InSITE
Initiative to Simulate Individual Travel Events

Baltimore Regional Transportation Board

February 23, 2022

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Baltimore Regional Transportation Board

Aggregate Versus Disaggregate Modeling

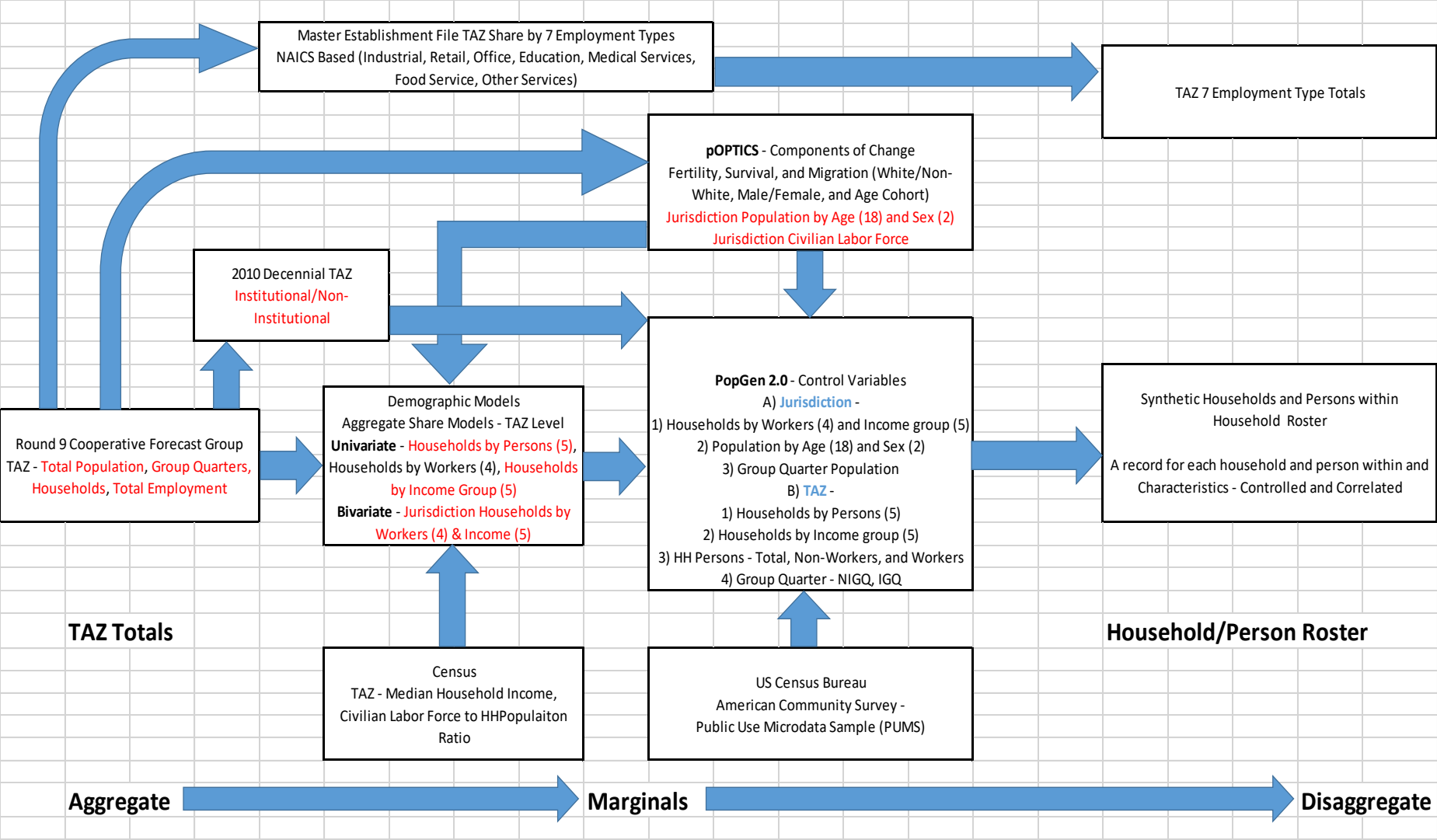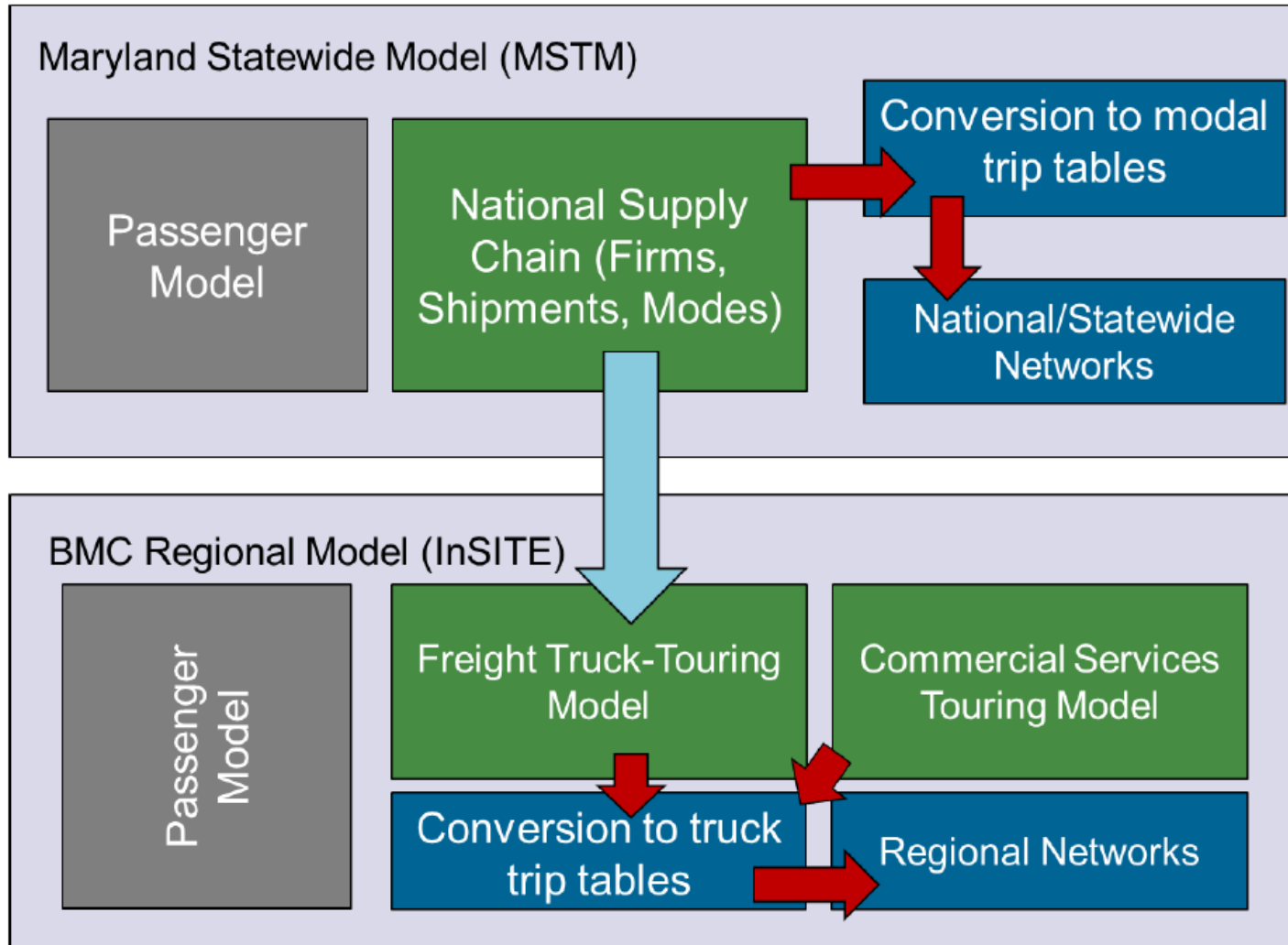| Trip Based Model - Aggregate	Activity Based Model - Disaggregate
Model 44 c	**InSITE**
1) Model Design 2004/MTA New Start 2) Estimated using 2001 HH Travel Survey 3) Calibrated using 2008 HH Travel Survey	1) Model Design 2014 2) Estimated using 2008 HH Travel Survey
4 - Step Model Households - Unit of Analysis	Micro Simulation – Activities Beyond the Household that Require Travel Person – Unit of Analysis
Cooperative Forecast 1) TAZ Household Stratification	**Cooperative Forecast** 1) TAZ Synthetic Household/Population
Trip Tables - Household Person Trips by Purpose	Person Trip Roster
Time of Day – 4 Periods	Time of Day – ½ hour
	Explicitly Capture 1. School/Day Care Escorting 2. Full Joint Non-Mandatory Travel
	Parcels – MD Property View

