

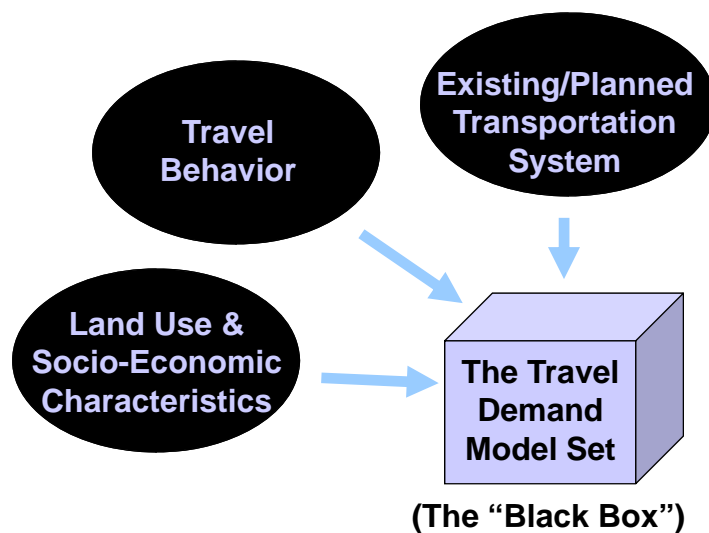
## Atlanta Travel Forecasting Methods:

### Traditional Trip-Based & Activity-Based Model

TMIP Webinar, July 14, 2010

Guy Rousseau, Modeling Manager, Atlanta Regional Commission

## Travel Demand Forecasting @ ARC Where Do We Start?



## ARC's Trip Generation

- 6 Trip Purposes:
  - Home-Based Work
  - Home-Based Shopping
  - Home-Based Grade School
  - Home-Based University
  - Home-Based Other
  - Non-Home Based

## ARC's Trip Production

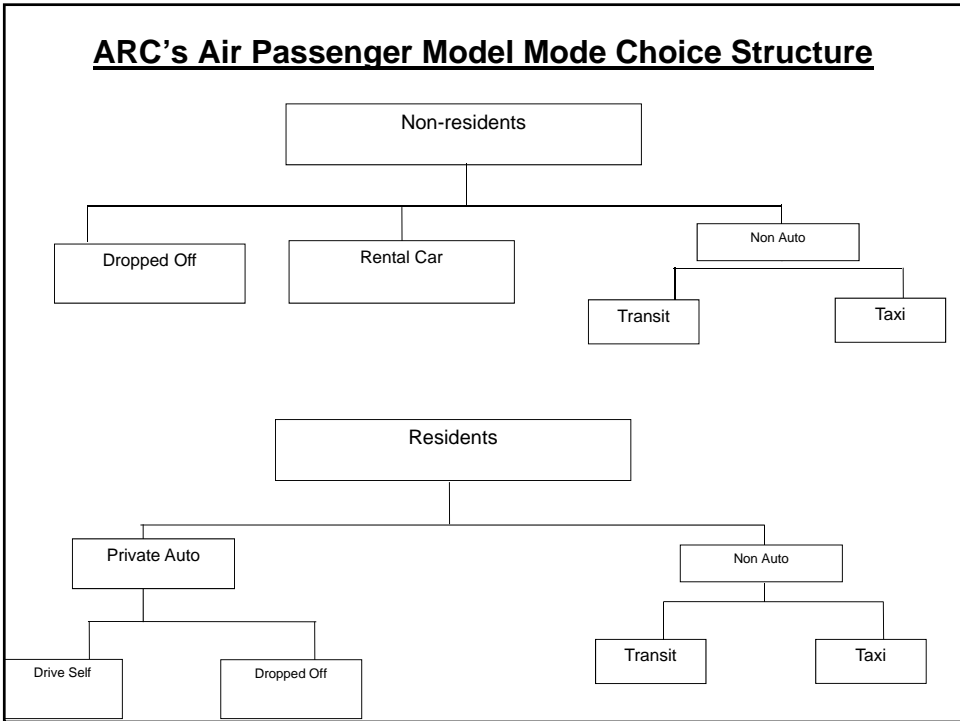
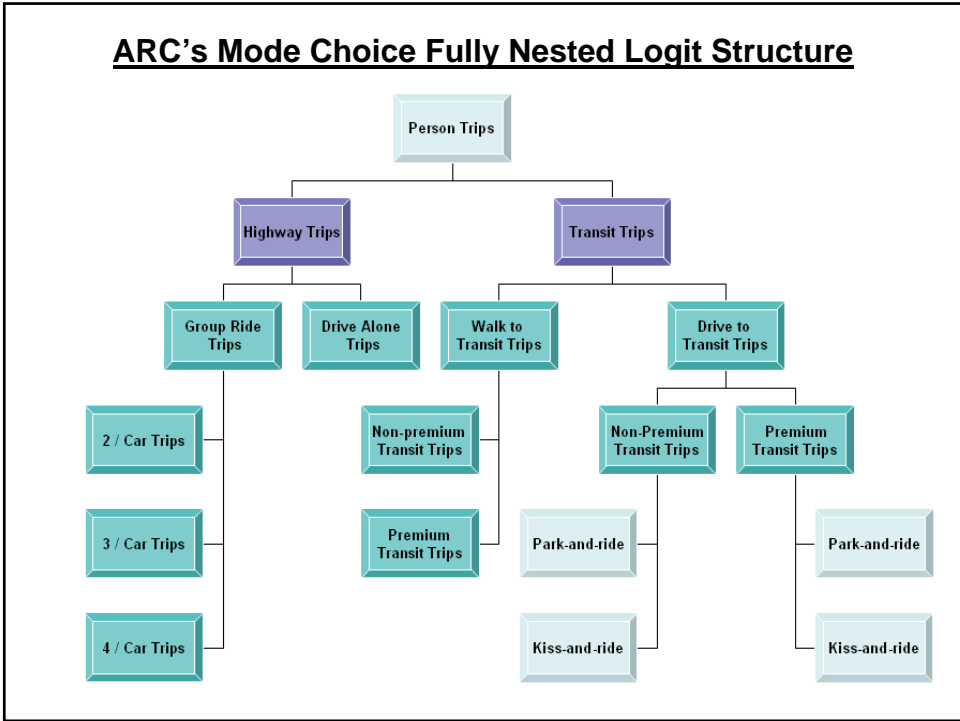
- IS NOT Cross-Classification, it's Logit
- Why? Allows more independent variables:
  - Household size (1, 2, 3, 4+)
  - Household income (<\$20K, \$20–50K, \$50–100K, \$100K+)
  - # of workers per household (0, 1, 2, 3+)
  - # of children per household (0, 1, 2, 3+)
  - # of autos per household (0, 1, 2, 3+)

