

Research Needs

1. Dynamic aspects of travel behavior (adjustment time, daily variability of travel, and trends versus turning points)

2. Preference characteristics of the population

a. Whether the preference intensity among alternatives is so great as to require that changes in service be very large to cause substantial behavior shifts

b. Whether we can identify the attributes of services to which behavior is most sensitive

3. Application of model estimates in different contexts

4. Improvement of linkage with application programs

5. Incorporation of aggregate flow information in model-calibration process

6. Improvements in data measurement

7. Definition of confidence limits in prediction

Workshop on Long-Range and Strategic Forecasting Techniques

Workshop Summary

CHRISTOPHER R. FLEET, Federal Highway Administration

Conferees at the Conference on Urban Transportation Planning in the 1980s (Airlie House, 1981) concluded that there will continue to be a need for systemwide transportation facilities planning. Long-range planning will be strategic rather than facilities oriented, and new methodologies may be required. The overall goal of this workshop was to identify travel-forecasting methods that could be applied to reach long-range planning solutions and to discuss the relationship between strategic and facilities planning methods.

More specifically, the issues relating to long-range and strategic planning identified in the initial context workshops were to be discussed in terms of the availability of methods to deal with the issues and research needed to close identified gaps between the state of the art and the state of the practice.

The papers presented by Creighton and Stuart were intended to spur discussion on the state of the art and the state of the practice. The discussion that followed covered a broad range of ideas and issues stimulated by the papers and the experience of those present. Although the discussion began within a rather broad framework of approaches to strategic and long-range planning, methods to accomplish this type of planning soon began to emerge.

The many methods that were discussed were summarized and matched against a summary of the almost 30 issues from the context workshops that the participants felt were relevant to strategic and long-range planning. Through this matching process, a consensus was developed of which of the methods were relevant or useful in dealing with the issues and finally of which issue-method pairs contained gaps between art and practice. These issue-method pairs were grouped into logical research areas for later detailing by workshop participants. The issue-method matrix was carried back to the context work-

shops as a vehicle for further discussion on how to close the gaps between art and practice.

A constant theme that was woven throughout the workshop was how to communicate better with decisionmakers and within the planning community. Better information for decisionmakers and better technology sharing were consistently recognized as vital ingredients in effective strategic and long-range planning. This is perhaps more critical in these planning functions than in short-range and operations planning since the policymakers can relate better and have a greater interest in near-term alternative improvements.

A second major discussion centered on the definition of strategic planning and how it and long-range planning relate to each other and to other functional planning areas. Although no firm definition was developed, a consensus did evolve out of the experiences shared by the workshop attendees. The following provides a useful framework for relating the methods discussed in this workshop to the planning areas discussed in other workshops:

1. Strategic planning should identify preferable transportation improvement strategies or policies (e.g., low capital versus capital intensive, alternative service levels desired, capital and subsidy limitations) as an input to plan development.

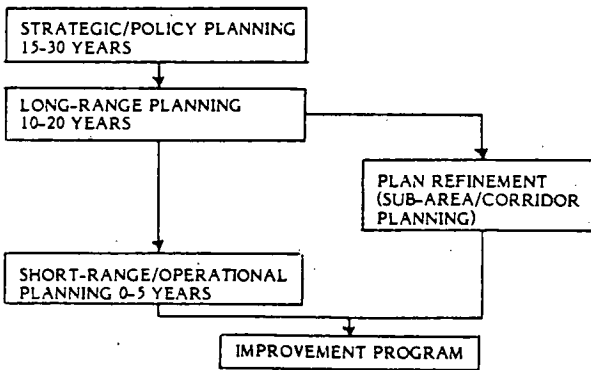
2. Long-range planning should identify corridors or subareas that are deficient, identify priorities, and outline a range of feasible candidate improvements in those areas.

3. The long-range regional land use and transportation plan provides a background or framework for subsequent corridor or subarea-level refinement through such techniques as windowing or focusing.

4. The planning process provides base-year data, models, and relationships useful in corridor or subarea planning.

5. The long-range data base (e.g., land use forecasts, trip tables, modal splits) provides back-

Figure 1. Relationship of methods and planning areas.



ground input or can be used directly within the corridor or subarea.

6. The programming implementation and process depends on a project-level assessment of impacts and design detail that cannot be accomplished at the regional system level. The long-range plan will continually be modified through the subarea and corridor-level planning. Impacts of short-range actions on the long-range plan need to be assessed, since their implementation could change the need for, or extent of, the proposed improvements in the long-range plan.

Conceptually, the framework might look like that shown in Figure 1.

