TRB SPECIAL REPORT

Metropolitan Travel Forecasting

Current Practice and Future Direction

JON WILLIAMS

The author is Associate Director, Studies and Special Programs, TRB, and served as study director for this project.

Metropolitan planning organizations (MPOs) develop regional transportation plans and programs to accommodate mobility needs for urban America. MPOs use network-based, computerized travel forecasting models to study proposed policies, operating strategies, and capital investments for the metropolitan transportation system and to determine which of these will best serve the public's needs for future travel and economic development. MPOs also use the model outputs to determine air quality and other environmental impacts of proposed transportation plans and projects.

The Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Office of the Secretary of Transportation, and TRB initiated a study to assess the state of the practice in metropolitan travel forecasting. The committee that conducted the study was also charged with identifying shortcomings in travel forecasting models, obstacles to better practice, and actions needed to ensure the use of improved travel forecasting methods. Chaired by Martin Wachs of the RAND Corporation, the committee included members experienced in the theory and practice of travel forecasting and who represented perspectives of MPOs, state transportation agencies, academic research, and private consultants (see box, page 27).

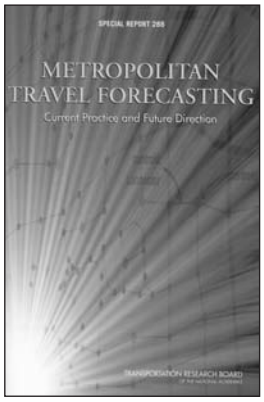
State of the Practice

The committee's report, *Metropolitan Travel Forecasting: Current Practice and Future Direction,* found that most agencies rely on a trip-based travel modeling process that has remained fundamentally unchanged in the past 40 years, despite incremental improvements. The current models may be appropriate for smaller metropolitan areas with stable growth but exhibit basic, documented deficiencies in meeting current analytic needs for larger, faster-growing metropolitan areas that have complex transportation systems. In addition, deficiencies in practice—particularly gaps in the data—must be redressed.

Advanced models that better meet the more com-

PHOTO: BILL HALL, CALTRANS

Interstate 80, San Francisco, west approach to the San Francisco–Oakland Bay Bridge—a major urban facility whose planning has benefited from urban travel demand forecasting.



TRB Special Report 288, *Metropolitan Travel Forecasting: Current Practice and Future Direction*, is available from the TRB online bookstore, www.TRB.org/bookstore; to view the book online, go to http://onlinepubs.trb.org/onlinepubs/sr/sr288.pdf. The findings of the surveys used to develop the report are also available online at http://onlinepubs.trb.org/onlinepubs/reports/VHB-2007-Final.pdf.

plex needs of MPOs have been developed and implemented satisfactorily in some metropolitan areas, such as New York; Columbus, Ohio; and the city of San Francisco. These more advanced models can provide a better representation of travel behavior and have been combined successfully with land use and traffic simulation models.

Considerable barriers to fundamental change remain, however, including resource limitations, practitioners' uncertainty that new practices will be better than those they replace, lack of coordination among stakeholders, and inadequate investment in the development and transfer of new techniques. Finally, the committee notes that no single approach or set of procedures for travel forecasting is correct for all applications or for all MPOs. Travel forecasting tools should be appropriate to the questions posed and to the types of analysis conducted.

Improving Travel Demand Forecasting

According to the committee, policy makers must be able to make informed decisions about future investments and public policies for the transportation system. The committee therefore recommends the development and implementation of new modeling approaches to demand forecasting that are better suited to providing reliable information for applications, such as multimodal investment analyses, operational analyses, environmental assessments, evaluations of a range of policy alternatives, toll-facility revenue forecasts, and freight forecasts. These new approaches are also needed to meet federal and state regulatory requirements.

The committee acknowledges that current practice is deficient in many respects and that introducing advanced models will not in itself improve practice. Therefore, steps must be taken to improve both current and future practice in metropolitan travel forecasting.

The committee believes that the government agencies with programs that would benefit from accurate, reliable travel forecasts—MPOs, states, and the federal government—are the key to change and growth in these areas. Following are the main recommendations from the report, organized by the level of government that would be responsible for the implementation.