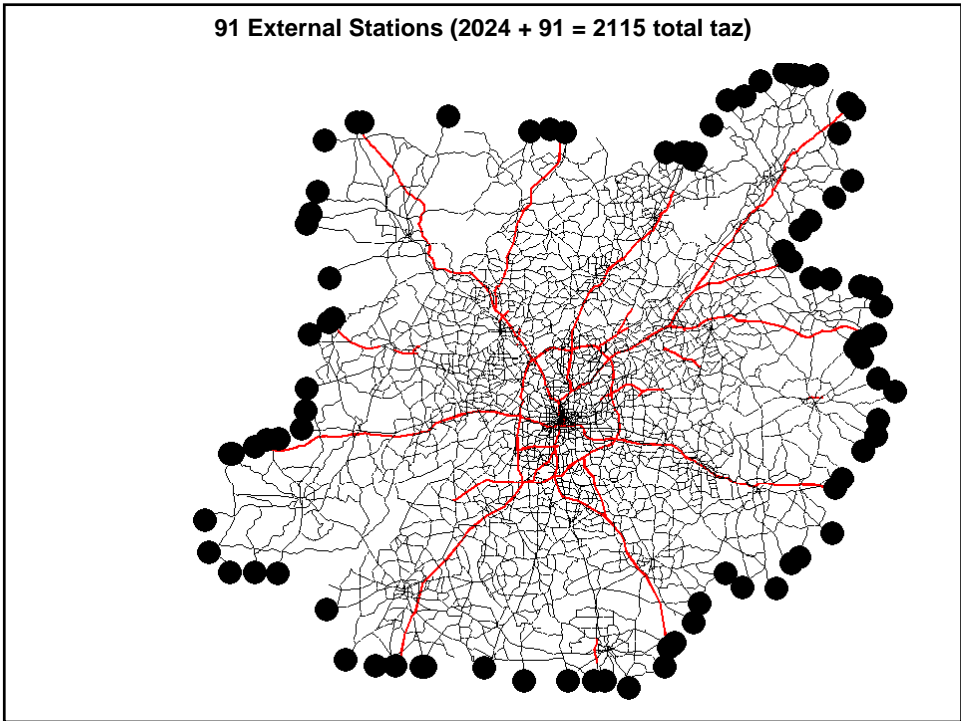
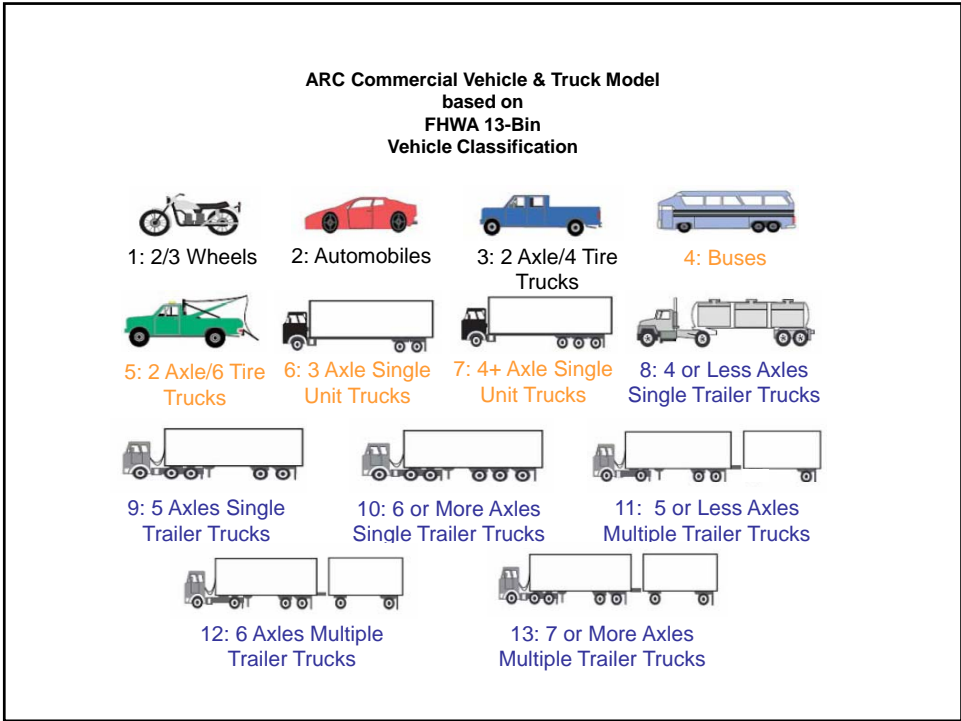
## ARC's Trip Attraction

