15th National Tools of The Trade Conference

INCORPORATING ADVANCED MODELS IN SMALL AND MEDIUM SIZE MPO TRAVEL MODELS
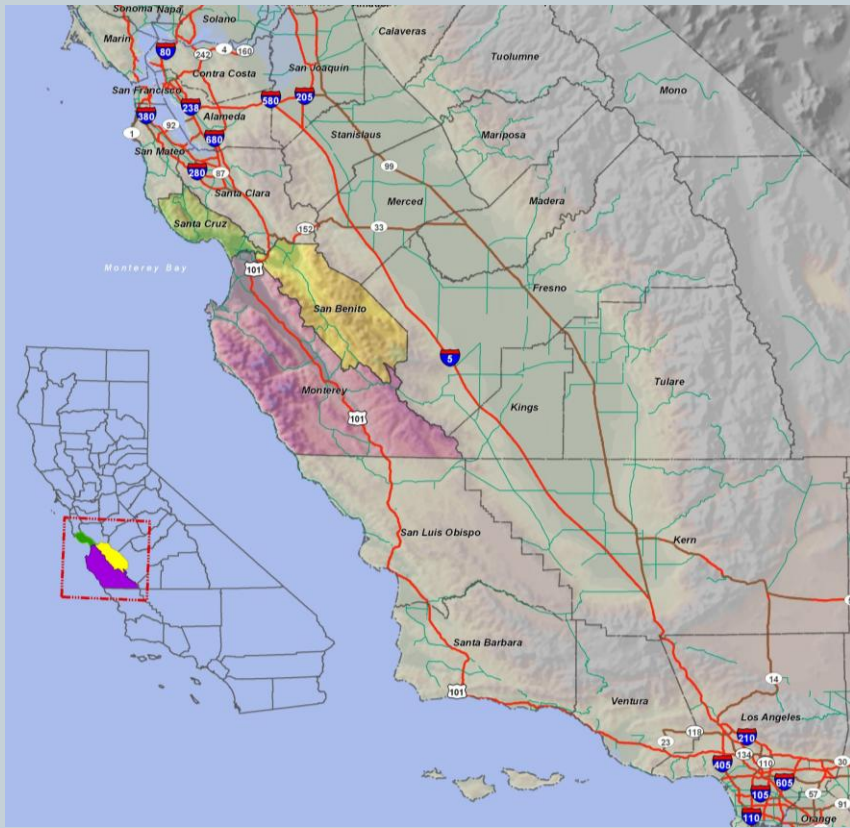
Association of Monterey Bay Area Governments (AMBAG)

Bhupendra Patel, Ph.D., Senior Transportation Modeler
Association of Monterey Bay Area Government (AMBAG)
Email: bpatel@ambag.org, Phone: 831-264-5091

Paul Ricotta, P.E. Principal Engineer
Jim Lam, Director of TransCAD Applications
Caliper Corporation
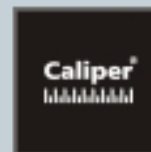
Monterey Bay Area

- Central Coast of California
- Metropolitan Planning Organization (MPO)
- Covering 3 Counties, 18 Cities
- 735,708 Population in 2010
- 66% Population live in cities
- 885,000 Population by 2035
- Major Employment: Agriculture, Service, and Government

Modeling Challenges

- Influence of SF Bay Area
  - Heavy commuter trips, telecommuting, flex schedule, work from home
- Job-Housing Imbalance
  - Coastal area vs. inland rural county area
- Agriculture activities
  - Farm workers are transient/ seasonal
- Aging population (65 +)
  - Attracts service trips, retirement homes
- Longer trip length
- Tourists attractions
  - Weekend, seasonal variation and special events

AMBAG RTDM Updates

- AMBAG Regional Travel Demand Model (RTDM) recently underwent a significant overhaul
- Completely re-estimated using local survey data
- Implements Short and Medium Term Improvements recommended by 2011 TMIP Peer Review panel
- Considers Long-term improvement strategy
- A step closer to an Activity Based Model (ABM)
- Upgrade travel model in response to;
  - Better measure transportation and land use relations
  - Integrate GHG modeling to address SB375 requirements

