ENHANCING THE FLORIDA STANDARD MODEL USING NEW INFORMATION TECHNOLOGIES

PROBLEM STATEMENT

In the past few decades, transportation modeling has advanced significantly in the application of state-of-the-art information technologies (e.g., travel demand in urban areas can now be simulated in a graphical environment). Advances in computer software and hardware capabilities, coupled with developments in micro-simulation methodologies, have contributed to new transportation modeling software and information technologies that merit integration into the Florida Standard Urban Transportation Model Structure (FSUTMS). FSUTMS has been enhanced significantly over the past two decades, and it has served the planning and modeling needs of the state very well. However, recent methodological advances in travel demand modeling that have occurred under the umbrella of the federal Travel Model Improvement Program (TMIP) offer a strong basis for further enhancing the Florida Standard modeling process. The Florida Statewide Model Task Force has affirmed a need to define new guidelines and conventions for integrating new information technologies and management systems into FSUTMS.

OBJECTIVES

The goal of this project was to provide information technology (IT) guidelines and conventions to enhance FSUTMS as the transition is made to new modeling software and database formats. Specifically:

1. Design a flexible and user-friendly transportation modeling environment in which users can define custom travel demand models most appropriate to their respective context.
2. Identify methodologies for translating, converting, merging, and integrating existing travel demand modeling databases into the new transportation modeling environment.
3. Develop guidelines for a new modeling platform that integrates GIS with transportation modeling processes.
4. Update and revise the information management systems in FSUTMS so that all data management is consistent with new data structures, formats, and information technologies/software.
5. Explore the integration of statewide freight and passenger models with the new travel demand modeling systems.
6. Develop plans for the enhancement of transit modeling technologies, tools, and methods in FSUTMS.
7. Formulate plans to develop IT resources for Florida travel survey data collection and analysis.
8. Gather information on the IT enhancements that the Model Task Force and the modeling community in Florida would like to have incorporated into FSUTMS.

FINDINGS AND CONCLUSIONS

This project has resulted in the development of guidelines and conventions for new information technologies and database formats to be implemented in the new FSUTMS. The findings and conclusions include the following:

1. There is a strong desire to retain consistency and standardization in the terminology, technology, and database/file formats underlying FSUTMS. Consistency and standardization of FSUTMS have provided significant benefits to the State of Florida (e.g., the modeling community can share knowledge and experiences, and transfer model files and databases across agencies).

2. There is also a desire to retain the ability to customize models within individual areas so the models can best represent local conditions. The modeling community feels that custom procedures, variables, and parameters in individual models should be accommodated to preserve consistency and standardization in the modeling procedures.

3. In cooperation with the modeling community, the vendor of Cube/Voyager, the new modeling software engine for FSUTMS, developed a series of guidelines and conventions that can be implemented in FSUTMS during the transition to the new platform. They take advantage of the features, enhanced information technologies, and database structures and formats in Cube/Voyager, significantly advancing the state of the art and the user-friendliness of FSUTMS.

4. The modeling community desires IT-related improvements to be made to FSUTMS on a continuous basis. Researchers documented a comprehensive list of their suggestions and the utilities and technology enhancements they would like to see implemented in future versions of FSUTMS. The enhancements were of two types: (1) those dealing with the user functionality, user-friendliness of the software, automated GIS and reporting capabilities and utilities, and software design, and (2) those dealing with the modeling methodologies and procedures incorporated in FSUTMS, including time of day modeling, trip chaining, junction-based modeling, and dynamic traffic assignment.

5. It is feasible to develop an integrated statewide passenger and freight travel demand model for statewide transportation planning. The statewide models should be migrated to the Cube/Voyager platform consistent with the local models, because all local models are based on the FSUTMS powered by Cube/Voyager. As the statewide models are essentially aggregated versions of the local models (to ensure consistency of data and networks), the connection between the local models and statewide model would be most seamless if the statewide models were in the FSUTMS – Cube/Voyager format.

6. The modeling community would like to see the transit modeling capabilities of FSUTMS enhanced as soon as possible. Researchers developed a plan and scope of work for enhancing the transit modeling capabilities of FSUTMS. The plan was developed in cooperation with the Transit Modeling Committee of the Florida Statewide Model Task Force and is consistent with Federal Transit Administration (FTA) requirements regarding good model practice for New Starts applications.

7. The models, parameters, and coefficients embedded in FSUTMS should be periodically updated based on the latest available survey data in Florida. The FTA is also placing strong emphasis on the use of locally available survey data for model development and calibration. The Model Task Force would like to have a plan for the establishment of IT resources for travel survey data collection and analysis in Florida. In cooperation with the newly formed Data Committee of the Florida Statewide Model Task Force, the researchers developed such a plan.

BENEFITS

This project sought to enhance the multimodal transportation modeling methodology in Florida by providing new and improved capabilities for estimating travel demand in urban areas while explicitly recognizing contemporary planning issues and needs. Researchers developed guidelines and conventions for integrating new information technologies and modern simulation and GIS-based software into the travel demand modeling processes of the State. Travel demand models in Florida are used for FIHS planning, MPO planning, transit planning, and many other planning studies. These planning studies often involve the analysis of multi-billion dollar transportation improvements and investments. It is critical that state-of-the-practice tools be used in the planning process to help guide transportation investments. These guidelines and conventions will benefit the Department and other planning agencies charged with analyzing alternative transportation projects. The new IT guidelines and conventions will enhance transportation investment decision-making by improving the accuracy, transparency, clarity, robustness, and information dissemination capability of the modeling process. The results of this research are already being implemented and are expected to reduce the time and cost involved in transportation modeling studies by a factor of 10-20%.

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