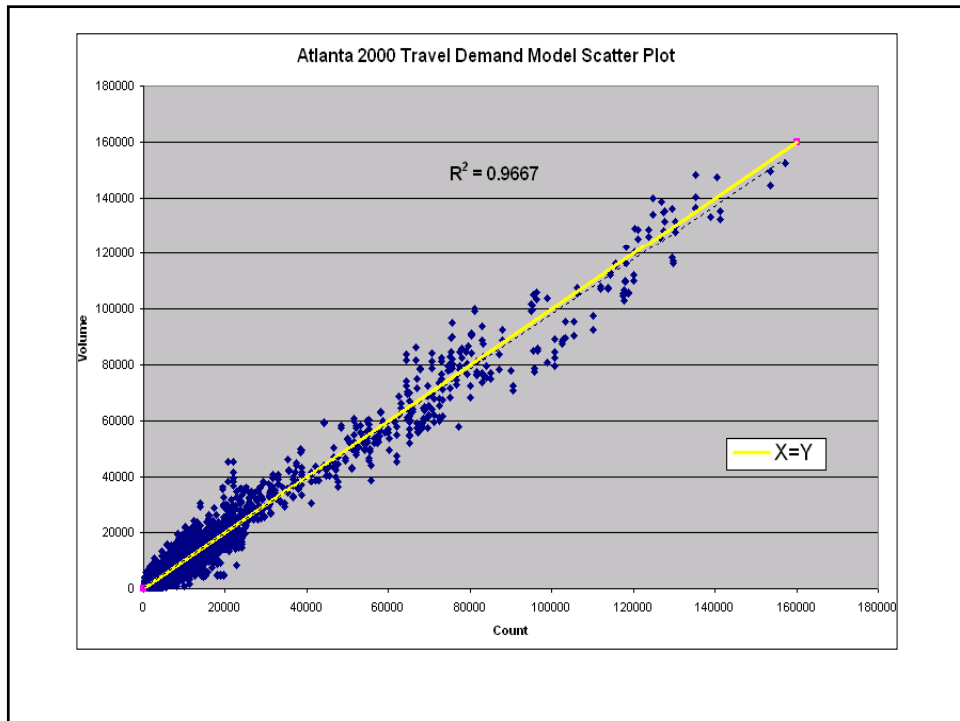
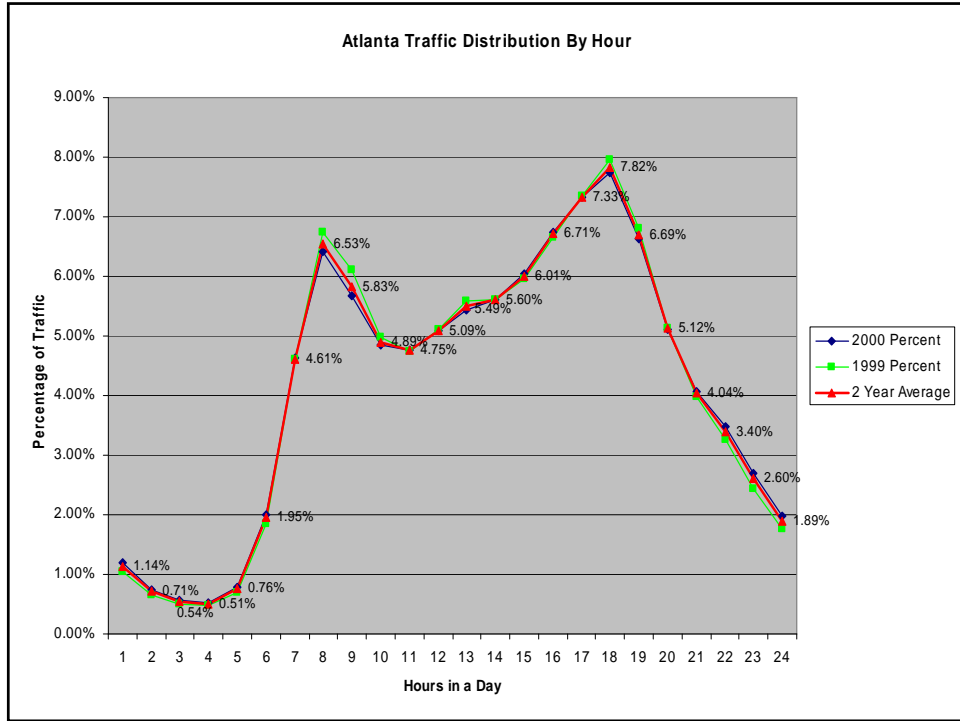
- Developed from Household Travel Survey & Workplace Establishment Survey
- Features an Attraction Share Model based on 4 market segments:
  - Households without cars
  - Households with cars < workers
  - Low income hshlds with # cars  $\geq$  # workers
  - High income hshlds with # cars  $\geq$  # workers

