

## Research Needs

### 1. Problem detection

a. Assemble, improve, and/or develop procedures that will, rapidly and at low cost, measure the type and severity of microarea problems; among these procedures might be

(1) Methods of measuring traffic delay, congestion, and level of service

(2) Method of measuring floor space and vacancy rates

(3) Methods of measuring and evaluating parking supply and utilization, including proximity to establishments

(4) Methods of measuring quality of transit service

(5) Methods for estimating automobile traffic or travel demand to, within, and through the microarea

b. Prepare guidelines to design processes for preparing definitive plans that span the issues identified

### 2. Alternative services

a. Assess demand for subscription, taxi-feeder, and paratransit service (existing demand methods not sensitive to these alternative service types)

b. Develop methods to allow for service design and for trading off among service alternatives in a subarea and on their ability to handle market shares

### 3. Fare policy

a. Determine methods for subarea planning, fare prepayment, and employer and merchant pass subsidies that are sensitive to subarea strategies such as employer or merchant transit subsidies or fare prepayment schemes

b. Determine demand-estimation methods capable of estimating use and impacts on mode choice

### 4. Parking management

a. Develop demand estimation techniques to assess parking pricing and supply

b. Provide methods and behavioral information to support them to assess the travel demand aspects of parking pricing changes and zoning policy toward residential parking

### 5. Ridesharing demand estimation

a. Develop methods capable of assessing the likely impact of ridesharing programs at major activity centers or major employers

b. Design (size) such programs, assess site impacts of major developments, and determine possible parking supply constraints in new or existing developments where increases in occupancy could reduce the need for parking

## Workshop on Systems Operations

### Workshop Summary

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This workshop reviewed travel analysis methods for transit fare and service proposals, including system retraction and mode substitutability, the relation of supply and cost to travel demand, and strategies for maintaining revenues. Barbatti's resource paper outlined the functional needs of such methods and the limitations of current methods.

The systems operations workshop focused on a short time frame with particular emphasis on how services will be provided two or three years from now. This workshop also noted the difficulty in trying to market transit services as long as they are regulated, because the regulatory restrictions may prevent the operation of services that may be justified from a demand viewpoint, or vice versa.

The following critical issues were identified:

1. Deregulation impacts: Analysis methods are required to determine mode shares of services with substantial similarity of attributes in order to determine impacts on the economy, finance, and new ridership market.

2. Financial consequences: Methods are needed to determine demand responses to service attribute changes, e.g., reliability, peak/base ratio, service cutbacks, and fare increases.

3. Market segmentation: Analysis methods are needed to identify market segments for service package development and impact assessment.

4. Social goals: Analysis methods are needed to evaluate transit effectiveness in meeting social (welfare) goals.

5. User-side subsidy: Analysis methods are needed to determine impact of user-side subsidies on transit patronage and revenue.

6. Equity: Analysis methods are needed to evaluate who benefits and who loses for various proposed service packages.

The workshop concluded that there is a wide gap between what is known and what is done in the areas of data-collection and analysis methods. Techniques are not being put into practice because of the following barriers:

1. Inadequate computer hardware capacity: There has been a lack of large-scale computers available in the small to medium-sized urban areas that would permit the utilization of many of the urban transportation planning (UTP) models. In addition, there has not been widespread use of remote terminals in these urban areas; these could be used for time-sharing of computers. Most likely, these deficiencies will not be corrected in the near future. One solution would be to program quick-response models

for small computers. These small computers, because of their low cost, will be available to most, if not all, urban areas in the next 5-10 years. This development would then make most of the UTP models (quick response) available to a wide range of practitioners. User-friendly software should be developed. This also applies to all types of models, including behavioral models.

2. Pay levels too low to attract necessary skills: Perhaps certification of expertise needed for use of UTP models should be initiated. Restrictions on available funds to local areas might be made if certification could not be made for selected positions. Alternatively, one might provide a salary supplement for certified individuals. That is, the state or federal levels of government might offer supplements to certified individuals.

3. Inadequate transfer of knowledge: There is a need to develop a wide range of technology-dissemination techniques to ensure adequate knowledge at local levels. The level of effort now expended in the technology transfer is small relative to that needed. Currently only reports and a limited number of short courses are used. Perhaps there is a need for regional training centers where courses are offered on a continuing basis to regional practitioners. In addition, more brief pamphlets are needed to give basic instruction on approaches to problem solving and where to seek additional assistance. More syntheses of research results should be prepared for use by practitioners. These syntheses should be promoted through structural promotional programs directed toward practitioners.

4. Current analyses too complicated for general use: Available methods have been criticized as too complicated, costly, slow, inflexible, policy-insensitive, and dependent on restrictive assumptions. Consequently, decisionmakers and managers are reluctant or resistant to support the use of these models. These shortcomings also hinder clear communication of methods and results as well as iterations and refinements of preliminary findings. Methods should be evaluated and improved to address these shortcomings. Better existing methods should be better documented and promoted, e.g., cost-saving improvements in sampling design or segmentation of large data banks. Caution should be used when quick-response techniques are employed by staff who lack appropriate judgement; these techniques should be refined with diagnostics and other aids to help less-experienced practitioners.

5. Lack of management support and acceptance of analysis outputs: The decisionmaking process is essentially political in nature. This applies both to public authorities (local, state, and federal governments) and to transport operators. Therefore, research to support policy decisions should be based on the understanding that (a) policymakers want to keep the final decision to themselves; (b) policy-

makers want to be successful rather than subject to criticism; (c) policymakers generally have no knowledge of research, methods, and especially not of mathematical formulas; and (d) help should be provided at the moment that it is needed, not at a moment convenient for researchers. Research will be considered a luxury unless it is made clear that research effort will give better information that can give policymakers an insight into the possible effect of their options and prevent them from pursuing ineffective strategies. A regular communication between research and policymaking is necessary in order to let researchers comprehend what the needs of today, tomorrow, and two years from now will be and to give policymakers the opportunity to rightly comprehend the value of research.

6. Failure to recognize limited skills and experience in data collection: Approval of large-scale expensive or regulation-required data collection should be conditioned on indications of adequate familiarity of responsible staff with scientific data collection. If this experience is lacking, approval might be conditioned on the use of data-collection methods suggested or required by others with such experience. Money, training programs, etc., should be available in an adequate, timely fashion to assist inexperienced staff and students in transportation planning. Experts should publicly or professionally evaluate and criticize data-collection efforts.

7. Lack of documentation of survey and data-bank content: Before a decision is formulated relative to analysis, the status and accuracy of any existing survey documentation and data-bank content should be assessed, along with identification of the staff, lead time, and costs needed to manage the data effectively. Adequate resources should accompany decisions to conduct analysis of incomplete data systems. New data sets, surveys, and methods applications should be carefully documented for further use.

The systems operations workshop concluded that efforts in the 1980s should be directed toward improving the state of the practice of travel analysis rather than improving the state of the art. There is a substantial difference in the quality of analysis between large and small urban areas, and many smaller areas need improvement.

The workshop also concluded that there is a distinct difference between U.S. and European practice in several areas. For example, European countries may have a national bus-operating entity that uses advanced travel analysis methods throughout the country, whereas U.S. practice has a large number of much smaller entities that provide service, not all of which are well skilled in analysis. Also, equity means interjurisdictional funding shares in Europe, whereas it means fares to low-income riders in the United States.