Management and Integration of Data and Modeling at Santa Clara County Congestion Management Agency

VTA Modeling and GIS Group
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Outlines

- Introduction
- VTA CMA and Modeling Group
- Organization of Data Development and Modeling at VTA
- Travel Demand Modeling

Introduction

- As the Congestion Management Agency, VTA is responsible for
  - ✓ Managing and monitoring congestion on roadway facilities.
  - ✓ Developing a comprehensive transportation improvement program among local jurisdictions that will reduce traffic congestion, improve land use decision making and improve air quality.

Introduction

- As the Transit Agency, VTA provides
  - ✓ Bus and light rail transit services in Santa Clara County.
- VTA also has taxing authority:
  - ✓ Administers the local sales tax measures that fund transit and roadway improvements.

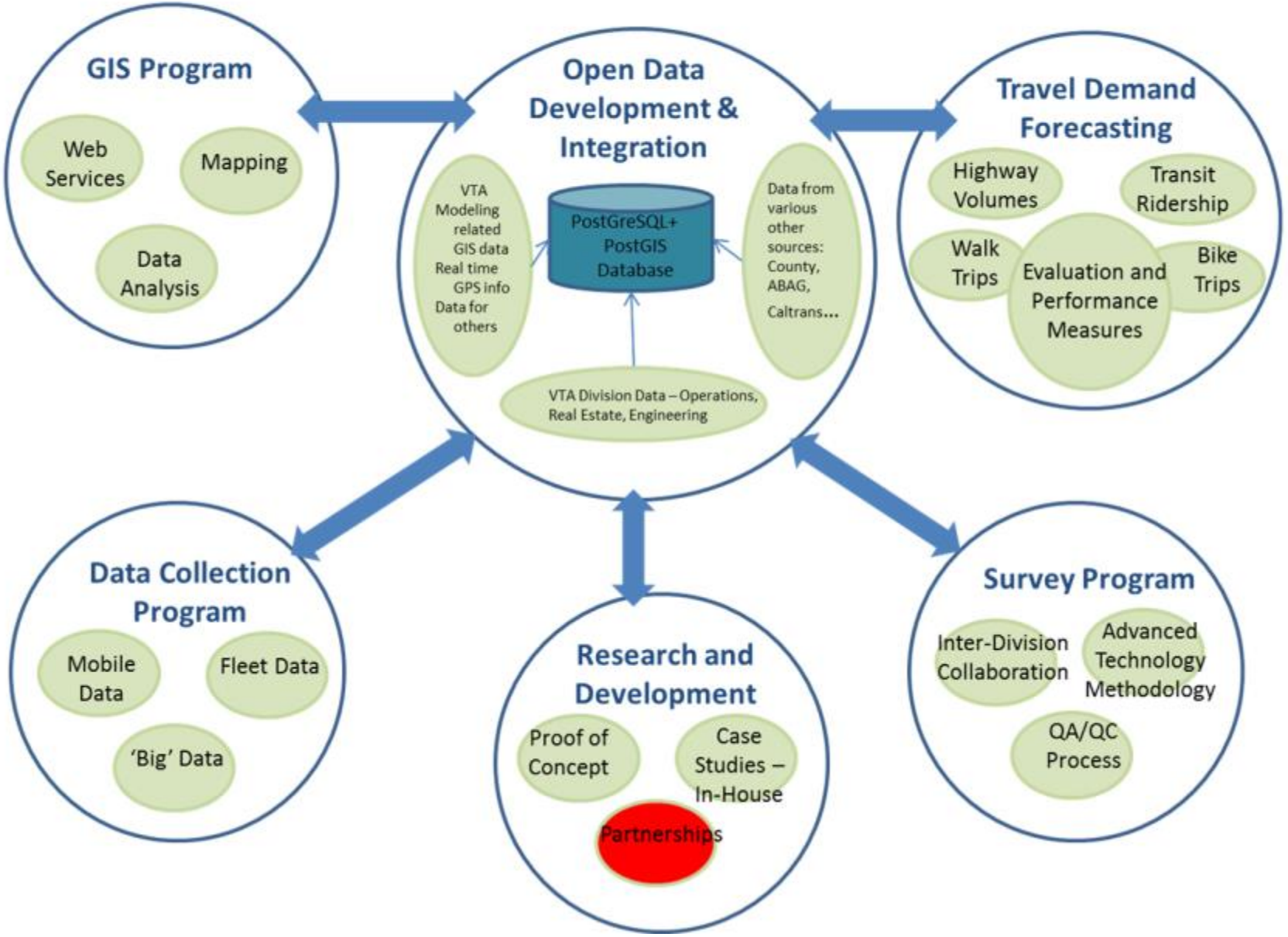
Introduction

- One of the responsibilities of the CMA:
  - ✓ Development and maintenance of a Countywide Travel Demand Model to estimate future transportation needs and impacts caused by growth in population and jobs.
  - ✓ VTA model is used to support capital projects through all phases of both highway and transit development.
    Examples:
    - BART Extension to Silicon Valley
    - El Camino Real BRT
    - Express Lane Corridors
    - Light Rail Efficiency Project

Modeling and GIS Group

- Travel Demand Forecasting Program:
  - ✓ Developing and maintaining the VTA Countywide Travel Demand Models
- Geographical Information Systems Program:
  - ✓ Web service, mapping, data analysis
- Data Collection Program:
  - ✓ Mobile data, fleet data
- Survey Program
- Research and Development
- Public Partnerships (CCAG, Alameda CTC, Caltrain, SamTrans)

VTA Data Ecosystem



Key Steps of VTA Data Ecosystem

- Database Infrastructure - Open Source PostGreSQL & PostGIS
- Developing Activity Based Model
- Developing Cube Land Model
- Developing Open Data Portal