## ARC's Trip Distribution

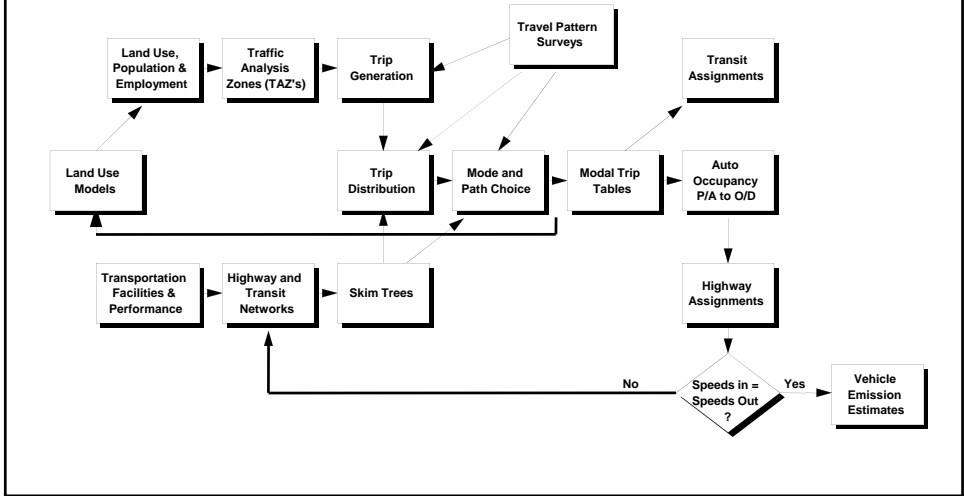
- Still using Gravity Model, but looking into Destination Choice
- Makes use of Topographic Penalty to compensate for area bias created by a river crossing
- The “topo” penalty is a lump sum of time in minutes (2 to 3) added to the composite time of interzonal times for all zone pairs on opposite sides of the river



