governments. This leads to the following conclusions regarding the ways in which the activities at each of the 2 levels of government can support the other.

Timing and Continuity

Under an ideal system the reporting dates and the frequency of reporting plan and program information should be the same for all states. The corresponding federal reporting frequency or frequencies should be the same as those for the states but possibly offset by a year to allow feedback between the federal and state results. Such a system, however, would neglect possible inefficiencies of manpower utilization since consultants, who are experts in a particular phase (e. g., data collection), may therefore not work in several states in sequence because the same type of activity would be going on in all states at once. Of course, because of the individual requirements of each state as determined by state laws, some of the state reporting dates might have to be out of phase with the federal requirements, in which case methods of making small adjustments for federal reporting purposes should be devised.

Time Horizons

The ideal system for federal purposes would be to maintain the same time horizons for plans and programs at any given point in time. This may also require adjustments to be made for federal-state compatibility.

Use of State Planning Data at the National Level

The federal data and analysis program should be geared to rely on the data bases generated as by-products of the state planning process as well as certain secondary sources outside the scope of the state.

Exchange of Talent

Professional planners at either level of government should be encouraged to spend some time at the other level in order to promote exchange of ideas.

Private Sector Coordination

National trade associations should be encouraged by the federal government to request that their membership in specific states or regions work with state planners in coordinating development strategies.

Performance Measures

A comparable set of performance measures should be promoted for use by the various states, against which progress through time and among areas may be compared. This is in contrast to a system where specific planning standards of performance are specified. The latter system reduces the scope of the state to selectively emphasize its own goals and objectives.

Evaluation Techniques

The use of comparable system evaluation techniques and associated methodologies should be promoted for use among the states.

Planning Assistance

Since much of the responsibility for system planning rests with the state, the federal government should seek to increase the state's capabilities in planning and programming and thereby increase the rationality with which the national system is planned.

Compatible Planning Assumptions

In addition to providing financial aid for state planning purposes, the federal government should provide information with respect to travel and freight projections as well as cost-estimating guidance and assumptions with regard to the availability and physical characteristics of new technological systems. This not only increases the comparability of the state plans and programs for federal purposes but also makes available valuable information for the state planning process.

Methodological Research

Because of the similarities in technique in state and national planning, efforts to improve the state of the art in different areas would have payoffs at both levels.

Wide Publication of Performance Measures

The public at large, the political decision-makers, and the planners themselves would benefit from having wide dissemination of indicators of current and anticipated performance of the transportation system such as overall speed, accessibility, and transit coverage.

THE NATIONAL TRANSPORTATION STUDY

After the initial experience with the first National Transportation Study (NTS), the new system is somewhat a refinement and will reflect a long-term effort to relate more closely in a technical, an administrative, and a political sense the state and federal transportations planning processes.

The following objectives have been established for the NTS:

1. Quantify the Nation's existing transportation system and future planned transportation system in terms of a set of consistent nationwide measures;
2. Provide the Secretary of Transportation and the Congress with information on which to base future national transportation system programs and policies;
3. Aid in evaluating the performance of the Nation's existing transportations system in terms of its contribution to national, state, local, and private sector goals according to a set of desired criteria;

4. Aid in identifying the deficiencies in the existing transportation system with respect to national, state, local, and private sector goals;
5. Aid in developing appropriate recommendations regarding federal-aid program authorization levels and structure to facilitate the implementation of recommended plans and expenditure programs;
6. Evaluate alternate future transportation systems in terms of performance measures at the national level and encourage similar evaluations at the state and local levels; and
7. Contribute to the improvement of the overall transportation planning process by encouraging at all levels of government (a) the continuing coordination of the U.S. Department of Transportation planning grants to facilitate comprehensive multimodal planning, (b) the development of comprehensive transportation plans reflecting state and local goals for both the long range (15 to 20 years) and the intermediate range (5 to 10 years), (c) the development of intermediate-range expenditure programs incorporating the higher priority elements of these plans, and (d) the development of a systematic data management system for continuing reporting of information regarding transportation system performance.