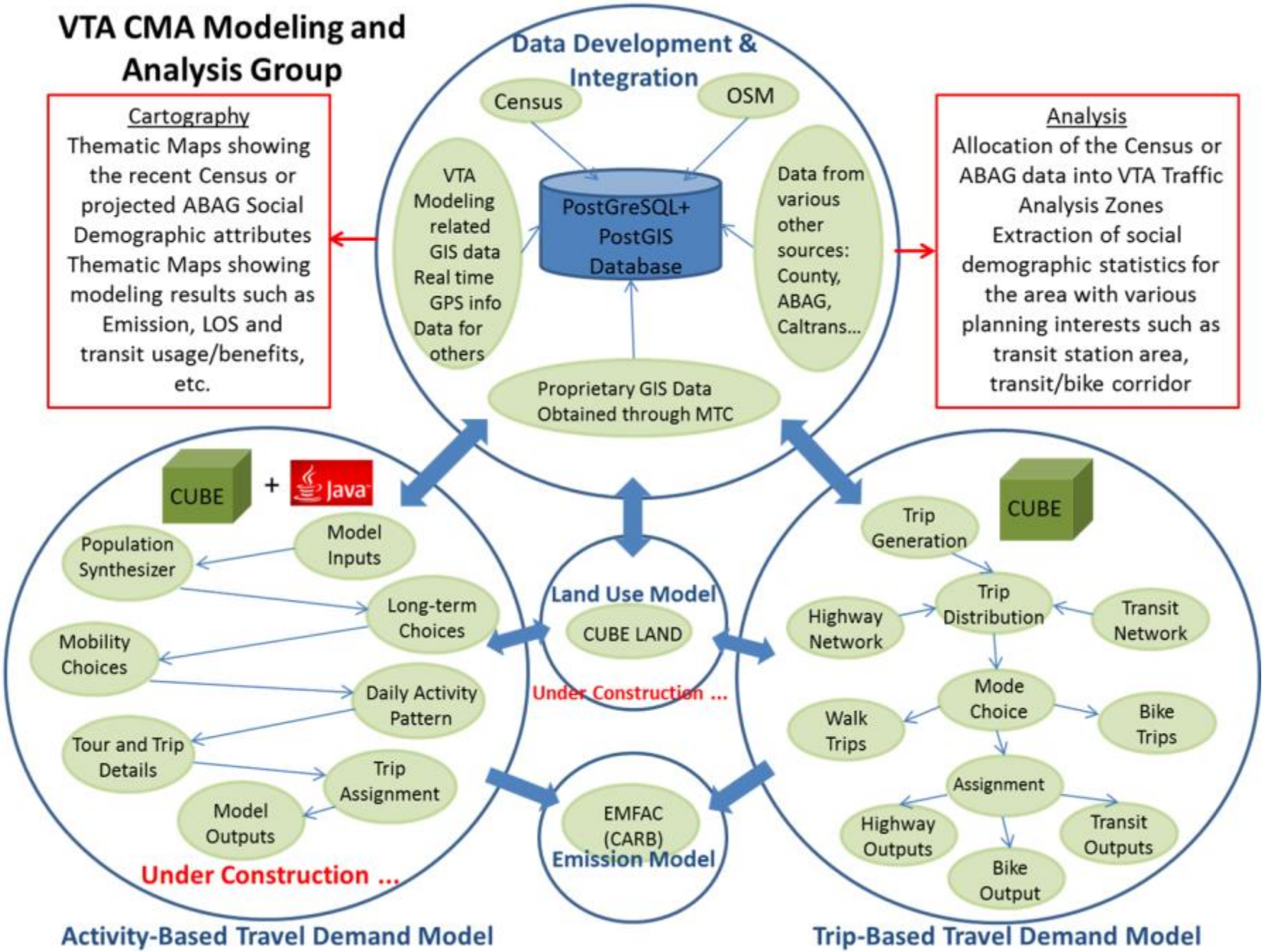
Key Steps of VTA Data Ecosystem

- Progress on Data Development:
  - ✓ Open Data Portal for Hack-a-thon/Public Sharing
  - ✓ American Community Survey
  - ✓ Association of Bay Area Governments (ABAG) land use projections and travel demand modeling input
  - ✓ GPS real time feed data from VTA bus fleet
  - ✓ Most data from the current GIS file folder, including parcel, CMP Networks and Intersections, Bike Facilities, Transit Facilities, etc.

Key Steps of VTA Data Ecosystem

- Research and Development
  - ✓ Google API Transit Virtual Ride
  - ✓ Open Trip Planner/Web + Mobile App
  - ✓ Smartphone Data Collection Trip Diary Surveys
  - ✓ Real Time Transit Application

