

Issues in Strategic Planning

FRANK SPIELBERG, SG Associates, Inc.

A standard implicit assumption in transportation planning has been that there is temporal stability in travel behavior relationships. A model developed for a given urban area at a particular time may not be transferable to another geographic area but should hold with some validity when used to make future projections for the same geographic area. It should be obvious that there are problems with this assumption. Travel behavior data observed at time t_0 reflect the environment at time t_0 . Numerous factors, including individual expectations of transportation system characteristics, dwelling unit composition, disposable income expenditures, and the like, affect all travel choices. All those factors are therefore implicitly represented in any travel demand relationship.

We know, however, that shifts are occurring in many of these implicit elements. During the 1970s there were dramatic changes in the composition of the typical household that have no doubt affected the validity of demand models in which dwelling units were a key variable.

The travel habits of women have changed as their role in society has shifted and they have entered the labor force in ever-greater numbers. Trip distribution or mode-choice relationships based on a typical population may no longer represent the population of the 1980s.

Automobile ownership and operating costs, in real terms, have risen. This shift may affect not only the choice of mode but also decisions regarding trip length and destination choice or even more basic residential location decisions.

Other illustrative examples of changes in basic conditions could be given. Rather than attempt to present an exhaustive list, however, let me mention only one more--the change in the real cost of home ownership. Although this shift started around 1976, it has been particularly noticeable in the past two or three years. This change may only be a short-term aberration or may represent a long-term phenomenon. The effects are still uncertain, but they could include a reversal of the trend to small family size, lessened residential mobility, or a shift in residential location patterns.

It is one thing to recognize that shifts in basic conditions affecting travel demand are taking place; it is quite another to know how to deal with the uncertainty in projections that these changes introduce. Even if we knew how to cope with the changes, we do not know whether or not the observed trends will continue. Put another way, we can deal with the unknowns; it is the unknown unknowns that give us trouble.

I will not attempt here to review the trends in basic social, economic, or demographic factors affecting travel demand. These are adequately addressed elsewhere. Nor will I attempt to suggest in detail how the strategic planning process will deal with the uncertainties introduced by the changing environment--that is the purpose of this workshop. Rather, the material that follows presents some of the issues that will need to be addressed. The list is not exhaustive; it is based only on my observations of demographic factors and of planning issues being raised in various cities.

GASOLINE PRICE AND AVAILABILITY

The transportation issue that seems to have the greatest public attention is the cost and supply of

transportation energy, especially gasoline. The public mood ranges between gloom when prices rise and shortages are predicted and euphoria when the popular press reports an oil glut. The public swings from forecasts of restrictive conservation with limited mobility to projections of gas stations once again offering giveaways and the resurgence of Detroit.

Most serious analysts believe that neither of these extreme conjectures is likely to occur. Continued real increases in the cost of transportation energy are projected through the 1980s, but moderate conservation measures, especially improvements in vehicle efficiency, will keep the cost per mile of highway travel, in constant dollars, at levels roughly the same as those for the 1980-1982 period for at least the next decade.

Even these cost levels, however, are greater than the automobile travel costs prevalent at the time travel behavior data in most urban areas were collected. Thus, we have travel-forecasting models that in many cases are built on a data base in which real automobile travel costs are implicitly significantly lower than will exist over the next decade.

As a result, the issues we might consider include the following questions:

How should long-range forecasts be adjusted to reflect changes in the cost of automobile transportation?

Do current procedures permit accurate assessment of the effects on lower-income groups of alternative transportation policies?

Related to gasoline cost is the question of availability. Although the United States has made significant progress in reducing its dependence on the members of the Organization of Petroleum Exporting Countries (OPEC) for imported oil (and even greater progress in reducing its dependence on the less reliable OPEC sources), there is still the real probability of sporadic supply constraints. Some work has been done on contingency planning, but it is generally agreed that we cannot afford to maintain systems solely for use in periods of supply restriction. Questions appropriate for strategic study include

What types of programs should be available if gasoline restrictions occur? How should the programs be managed? How should the cost be allocated?

Should a proportion of the costs of nonautomobile systems be allocated to their stand-by function?

