

2024 Pacific NW Regional Economic Conference, Bend Oregon

# The 2024 Oregon Travel Study: Behavior Data Used in Travel Forecast Models

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# Today's Topic Includes:

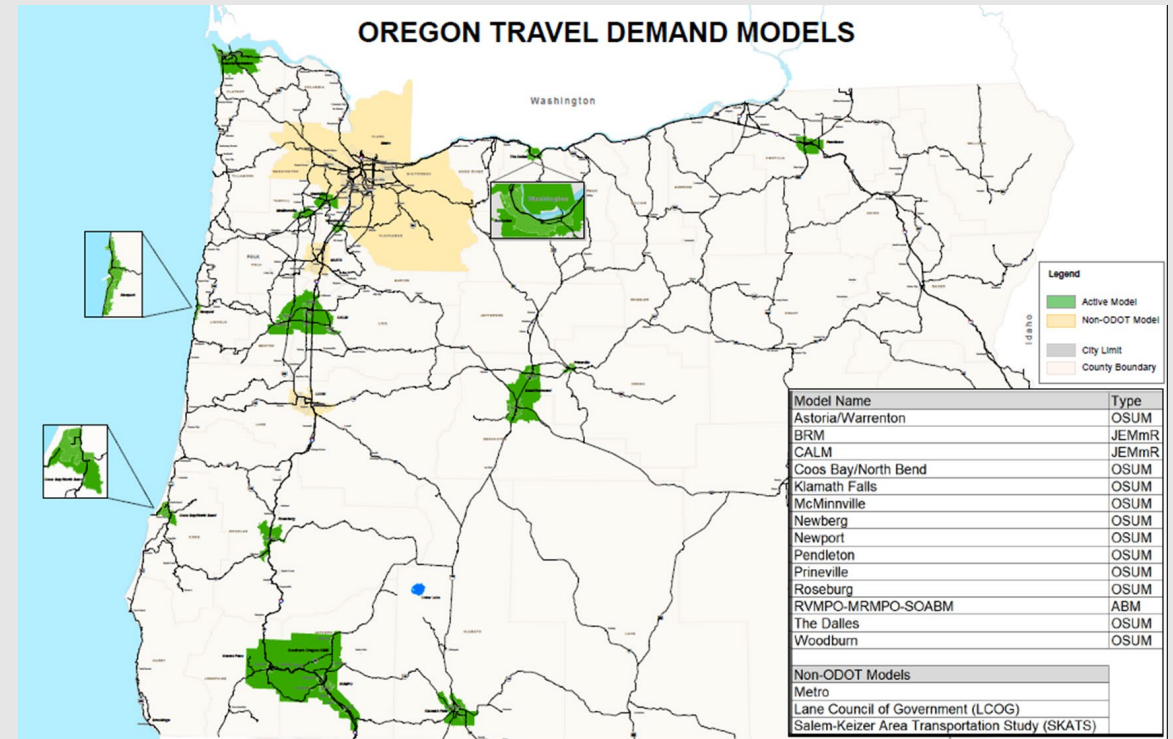
- Who needs the data
- What a Travel Survey is
- How the data is collected
- How the data will be used



<https://oregontravelstudy.com/>

# Household Travel Surveys Inform Forecast Models

- Urban travel models are **required** by Federal Highway Administration (FHWA) for use in developing Metropolitan Planning Organizations' (MPOs) Transportation System Plans,
- FHWA requires use of **current data**
- ODOT statewide model provides context to MPO models, forecasting future changes to external economic and traffic conditions



