

**A Method to Enhance the Performance of Synthetic  
Origin-Destination (O-D) Trip Table Estimation Models**

by

Dhruv Nanda

Dr. R. Sivanandan, Chair

Civil Engineering

(ABSTRACT)

The conventional methods of determining the Origin-Destination (O-D) trip tables involve elaborate surveys, such as home interviews, requiring considerable time, manpower and funds. To overcome this drawback, a number of theoretical models that synthesize O-D trip tables from link volume data have been developed in the past. The focus of this research was on two of these models, namely, The Highway Emulator (THE) and the Linear Programming (LP) models. These models use target/seed tables for guiding the modeled trip tables. In an earlier research effort conducted by Virginia Tech Center for Transportation Research, potential was noted for enhancing these models' performances by using a superior target/seed table. This research study exploits the readily available socio-economic/census data and link volume information and proposes a methodology for obtaining improved target/seed tables, by performing the trip generation and trip distribution steps. This table was provided as target to THE and LP models, and their performances evaluated using Pulaski town as case study. In addition to measuring the closeness of the output tables to surveyed tables and their capability to replicate observed volumes, their improvements over the case when a structural table is used as target was also studied.

Tests showed that the use of the superior target/seed table significantly improved the performance of the LP model. However, for THE, mixed trends are seen in terms of different measures of closeness. The sensitivity of the user parameter to place certain degree of belief on the target/seed table for LP model was also analyzed.