EVALUATION OF TRANSPORTATION MODELS FOR THE STATEWIDE MODEL TASK FORCE

PROBLEM STATEMENT

The Florida Standard Urban Transportation Model Structure (FSUTMS) forms the backbone of all transportation demand modeling in Florida. FSUTMS provides the traffic forecasts and key measures of level of service and system performance that are used for a wide variety of transportation planning processes and decision-making. FSUTMS is implemented via a software system supported by the Central Office so agencies, consultants, and other entities in the state can use the model for transportation planning studies and analysis.

The current version of the FSUTMS software, which has been in use for about 20 years, uses TRANPLAN as its engine. TRANPLAN is at the core of the current version of FSUTMS, and it has provided strong modeling capabilities for the past two decades. Advances in transportation modeling methods and software capabilities that have occurred over the past decade provide a great opportunity for enhancing the FSUTMS modeling structure and its TRANPLAN-based components and associated modules. To improve transportation modeling required in many Florida urban situations, many new and enhanced modeling capabilities now available in various modeling software packages need to be evaluated for potential inclusion in the FSUTMS toolbox. Such evaluation would help ensure that the FSUTMS toolbox is well positioned to serve the future modeling and planning needs of the state.

Recently, there have been considerable advances in the modeling of travel demand and forecasting of link volumes by time of day. These advances have been motivated by the need to address contemporary planning issues and answer policy questions that will likely face transportation planners and engineers in the future. Recognizing the importance of and the advances made in the modeling of travel demand, the USDOT's Travel Model Improvement Program (TMIP) embarked on the development of a new generation of modeling systems, TRANSIMS, that is capable of accurately simulating travel patterns on a very detailed spatial and temporal scale. In step with the directions provided by TMIP, this project will evaluate alternative transportation modeling technologies and software packages for potential adoption in Florida, which would, in turn, provide the state the platform for gradually transitioning to more advanced microsimulation models of activity and travel demand, such as TRANSIMS.

OBJECTIVES

The objectives of the research project were to:

- Identify planning issues and policy questions that are likely to be of importance to transportation planners in the state, both now and in the future
- Identify planning methods, tools, technologies, and procedures that have been implemented successfully in various areas around the country and merit consideration for adoption in Florida
- Convene a blue-ribbon panel to help guide the model evaluation study to be undertaken within the research project

- Review alternative transportation modeling software packages and tools and identify those procedures most suitable for implementation in FSUTMS
- Conduct a survey of users and agencies around the country to learn about their experiences with various software packages and in transitioning from one software package to another
- Facilitate Model Task Force deliberations on the selection of a new software engine for FSUTMS
- Provide guidance on the potential transition to a new FSUTMS.

FINDINGS AND CONCLUSIONS

This research project has provided several key deliverables that would be of immense use to state and local agencies in their attempt to upgrade, update, and enhance their transportation planning processes and travel demand modeling software. Some of the major research findings include the following:

- The final report includes a detailed discussion of emerging planning issues and policy questions that transportation planning processes should be able to address. These issues range from traditional highway capacity expansion issues to more recent e-commerce impacts on transportation. Also addressed are new and emerging travel demand modeling paradigms, frameworks, methodologies, and data that the state should consider adopting.
- CDs have been developed that contain sample Broward County Model databases that can be run using the different transportation modeling software packages considered in this study. The software packages considered in this study include VISUM (Innovative Transportation Concepts, Inc.), Cube/Voyager (Citilabs, Inc.), EMME/2 with ENIF (INRO Consultants, Inc.), and TransCAD (Caliper Corporation). A set of sample modeling databases that can be used with the various software packages has been developed. They provide the Model Task Force with valuable information regarding the level of effort, resources, and time needed to convert current Tranplan-based FSUTMS models to the various new software technologies considered in this study.
- The research showed that the state-of-the-art in travel demand modeling software technology has advanced greatly over the past two decades. The final report documents the features, capabilities, and tools available in each modeling software package considered in this study.
- The final report provides detailed documentation of the process followed by the study steering committee and the Model Task Force for the model evaluation study. The research project showed that conducting a model evaluation study is an extremely challenging task and that comparisons across modeling software packages are difficult to make. The final report documents the process that the Florida Department of Transportation and other agencies in the state can follow in the future for similar evaluation studies.
- In general, the research project showed that modeling software packages are extremely competitive with respect to their capabilities, cost, and support structures. The technical evaluation committee rated two software programs, Cube/Voyager and TransCAD, as equally capable from a technical standpoint. Finally, the state chose to proceed with TransCAD based on the final vote provided by the Model Task Force. The user survey showed that all software systems in the study have strong customer loyalty with users strongly endorsing the software that they currently use in their jurisdiction.

- The research provided an understanding of the level of effort, resources, and time required for transitioning to new modeling software including FSUTMS model conversion, database export/import, and model enhancement. The transition effort and costs are substantial, not only from a model conversion standpoint but also from a staff training and expertise standpoint. It is clear that substantial investment must be made in training staff to develop in-house and consultant expertise in the use of the new software.

BENEFITS

This research project resulted in the transition from a Tranplan-based FSUTMS to a TransCAD-based FSUTMS in 2003. Through this project, the Model Task Force and other modeling and planning professionals in the state have gained tremendous knowledge and experience in the use of alternative travel demand modeling software packages. By choosing to adopt TransCAD as the new modeling software package for FSUTMS, the state has upgraded, updated, and modernized its travel demand modeling toolbox and technology. In addition, the transition to TransCAD will provide enhanced tools and capabilities that were not available previously to modeling and planning professionals. Once the initial investment in training and software acquisition is completed, agencies are expected to transition to the new FSUTMS TransCAD platform. An estimate of the cost and time savings associated with this transition can only be made after the agencies start using the new FSUTMS TransCAD platform for a variety of planning studies and long range transportation plan development.

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