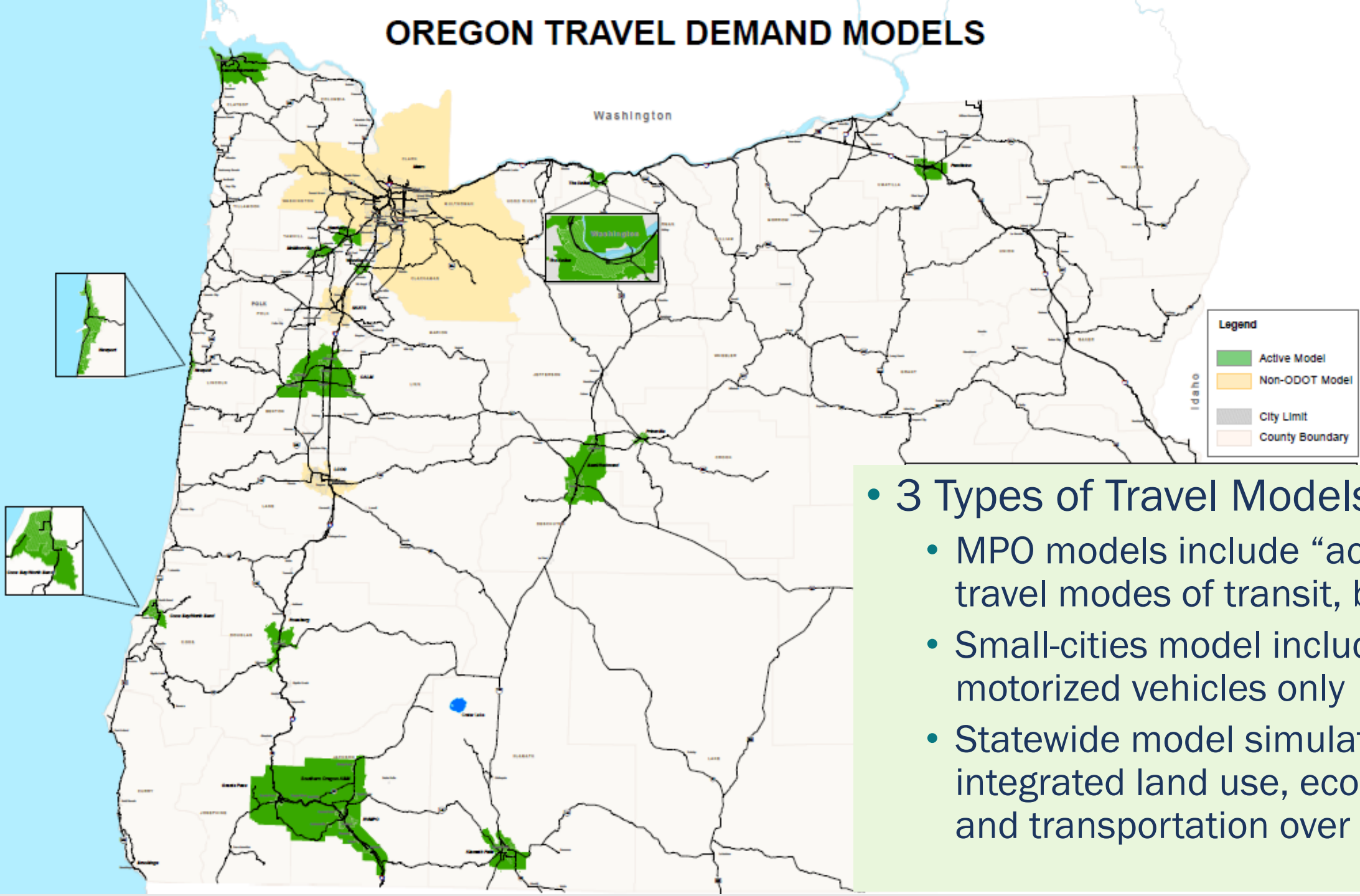
# Household Travel Surveys Inform Forecast Models



- Models are based on **utility theory**, assumes people seek to minimize travel costs
- **Trip simulation models** represent the current standard of practice. These are also called “four-step models” based on the sequence of equations for estimating:
  1. Trip Generation,
  2. Trip Distribution,
  3. Mode Choice,
  4. Traffic Assignment.

