Background Information on Transportation Analysis

Tysons Corner Study
Fairfax County Planning Commission
Tysons Committee

February 5, 2009
Overview of Travel Demand Modeling For Tysons Corner

For Tonight:
- What is a travel demand forecasting model
- How was the travel demand model applied in this study
Overview of Travel Demand Modeling For Tysons Corner

What is a Model?

- A simplified representation of a real-world process or entity
- In the context of urban transportation planning, a mathematical representation of the transportation system and the processes that generate travel demand
Overview of Travel Demand Modeling For Tysons Corner

- A. 4-Step Travel Demand Model
- B. Customized Tysons Corner Model
Travel Demand Forecast
Model

- Future Land-Use
- Future Highway & Transit Facilities
- Impact of Land-Use on the Transportation System
Washington, DC Regional Model

- Council of Governments (COG) Model
- 6,800 square mile area
- 2,000 Zones
- 27,000 road segments
- 600 transit routes
Washington, DC Regional Model

- Extended Region Modeled
Fairfax County Sub-Area Model

- Based upon and is an extension of MWCOG travel demand model
- Land area is divided into more (smaller) zones
- Provides more accurate traffic estimates due to more detail on road network
Four Step Model Process

- Basic Inputs at Traffic Analysis Zone (TAZ) level
  - Number of Jobs by Type
  - Number of Households
  - Household Size
  - Vehicles per Household
Four Step Model Process

- Trip Generation
- Trip Distribution
- Mode Choice
- Assignment

Why
Where
How
Which
Trip Generation

How Many Trips are There in the Area?

- Work & more Trips
- Shopping Trips
- School Trips
- Non-Resident Trips
- Commercial Vehicle Trips
Trip Generation

- Four Primary Trip Purposes:
  - Home-Based-Work (HBW)
  - Home-Based-Shop (HBS)
  - Home-Based-Other (HBO)
  - Above Two Combined
  - Non-Home-Based (NHB)
Trip Distribution

Where are the Trips Going?

- Suburbs
- Middle of Big City
- Activity Centers

- Identifies destination by type of trip
- Distance
- Travel time
- Land Use
Mode Choice

How do you Travel?

Walk

Bike

Transit

Auto
Traffic Assignment

What path do you use to get there?

- Highway
- Transit
- Minimum Path
- Congestion
Model Outputs

- Overall Indication of Travel Patterns
- Number of Trips Produced and Attracted for each Zone in Tysons
  - By Trip Purpose
  - By Mode (Motorized (SOV, HOV)), Transit, Non-Motorized)
- Through trips, Internal trips
- Traffic Volumes
Model Outputs

- What it is Not:
  - Detailed Traffic simulation model of how each road or intersection will function in the future
  - These type of studies more appropriate at development review stage
Other Considerations

- Add-Ons to Model (post-processor)
- Transportation Demand Management (TDM)
  - Development densities, carpool facilities, jobs/housing balance, existing TDM programs, already incorporated into model
  - Enhanced TDM – examined to see if more TDM efforts can shift greater % from SOVs
  - FHWA TDM Model
Other Considerations

- Add-Ons to Model (post-processor)
  - Effect of Density, Diversity, Design, and Destinations (4D’s (Smart Growth))
  - Effect of 4D’s for work trips captured in model
  - EPA Smart Growth Index
  - Answers question: How many fewer non-work vehicle trips taken due to 4D’s

- Questions?