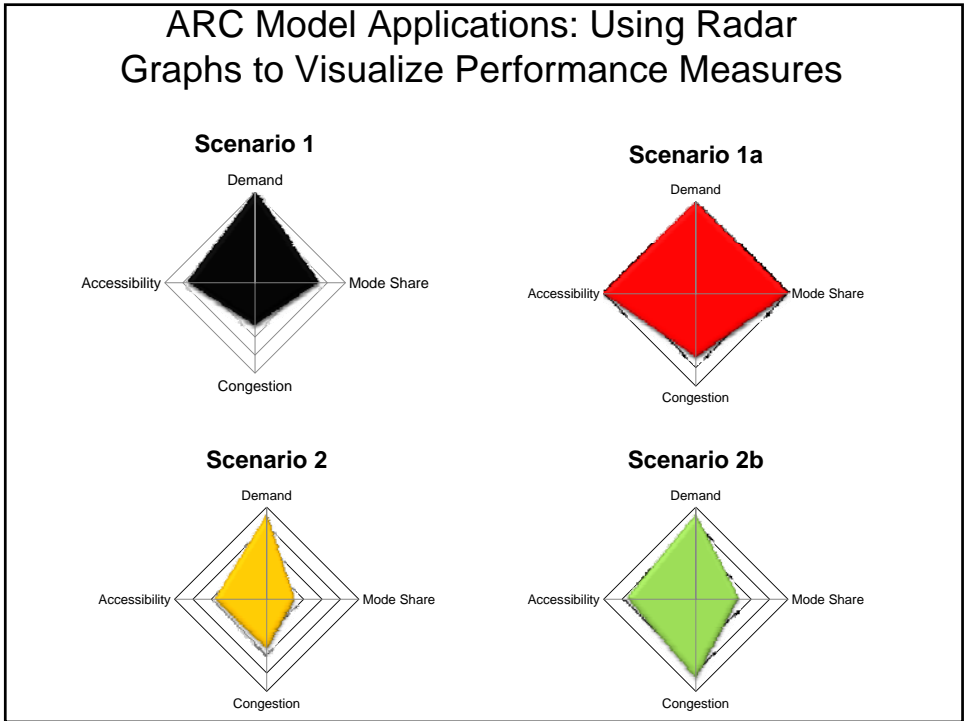




# The 4-Step Process ARC Travel Demand Forecasting



## ARC Model Applications: Using Radar Graphs to Visualize Performance Measures



## ARC's Activity-Based Model

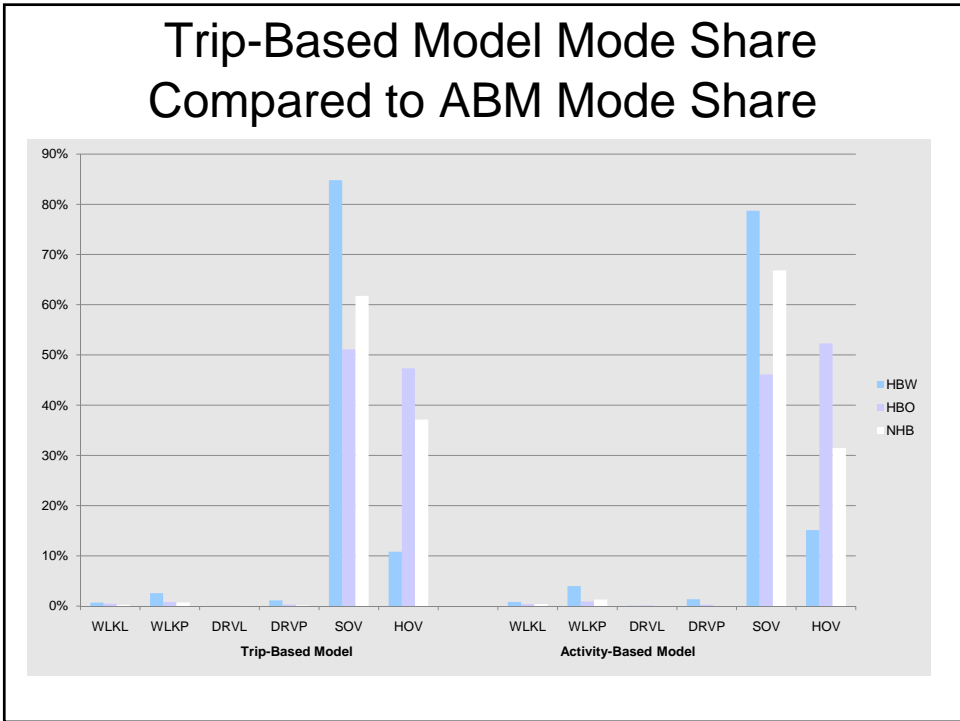
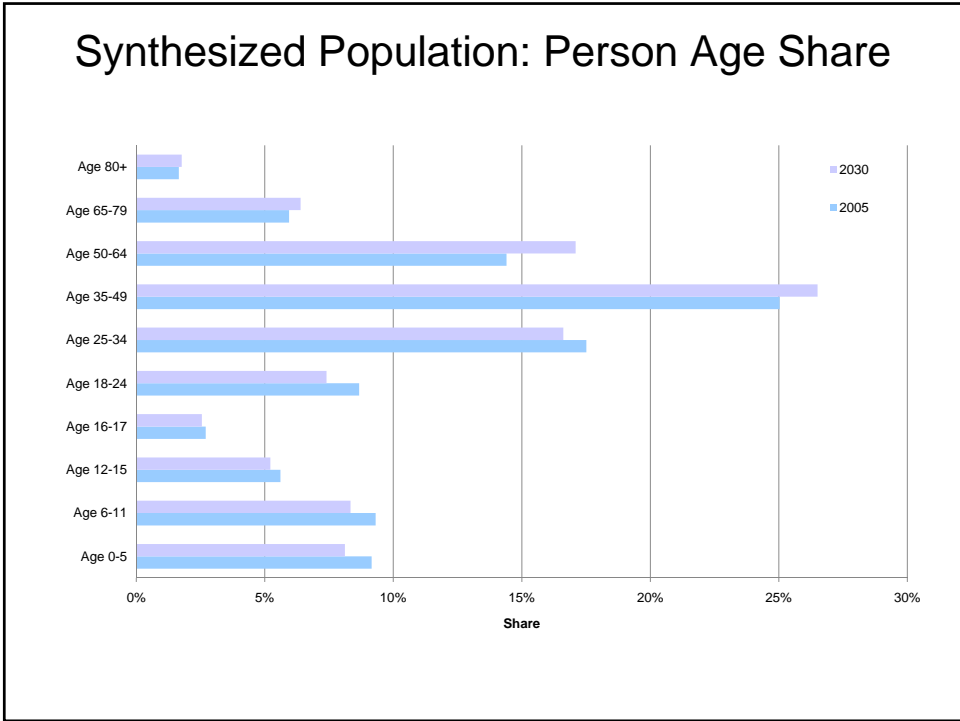
- Provides results similar to 4-step trip based model
- Ok, so then why bother with an ABM?
- Because ARC's ABM provides additional details, more info about travel patterns & market segments
- ABM allows to answer questions the 4-step model is not capable to provide
- For internal use only, not for official purposes, hence dual/parallel track of models