This study is to encompass planning with regard to all major modes of transportation, and the process is designed to make maximum use of the information developed through existing planning assistance programs of the department in highway, airport, and public transportation modes and information developed by public and private agencies with regard to other modes of transportation.

The NTS encouraged multimodal planning activity and the coordination with comprehensive planning that includes economic development, land use, and provision of other public services. Both long-range plans (1990 for the 1974 study) and short-range programs (to 1980) are to be reported by the states. In addition, a report on the 1980 plan is requested in order to compare the implications of the long-range plan with the program for a common year. The program would be developed with particular attention to budget constraints and sources of funds, including estimates of federal-aid funds available to each state during the period 1972 through 1979. The plan would not require strict consideration of budget constraints. In addition, information with respect to a base-year (1972) inventory is required.

The following comprehensive set of information will be reported:

1. 1972 inventory—physical state of the transportation system existing as of January 1, 1972, low-capital and noncapital programs existing as of January 1, 1972, transportation system operating costs for the year 1971, and performance of the transportation system existing as of January 1, 1972;
2. 1990 plan—description (in terms used for 1972 physical state) of the 1990 transportation system plan resulting from the transportation planning process, performance of the 1990 transportation system plan, description of low-capital and noncapital programs that are part of the 1990 plan, operating costs in constant 1971 dollars for the year 1989, and costs to develop the 1990 planned system (1972 to 1990) in constant 1971 dollars;
3. 1980 plan—description of the 1980 transportation system plan resulting from the transportation planning process, performance of the 1980 transportation system plan, operating costs for the year 1979 in constant 1971 dollars, description of low-capital and noncapital programs that are part of the 1980 plan, and costs to develop the 1980 planned system (1972 to 1980) in constant 1971 dollars; and
4. 1980 program—description of the 1980 programmed transportation system, performance of the 1980 programmed transportation system, description of low-capital and noncapital elements that are part of the 1980 programmed system, costs to develop the 1980 programmed system (1972 to 1980) in constant 1971 dollars, operating costs for the year 1979 in constant 1971 dollars, and sources of funds (1972 to 1980) anticipated to finance the programmed system.

Emphasis is being placed on the use of transportation performance measures that describe the current system and future planned and programmed systems. These

measures describe not only the service that the systems offer or would offer to users but also some of the impacts on nonusers. Examples of performance relating to public transit service include percentage of population within walking distance of public transit service, average vehicle speed, average headways, and load factor. Examples of impacts on nonusers or the public at large include tons of pollutants by type and population within certain noise contours.

Beyond the information describing overall transportation systems in different areas, an additional less aggregative reporting is contemplated that would employ accessibility techniques to calculate the transportation service available to different population groups with regard to specific types of trips. Included here, for example, would be measures such as the percentage of area residents within specific travel times (by automobile and separately by public transit) to metropolitan facilities such as hospitals and schools. This type of analysis is contemplated only for urbanized areas of more than 500,000 population.

Besides their use at the state and urban area level, the following uses are contemplated for the information at the federal level.

1. Monitoring of system performance, physical development, and expenditures through time—Information regarding the 1972 inventory, future year inventories in future studies, and expenditure patterns between inventory years (beginning with the 1976 study) will be useful to the department in monitoring the effectiveness of transportation expenditures of different types through time. In a gross sense, this will indicate to what extent the system is improving, changing, or deteriorating, in what types of areas the effects are being felt; and in what way these phenomena relate to transportation expenditures, particularly federally aided ones. This would indicate whether program areas might warrant increased or decreased emphasis of the federal government.

2. Comparison among states and areas—The static information regarding the 1972 inventory will be useful in a comparison of the level of service offered, the physical facilities present, and their cost of operation among states and other areas. A time series of inventory information will eventually indicate those areas that make the most gains in different performance measures. Publication of these data will enable states to make comparisons of their own experience with that of other states in the context of the national system. In effect, this would begin to establish a minimum continuing transportation data base throughout the Nation. Analysis of this information would also indicate whether certain general types of geographic areas might warrant increased or decreased program emphasis by the federal government.