InSITE – Modeling Components

- ## Three Models
  - PopGen2.0 – Synthetic Household and Person Roster
    - Synthesized record for each household and persons roster containing characteristics – income group, household size (persons (child/adult) & PT/FT workers), person type (eight), gender, race (non-Hispanic white alone & other), and poverty. Jurisdiction/TAZ margins developed from Round9A, demographic sub models, and pOPTICS.
  - Freight Modeling System – Long distance commodity flows, and local freight and commercial truck/vehicle goods, deliveries, and service tours
    - Micro simulation of establishment fleet's tour/trip roster simulating origin start time, destination, dwell time, purpose, and pick-up and/or deliveries. Estimated from FAF and truck/commercial vehicle survey data (Texas & Ohio) and calibrated to regional truck counts.
  - Activity Based Model – Daily Activity Pattern/Person Trip Roster
    - Micro simulation of household/person long term choices (auto ownership, usual place of work) and average weekday tours/trips – destination, mode, time of day, and purpose for all synthesized persons.
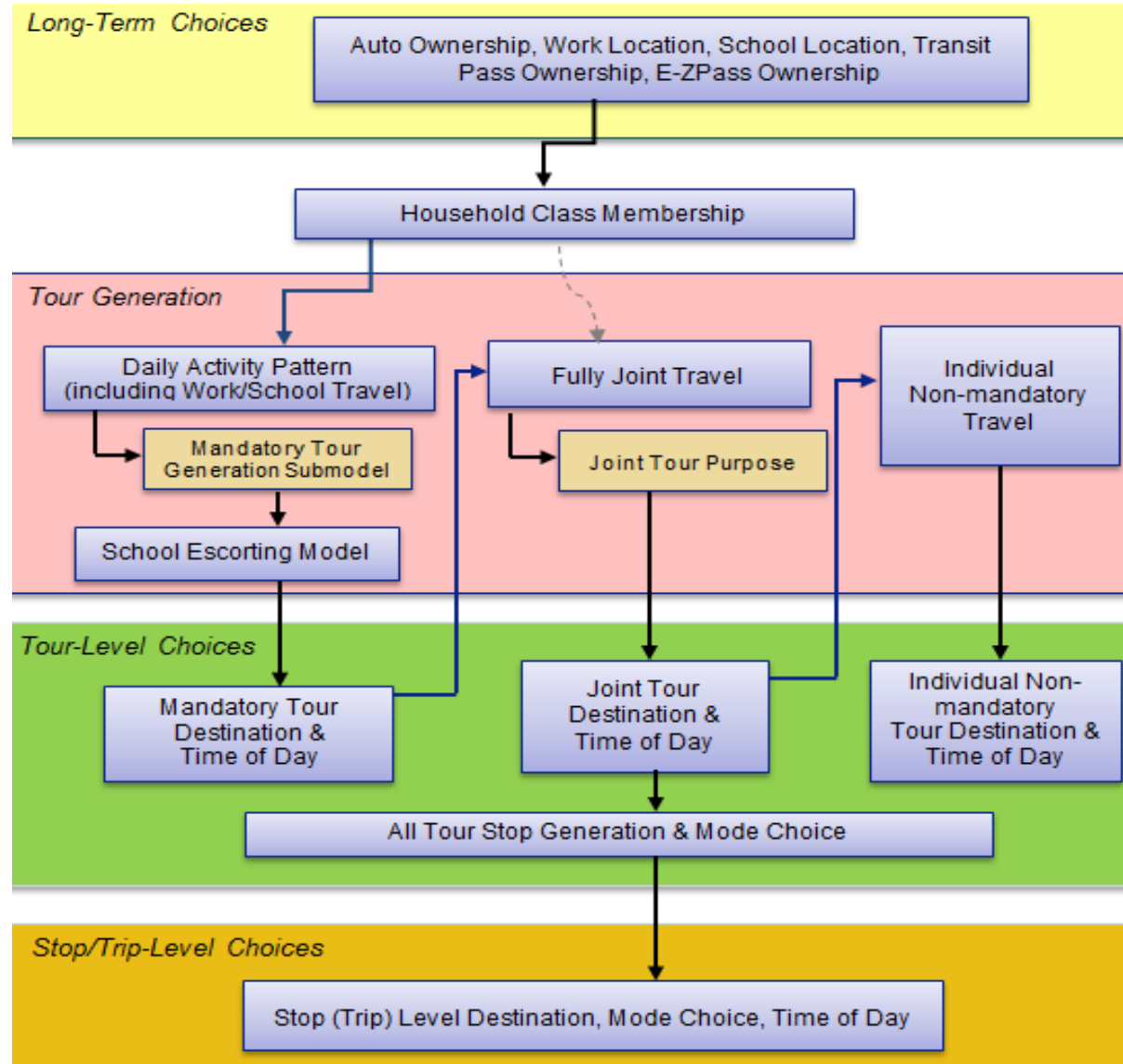
InSITE: Synthetic Household/Population Model Components