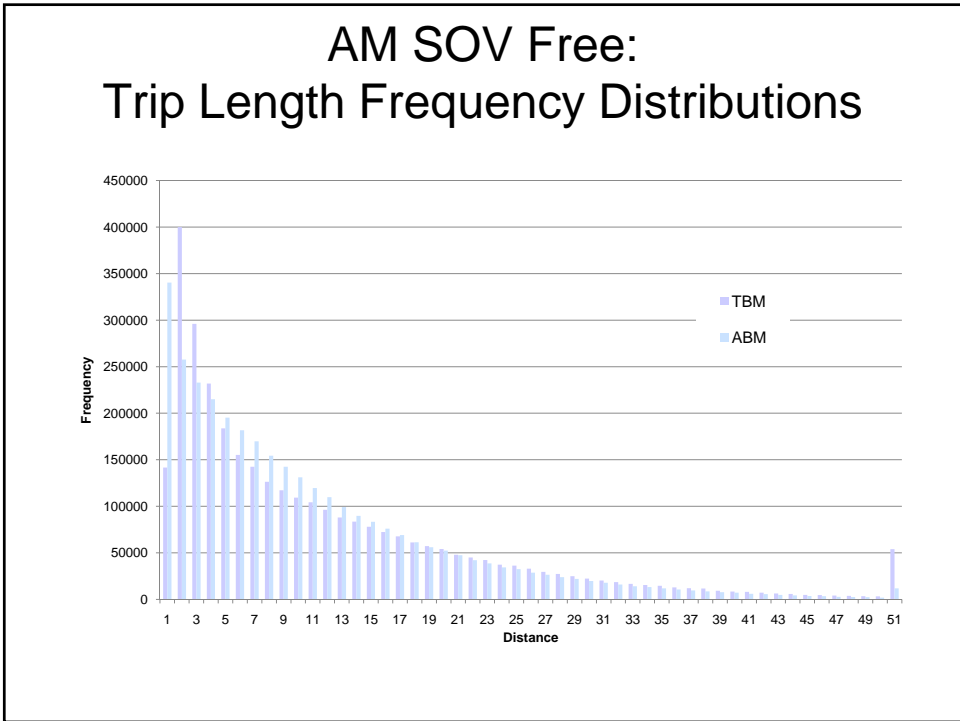
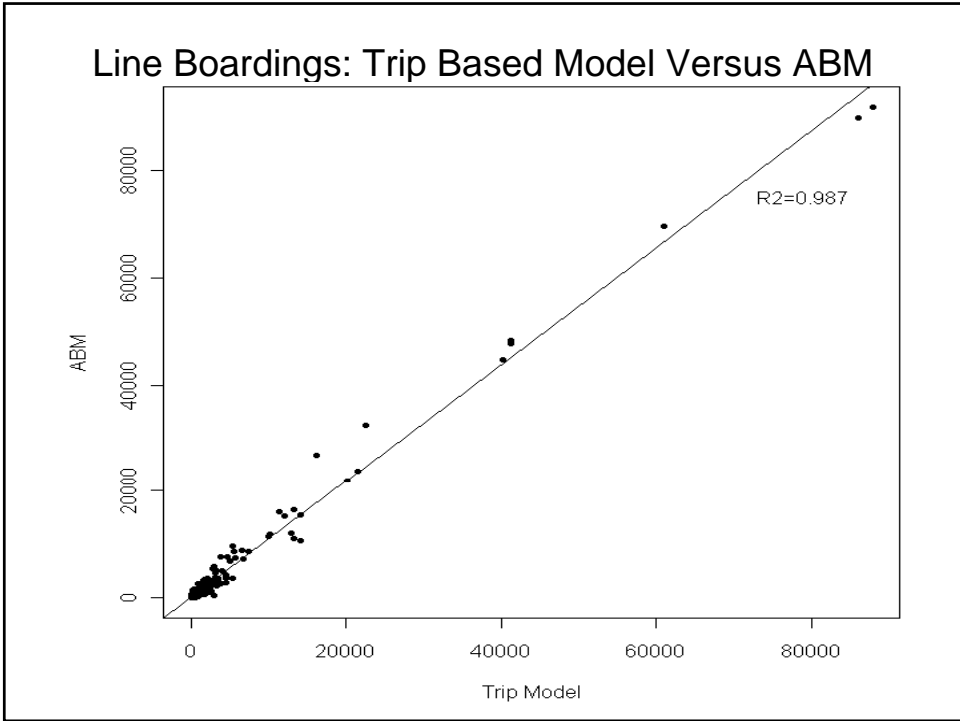
## ARC Activity-Based Modeling System

