



Need for Advanced Models

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Need for Improved Models

- Current Models can not address
 - Road pricing
 - Time specific policies
 - Speeds, volumes
 - Traffic operations improvements
 - Non-motorized travel
 - Peak spreading
 - Goods movement
- (Source NCHRP – 288)




What is Needed

- Better representation of demand
 - Tours vs. trips
 - Disaggregate, household or individual vs. zones
- Better Network Representation
 - Continuous time representation vs. peak and off peak
 - Ability to integrate operational changes

Comparisons of Current and Advanced Models (Demand Side)

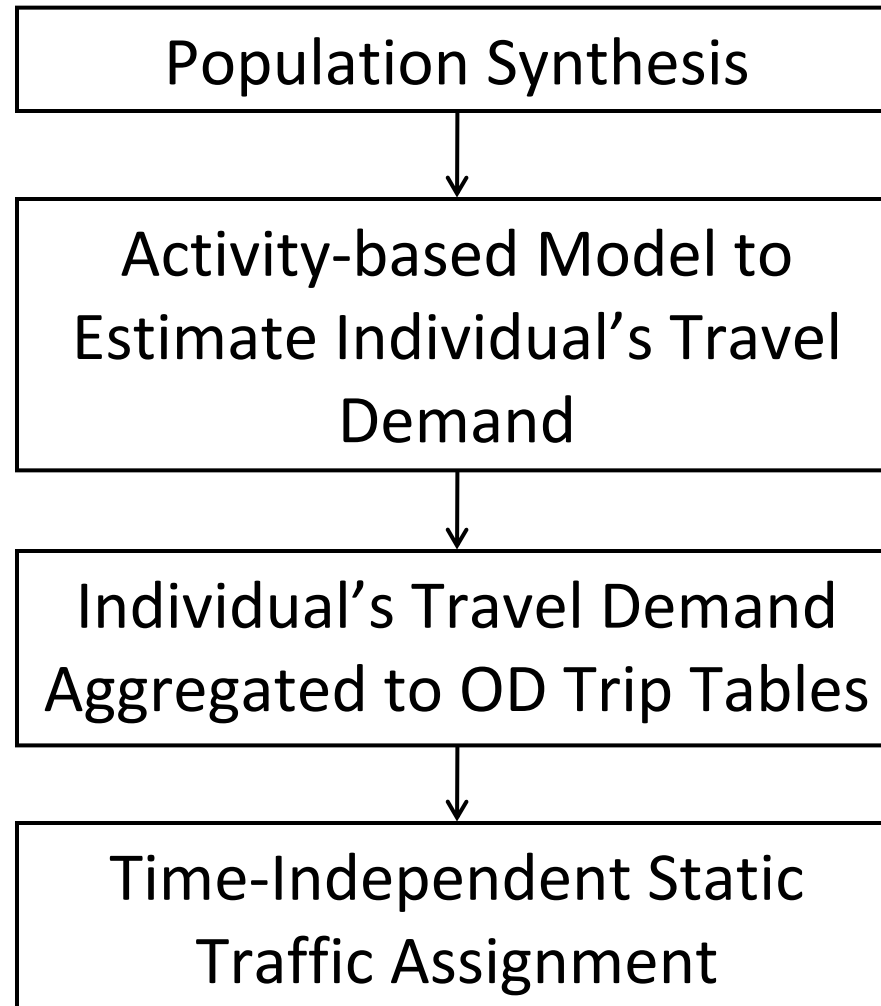
| | Current Model | Advanced Model |
|-----------------------|-------------------------|---------------------------------------|
| Analytical Unit | Trips between TAZ pairs | Individuals' activity-travel patterns |
| Demand Categorization | Trip purpose | Activity type |
| Spatial Distribution | Gravity model | Activity location choice |
| Travel Mode | Trip mode split | Tour mode choice |
| Time-of-Day | Trip time-of-day split | Activity timing and duration |



Comparisons of Current and Advanced Models (Supply Side)

| | Current Model | Advanced Model |
|------------------------|--|---|
| Analytical Unit | Aggregated vehicle trips between TAZ pairs | Each vehicle with its driver/passengers |
| Time Period | Multiple hours | Second-by-second |
| Travel Time Estimation | Volume-delay function of v/c ratio | Micro-simulation of Traffic |
| Assignment Method | Time-independent static assignment | Time-dependent dynamic assignment |

Paths to Reach the Advanced Model (from demand side)



Paths to Reach the Advanced Model (from supply side)

TAZ-level Population Update



Trip-based Model to Estimate
TAZ-level Travel Demand
(OD Trip Tables)