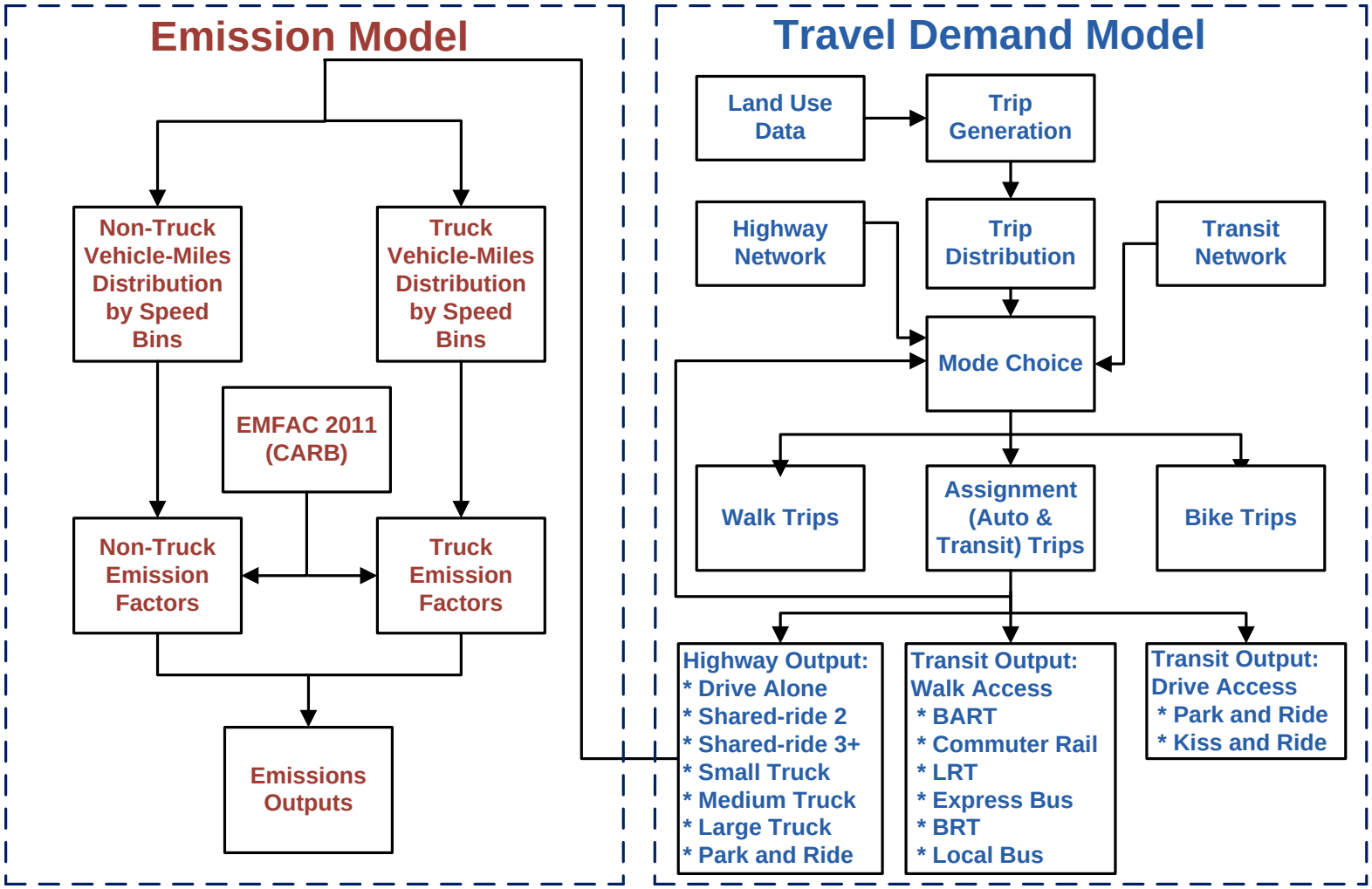
VTA CMA Modeling and Analysis Group



Trip Based Model

- Consistent with the Metropolitan Transportation Commission (MTC) regional model, BAYCAST-90
- Emission Model and Land Use Model Integrated into VTA Trip-Based Model.

Trip Based Model



VTA Trip-Based Model and Emission Model

Activity Based Model

- Based on Metropolitan Transportation Commission (MTC) regional activity based model (Travel Model One) for nine-county San Francisco Bay Area using Coordinated Travel – Regional Activity Based Modeling Platform (CT-RAMP) and programs.
- Components of the model were transferred from models previously developed for the San Francisco County Transportation Authority (SFCTA) and Atlanta Regional Commission (ARC).