Actions to promote efficiency of petroleum consumption have already been implemented but as a result of legislative action based on balance-of-payments considerations rather than personal mobility. Since the cost of automobile use is projected to be reasonably stable, there is no need for action planning for price changes. Availability is a different issue. Here planning is useful but choice-oriented procedures are probably not appropriate. If shortages become sufficiently severe to warrant implementation of formal contingency plans, the requisite programs will be deterministic.

HOUSING PATTERNS

The shift in population from central cities to suburbs has not abated. In spite of well-publicized instances of gentrification, city to suburb movement has continued as middle-class blacks have followed the trend of middle-class whites. The most likely projections suggest that this trend will continue. The single-family home is still the desired goal of most families and the expanding suburbs remain the areas in which such homes are being built. If this in fact occurs, the strategic forecasting procedures in use will likely be applicable.

However, as we are all aware, the real cost of buying a new home has risen sharply. Prior to 1976 the true rate of mortgage interest, given inflation and tax incentives, was negative for most families. This is no longer true. Creative financing, down-payment assistance, variable-rate mortgages, and the like may succeed in bringing monthly payments into a range such that home purchase patterns experienced between 1950 and 1976 may again become the norm. If the mechanisms do not achieve this goal, changes in both housing and transportation patterns may occur.

Housing pattern changes could take several forms, including an end to the decline in family size due not to greater fertility but rather to a return to multigenerational families or expanded house-sharing adopted as cost-reduction strategies. Evidence of such arrangements is already appearing. Many older individuals who live in a large house purchased when the family had growing children are now renting out part of the dwelling. In some localities zoning laws have been changed to permit such use. Even where precluded by zoning, such arrangements are common. Frequently the boarder is another elderly individual. An interesting twist, however, is the reported situation in which an elderly owner offers a reduced rent to a young tenant, who in turn agrees to provide transportation for the owner.

These expanded households will probably have trip rates and trip patterns significantly different from those of the typical single-family household.

How can demand forecasts recognize the probability of shifting household composition? How can the uncertainty element be taken into account?

The data suggest a continued trend to low-density living, although signs of a moderation or reversal may possibly be discerned. If the projected trends persist, suburban travel will become more difficult. However, even if there were agreement on desirable or efficient housing patterns, there is little, if anything, that could be done to promote these patterns. Transportation analysts can only monitor the housing patterns in their area and review their plans on a periodic basis to ensure that demands can be accommodated.

ELDERLY POPULATION

It has been recognized that age, or more properly life-cycle stage, is related to individual travel patterns. Aside from areas that have a substantial retirement population (e.g., Phoenix), however, metropolitan planners have not typically given special consideration to the elderly. Yet this segment of the population will grow rapidly for the remainder of the century.

Most studies of the elderly to date show them concentrated in central cities and more dependent on public transportation than the general population. Related studies suggest that these observations merely reflect choices made and habits developed by these individuals in previous years. The location

and travel habits of the elderly in 1990, by contrast, will be those of people who were 30 to 40 years old in the 1950s. They will be found in suburbs rather than cities and, unless inhibited by physical impairment or reduced income, will choose to drive rather than use transit.

If there is a significant suburban elderly population who cannot drive, what type of service can provide for their mobility? How can this service be efficiently provided? How strong a lobby group will the suburban elderly form?

Here again, the analyst's role should be to monitor the location of the elderly, their travel patterns, and their needs.

NATIONAL MIGRATION (SUNBELT-SNOWBELT)

Much has been written about the shift in population from the northeast and north central regions to the South and West. This generalization is broadly accurate, although selected northern cities are growing and selected southern cities are declining. The overall trend represents a continuation of the historic U.S. pattern of migration to open spaces, as well as a shift from the North to the South and West as the receptor areas for both foreign immigration and rural-to-urban migration.

The major transportation effects of this shift relate to trip patterns and mode choice. Cities of the North and East were developed at densities that permit reasonable transit service and have established transit systems. New cities of the South and West have expanded during the automobile era and lack both the established transit system and the population densities conducive to transit use. Yet, even some of these automobile-oriented cities are finding it increasingly difficult to cope with growing automobile demands.

Will the more rapid growth of the South and West compared with that of the North and East continue?

Will higher-density concentrations develop in these growing cities?

