Statewide Transportation Planning: Detailed Studies, Unifying Controls, and Performance Monitoring


Statewide transportation planning involves at least five freight modes, four passenger modes, four levels of jurisdictions and hundreds of individual jurisdictions, private carriers, and many agencies dealing with land use, economy, social welfare, and environment. To help state departments of transportation maintain control over diverse planning studies, an approach is offered involving detailed studies, maintenance of unifying controls (e.g., demand estimates and environmental reports), and performance monitoring (e.g., recognizing key objectives such as safety, energy consumption, and costs). This approach recognizes the inevitability of detailed studies, the need to control and monitor studies, and the need to implement the approach with only minor organizational changes.

More than 30 states have established departments of transportation (DOTs). These departments are extending their activities and concerns beyond highways alone to other modes of transportation needed for people and freight. Initially, the greatest activity related to the nonhighway modes is planning. An important question for state government is: What approach should be taken to planning, which affects both public and private providers of transportation services? Planning identifies both present and future problems that may call for remedial actions by the state.

Statewide transportation planning must deal with multiple modes, multiple jurisdictions, and the many dimensions of a state (e.g., population, economy, land development pattern, and environment). At the state level, there are at least five freight modes, four passenger modes, four levels of jurisdictions and hundreds of individual jurisdictions, private carriers, and many agencies dealing with land use, economy, social welfare, and environment. All have a number of legitimate goals; some are shown in Figure 1. In addition to transportation goals, other dimensions and objectives of state life, such as the following, should be acknowledged.

1. Economy: maintaining technological efficiency; increasing economic activity; reducing trade deficits; increasing productivity; reducing unemployment; promoting free enterprise.
2. Society: increasing personal real income; reducing poverty; providing security, health, and adequate housing; increasing educational opportunities; promoting the equitable distribution of wealth; providing equal employment opportunities and increased cultural and recreational opportunities.
3. Land use: preserving prime agricultural lands, scenic areas, coastal zones, historic buildings and sites, and park and open spaces; making urban areas attractive, functional, and economic; eliminating urban decay.
4. Natural resources: using energy efficiency; preserving wildlife habits, natural environment, and endangered species; reducing pollution.

The length of these lists is a measure of the difficulty facing policy makers and professional planners at the state level. It is essential, however, to comprehend and deal with these multiple goals and objectives, not only as a means to preserve sanity and self-respect but also to enable professionals to explain them to policy makers. Developing a philosophy for planning with multiple objectives is, therefore, the problem to which this paper is addressed.

To make the problem both more difficult and more real, the actual issues that are facing planners and policy makers at the state level must be considered. A survey taken in five states in 1974 for National Cooperative Highway Research Program Project 8-17, which focused on freight transportation planning at the state level, disclosed that there were at least 74 issues of real concern to planners (1). A revised version of these issues, limited to the rail mode, was included in the Federal Railroad Administration Rail Planning Manual. These issues included threatened termination of service on light-density lines; freight-car supply; condition of roadbed and track on light-density lines; taxation of roadbed facilities; quality of rail service; restructuring of rates and other regulatory controls; improvement of ground access to freight yards and terminals for intermodal services; provision of new and improved intermodal transfer facilities; development, testing, and marketing of new services to promote rail use; development of a national or regional rail systems plan for mainlines; construction of rail bypass routes around urban areas; replacement and modernization of terminals and yards; condition of roadbed and track on mainlines; merger of competing or complementary railroads; and passenger services.

The situation facing state transportation planners is a difficult one. The planner and the policy maker are confronted with a host of issues and with competing and often conflicting objectives that are in need of satisfaction. One problem is which issue to address first. A more difficult problem is how to determine whether a recommendation for a given project or policy will be wise when relevant objectives selected from the entire range of objectives are taken into account. The following are examples of such problems:

1. The plan for a major interstate highway is stalled because it conflicts with the objectives of environmental groups. However, failure to build the highway may be a significant factor contributing to urban economic decline.
2. A plan for rail freight transportation correctly permits the elimination of a few light-density lines in a state. However, the plan is silent on positive state action that is needed in industrial location policy and in rate making. Action in these two fields could increase rail utilization and hence support the rail industry.
3. A plan for statewide rail and air passenger service discloses that there will be shortfalls in operating costs if service is improved as indicated by the plan. Should these funds come from state highway sources, replacing maintenance or capital activities in the highway sector?

In each case, both the state transportation planner and the policy maker are faced with a decision that involves multimodal, multijurisdictional, and multifaceted objectives. Gains toward one objective mean losses from other objectives. Dozens of such balancing acts must be performed each year. How is the planner to work in this kind of situation?