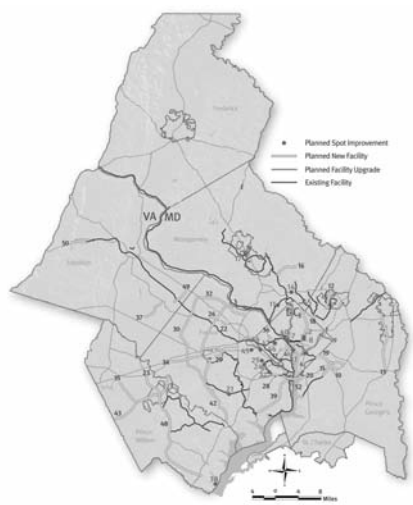
Metropolitan Planning Organizations

The committee believes that MPOs should

- Establish a national metropolitan cooperative research program, perhaps using a modest take-down from the approximately $365 million that FHWA and FTA annually provide to all MPOs;
- Conduct formal peer reviews of modeling practices;
- Develop partnerships with universities to foster research on travel modeling and on the implementation of advanced modeling practices;
- Check the reasonableness of demand and cost forecasts for major projects; and
- Document experiences associated with the introduction of advanced modeling practices.

State Transportation Agencies

States play an important role in supporting travel forecasting at smaller MPOs, and they collaborate with the larger MPOs within their borders. Accordingly, the committee recommends that states



Images: National Capital Region Transportation Planning Board

Planning maps showing (*left to right*) highway, transit, and bicycle projects in the metropolitan Washington, D.C., area.

◆ Support the creation of a national metropolitan cooperative research program and encourage other research related to MPO needs;

◆ Support model user groups for training, discussion of common issues, and purchase of modeling software for use statewide;

◆ Evaluate, in cooperation with MPOs, the socioeconomic forecasts used for MPO modeling and forecasting; and

◆ Coordinate with MPOs on statewide and metropolitan models and data needs.

Federal Government

The federal government has a historic precedent for providing strong leadership and resources for the development and implementation of travel models and for associated training. This role is underscored by the many federal requirements that guide MPO planning activities. The federal government has an interest in ensuring that federal funds are supporting the highest-priority needs for maintenance and improvement of the national transportation system.

The committee recommends, therefore, that the federal government support and provide funding both for incremental improvements to trip-based models in settings appropriate for their use and for the continued development, demonstration, and implementation of advanced modeling approaches, including activity-based models. Specifically, the committee recommends that the federal government

◆ Rely on the Travel Model Improvement Program as an appropriate mechanism for advancing the previous recommendations and ensure the funding necessary to support the program;

◆ Continue to support the implementation of activity-based modeling and other advanced practices and expand this support through deployment in several urban areas;

◆ Request Congress to authorize additional funding at an appropriate level to support the federal government's role as a partner with MPOs and state transportation agencies—$20 million annually would be comparable to the amounts invested by the federal government for developing models 30 years ago;

◆ Continue the federal MPO certification process, with a checklist to provide MPOs with useful information on the minimum expectations for their models and incorporate into the process an examination of the results of peer reviews; and

◆ Support planning guidance and planning regulations that allow MPOs substantial flexibility in their travel demand modeling practices.

Committee for Determination of the State of the Practice in Metropolitan Area Travel Forecasting

Martin Wachs, RAND Corporation, Santa Monica, California, *Chair*
Laura L. Cove, Town of Cary, North Carolina
Thomas B. Deen, Consultant, Stevensville, Maryland
George B. Dresser, Texas Transportation Institute, College Station
Ronald W. Eash, Northwestern University, Evanston, Illinois
Robert A. Johnston, University of California, Davis
Eric J. Miller, University of Toronto, Canada
Michael R. Morris, North Central Texas Council of Governments, Dallas
Richard H. Pratt, Richard H. Pratt Consultant, Inc., Garrett Park, Maryland
Charles L. Purvis, Oakland Metro Transportation Commission, California
Guy Rousseau, Atlanta Regional Commission, Georgia
Mary Lynn Tischer, Virginia Department of Transportation, Richmond
Richard E. Walker, Metro Portland, Portland, Oregon

Intergovernmental Cooperation

A large degree of intergovernmental cooperation is inherent in the metropolitan planning and travel forecasting process. As a result, the committee recommends that

◆ MPOs, state transportation agencies, and federal agencies should work cooperatively through a national steering committee to establish appropriate goals, responsibilities, and means for improving travel forecasting practice;

◆ A national travel forecasting handbook should be developed and kept current, to provide salient information for travel demand forecasting practitioners;

◆ Studies should compare the performance of conventional and advanced models; and

◆ MPOs, with the federal government and the states, should examine in detail the data requirements for validating current travel forecasting models, meeting regulatory requirements, and developing freight models and advanced travel models.

A Call to Action

The practice of metropolitan travel forecasting has resisted fundamental change. Every 10 years or so a cycle of research, innovation, and resolve begins with the goal of putting innovation into practice but eventually fails to effect a change in travel forecasting practice.

This sobering assessment underscores the need to break out of the cycle by coordinating the resources of each level of government in an alliance with academia and the private sector. This would stimulate creativity and a willingness to innovate—the hallmarks of the early days in which travel forecasting was pioneered.