TRAVEL FORECASTING PROCEDURES FOR TRANSIT CORRIDOR STUDIES

Role of Travel Forecasting in Corridor Studies

The analysis of current and future travel behavior and transportation system performance is at the core of a transportation planning study; especially the effects that the various transportation improvements are expected to have on future travel behavior and system performance. The activity that performs this analysis is referred to as travel demand forecasting.

Travel demand forecasting typically involves the use of regional computer models that consider both the demographic characteristics of the population and employment and the operational characteristics of the regional transportation system.

The demographic characteristics include the number and locations of where people live, work, and go to school, shop and participate in other activities that cause people to make trips. Other characteristics might include household size, income, and/or auto ownership which can affect the choice or ability to drive, carpool, or take transit, as well as the choice of where to reside and work. The demographic information is assigned to small geographic areas of the region called traffic analysis zones (TAZs) or just "zones".

The regional transportation system is the roadways, transit lines and stations, and the policies that affect the time and costs of using the system to the make trips. Segments of the roadways (streets, highways, etc.) are represented as links and where those links connect to one another (intersections, interchanges, etc.) is represented as nodes. The characteristics of this network of links and nodes that affect travel performance and costs, such as number of traffic lanes, speed limits, traffic signals, tolls, parking availability and costs, are included in the forecasting model as well. Transit service is similarly represented with rail and bus lines defined as links and stations, terminals, and bus stops as nodes. Factors affecting travel time and costs (fares) are included, particularly for transit services that operate in conditions affected by traffic. Access to transit services from zones is defined by drive and walk links to the station or stop nodes. Parking supply and cost are included, if present.

The travel forecasting model is created by using known information on travel behavior and patterns – how many trips, for what purpose, between what origins and destinations, at what time of day, by what means (auto, carpool, transit, etc.), by what path or route -- for a given time (say 2003) for a set of known demographic characteristics and transportation system characteristics of the same time. Using a set of mathematical algorithms, statistical analyses, and data processing methods, the model is "calibrated" to replicate the known travel behaviors and patterns given the demographic and transportation system characteristics. The model output includes information on trips between various parts of the region, traffic volumes on specific roadway links, comparisons of the assigned traffic volumes to the capacities of the roadways, which produce resulting traffic speeds and levels of service, transit usage on the various bus and rail routes, and system performance such as vehicle miles traveled, person travel times, regional trips by mode, and many other types of information useful for planning and policy analysis.

By knowing how current travel behavior and patterns are created by current demographics and transportation system performance, the travel model can then be applied by using projected changes in the demographics of the regions such as population and employment growth, shifts

population and employment in various parts of the region, and changes in the system facilities (a new highway) or services (a change in transit route) to estimate future changes in travel patterns and system performance. In a typical transportation study, future demographic forecasts for say the year 2030 are applied to the regional future transportation system (i.e., the existing system plus any already committed projects) and the resulting travel patterns and performance forecasted, such as highway volumes, travel speeds, and travel times. This information is used to identify various mobility or transportation problems or needs to be addressed by the study. Then, various transportation improvement alternatives can be tested in the model to forecasts the effect each would have on the system performance. For instance, a new highway would be added into the network or new lanes added to an existing highway, or a new transit line or enhanced bus service added to the transit system network. The effects of these changes can be measured from the standpoint of solving a congestion problem, or improving transit service for certain types of trips. The resulting changes in the performance of the transportation system performance and the effect on travelers can then be compared to the costs and impacts of the alternatives as part of an evaluations process.

In Maryland, there are two primary regional travel forecasting models:

- One for the Washington DC region that includes the District of Columbia, northern Virginia, and most of Maryland. It has been developed and is maintained by the Metropolitan Washington Council of Governments (MWCOG)

- One for the Baltimore region that includes most of Maryland. It has been develop and is maintain by the Baltimore Metropolitan Council (BMC)

Both models have been undergoing a service of improvements and enhancements to meet the latest requirements for use in the FTA News Start process. Each model has to be reviewed and accepted for use by FTA as specific projects enter the New Starts process.