For more information see Chapter 17 of the ODOT Analysis Procedures Manual  
[https://www.oregon.gov/odot/Planning/Documents/APMv2\\_Ch17.pdf](https://www.oregon.gov/odot/Planning/Documents/APMv2_Ch17.pdf)

# OREGON TRAVEL DEMAND MODELS



- 3 Types of Travel Models

- MPO models include “active” travel modes of transit, bike, walk
- Small-cities model includes motorized vehicles only
- Statewide model simulates integrated land use, economics, and transportation over time

# A Travel Survey is a Diary of all Household Activity and associated Travel

- Revealed-preference survey
- Travel is a derived demand
  - Joint HH decision making
  - Facilitates economic activity
  - Connects people to what they want & need
  - Time of day/day of week variations

*No other data sets adequately represent person-level behavior with context*



# Data Collection Approach



- Statewide, collecting data from ~23,000 households
- 8 Oregon MPOs are funding partners
- ODOT covers non-MPO areas with small cities and rural regions

# Oregon Modeling Statewide Collaborative (OMSC)

[About the OMSC](#)[OMUG](#)[Meetings](#)[Subcommittees](#)[Documents](#)[More](#)

## About the OMSC

The Oregon Modeling Statewide Collaborative (OMSC) began in 1996 as a peer review group for the Oregon Department of Transportation's Modeling Improvement Program. Since the OMSC was first convened, participating agencies saw a need for collaboration as analysis tools were developed by different transportation and planning organizations around the state. The OMSC allows Oregon to leverage the collective strengths and experiences of multiple agencies when developing new transportation analysis tools, associated data, and research.

The OMSC is a voluntary staff-level technical collaborative.

We do not direct or recommend public policy.



OREGON HOUSEHOLD  
ACTIVITY SURVEY



<https://www.oregonmodels.org/>

# Data Collected

## Household demographics

- Size, income, location, race,

## Person demographics

- Employment status, age, occupation



## **\*NEW\*** Data

- Uber, Lyft,
- E-commerce purchasing and deliveries (Uber eats, groceries, Amazon)
- Telecommuting



## Trips

- All trips, all modes-drive, bike, walk, bus
- Time of day, duration, route, origin-destination
- Trip purpose – shopping, commute, personal business,

## Vehicles

- Auto make, model, year, fuel type
- Bike ownership

# Primarily smartphone-based data collection



Smartphone app-based data collection provides:

- ✓ Detailed demographic information
- ✓ Detailed trip paths/traces, locations, and travel times

Week-long travel periods provide:

- ✓ More geographic coverage in trip data
- ✓ More data for less common modes – bike, transit, Uber/Lyft

Continue to see a year-over-year increase in smartphone participation. Currently seeing between 50-80% smartphone participation. Since 2015, rMove has been used by over 100,000 survey participants in 12 languages



# Data Collection and Analysis

## RECRUITMENT



### Mailed Invitation Materials

- **Address-based sampling** used by drawing a random sample of addresses from all residential addresses in the survey region.
- An invitation letter is sent followed by 1 or 2 reminder postcard(s).

## DATA COLLECTION



75%

SMARTPHONE



20%

ONLINE



5%

CALL CENTER

*Approximate shares by participation mode*

## DATA ANALYSIS

Data from all three participation methods is combined into a single weighted dataset.

- Allows for the full sample to be used in all analysis.
- Weighting accounts for historical trip underreporting observed in online and call center participant diaries.



# Historical Underrepresentation in Travel Survey Data

Some demographic groups are considered hard-to-reach because they face significantly more barriers to participate in surveys, including:

People with low  
incomes

People with  
disabilities

People of color

People who are  
recent immigrants or  
new Americans

To address underrepresentation, we must take action to reduce these additional barriers to participation that certain demographic groups face and incentivize participation.