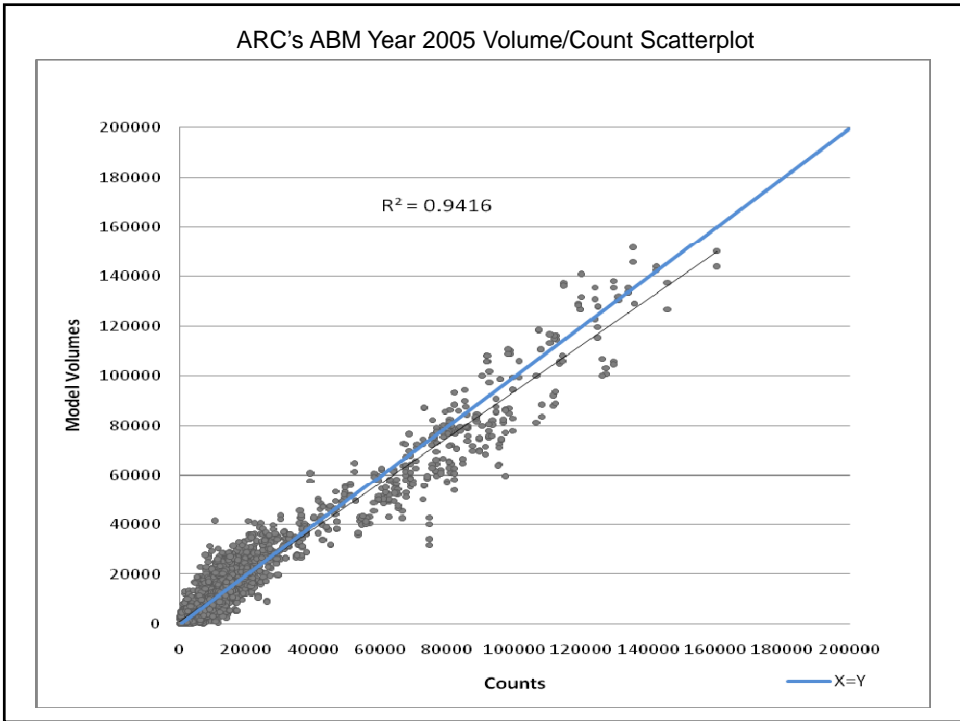
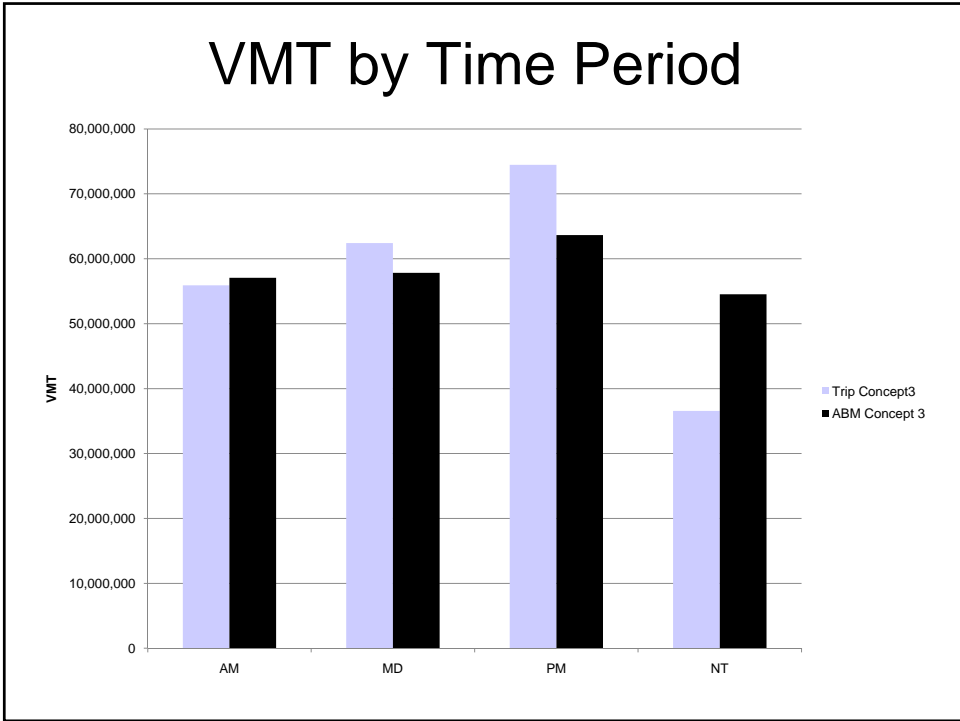
- Based on the CT-RAMP<sup>1</sup> family of ABMs developed in New York, NY, Columbus OH (MORPC) and others
  - Explicit intra-household interactions
  - Continuous temporal dimension (Hourly time periods)
  - Integration of location, time-of-day, and mode choice models
  - Java-based package for AB model implementation
- Implemented with the existing Cube-based networks, GUI and ancillary models (external model, truck model, assignments, etc)
- Households: 1.7 million in 2005, 2.7 million in 2030
- Model development parallel effort with MTC