Master Establishment File TAZ Share by 7 Employment Types NAICS Based (Industrial, Retail, Office, Education, Medical Services, Food Service, Other Services)

TAZ 7 Employment Type Totals

pOPTICS - Components of Change Fertility, Survival, and Migration (White/Non-White, Male/Female, and Age Cohort) Jurisdiction Population by Age (18) and Sex (2) Jurisdiction Civilian Labor Force

2010 Decennial TAZ Institutional/Non-Institutional

Round 9 Cooperative Forecast Group TAZ - Total Population, Group Quarters, Households, Total Employment

Demographic Models Aggregate Share Models - TAZ Level **Univariate** - Households by Persons (5), Households by Workers (4), Households by Income Group (5) **Bivariate** - Jurisdiction Households by Workers (4) & Income (5)

PopGen 2.0 - Control Variables A) Jurisdiction - 1) Households by Workers (4) and Income group (5) 2) Population by Age (18) and Sex (2) 3) Group Quarter Population B) TAZ - 1) Households by Persons (5) 2) Households by Income group (5) 3) HH Persons - Total, Non-Workers, and Workers 4) Group Quarter - NIGQ, IGQ

Synthetic Households and Persons within Household Roster

A record for each household and person within and Characteristics - Controlled and Correlated

TAZ Totals

Census TAZ - Median Household Income, Civilian Labor Force to HHPopulaiton Ratio

US Census Bureau American Community Survey - Public Use Microdata Sample (PUMS)

Household/Person Roster

Aggregate → **Marginals** → **Disaggregate**

InSITE: Freight Modeling System

Maryland Statewide Model (MSTM)

- Passenger Model
- National Supply Chain (Firms, Shipments, Modes)
- Conversion to modal trip tables
- National/Statewide Networks

BMC Regional Model (InSITE)

- Passenger Model
- Freight Truck-Touring Model
- Commercial Services Touring Model
- Conversion to truck trip tables
- Regional Networks

InSITE: Activity Based Model Components

For More Information

Charles Baber | Principal Transportation Planner

410-732-0500 x1056 | cbaber@baltometro.org | www.baltometro.org

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