



CCRPC Land Use & Travel Demand Model Training

Executive Summary Training Handout



Chittenden County
Metropolitan Planning
Organization



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CCRPC Main Conference Room

Executive Summary Training

- What is the transportation model used for ?
- What are the underlying data and assumptions ?
- What does the model produce ?
- How does the model compare to other regional models ?
- How well does the model replicate observed travel behavior and conditions ?
- What software is used to run the model ?



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What is the model used for ?

- To forecast future transportation demand and impacts
- To prioritize transportation projects (TIP, LRTP)
- To estimate results of regionally significant infrastructure and land use projects
- Travel model forecasts are used for several key purposes in transportation policy, planning, and engineering:
 - to calculate the capacity of new infrastructure, eg. how many lanes a bridge should have
 - to estimate the financial and social viability of projects, eg. using cost-benefit analysis and social impact assessment
 - to calculate environmental impacts, eg. air pollution and noise



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What period is the model estimating?

- The model is "calibrated" to the year 2005
- Calibration achieved when model forecast reasonably replicates model period according to industry standards
- The model forecasts daily travel (24-hour period) for an average September weekday (T, W, Th) when schools are in session
- The model forecasts traffic volumes and congested travel times for each individual hour of the day. Special emphasis on AM peak hour (8-9 am) and PM peak hour (5-6pm) results for traffic engineering purposes



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What does the model produce?

- The model is very data intensive. Uses a great deal of input data and also produces a wide range of outputs
- The mostly commonly used travel model outputs are:
 - Auto roadway and intersection traffic volumes
 - Truck roadway and intersection traffic volumes
 - Travel times, trip distances, and path-route choices
 - Transit system usage (eg. bus boardings)
 - Regional Measures
 - Total Vehicle Miles of Travel (VMT)
 - Total Vehicle Hours of Travel (VHT)

Is the model based on an accepted framework ?

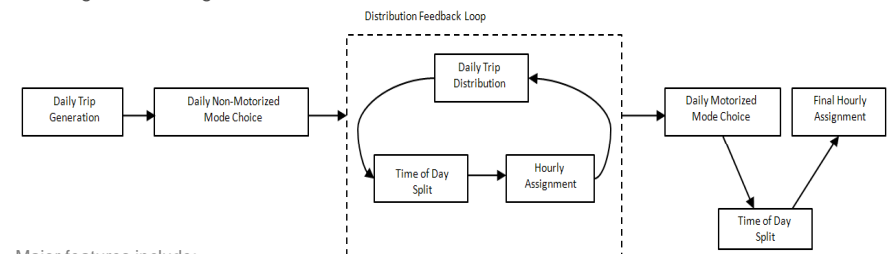
- The model is based on a commonly used framework known as the "4-Step Process" which attempts to represent the why, when, where and how to make a trip as well as what route to follow
 - Trip Generation - estimates the number of trip ends generated by the land use
 - Trip Distribution - the joining of trip ends to form complete trips
 - Mode Choice - the splitting of trips into different modes such as drive or transit
 - Vehicle Assignment - loading of the vehicle trips onto the roadway network

How does the model compare to other models?

- The model represents current best-practice among agencies using trip-based *aggregate* travel demand models
- The CCMPO model does have special features that are less common in a region of this size
 - Land Use Allocation module
 - Truck Model
 - Representation of Roadway & Intersection Delay
 - Mode Choice module (non-motorized and bus/rail)
 - Distribution-Assignment Feedback mechanism
- The next generation of regional travel demand models known as '*disaggregate*' models have only been adopted in a few of the nation's largest urban areas

Overall Model Structure

- Traditional 4-Step travel demand model process
 - With pre-distribution non-motorized mode choice module
- Distribution-Assignment feedback loops ensure agreement between travel times input to distribution and those produced by assignment
- Mode Choice step was deliberately not included in D-A feedback since transit usage in the region is low



Major features include:

- Daily model with 24-hourly assignments
- Link & Intersection Delay are represented
- Includes a Land Use Allocation Module
- Includes a Medium/Heavy Truck Model