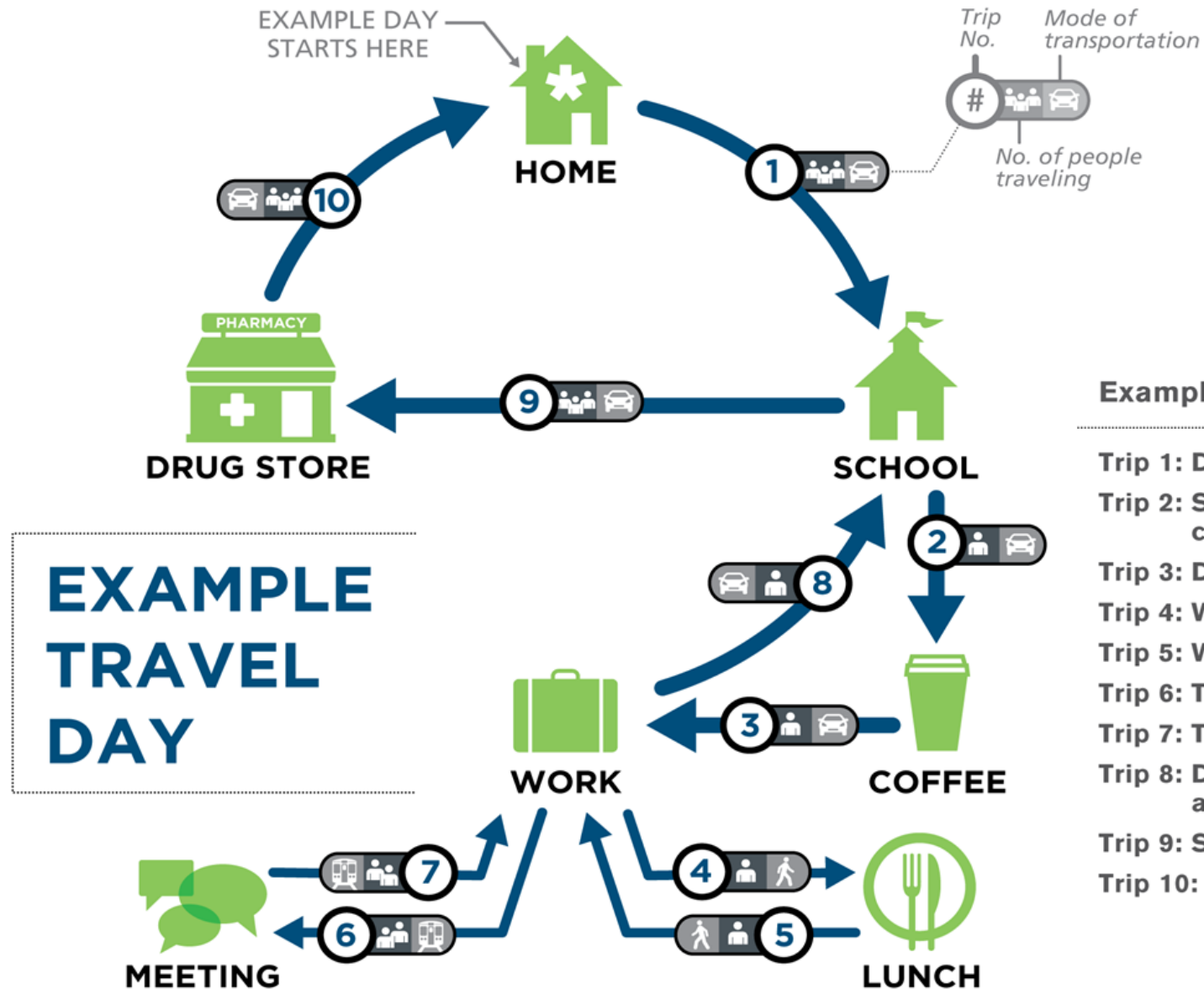


# Efforts to improve equity and representation

1. Outreach to community-based organizations from underrepresented communities to build partnerships and communicate the importance of the survey
2. Implement new sampling approaches:
  - More aggressive oversampling using address-based sampling
  - Implement supplements to address-based sampling
3. Offer differential incentives to underrepresented groups
4. Multiple language options to reduce barriers to participation for limited-English speakers



