

# Chapter 6

## Twin Cities Travel Demand Forecast Model and Forecast Guidelines

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# Twin Cities Travel Demand Forecast Model

- History
- Current Model
- Soon to be (2004 and 2005)

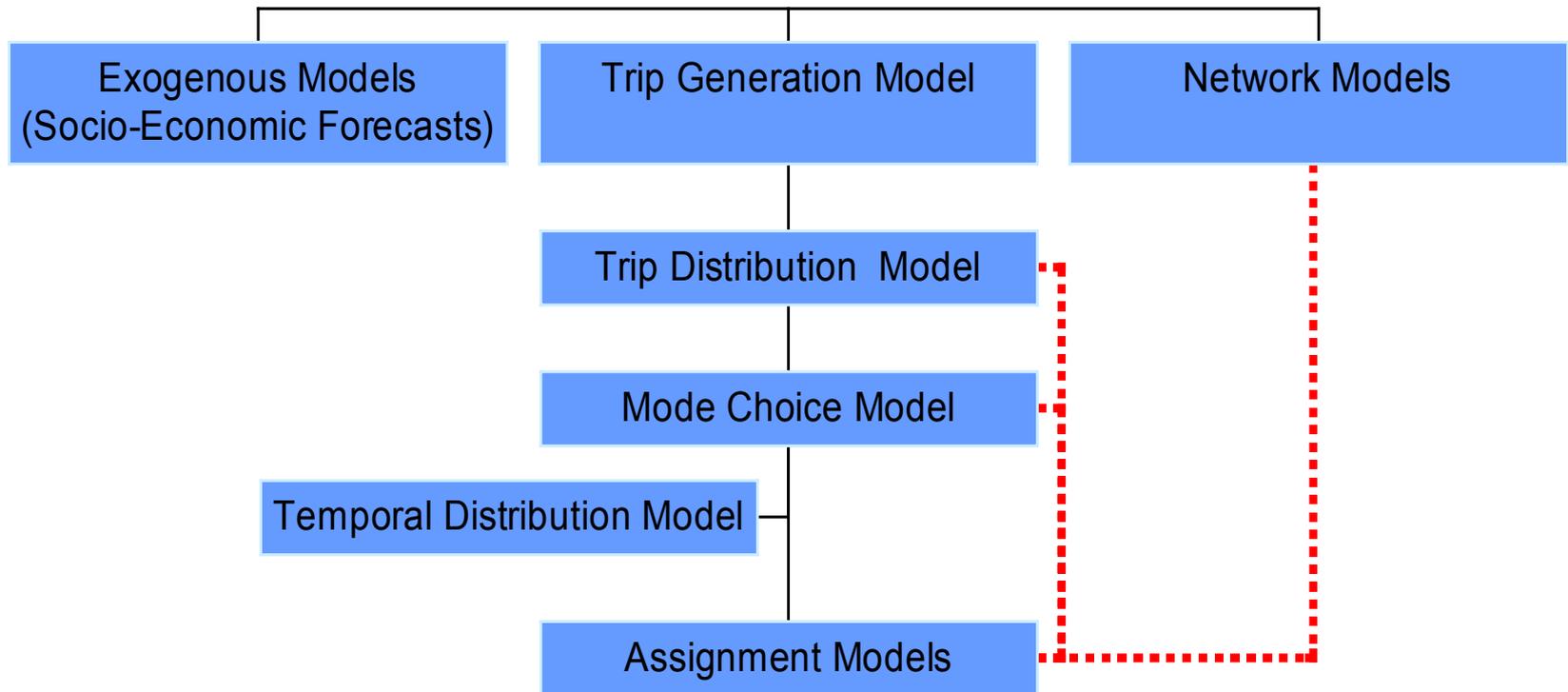
# History of Twin Cities Travel Demand Forecast Model

