

A STUDY OF ALTERNATIVE LAND USE FORECASTING MODELS

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ABSTRACT

FSUTMS (Florida Standard Urban Transportation Modeling Structure) requires future land use forecasts as input data to predict future travel demand and transportation needs. Given that the performance of the FSUTMS models relies heavily on the accuracy of land use forecast, there is a strong desire by planners to improve model input, especially for future forecast years. The purpose of this study is to investigate the potential of UrbanSim as a land use model for Florida applications. UrbanSim is a promising model for its spatial disaggregation (use of parcels to model land development), temporal disaggregation (one-year time steps), dynamics (disequilibrium model), detailed disaggregation of households and firms, and support to activity-based travel models. In this study, UrbanSim is applied to Volusia County, Florida, based on five scenarios of growth and transportation improvements. The model is validated by comparing the simulation results to the socioeconomic and demographic data adopted in the 2020 LRTP and the 2005 InfoUSA employment data. This study includes the implementation process of the land use simulation, including data collection and processing, model estimation and validation, and scenario building and testing. Results from the UrbanSim model are analyzed and recommendations are made regarding integrating UrbanSim with FSUTMS.

The main findings from this study include: (1) UrbanSim has been found to simulate land use changes reasonably well; (2) Feedback from the travel model to UrbanSim influences the land development patterns. Recommendations are: (1) Community visions of future growth need to be put in more concrete terms of possible developments so that they may be included in UrbanSim; (2) Consultations with local government agencies are desirable when developing model specifications and estimating model parameters since location choice models and developer model reflect the behavior of local activities; (3) A GIS-based database tool is necessary to facilitate data compilation, featuring with simple statistics functions to allow examination of the data so that effects from missing or outdated information in the data can be minimized; (4) The development of an UrbanSim model requires expertise in both GIS and statistics, the latter for estimating discrete choice models.