# Trip Generation

CAMBRIDGE SYSTEMATICS
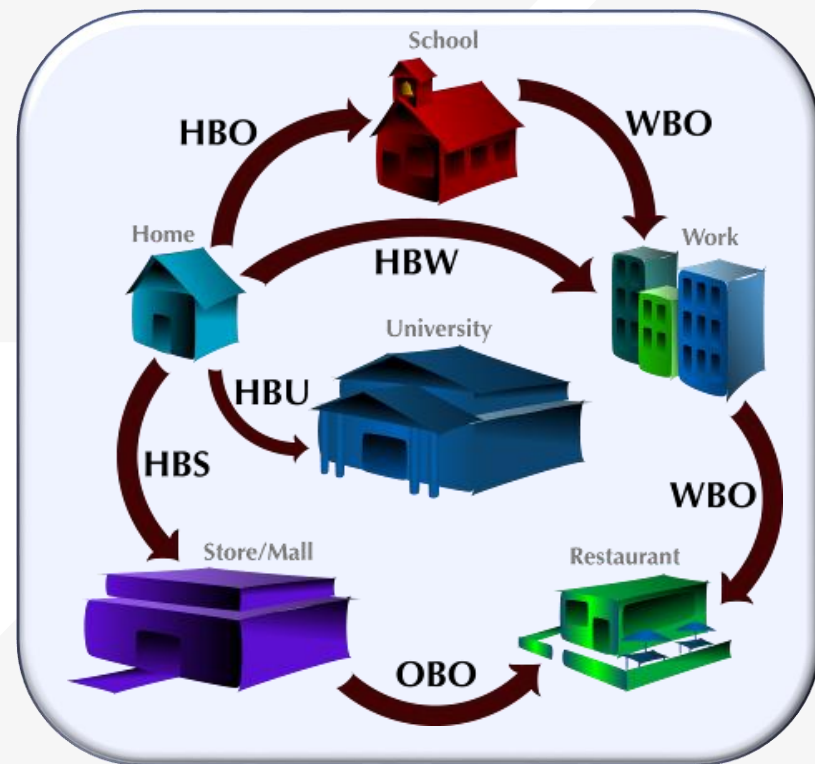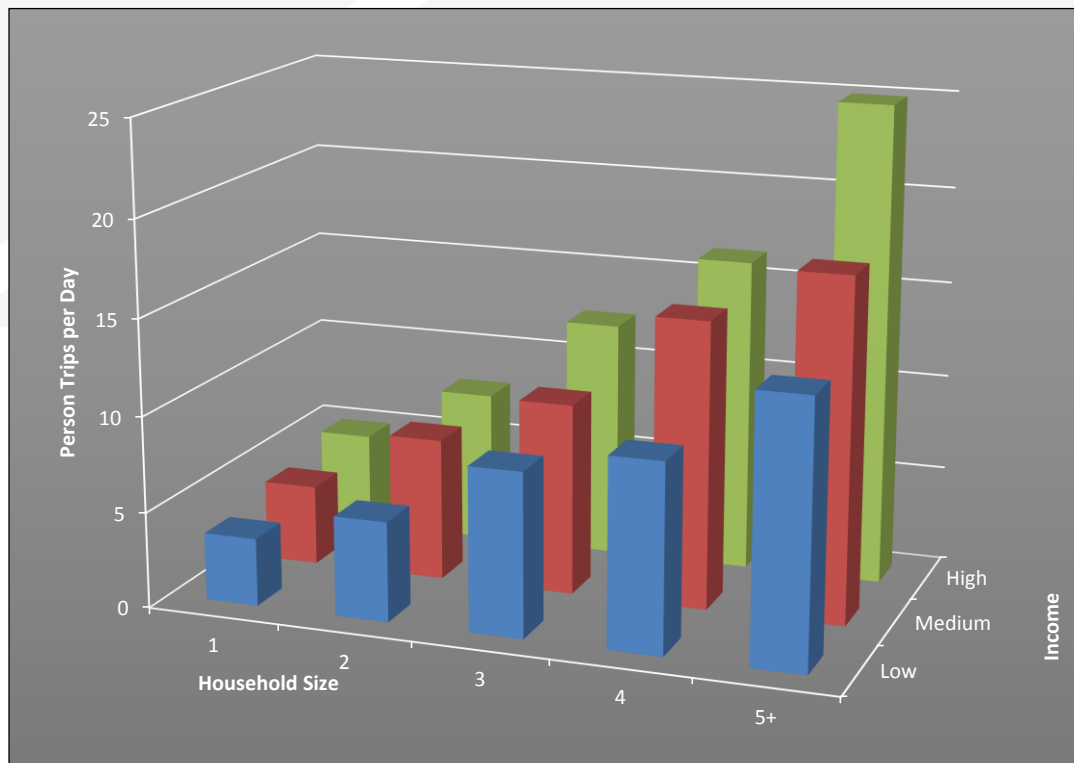
# Trip Generation: *How Many Trips?*

