Trip Distribution

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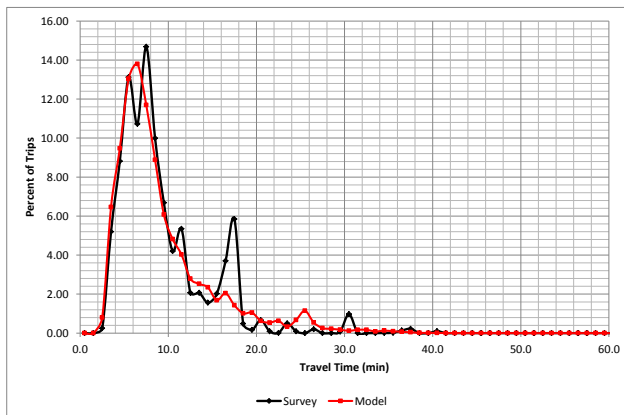
Trip Distribution: *Where will they go?*

➤ Match
  » Productions & attractions

➤ Survey Data
  » Trip length distributions
  » Subregion to subregion patterns

The *Gravity* concept can be used to model travel!

Trip Distribution

➤ Trips production and attractions are matched by trip purpose

➤ The distance between the production and attraction zones affects how many trips are made

» Zones closer together will have more trips between them

➤ Distance is accounted for by *friction factors*

» As the zones get further away from each other the friction factors decrease

➤ Friction factors are typically estimated based on household travel surveys or using Big Data (observed OD trip patterns)

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Trip Distribution

Trips between zones i and j are

$$T_{ij} = P_i \cdot \frac{A_j \cdot F_{ij} \cdot K_{ij}}{\sum_{i=1}^{n}(A_j \cdot F_{ij} \cdot K_{ij})}$$
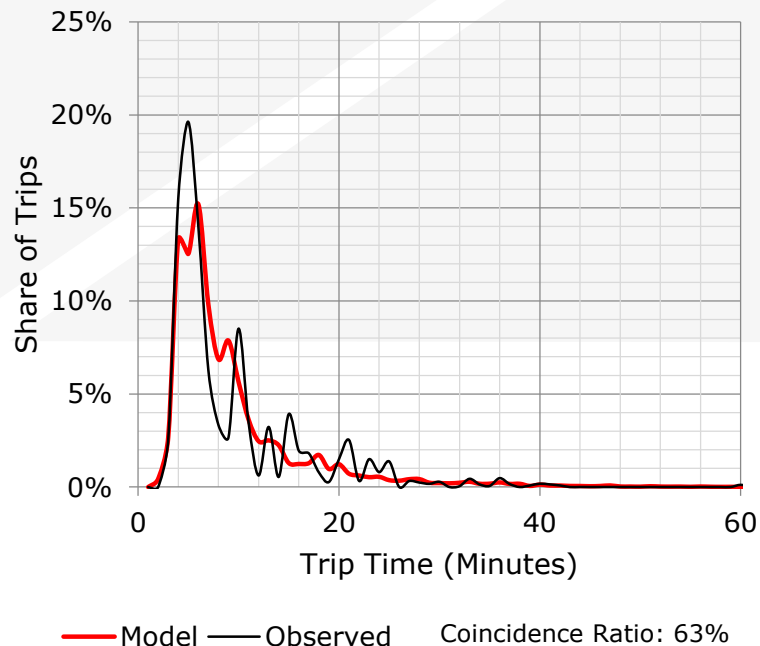
Where:

T_{ij} = trips from zone i to zone j

P_i = productions in zone i

A_j = attractions in zone j

K_{ij} = K-factor adjustment from i to zone j

i = production zone

j = attraction zone

n = total number of zones

F_{ij} = friction factor

Example of friction factors plot

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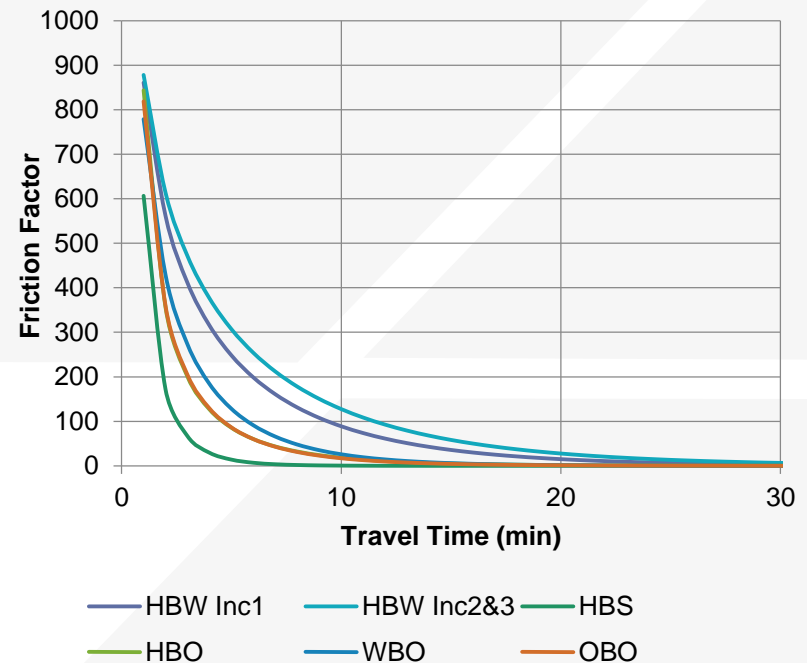
Trip Length Distributions

City of San Luis Obispo Home-Based Work Trip Length Distribution

- Friction factors are adjusted until the modeled trip length distribution looks similar to the observed trip length distribution

- Different friction factors are estimated by trip purpose

- Friction factor distribution is a Gamma function with 3 parameters that can be adjusted

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Intrazonal Trips

Interzonal trip

- » Considered in mode choice and assignment
- » Trips travel zone to zone

Intrazonal trip

- » Trips stays in zone
- » Trips never appears on network links

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