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METROPOLITAN TRAVEL FORECASTING

CURRENT PRACTICE AND FUTURE DIRECTION

Metropolitan planning organizations (MPOs) develop regional transportation plans and programs to accommodate mobility needs for urban America. Network-based, computerized travel forecasting models are used by MPOs to study proposed policies, operating strategies, and capital investments in the metropolitan transportation system and to determine which will best serve the public's needs for future travel and economic development. The model outputs are also used 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 the Transportation Research Board 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. The committee, chaired by Martin Wachs of the RAND Corporation, included members experienced in the theory and practice of travel forecasting and representing perspectives of MPOs, state transportation agencies, academic research, and private consultants.

State of the Practice in Travel Demand Forecasting

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

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Advanced models that better meet the more complex needs of MPOs have been developed and satisfactorily implemented in some metropolitan areas, in particular New York; Columbus, Ohio; and San Francisco. The more advanced models can provide a better representation of actual travel behavior and have been successfully combined with land use and traffic simulation models. However, there are considerable barriers to fundamental change, including resource limitations, practitioners' uncertainty as to whether 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 finds that there is no single approach to travel forecasting and no set of procedures that is "correct" for all applications or all MPOs. Travel forecasting tools should be appropriate for the nature of the questions being posed and the types of analysis being conducted.

Recommendations for 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 development and implementation of new modeling approaches to demand forecasting that are better suited to meeting federal and state regulatory requirements and to providing reliable information for such applications as multimodal investment analyses, operational analyses, environmental assessments, evaluations of a wide range of policy alternatives, toll facility revenue forecasts, and freight forecasts. The committee also acknowledges evidence that current practice is deficient in many respects and that introducing advanced models will not by itself lead to improvement. Therefore, steps must be taken to improve current and future practice in metropolitan travel forecasting.

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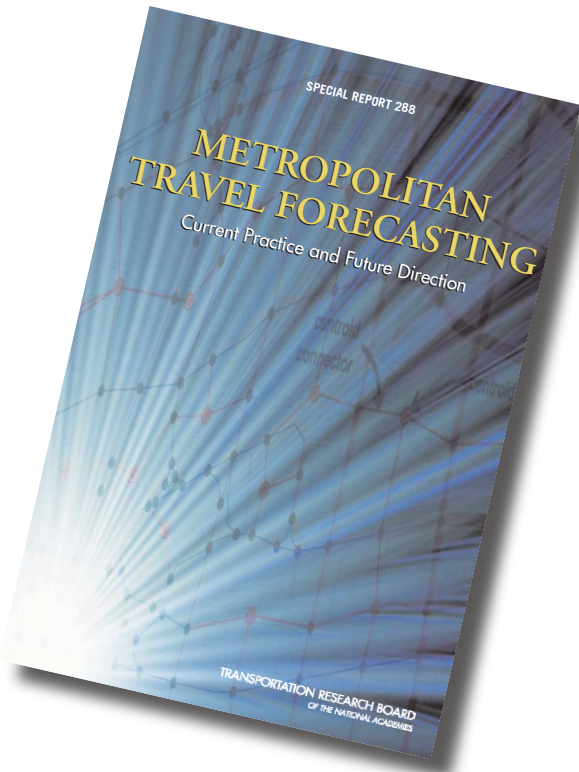
MPOs

The committee believes that MPOs should

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

State Transportation Agencies

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

- Support creation of a national metropolitan cooperative research program and encourage other research related to MPO needs;
- Support model user groups as a means for training, discussion of common issues, and purchase of modeling software for statewide use;
- Evaluate, in cooperation with MPOs, socioeconomic forecasts used for MPO modeling and forecasting; and

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

Federal Government

There is a historic precedent for a strong federal role in providing leadership and resources for the development and implementation of travel models and associated training. The need for this role is underscored by the considerable federal requirements that guide MPO planning activities. It is also in the federal interest to ensure that federal funds are being used to support the highest-priority needs for maintenance and improvement of the national transportation system. Therefore, the committee recommends in general that the federal government support and provide funding both for incremental improvements in existing 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 foregoing recommendations, with funding necessary to support the program;
- Continue support for the implementation of activity-based modeling and other advanced practices and considerably expand such support through deployment efforts in multiple urban areas;
- Request congressional authorization of 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 with amounts being invested by the federal government in model development 30 years ago);
- Continue the federal MPO certification process, with a model checklist to provide MPOs with useful information on minimum expectations for their models, and incorporate into this 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.

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 work cooperatively through a national steering committee to establish appropriate goals, responsibilities, and means of improving travel forecasting practice;

- A national travel forecasting handbook be developed and kept current to provide salient information to those practicing travel demand forecasting;
- Studies be performed to compare the performance of conventional and advanced models; and
- MPOs, together with the federal government and the states, 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 been resistant to fundamental change. Every 10 years or so there begins a cycle of research, innovation, and resolve to put innovation into practice, and eventual failure to effect any appreciable change in how travel forecasting is practiced. There is a need to break out of this cycle by using the coordinated resources of each level of government in an alliance with academia and the private sector. It is time for a return to the creativity and willingness to innovate that were hallmarks of the early days in which travel forecasting was pioneered.