➤ Based on household survey

➤ Different trip purposes

➤ Generate all person trips*
- ▪ Walk
- ▪ Bike
- ▪ Transit
- ▪ Auto

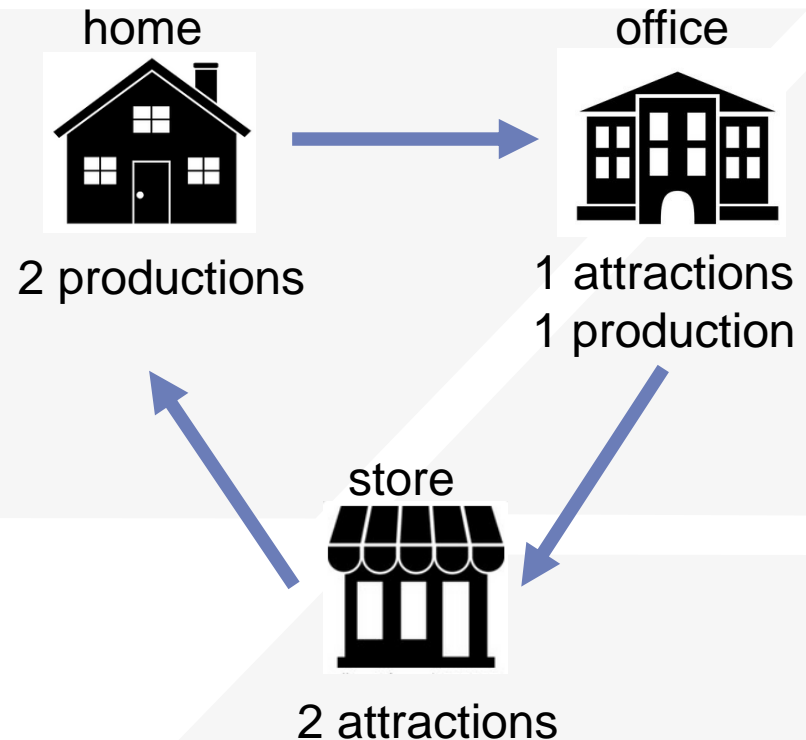*\* This is different than ITE Trip Generation, which only considers vehicle trips*

CAMBRIDGE SYSTEMATICS

# Trip Generation: *How Many Trips?*

➤ Cross-classified production rates

» Household size, income, number of workers

CAMBRIDGE SYSTEMATICS

# Trip Production and Attractions

➤ For a home-based trip, the home-end of the trip is always the production end and the other trip end is always the attraction end

➤ For a non-home based trip, the origin trip end is the trip production and the other end is trip attraction

home

office

2 productions

1 attractions
1 production

store

2 attractions

CAMBRIDGE SYSTEMATICS

# Production Rates

➤ The most common way to estimate trip productions is based on cross-classified trip rates

➤ Segment population by 2 or 3 important characteristics including household size, income, number of workers, vehicle availability, etc.

➤ Estimate trip production rates for each segment (typically using a household travel survey)

» Trip rates are usually estimated by trip purpose

➤ Smooth trip rates across segments based on expected patterns- i.e. as the income rises so should trip rates

**CAMBRIDGE SYSTEMATICS**

# Attraction Rates

➤ Attractions are typically estimated based on regression equations

➤ For example, in the SCAG model

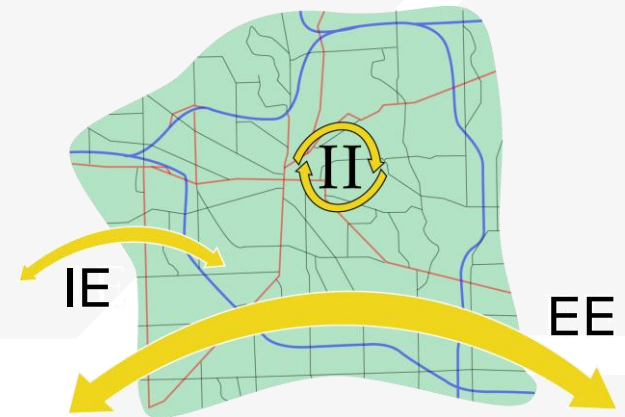WBO attractions=

$0.036*$ HHlds+

$0.202*$ TotEmp+

$0.513*$ RetEmp+

$1.147*$ ServEmp

SCAG Southern California Association of Governments

CAMBRIDGE SYSTEMATICS

# External Trips

- In addition to trips within the modeled region, there are trips that begin and/or end outside the region

  » There are trips from San Diego to Fresno

- Internal-external/external-internal (IE/EI) trips have one end in the modeled region while external-external (EE) trips are through trips

- IE/EI and EE trips are usually based on counts along facilities that cross the regional boundary

- IE/EI trips are distributed within the modeled region together with the II trips



II

IE

EE

CAMBRIDGE SYSTEMATICS

# Special Generators

➤ Land uses that have unique trip generation and distribution characteristics that are not well captured by the standard model trip rates and trip distribution

» Lower or higher trip attractions

» Different trip purposes

➤ These are typically attractions

➤ Examples

» Universities

» Airports

» Casinos

» Sports Arenas

CAMBRIDGE SYSTEMATICS

# Trip Productions/Attractions Balancing

➤ Since trip productions and attractions are calculated independently of each other, the total numbers will likely be different

➤ May get 10,000 HBO productions and 9,000 HBO attractions

➤ Most of the time will want to balance to productions (household estimates are more reliable than commercial land use estimates)

➤ To balance to productions, will increase HBO attractions in each zone by multiplying by 10,000/9,000=1.11

CAMBRIDGE SYSTEMATICS