Initial discussion on methods culminated in four approaches to conducting strategic and long-range planning. These approaches, with important features of each that evolved from the discussions, are summarized below:

1. Traditional forecasting process: long-range plan as a product

2. Alternative scenarios

- a. Traditional long-range models
- b. Product is plan tested against range of alternative land use patterns and growth assumptions
- c. Process reflects need to input wide range of local interests
- d. High degree of communication with decisionmakers throughout
- e. Relatively high level of effort required

3. Sketch planning

- a. Some traditional methods used with variations--often manual rather than computerized
- b. Quick turnaround at lesser level of detail than traditional systems planning
- c. Provides flexibility for decisionmakers and analysts to ask what-if questions and screen out infeasible alternatives from further analysis
- d. Less detailed product, often range of alternatives requiring further analysis

4. Management planning

- a. Agency management
 - (1) Internal to agency
 - (2) Management strategies
 - (3) Policy direction
 - (4) Decision process, not plan
- b. Regional or statewide policy planning:

output is typically broad set of policies to guide state's growth and development

These approaches to strategic and long-range planning served as a benchmark for the workshop discussion on methods. Within the context of the four planning approaches, a broad array of methods was developed. These were considered in terms of the relevant issues that came out of the context workshops.

Almost 30 issues were identified initially as having potential relevance to strategic and long-range planning. These issues were categorized into the four broad areas below:

1. Planning and forecasting process

a. Uncertainty and reliability (this broad area includes issues related to the quality of input data, range of forecasts, and technology transfer among planners and staff)

(1) Accuracy of forecasts, input data, etc.

(2) How to incorporate uncertainty into planning process

(3) Ability to anticipate change

(a) Changes in trends and approaches to critical thresholds

(b) Impact assessment and analysis of effects

b. Communication with decisionmakers

(1) Education--to assist decisionmakers in using planning output and evaluation of impacts of alternative actions

(2) Understanding--to enhance decisionmakers' understanding of what planner is able to provide to assist in policy decisions

2. Forecasting products

a. Equity and distribution of impacts

(1) Who benefits and who loses from alternative improvements or transit service packages

(2) Transit effectiveness in meeting social goals

(3) Accessibility and mobility

(4) Market segmentation for service development and impact assessment

b. System effectiveness and efficiency

(1) Monitoring--knowing what travel is taking place and what systems are in place--also whether there is improvement in trends over time

(2) Evaluation of past assumptions

(3) Feasibility of proposed projects (benefit/cost)

3. Ability to analyze current policy options

a. User-side subsidies--impacts on transit patronage and revenues

b. Demand response to service changes

c. Technology

(1) Upgrades to existing models

(2) Better use of existing models

(3) New models

d. Impacts of deregulation on

(1) Economy

(2) Finance

(3) New ridership market

4. External factors

a. Economy

b. Family life-style

c. Resource allocation

These issues were matched with a list of 15 meth-

Table 1. Issue-method relationships.

Method	Issue					
	1a. Uncertainty	1b. Communication	2a. Equity	2b. Effectiveness	3. Policy Options	4. External Factors
Data and inventories						
Socioeconomic and demographic forecasts	⊕	⊕	⊕		+	⊕
Data-base management		⊕	⊕			+
Performance monitoring (system use, quality of service, pavement management)		⊕		⊕		
Planning process						
Traditional process (regional and subarea)	⊕	⊕	+	+	⊕	
Alternative scenarios	⊕	⊕	+	+	⊕	⊕
Sketch planning (system and corridor policy assessment and facility options)	⊕	⊕	+	+	⊕	
Policy planning						
Agency management and policy direction (internal efficiency)		⊕		+	+	+
Regional or statewide	+	⊕	+		+	+
Freight and goods movement						
Freight study (state)	+		+	+	⊕	⊕
Goods movement (urban)	+		+	+	⊕	⊕
Revenue forecasting	⊕	⊕	+		⊕	⊕
Impact assessment						
Short-range planning or project on long-range plan	+	⊕	+	+	+	
External	+	⊕	+	+	+	+
Behavioral and market segmentation						
Behavioral demand modeling (demand modification)	⊕	⊕	⊕		⊕	⊕
Market segmentation (socioeconomic, geographic, attitudinal)	⊕	⊕	⊕		+	⊕

ods that evolved from the workshop discussion. The result was the matrix shown in Table 1. The plus sign indicates those methods that the workshop participants felt were relevant or useful in dealing with the general categories of issues. The circled plus sign indicates the issue-method pairs where research is needed to close the gap between art and practice.

Seven general areas of research needs were carved out of the more than 30 issue-method pairs that were identified as needing work to close the art-practice gap. In many of these cases it was felt that the methodology existed but that there was a great need to transfer the information and make it known to the practitioners through applications research or synthesis studies. The general research areas needed with the relevant issue-method pairs are shown below (numbers in parentheses in Issue column refer to list of issues above and in Table 1):

<u>Issue</u>	<u>Method</u>
Dealing with uncertainty and communicating uncertainty to decision-makers (1a, 1b)	Socioeconomic and demographic forecasts and planning process

<u>Issue</u>	<u>Method</u>
Ability to analyze alternative policy options (3) under uncertainty (1a) and the impact of external factors (4)	Revenue forecasting
Uncertainty and reliability (1a), equity and distribution impacts (2a), policy options (3), and external factors (4)	Behavioral demand modeling and market segmentation
Dealing with uncertainty in travel-forecasting process (1a)	Socioeconomic and demographic forecasts, planning process
Better use of existing communication procedures (1b)	All methods as appropriate
Ability to deal with policy options (3) and external factors (4)	Freight study and goods movement
Equity and distributional impacts of accessibility and market segmentation (2a)	Socioeconomic forecasts and data-base management