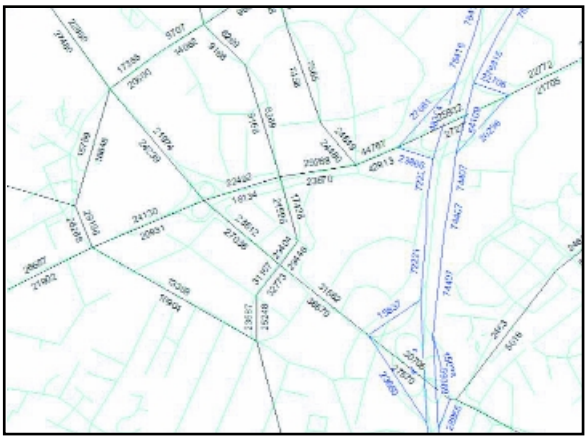
TransAction2030

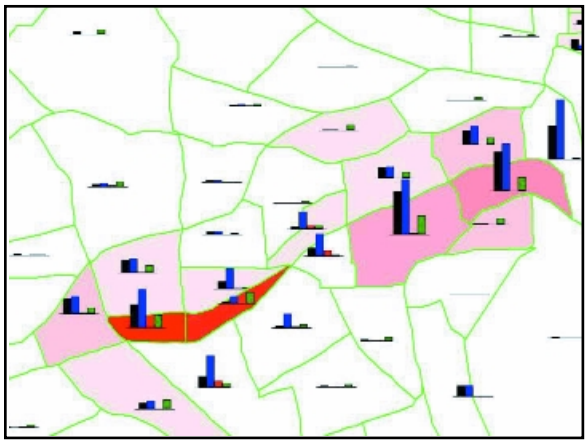
Transportation for Today and Tomorrow

OVERVIEW OF TRAVEL DEMAND FORECAST MODELING



The transportation systems that serve our cities are an important element in keeping the vitality and economic growth of a region prospering. These dynamic systems require coordinated, continuing and cooperative planning efforts. Impacts or proposed changes can have far reaching consequences that are not easily understood. The ability to evaluate the impacts before these changes are implemented is an important component of any good transportation plan. The travel demand forecast model (travel model) is a tool used in this evaluation.

A travel model uses mathematical relationships to analyze travel behavior and choices. The inputs to the model are usually the forecast land-use, population and employment data, and a transportation system network. Given these inputs the travel model produces potential transportation system traffic volumes, transit system patronage, parking demand, and freight movements. Travel models are most often developed for metropolitan areas and model large geographic regions. The travel model for the Washington Metropolitan Area has been developed and is maintained by the Metropolitan Washington Council of Governments (MWCOG)/Transportation Planning Board (TPB). The current model is the *COG/TPB Travel Forecasting Model Version 2.1 D*. This model covers all of the Washington Metropolitan Area. The area is defined from the Pennsylvania border in the north to Spotsylvania County, Virginia in the south.



Travel models have many different applications including transportation alternative testing, air quality analysis, environmental and socio-economic analysis, and land-use evaluations. Being able to plan and test solutions to transportation problems is an integral part of every large transportation study. The travel model is the main tool for doing travel demand forecasting, especially for long range plans and large capital improvements. It is important to recognize that travel demand forecasting is not transportation planning. Travel demand forecasting and the use of models play an important role in informing decisions-makers of the potential needs, alternatives to meet those needs and potential impacts resulting from their choices.

[1] *Introduction to Urban Travel Demand Forecasting, National Highway Institute, Washington, D.C., August 2000 pg. 1-11.*

The COG/TPB travel model incorporates four basic modeling steps and within each step there are several sub-models. These four steps attempt to cover the major components of travel behavior. They answer the why we travel, the where we travel, the how we travel, and the way in which we travel. In travel demand forecasting terms these basic four sequential steps are referred to as:

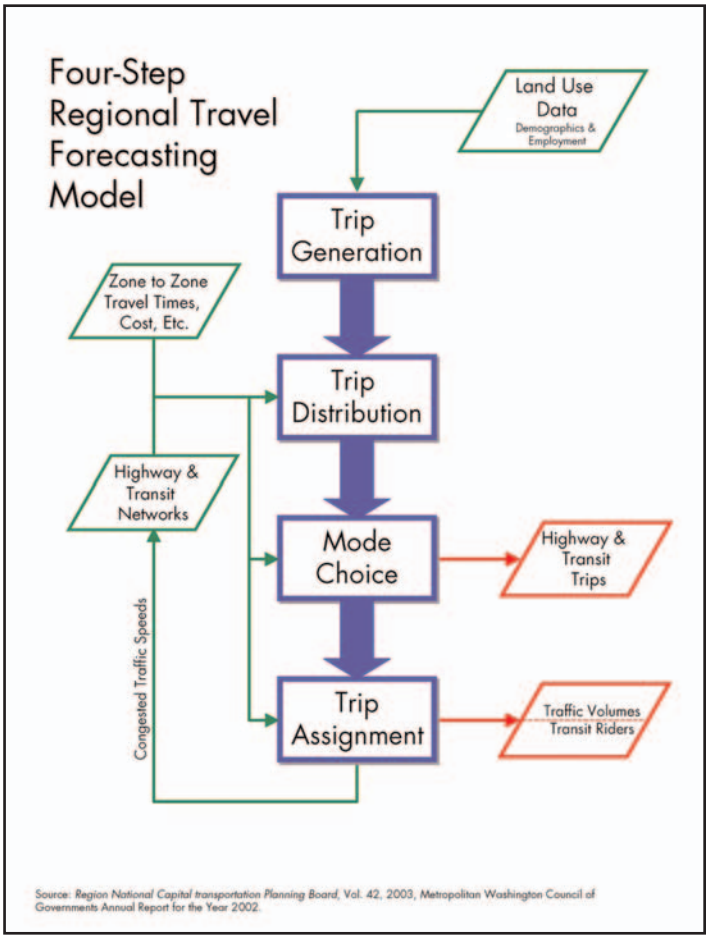
- Trip Generation – How many trips? This step produces the number of trips for each neighborhood area know as a travel analysis zone (TAZ). Trip rates are a function of the number of households, income, and employment type.

- Trip Distribution – Where will people go? This step measures the attractiveness of alternative destinations. Trips pairs are determined based an iterative feedback process which evaluates the changes in the transportation network and the impacts of congestion on destination choice.

- Mode Choice – How will people travel? This step evaluates the travel time costs of different modes and determines the probability for using a specific mode. Travel modes include drive alone, HOV 2, HOV 3, bus and rail.

- Assignment – What route will people take? This step produces the paths which travelers take to get between their origins and destinations. There are typically three time periods that are assigned, and these include the AM peak period, the PM peak period and the off-peak period.

The travel model is built around capturing the decisions and behaviors that impact our travel patterns today and applying those same factors to future year networks, population, and land-use. In order to develop a valid model set, a base year has to be determined and data collected. Once all of the sub-models are calibrated, the model set in its entirety is tested to insure that it adequately replicates the base year. This final testing of the model set is referred to as the model validation. All models are calibrated and validated for a base year. Once a base year model is calibrated and validated it is then used to estimate travel for a future year given the forecast changes in the number of persons, households, employment, and changes to the transportation system. In this way the effects of the proposal TransAction 2030 improvements will be modeled for future years.



Contact Information:

- Visit our website at:
  www.transaction2030.com
- Email us at:
  info@transaction2030.com
- Call us at: 1-888-710-2030
- Write to us at:
  TransAction2030
  3900 Jermantown Road
  Ste 300
  Fairfax, VA 22030