# Travel Day Data Collection

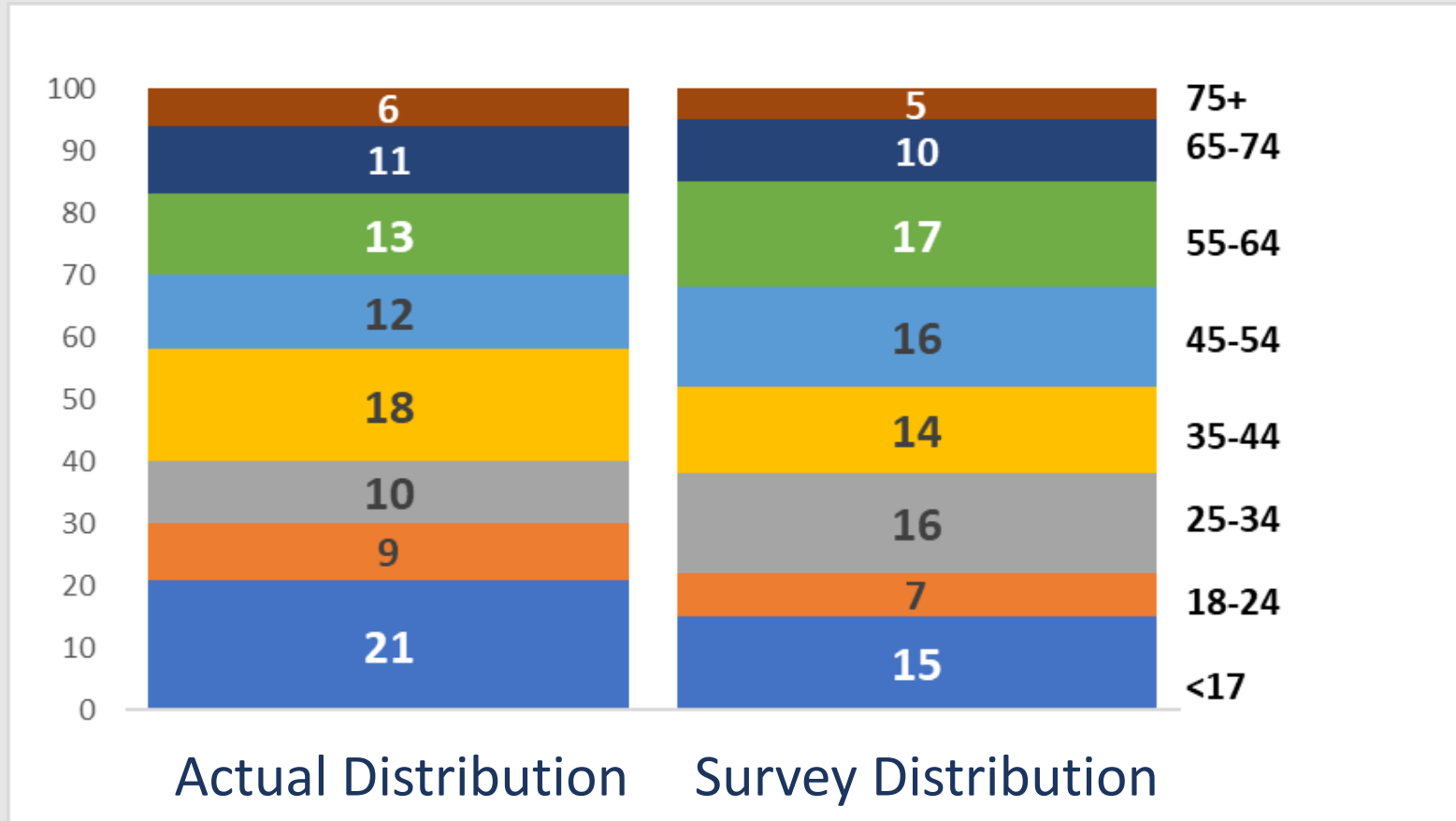


## Example Travel Day Trips

- Trip 1: Drive children to school
- Trip 2: Stop to get coffee at convenience store
- Trip 3: Drive to work
- Trip 4: Walk across street to lunch
- Trip 5: Walk back to work
- Trip 6: Take subway to a meeting
- Trip 7: Take subway back to work
- Trip 8: Drive to pick up children at school
- Trip 9: Stop at drug store
- Trip 10: Drive home