3. Comparison of long-range plans with current systems and comparison of long-range plan performance among areas—The 1972 inventory and the 1990 plan would be used to indicate the changes in system performance that could be anticipated if the plans were implemented and to indicate the cost. In a gross way, this would serve to point up what the Nation would be buying if the long-range plans were implemented in terms that can be related to current experience with system performance. The general public as well as public sector decision-makers would benefit from being able to relate anticipated changes to their current satisfaction or dissatisfaction with different elements of the system and to make judgments regarding the value of implementing such long-range plans at the estimated cost.

4. Comparison of current system with anticipated changes under current funding assumptions—The 1972 inventory and the 1980 program would be compared to indicate whether changes in funding at various levels of government and in different programs might be warranted. In effect, lack of progress in performance in certain program areas or geographic areas may indicate a need to shift funding priorities.

5. Anticipated progress in meeting goals of the long-range plans—The 1980 plan and the 1980 program would be compared in terms of the extent to which the anticipated budget-constrained program is on target with respect to attainment of 1990 plan objectives. This would be useful in setting realistic national objectives on which to base federal programs and policies.

6. Transportation expenditure priorities—The 1980 plan and the 1980 program would be compared in order to determine those programs to which states and local areas would assign higher priorities under funding constraints. This information, along with narrative information in the state reports, would indicate the extent to which state or local priorities are consistent with national goals and transportation policies, whether current programs and policies might impede progress toward certain state goals, or whether state and local programming decisions under current programs might produce deficiencies with respect to national goals.

7. Analysis of alternatives—The information will provide a cross section of various state and local government solutions regarding physical development, performance, and cost. This and secondary sources of data can be used to derive relations between the dimensions given above in such a way that one or more can be varied and the resultant changes calculated for the other variables. Some such analytical tools have already been developed by the department and are extremely useful in analyzing the sensitivity of system performance to alternative investment and operating policies. They are useful in answering questions such as, What would it take to make specific percentage improvements to optimize weighted service levels given budget constraints?

8. Sources of funds—The information regarding sources of funds for the 1980 program is considered necessary to develop realistic programs. The information can serve to identify at the national level the differences among the modes and geographic areas in raising operating and capital funds and in particular the extent to which expenses would have to be borne by the general taxpayer.

9. Consistency checks—Certain items of information are useful in checking the validity of the remaining items. For example, total operating expenditures minus operating subsidies divided by total passengers should be an approximate indicator of average fare on an urban public transportation system.

10. Status of plans—Information regarding the sources of information that was used in developing the plans and programs will indicate the extent to which department-sponsored plans and planning processes are kept current and are used in developing expenditure programs.

11. Exchange of information—Publication of all of the information given above will be useful in keeping states informed of progress in transportation performance throughout the country and will improve planning and programming practices by disseminating information on how the planning and programming process is carried out across the Nation.

12. Special issues—Certain of the detailed information will provide a basis for analysis of specific issues such as service to poor or elderly citizens and service to different land uses.

Of course, not all of the uses of the data given above will be fully developed after the 1974 study, but the intent is to develop reliable information for all of these purposes as time goes on and as the information system is improved.

Another important feature of the 1974 NTS is that the process is designed to encourage the involvement of elected officials in the planning and programming process. For example, the governor of each state appoints a representative to be in charge of the study and designates urban planning groups to coordinate the activity in each urbanized area. The urban planning group would ideally have a policy board including or responsive to local elected officials. In addition, states are encouraged to involve key legislative officials concerned with transportation, for example, by asking them to review the study results or to form an advisory board to oversee the study.

To summarize, the 1974 NTS and the continuing national transportation study have been designed in such a way that national, state, and urban transportation planning efforts may reinforce one another in a coordinated fashion.