Hybrid Approach

- Implements advanced practice techniques such as population synthesis to drive a disaggregate trip generation

- Destination choice modeling to aid in better alignment of housing to job location

- Provide increased model sensitivity to land use changes and 4D measures (Density, Diversity, Design, and Destinations)

  - Capture individual-based travel behavior

  - Streamline reporting to increase productivity and efficiency

  - D Variables fully integrated with Destination Choice and Mode Choice model components

Trip Generation

- Disaggregated trip generation approach
  - Population Synthesis
    - Sophisticated nested population synthesis routine
    - Anchoring the socio-economic component
  - Productions calculated on a person basis
  - Population derived from a synthetic population
  - Match totals of HH's by:
    - Size at Block level and Income Category, Workers, Auto Ownership at Block Group level
    - Persons over 65 years of age and under 18 years of age residing in household at Block Group
  - Estimating future years synthetic population is a challenge

Trip Distribution

- Fully estimated destination choice framework

  ➢ Assists in better aligning workers with their job locations

- Deployed destination choice model

  ➢ Other home-based trip purposes to better align non-work travel choices

- Includes shadow pricing to match attraction totals

- Utilizes a tract-based approach for choosing destination

- "D" measures incorporated for several purposes wherever found to be significant in model formulation.

- Continued use of Gravity for purposes thought to be more proximity-based (e.g., NHBW/NHBO)

Mode Choice Structure
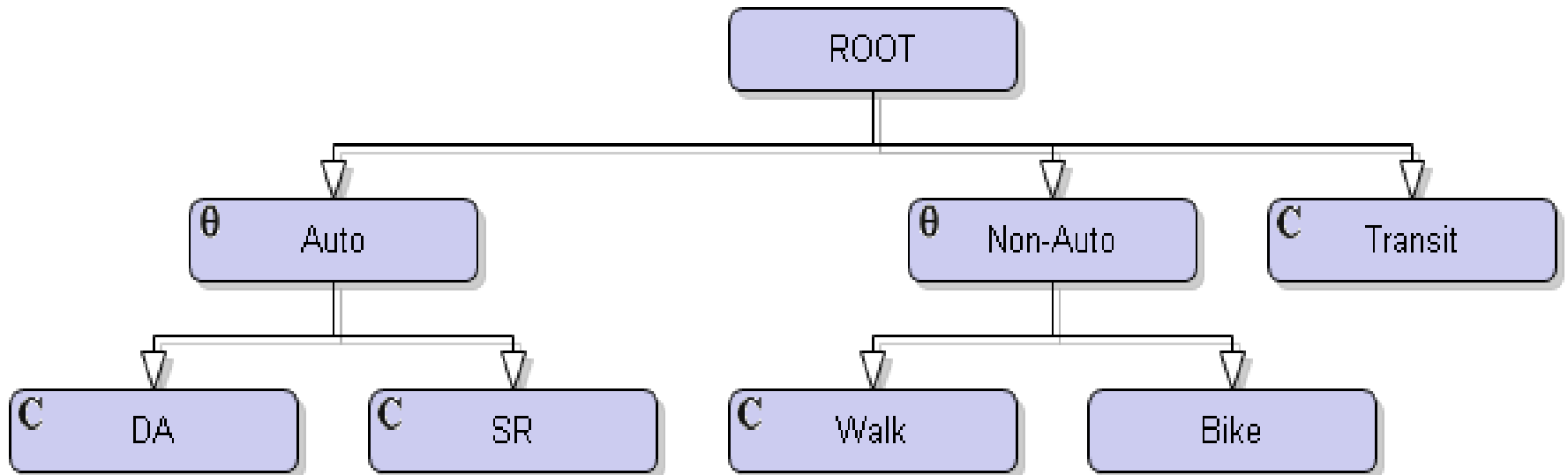
Mode Split

- Significant upgrade to nested logit structure

  ➢ Utilizing a completely estimated formulation

- Utilizes "D" measures wherever they were found to be significant

- Allowing sensitivity to changes in land use policy resulting in increased accessibility to destinations via transit or non-motorized modes.

- Exceptional match on observed mode shares

Daily Flows
(%RMSE: 29.73)