the benefits of improved models of this nature will be mitigated if concurrent advances are not made in evaluation methodology by which the full range of benefits and costs, quantitative and nonquantitative, associated with particular alternatives can be fully displayed for the use of decision-makers and the public in making trade-offs and choices. Again, methodology has been developed primarily in the urban transportation area and may not be adequate for the scale and range of impacts involved in planning statewide systems or subsystems.

Three additional research areas were either only briefly touched on in the resource paper or not examined at all.

1. Given the changing climate with respect to environmental impacts and the growing interest of federal, state, and local government in better control of land development and resource management, I believe more emphasis should be placed on research directed at methodology that permits better estimates of the influence of transportation improvements on the nature and location of economic activity and the role that transportation planning and programming can have in supporting comprehensive and economic planning for the state.
2. Some research is needed in the area of normative planning and modeling, that is, the development of methodology that accepts as input a desired or planned configuration of land and activity arrangement and produces as output the nature and sequence of a transportation improvement program that most efficiently supports that end state. Progress on these kinds of models has not been overwhelming in the past. However, changing attitudes on behalf of government and the public make their potential utility of growing value and interest.
3. Better fiscal and financial planning methodology is needed. It is clear that grandiose long-term investment plans developed without any thought concerning how they will be paid for are of rapidly declining interest at all governmental levels. Planners and decision-makers must have the tools with which to make relatively accurate assessments of the feasibility and impact of alternative financing mechanisms. Such tools must estimate not only the likely yield of such alternatives but the distributional impacts on the population and the effect upon demand.

I cannot conclude my remarks without strongly endorsing Pecknold's discussion of the continuing statewide planning process and in particular the interdependence between long-term system planning and time-staged project planning. Although I recognize that the proposed scheme is mostly conceptual at this point, I believe it holds the prospects for some very exciting and fruitful methodological development. The paper presents a comprehensive assessment of where we are today in terms of statewide transportation planning and programming methodology and where we ought to be investing future research funds.

Discussion of Resource Paper

Max R. Sproles, Harland Bartholomew and Associates

Two major points in Pecknold's excellent resource paper should receive additional emphasis: the type of methodology to be used to consider the question of environmental quality and the concept of equity of investments in transportation.

The coverage was extremely good of those techniques being tried in the states that have a formal program of statewide planning. But what is being done in the less organized states? Each state is going about the job of assigning priorities, building projects, and dividing transportation funds among regions and types of projects that fit into their legislative mandates. How are all these decisions arrived at? How are

fund levels determined? How are funds being allocated to road systems? How are funds being allocated to areas, and how are funds being allocated to modes? How does the political planning and decision process fit into the technical planning process, especially when the technical process is informal and unorganized?

The question of citizen participation at the state planning development stage needs much more study. To generate broad coverage and involvement in a process is difficult if people do not understand the process and cannot see the impact of a construction project for 5 to 20 years. In other words, how do we solicit the opinions of all those disinterested persons who do not care enough to participate or think that everything is going okay so why participate or have been so dulled by the political process that they feel they cannot make an input that will change anything? How can we integrate the citizen participation program into the political process so that we can depend on political decision-makers to obtain the consensus of their constituency and then be responsible to that constituency?

My major interest in commenting on methodology for statewide transportation planning is to make sure that the individuals at the state level who must organize and develop capabilities for decision-making have as a reference recommendations for methodologies that are practical. Too often the statewide transportation planning process has emerged as the result of many relatively minor decisions rather than being a rational process that forms a framework for the decision-making process. The statewide planning process must be supported by funds and personnel capable of responding to a broad range of questions and documenting technical information and presenting it to the administrators.

The point is that decisions are going to be made quickly with or without the technical review and documentation. Therefore, the methodologies that are in the kit of the statewide transportation planner must range from the "quick and dirty" to the very sophisticated. I estimate that two-thirds of the questions that must be answered relative to statewide planning will be answered through the quick-and-dirty process. Therefore, the main aim of the development of methodologies should be to establish an overall framework with as much sophistication as can be justified but with specific emphasis on the ability to answer as quickly as possible the day-to-day questions regarding policy.

This means that considerable changes will have to take place in the existing methodology and that possibly very little of the urban transportation planning process will be directly applicable. I am particularly concerned about the use of the urban transportation planning modeling technique in the development of methodologies for statewide planning.

I have 2 additional concerns. One is that in the development of methodology, particularly with regard to data requirements, we must be very careful that we do not fall into the trap of the highway planning survey and the urban transportation planning process in which most of the time and energy was devoted to data collection that was difficult to make relevant to the decision that had to be made with or without data. In addition, we must be very careful in using modeling techniques and in recommending modeling techniques that are more complex than the decision they are designed to assist.

The other concern is that we develop methodologies that will allow the integration of private transportation and land use planning into the public planning process. If we are to develop an effective transportation planning process at the statewide level, input related to decisions of private transportation operators and the land development community must be included as early as possible.