- Four Generations to Date: 1964, 1974, 1986, 1994
- Each Successive Version Updated the Model and Added Upgrades
- Most Significant Upgrades
  - 1974...Expanded Model Area to 7 County Boundary
  - 1986...Enhanced Transit and HOV Features
  - 1994...Incorporated Temporal Distribution and Induced Demand

# Current Twin Cities Travel Demand Forecast Model

- “Four” Step Travel Forecast Process
  - Trip Generation
  - Trip Distribution
  - Mode Choice
  - Assignment

# Current Twin Cities Travel Demand Forecast Model



# Trip Generation Model

- USES....Income, Household Size, Vehicle Availability, Employment Type and Number, Locations, Travel Times, and Travel Distances
- DEVELOPS....Person Trip Ends (Expressed as Productions and Attractions) For Use in Trip Distribution

# Trip Distribution Model

- USES.... Person Trip Productions and Attractions From Trip Generation Model, Travel Times/Costs, and Scales of Development Activity
- DEVELOPS....Trips and an Estimate of Where They Will Start and End

# Mode Choice Model

- USES....Distributed Person Trips, Travel Times/Costs, Income, Auto Ownership, and Parking Costs
- DEVELOPS....Estimates of Mode by Which Trips Will be Made
  - Single Occupant Vehicle (SOV)
  - High Occupancy Vehicle (HOV)
  - Transit

# Assignment Models

- USE....Travel Times/Costs
- DEVELOPS....Assignments of SOV and HOV Vehicle Trips to Road Segments and Transit Trips to Transit Route Segments (For Each of Six Daily Time Periods... 2 AM Hours, 3 PM Hours, Remaining Hours)

# Future Twin Cities Travel Demand Forecast Model

- First Quarter 2004....Updated Model Based on 2000 Travel Behavior Inventory and 2000 Census
- Later in 2004....Vehicle Assignment Peak Spreading on Congested Corridors/Links
- 2005....Model Extended to Include Adjacent Counties and Freight

# Forecast Guidelines

- Forecast Models Produce Precise Assignments of Vehicles
- BUT....They May Not be Very Accurate

# Forecast Guidelines

- A Review of Forecasts Used to Design the Interstate System in the Twin Cities Relative to Actual Volumes in the Forecasted Year Revealed
  - Forecasts Low on About 50% of Segments
  - Forecasts High on About 50% of Segments
  - Forecasts Within 20% High or Low on About 50% of Segments
  - Forecasts More Than 20% High or Low on About 50% of Segments

# Common Sources of Errors in Travel Demand Forecasts

- Inflated or Discounted Population, Household, and or Employment Forecasts
- Misallocated Population, Household and or Employment Forecasts
- Overstated or Understated Future Built Network (Road Expansions, Frequency of Service)
- Unreasonable Peak Hour Percentages
- Unreasonable Directional Splits

# Mn/DOT Metro District Travel Demand Forecast Guidelines

- Developed Working With NCITE Planning and Methods Committee
- Adopted by Metro District, November 6, 2003
- Will be Included/Referenced in Requests For Proposals and Consultant Contracts
- Required For Forecasts Prepared For the Metro District, Best Practice For Forecasts Prepared For Others

# Forecast Guidelines

## Implementation/Enforcement

- Focused Through Area Managers and Area Engineers
- Review of Draft Forecast and Methodology with Directions For Adjustments
- Assessment of Final Forecast....High, Low, How Much, and Why

# Major Messages

- Forecast Volumes Which Are Developed Consistent With the Guidelines Have a Confidence/Error Range of Plus or Minus 15%
- Forecast Volumes Which Are Not Developed Consistent With the Guidelines May Be High or Low by Much More Than 15%

# Implications for Operational Modeling/Modelers

- Model More Than One Future Scenario....Perhaps the Limits of the Confidence/Error Range
- Model One Future Scenario and Provide Professional Assessments of Likely Operational Characteristics if Forecast Values Were Higher or Lower