What type of public transportation service is appropriate in these newer cities?

Can the transit systems of the older cities be maintained and revived?

The effects of interregional migration are of primary interest to planners in each urban area. If their area is a growing region, additional facilities will be required; if the area is stable, greater attention can be directed to system maintenance. At a local level the principal action will be to monitor migration trends to see whether they are continuing or if other factors (e.g., water supply) are reversing current patterns.

Similarly, at a national level, continued South and West movement would suggest highway funding emphasis, whereas stabilization or reversal would suggest renewed attention to transit.

TRANSPORTATION FINANCE

The types of tactical transportation actions that can be considered are constrained by the strategic decisions made on the levels of financing and restrictions on the use of funds. Having come through a period of relatively free spending on all transportation modes, all agencies are now adjusting to reduced real funding levels. Both highway and tran-

sit systems have faced the combination of rapidly rising costs and reduced real revenue.

For highway systems the financial issues will focus on maintenance and reconstruction of all facility types and construction of arterial roadways. Methodologies to deal with issues of cost allocation among the several classes of users and between the public and private sectors will be essential. The demand-forecasting elements of the process, however, seem to be adequate for the job.

Several commentators have suggested that public subsidies for transit are out of control. The increased government contributions to transit operating budgets have resulted from decisions to maintain low fares, rapid increases in fuel and labor costs, and expansion of services into areas of lower transit use. It is almost certain that real increases in public contributions to transit costs will not continue to grow at the rates of the 1970s, and the public subsidy may in fact decline. The traditional responses to budget constraints are to raise fares and reduce service. In the public operating environment these actions have limitations. Fare increases contravene one of the stated public goals of low-income group mobility. Service reductions often endanger the political coalition developed for regional transit support.

Options being considered to avoid this dilemma include targeted fare increases, user-side subsidies, more specialized services, and increased private-sector involvement in the provision of transit service. In particular, it is argued that for the majority of the population (not necessarily the majority of transit riders) service is of greater importance than fares and the substantially higher fares would be paid were service quality improved. In selected cases, private entrepreneurs, freed of much regulation, including existing labor contracts, could provide tailored transit service at fare and cost levels that would lead to profit. Greater freedom from regulation in the provision of taxi and other paratransit services is also proposed.

What would the effects be of greater competition in the transit market? Are profits for some services a reasonable expectation?

For what routes or service types should market competition be encouraged?

How would user-side subsidy affect user choice and transit economics?

What are the mobility and economic effects of either reduced transit service or monopoly relaxation? What is the incidence of these effects?

The entire issue of transportation system financing is one in which the transportation professional can have a role in strategic planning. The key to influence in this area is to develop reasonable measures of need together with credible measures of the benefits associated with any type of transportation investment. The quality of transportation financing and investment decisions, overall, would be improved were there better methods for evaluating the joint effects of transportation and other public policy decisions on community development and on the economic activity in the community. Such analysis would encourage a more rational allocation of transportation resources.

TRANSIT SECURITY

The popular image of many transit systems is one of a lower-class service. Rowdy behavior, loud radios

or tape players, smoking, graffiti, and similar conditions often lead to the perception that a transit station or transit vehicle is not a secure environment. This perception no doubt dissuades some individuals with middle-class mores from using transit and contributes to the eventual abandonment of at least some transit services by the groups who could afford or would pay reasonable fares.

To what extent do perceptions of security affect transit ridership? What types of actions would be effective in changing this perception? How long would it take for actions taken to improve security to result in increased ridership?

DEVELOPMENT OF CENTRAL BUSINESS DISTRICT

In spite of the much-heralded decline of the central cities, there are many central business districts (CBDs) that are experiencing rapid growth in office space and project substantial additional growth over the next decades. Although Dallas and Houston are frequently cited as examples of this phenomenon, it is true for selected cities in all parts of the country. However, there are limits on the transportation capacity serving CBDs. Most of the radial freeways to be built under the Interstate program have been completed. The ability to add CBD-oriented freeway capacity is limited not only by financial constraints and neighborhood impact issues but also by the real problem of what to do with the cars when they reach the CBD. In the growing CBDs, land is becoming too valuable to devote to surface parking. The costs of structure parking, however, now require daily revenues in excess of \$6 per space to achieve break-even levels. Drivers may not be willing to pay these rates.