# Data Sampling Frame

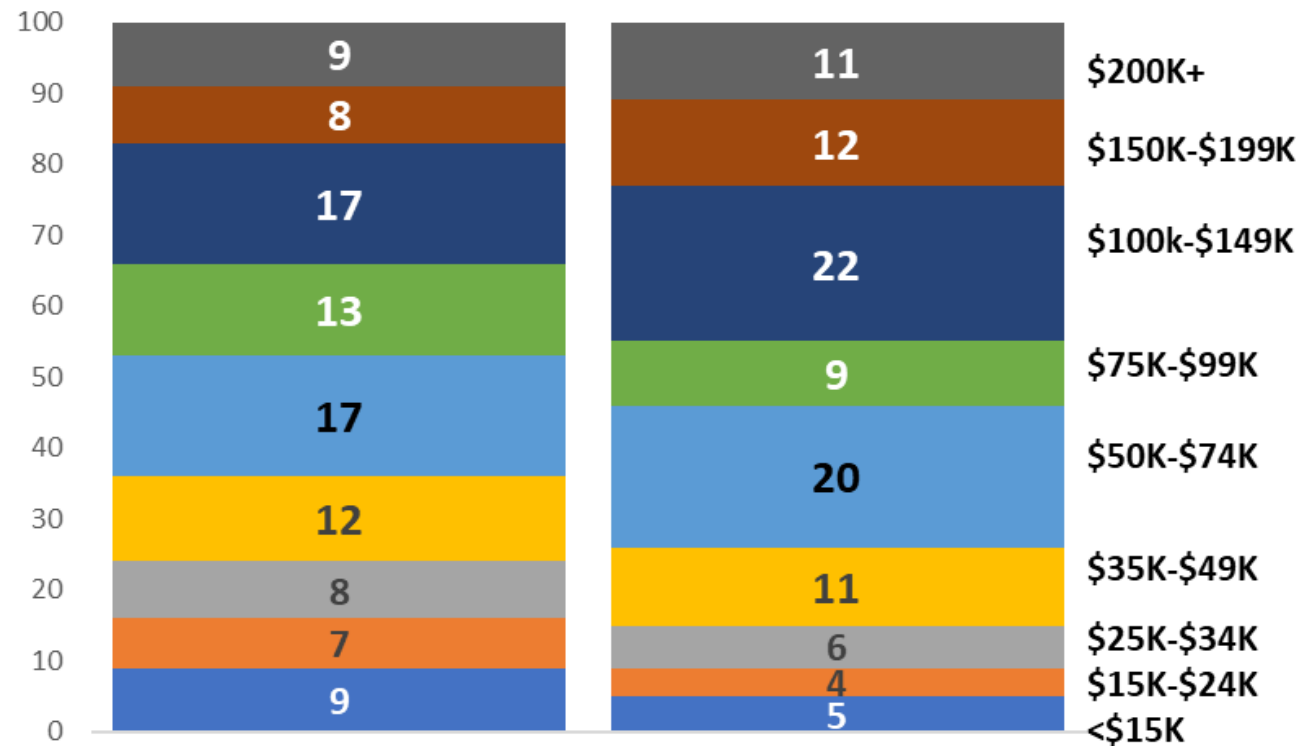
## Example: Sampling by Age



- Goal is to gather a data set that statistically represents the Oregon population
- Data must be collected randomly, sampling targets identified and met for variables key to accurate demand representation

# Data Sampling Frame

## Example: Sampling by Income



Actual Distribution    Survey Distribution

- Final survey will be weighted to represent the entire state.
- Any mismatch between what the actual distribution compared to what was collected will introduce bias and error to analysis using the data



# Survey Branding



## Mailing Envelope



## Invitation Letter & FAQ

OREGON TRAVEL STUDY

PO Box 250, Gladstone, OR 97027

First and last name/City name resident:  
Street Address 1:  
Street Address 2:  
City, OR < 97027 >

Letter Date:

We're inviting you to participate in the Oregon Travel Study sponsored by the Oregon Modeling Statewide Collaborative.