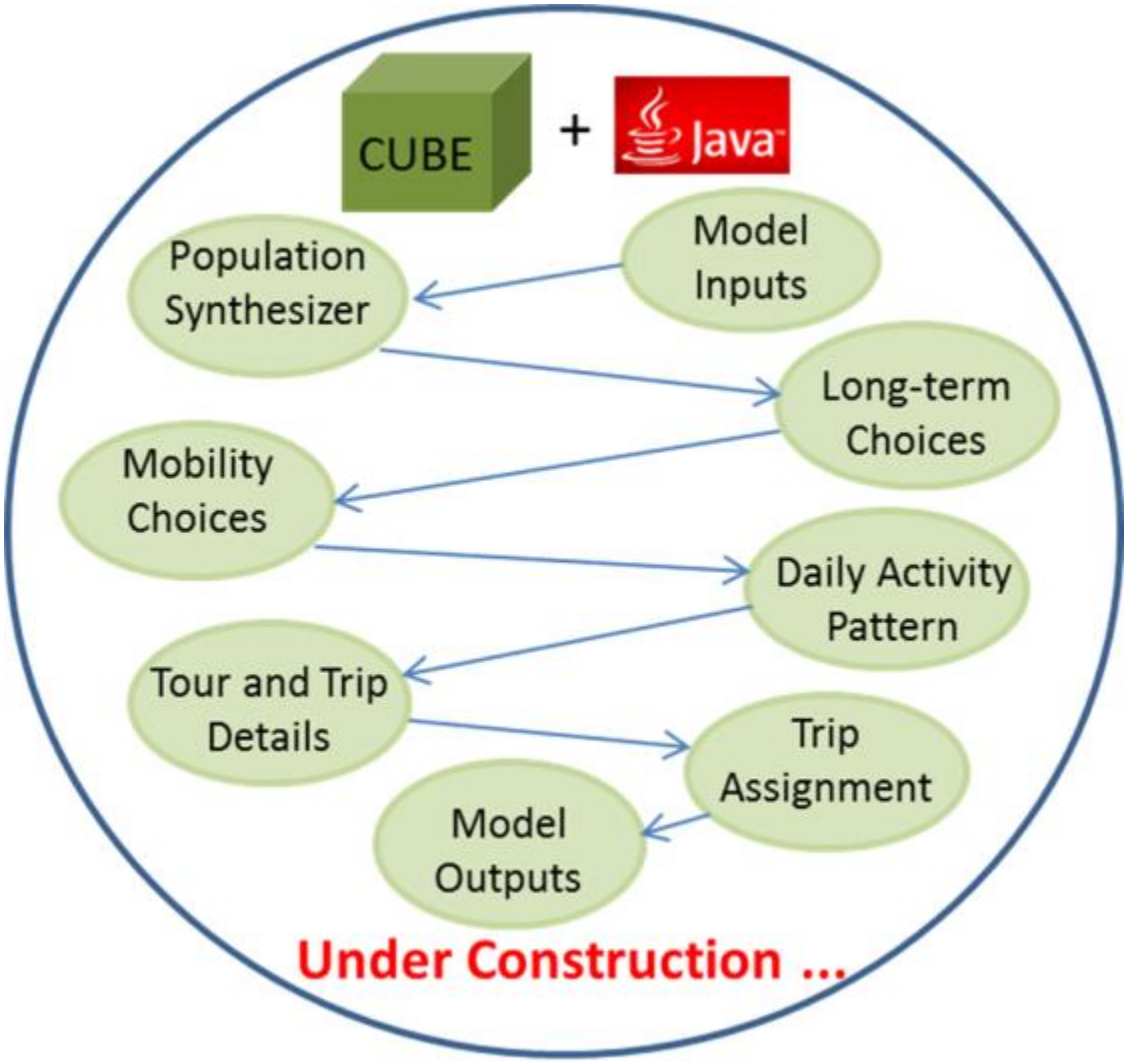
Activity Based Model

- Population Synthesizer: Simulate individual travel with inputs of synthetic household and population files.
- Inputs of Population Synthesizer: Summary File 1, Summary File 3, Census Transportation Planning Package (CTPP), American Community Society (ACS), and Public Use Microdata Sample (PUMS) data.

Activity Based Model

- Computing Environment and System Design: one main machine with three satellite machines - high memory and high-speed CPU are required to simulate every household and person
- Current Progress: Integrate VTA's TAZ structure, highway and transit coding into MTC regional model.
- Recalibrate and Validate Models
- Next Challenge: Improve model running efficiency.

Activity Based Model



Flow Chart of Activity-Based Model

Questions?

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Thank You!