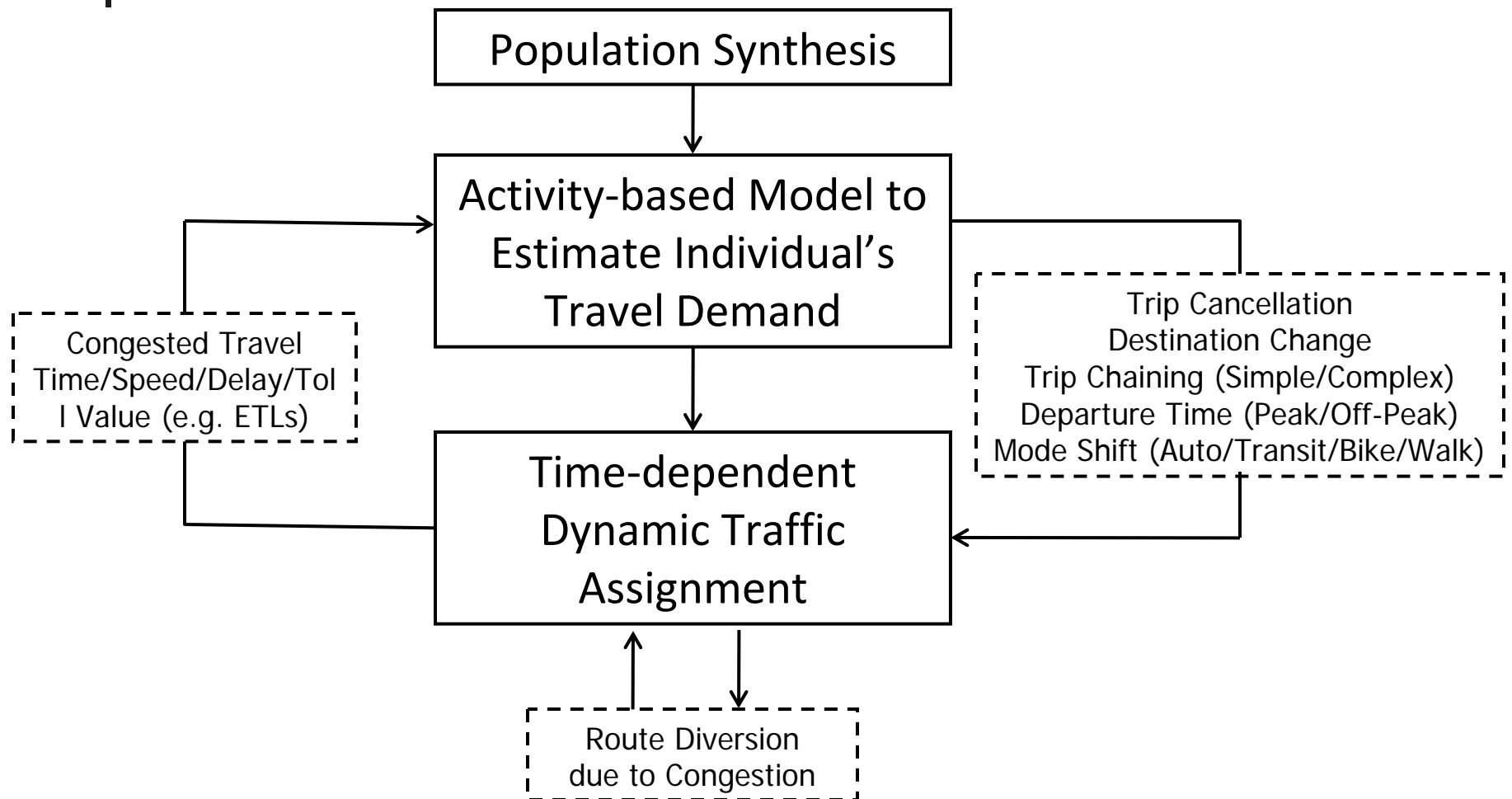


TAZ-level Travel Demand
Disaggregated by Time-of-



Time-dependent assignment

The Advanced Model





Issues with Advanced Models

- Run Time
 - Will take longer, more processing
 - Computer speed continues to improve
 - Three times faster today than 2007
- Staff availability
 - Improving as more MPOs move to advanced models



Issues with Advanced Models - Continued

- Data
 - Activity data for demand
 - More detailed land use data
 - Traffic operations data
- Interpreting/Presenting results
 - New techniques require new understanding of results



Experience with advanced models

- Demand
 - Implemented
 - Columbus
 - Sacramento
 - New York
 - Planned
 - Atlanta
 - Dallas
 - Seattle



Experience with Advanced Models

- Supply
 - Chicago
 - Burlington, VT
 - Need to talk to Brian



Integrating Demand and Supply

- Burlington, VT
- Jacksonville, FL
- Sacramento, CA
- Columbus, OH