Florida Department of Transportation Research
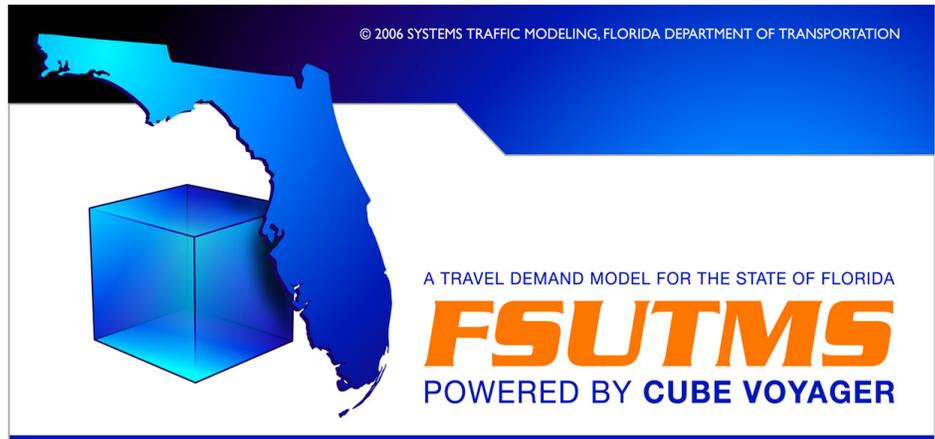
Procedure for Forecasting Household Characteristics
for Input to Travel-Demand Models
BD545-79

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A TRAVEL DEMAND MODEL FOR THE STATE OF FLORIDA

FSUTMS

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FDOT identified a need to develop disaggregate, or individual household-level, travel demand models as part of its Florida Standard Urban Transportation Modeling Structure (FSUTMS) computerized modeling program. Previous models have not included certain socio-demographic variables such as zonal population, number of households, and employment levels to predict travel demand. FSUTMS is used by FDOT and other transit agencies to perform transportation planning analysis.

Researchers at the University of Florida, Transportation Research Center, studied developing a methodology to comprehensively forecast all traveler characteristics required to create more accurate travel-demand forecasting models, referred to as synthetic population generation. Researchers developed a new algorithm to synthesize population with a large number of control tables at the household and person levels. Researchers synthesized year 2000 population for 13 census tracts and estimated two sets of populations — the first with only household-level controls and the second with both household- and person-level controls.

Researchers then synthesized 1990 populations for the same 13 census tracts, again synthesizing two sets of population — one using the year 2000 population synthesized with only household-level controls as the seed data, and the second using the year 2000 population synthesized with both household- and person-level controls. Researchers compared the aggregate characteristics of the synthesized populations with several control tables from the 1990 Census. The results indicated that using both the person and household controls in the base year synthesis leads to more accurate population estimates, highlighting the value of a methodology that incorporates both controls in population synthesis.

Finally, researchers compared travel estimates obtained by applying trip generation models to the true population with those obtained by applying the same models to a synthetic population. The estimated models were applied to the Florida sample survey data to predict travel estimates. Researchers found that for two trip purposes, the disaggregate models performed as well as the aggregate models.

For same trip purposes, researchers found that travel estimates obtained by applying the models to the synthetic population are as accurate as those obtained by applying the same model to the true population. Researchers concluded that the need to synthesize population characteristics does not substantially deteriorate trip generation predictions.

The research highlighted the need to select the appropriate econometric structure when developing disaggregate models and the correct control variables for population synthesis.