Public transit, the alternative usually considered when highways are congested and parking is costly, can provide added capacity but is faced with its own financial difficulties. Peak bus services are quite costly and will require high fares if subsidies are to be contained. Rail systems can also provide capacity but few new starts will be considered in the present financial climate.

Will existing transportation capacity be a constraint on CBD development?

How can capacity be expanded within the financial abilities of metropolitan areas?

How should the costs of capacity expansion be affected?

Growth or decline of the CBD in any specific region will relate to a host of factors other than transportation, including the economic base of the region, city policies, and historic practice. Transportation may be a necessary but not a sufficient condition for CBD development. The analyst will need to monitor CBD activity in his or her region to ascertain the rate at which existing transportation supply is being consumed. Methods and techniques will be required to assess spreading of peak traffic times and the effects of congestion (or of improvements) on economic investment in the CBD. The techniques will also need to be able to consider the effects of specific modal actions (e.g., automobile, ridesharing, transit).

SUBURBAN TRAVEL

The most rapid growth in travel demand has occurred in the suburbs of metropolitan regions. This results from the growth of population in the suburbs

and the greater trip rates of suburban residents. Suburban-oriented travel continues to increase as employment centers in suburban areas become more prominent.

Suburban trip patterns differ from those of central cities. They are less focused (i.e., non-radial) and more automobile oriented. The transportation actions needed to provide central city access, although costly, are known. For suburban centers the solutions are less well defined.

Suburban centers are designed for automobile access, but congestion at suburban locations is becoming a common experience. The road space in suburban areas is frequently limited based on preexisting rights-of-way. Frequently, those existing arterials have been widened to practical limits. Existing neighborhoods restrict the availability of new rights-of-way, whereas dollar costs and environmental considerations serve as further constraints on roadway development.

Are there actions that can be taken either to reduce suburban highway congestion or to provide alternative mobility? (Conventional transit is not efficient in most suburban locations.)

Does the design of suburban commercial and employment centers contribute to inefficient transit service? What types of practical changes in design could be encouraged?

What will be the long-term effects (on development, on trip patterns) of increased suburban highway congestion?

The problems of the suburbs will be in many ways akin to those of the CBDs--how to provide service to concentrations of development. The difference is that most CBDs are served by established transportation systems including public transit and radially oriented freeways and have trip patterns amenable to use of those systems. Suburban centers are developing after the period of great highway expansion. They lack efficient transit and have more diverse trip patterns.

Analysis issues and required methodologies are similar to those for CBDs--how does congestion spread and how does congestion affect trip patterns? More work, however, will be required on developing practical solutions for analysis.

PLANNING FOR RECONSTRUCTION

Many of the urban freeways constructed under the Interstate program will be reaching the end of their design life during the 1980s. These facilities will need major reconstruction and maintenance, not only to restore their physical integrity but also to accommodate greater traffic and modern design standards. Frequently, closure of all or part of the facility for extended periods will be necessary to permit reconstruction.

Closing a freeway is quantitatively different from closing an arterial. Freeway traffic volumes are typically two to four times greater than those of arterials; there are rarely alternative facilities of similar quality that have the capacity to absorb additional loads; the limitation of access and egress traps drivers in traffic congestion; and even if alternative capacity exists, travel times may double. Since the condition is temporary, drivers will not adjust long-term patterns to accommodate the changed transportation supply.

What effect do temporary changes in transportation supply have on travel behavior?

Will travelers accept short-term mode or time-of-day changes when road space supply is restricted?

If alternative services are provided, how should they be funded?

How should major system reconstruction be planned?

TELECOMMUNICATIONS

Reading the popular press could lead one to believe that we are approaching the time when all communication and information transfer will be by wire. All travel, save that of those who repair communications equipment, will be abolished unless made for the pure pleasure of travel. Clearly, significant advances to improve the capability and reduce the costs of telecommunications are being made. Many types of tasks, ranging from computer programming to secretarial services, can be conducted from remote locations, frequently the individual's home. Even some retail shopping functions appear to permit substitution of communications for transportation.

