

Reconstruction of Spatial Distribution of Travelers for Activity-Based Traffic Demand Model Using LandScan USA Data set

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ABSTRACT

Transportation Analysis and Simulation System (TRANSIMS) is one of most popular activity-based travel demand models, consisting of multiple modules responsible for exclusive and interconnected tasks. The first module (i.e., population synthesizer) generates the synthetic representation of households and individual demographics as well as assigns them in the traffic network by evenly distributing the activity location along the street. In contrast, this study attempts to develop the origin and destination of individual travelers based on census data, including Census Transportation Planning Products (CTPP) and Summary File 3 (SF3), as well as LandScan USA. While CTPP and SF3 provide the spatial distribution of workers between census tracts of interest and individual travel time distributions from each block group, they don't deal with specific location of individual households and persons. On the other hand, LandScan USA addresses the spatial and temporal population location at a spatial resolution of 3 arc-seconds, but not demographic information. Therefore, this study integrates both data sets to synthesize the individual travel time of workers to place of work with non-parametric empirical cumulative distribution function (ECDF) and spatially distributes them into the study area based on the residential population (origin) and day time worker population (destination) derived from LandScan USA data. The proposed method is applied to and tested in nine counties centered on Knox County in Tennessee. The obtained spatial information of the origin and destination of workers can play an important role as the input data of the TRANSIMS.

Key Words: *Activity-Based Traffic Demand Model, Transportation Analysis and Simulation System, TRANSIMS, Census Transportation Planning Products (CTPP), Summary File 3 (SF3), LandScan USA, Origin and Destination*

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Acknowledgments

Prepared by Oak Ridge National Laboratory, P.O. Box 2008, Oak Ridge, Tennessee 37831-6285, managed by UT-Battelle, LLC for the U. S. Department of Energy under contract no. DEAC05-00OR22725.

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