In past urban area transportation planning, planners
were able to deal fairly successfully with very large systems in their entirities. However, success was due in large part to limiting the planning process to four major objectives (speed, safety, vehicle operating costs, and capital costs of new roadways), to a single client (the policy committee), and to the practical exclusion of land use and other considerations through making independent estimates of a single land use scenario for which the new transportation system was to be planned. These limitations cannot be accepted for today's state-level planning.

An alternative is to continue with the old idea of a single transportation planning process, but to expand that process to encompass the multiple goals that we have identified and to deal also with plural land use scenarios, plural energy scenarios, and other variable conditions. This approach becomes ponderous in the extreme and will probably fail of its own weight, or else become so generalized as to be meaningless.

The approach that I advocate recognizes the extreme practical difficulties of attempting too much. What is needed is a means by which a state department of transportation can maintain control over diverse planning studies so that it can interpret and evaluate those studies in the light of a common series of benchmarks. Four are critical:

1. Future population and economy of the state;
2. Future land development;
3. Environment; and
4. State's financial resources.

If separate, specialized transportation plans are related to these benchmarks, then their worth can be established. Accordingly, each state department of transportation must recognize that certain ordinary tasks—detailed studies, maintenance of unifying controls, and performance monitoring—need to be performed in a highly coordinated way.

The first task is to respond to particular issues (such as uneconomic light-density lines, need for commuter air service, or need for high-speed rail passenger service) by detailed studies of that particular issue. This is hardly novel, but the approach recommended here would impose three significant conditions on such studies:

1. The studies would have to accept state-generated population and economic growth projections by appropriate geographical subarea as inputs to any demand estimation by the detailed study.
2. The studies would have to produce selected, prespecified estimates of economic, social, environmental, and energy impacts. These estimates would relate to certain unifying controls.
3. The studies would have to produce both capital and operating cost estimates, to fit into the state's capital budgeting process.

The second action is for the state to maintain certain unifying controls (estimates, plans, and processes) as the means for judging each detailed study and the desirability of its recommendations. There are four important unifying controls (2):

1. Demand estimates. Most detailed studies develop their own estimates of passenger and freight demands, often using different population and economic forecasts as bases. It is very important for state DOTs to maintain, as a unifying force, a common set of demand estimates based on a common set of population and economic forecasts.
2. Target for state development. Some codified view of development targets for the state is needed, if only to provide the basis for criticizing detailed studies and their specialized demands for land, or impacts on economic growth.
3. An environmental report. Maintaining and improving the environment of the state is an important goal that may influence decisions in the transportation field. A statewide environmental impact report should be prepared describing (a) the present conditions of the environment in terms of air quality, water quality, wildlife; endangered species; and (if environment is very broadly defined) the social, economic, and "built environment" conditions within which the population of the state resides. It is desirable for the subject of energy to be dealt with in the environmental report since the consumption of energy is a major source of pollution.
4. A capital and operating program. The recommendations of most detailed studies are judged by their financial requirements, and these requirements can best be judged in terms of their impact on other capital and operating projects that compete for available resources. Hence, there is a great need for programming as a unifying element.

The third action is for the state to monitor its transportation system to determine performance levels in terms of a relatively small number of key objectives, such as safety, energy consumption, speed of travel, reliability, costs to users, costs to the state, and condition. The monitoring activity would produce information that would help to identify important issues needing detailed study. This, therefore, completes the cycle of statewide transportation planning.

The three kinds of tasks described form a statewide transportation planning cycle (Figure 2). Critical issues lead to detailed studies. The detailed studies are con-
trolled by, and evaluated in the light of, four unifying elements, one of which leads directly to implementation. The performance of the state's transportation system is monitored continually, and this leads to a performance report and provides the basis for evaluating which issues are most critical.

I favor this approach because

1. It recognizes the inevitability of the detailed studies that address individual issues.
2. It provides a means whereby the state DOT can consciously control and evaluate detailed studies on a uniform and objective basis.
3. It provides a recognized place in the planning cycle for performance monitoring.
4. The entire cycle is readily implementable in state DOTs with only minor organizational changes.

Basically, this is an institutional, rather than a highly technical, response to the world of multiple objectives. This is not to say that technique is not vitally important; it is, and in all three kinds of tasks. However, an institutional recognition of the need to structure statewide transportation planning along the recommended lines is the first order of business. Without coordinating these parts, facts cannot be coordinated or presented in a fashion that will permit policy to be developed objectively and systematically.

REFERENCES