<sup>1</sup>Coordinated Travel-Regional Activity-Based Modeling Platform







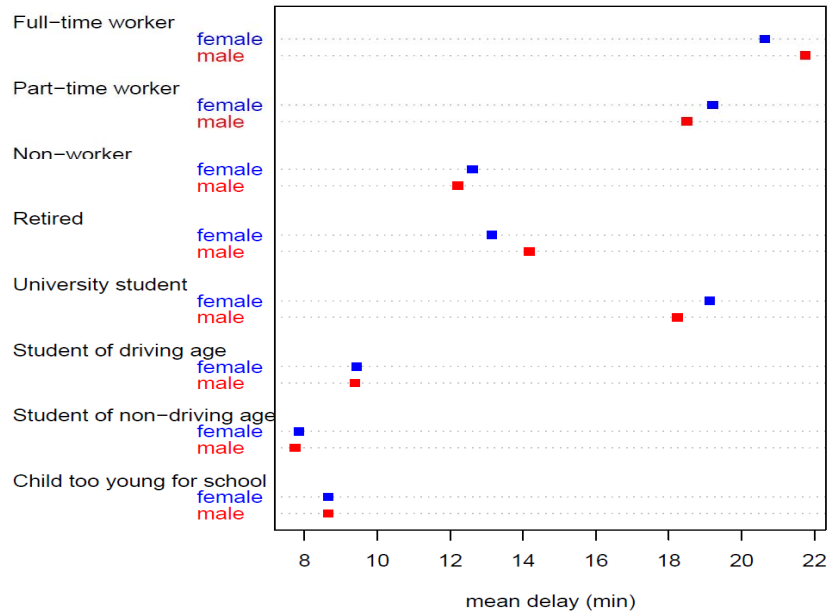


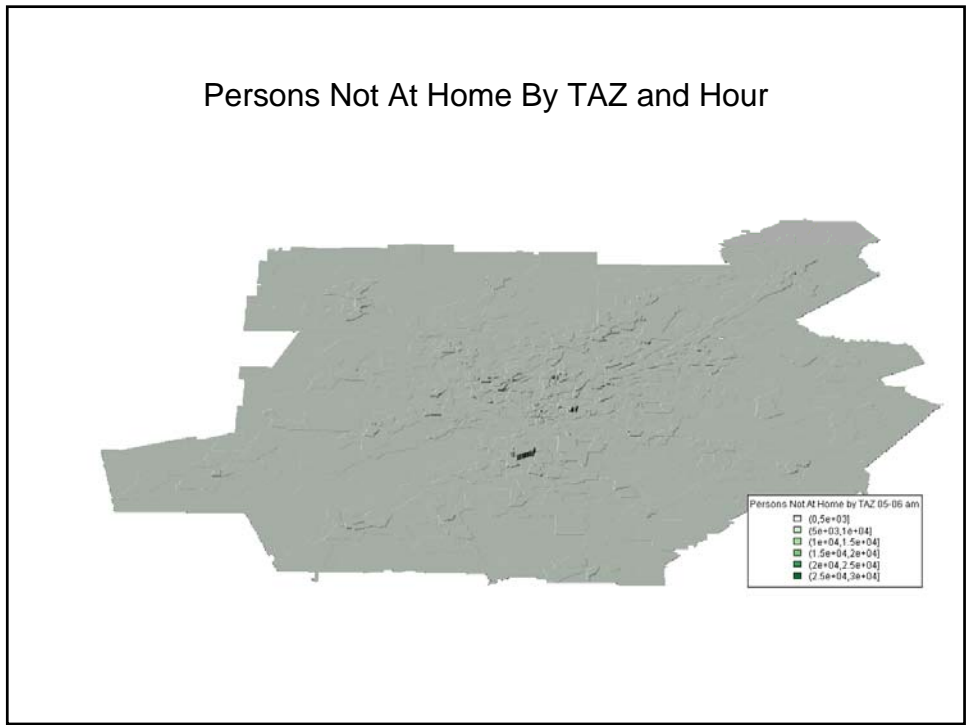
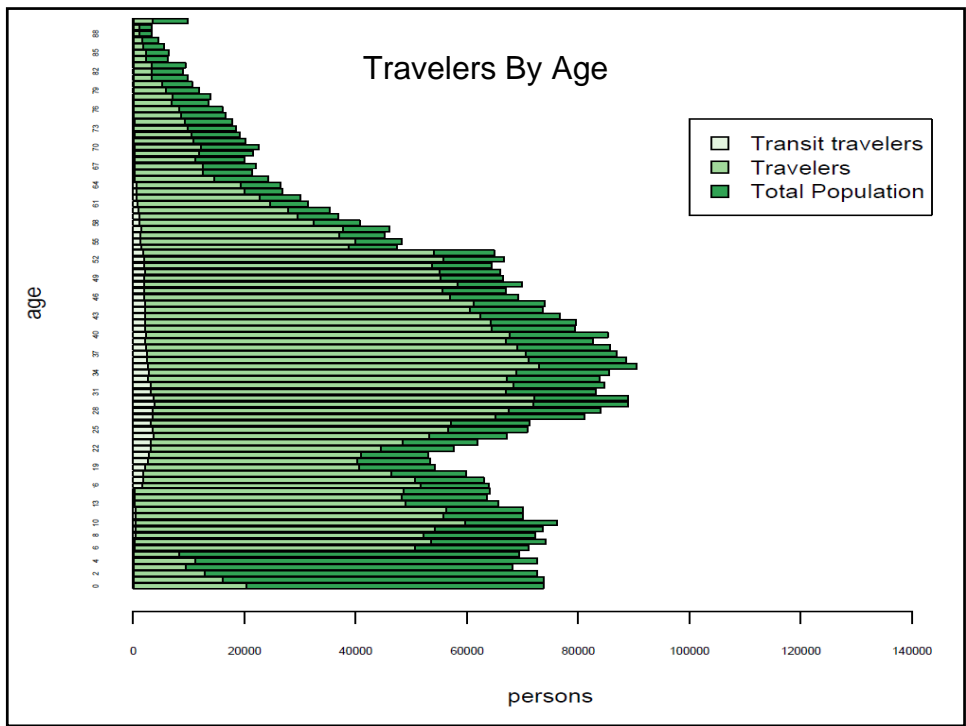
## What Sort of Performance Measures & Visuals are Possible with an Activity-Based Model?

ABM results in a complete activity diary for all ARC residents

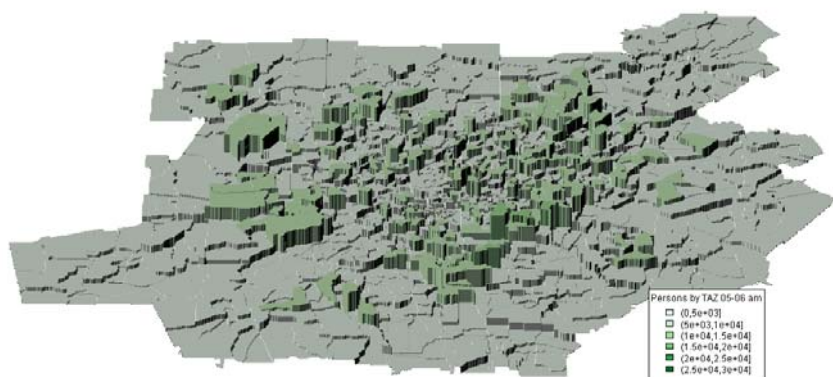
- A wealth of activity/travel results
- Just about any custom report/query/visual is now possible
- Performance Measures also available by Age, Gender & Household Types

## Mean Delay, Peak Period Travel





## Persons By TAZ and Hour



## Questions / Comments

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