Yet the workplace involves more than information exchange. Many jobs still retain a physical element. Face-to-face meetings in which subtle body language conveys more than spoken words are essential in many managerial or marketing activities. Even for those who deal solely with information, gathering at a workplace may offer psychic or social benefits that outweigh the inconvenience of travel.

Strategic planning for the 1980s and, more pertinently, the 1990s must recognize the potential for the communications revolution.

To what degree can communications substitute for work or other travel? What types of jobs are amenable to such substitution? Are person-miles of travel likely to be reduced?

Will communications lead to changes in workplace location? What functions could shift from the CBD to lower-cost suburban space? Will suburban remote offices develop? Will office dispersion affect midday travel patterns?

SUMMARY

The issues presented above represent a broad range, from the long-term effects of suburban growth to the immediate effects of facility closure for reconstruction. All are representative of the types of problems that will be faced by transportation analysts.

Existing, widely used methodologies are applicable to some issues. Most other items can be addressed by methodologies or techniques that have been reported in the literature but for various reasons have not been widely adopted by practitioners. I have in mind here, in particular, the issues of the effect of congestion on overall travel patterns and on economic development. These available methods will likely come into greater use as the issues come to the fore, as information dissemination continues, and as newly trained practitioners enter the field. Further work, however, is needed to assess the validity of these techniques and to develop tools to ease the application of the methods.

Several of the issues relate to allocations--of costs, of benefits, of use. Here demand forecasting is not the primary product but merely an intermediate step. The practical problems are credibility, reasonableness, and understanding when the results of the analysis are used for funding justification.

This conference is related to travel analysis and most of the discussions will likely be related to research needs, methodologies, and procedures. In these discussions we must remember that the issues will arise whether or not specific analysis techniques are available and that analysts on the firing line will be more interested in finding solutions than in sophisticated analysis. As they have in the

past, these analysts will improvise by using existing procedures, modifications of available techniques, or ad hoc back-of-the-envelope methods. The products of the effort will depend more on the creativity of the planner in recognizing problems and devising options to test than on the specific techniques used to evaluate alternatives.

Research Needs

1. Relationship between regional investment in transportation infrastructure and regional economic activity

a. Analyze government policies and evaluate transportation funding needs

b. Assemble data on regional characteristics and economic activity and quantify aggregate transportation supply

c. Model observed relationships between transport investment and economic activity; isolate effect of transport investment and quantify its contribution to the regional economy

d. Make case studies of the impact of varying investment levels on regional economic activity

2. Causal models of travel

a. Determine how to transform underlying individual life-style values, priorities, and preferences into future travel behavior to provide a means of identifying changes in individual goals and objectives that underlie and/or determine changes in qualitative and quantitative characteristics required of transportation technology

b. Transfer the behavioral data through some modeling process that reliably and rapidly relates such data to transportation investment decisions

3. Causal models influencing private investment

a. Determine and use transportation investment trends; establish ratios of public and private involvement

b. Determine regional development objectives based on economic indicators, employment trends, and population shifts

c. Develop behavioral techniques for in-depth interview with investors and those in public sector responsible for leverage to establish influencing factors that create investment

d. Establish link between transportation for transportation-related variables and investment de-

terminations; also establish thresholds of investment: at what point is investment decision made and how the timing of investment affects strategic plan

4. Simplified applications of demand analysis

a. Assess existing models and their relevance

b. Determine bounds on level of aggregation and level of complexity of techniques

c. Assign confidence intervals to forecast values

d. Develop forecasts according to a scenario of inputs

e. Explore new techniques and their applicability to the existing situation

5. Providing mobility in the suburbs

a. Categorize typical suburban trip patterns

b. Estimate probable trip densities and compare with typical supply density

c. Estimate probable congestion growth

d. Analyze actions to reduce congestion

e. Categorize and analyze institutional, financial, and physical constraints

6. Successful communication

a. Identify successful communication tools or methods now in use between strategic planners and decisionmakers

b. Survey, identify, and distribute good examples of successful communication between a strategic group and decisionmakers

7. Basic work on travel changes in response to price constraints

a. Determine distributional effects of increases in automobile operating costs

b. Identify pockets of emerging demotorization and their effects on life-styles, employment, etc.