By taking part, you'll help us understand how local roads, highways, public transportation, bike lanes, and sidewalks are used today, and how they can be improved to make travel better in the future. We want to hear from you even if you don't travel often. Your input will have a big impact because only a limited number of households have been invited to participate in the survey. Follow the instructions below to sign up today. Your voice can shape the future of your community.

**GET STARTED TODAY** INVITATION ACCESS CODE: XXXXXXXX

**OPTION 1** Download the smartphone app rMove™ and sign up → Tell us about your travel for 7 Days → Receive \$XX per adult after all adults complete the survey

**OR**

**OPTION 2** Sign up at OregonTravelStudy.com or call 1-888-205-7905 → Tell us about your travel for 1 Day → Receive \$XX per household after completing the survey

You can participate in English and Spanish through the survey smartphone app, the online survey, or by calling toll-free.

**ESPAÑOL** - Lo invitamos a completar una encuesta sobre su viaje. Si participa, nos ayudará a mejorar los servicios de transporte en su comunidad. Después de haber completado la encuesta, le enviaremos un tarjeta de regalo como agradecimiento. Para aprender más, visite OregonTravelStudy.com o llame al 1-888-205-7905.

Learn more at OregonTravelStudy.com or by calling 1-888-205-7905

OREGON TRAVEL STUDY

**FREQUENTLY ASKED QUESTIONS**

**What is this study all about?**  
We want to learn how, when, where, and why people travel in and around Oregon. We're asking you to log your travel to help us understand regional transportation patterns. By participating you can help us plan for future transportation improvements in your community.

**Why should I participate?**  
Your participation ensures that households like yours are represented in our regional transportation plans. Your input has a big impact because only a limited number of households are invited to participate.

**How is my personal privacy protected?**  
We are committed to protecting the confidentiality, integrity, and security of your personal information. We take this responsibility seriously. We will not disclose or share personal information we collect from you except as required by law. Our Privacy Policy is intended to help you understand how we collect and safeguard your information. To read the study's full privacy documentation, visit OregonTravelStudy.com.

**What if I don't travel much?**  
Any amount of travel (even if you don't make any trips) will help us improve regional transportation planning. Don't forget that short trips, such as walking the dog, count too.

**What if my transportation habits during the study aren't my "typical" habits?**  
That's no problem - we still encourage you to participate. We'll also ask about your typical travel habits. How your travel has changed over the past year, and how you think you'll travel in the future.

**How was I selected to participate?**  
Invited households were selected at random from the State of Oregon.

**I was invited to use the study smartphone app, rMove. How does it work?**  
After you download rMove and sign up, rMove will log your trips for one week while you go about your daily life. Each day you'll be asked to complete a short daily survey about your travel habits as well as a trip survey about each trip you make.

**What do I get for participating?**  
You will receive a gift card once all members of your household have reported their travel and completed their surveys. If your household participates using the smartphone app, rMove, each adult will receive a gift card after completion (e.g. a household with two adults receives two gift cards). All adult household members must complete the study to be eligible for gift cards. Households that report their travel online or by calling in will receive a single gift card.

**How much time does it take to participate?**  
It takes about 10 minutes to sign up for the study. Once you sign up, we'll give you instructions for logging your travel and completing the study. Households that log their travel for seven days in the smartphone app, rMove, will spend about 5-10 minutes each day reporting their travel. Households that log their travel online or over the phone will spend about 10 minutes per household member reporting their travel for one day.

**Who is sponsoring this study?**  
This study is sponsored by the Oregon Modeling Statewide Collaborative.

Learn more at OregonTravelStudy.com or by calling 1-888-205-7905



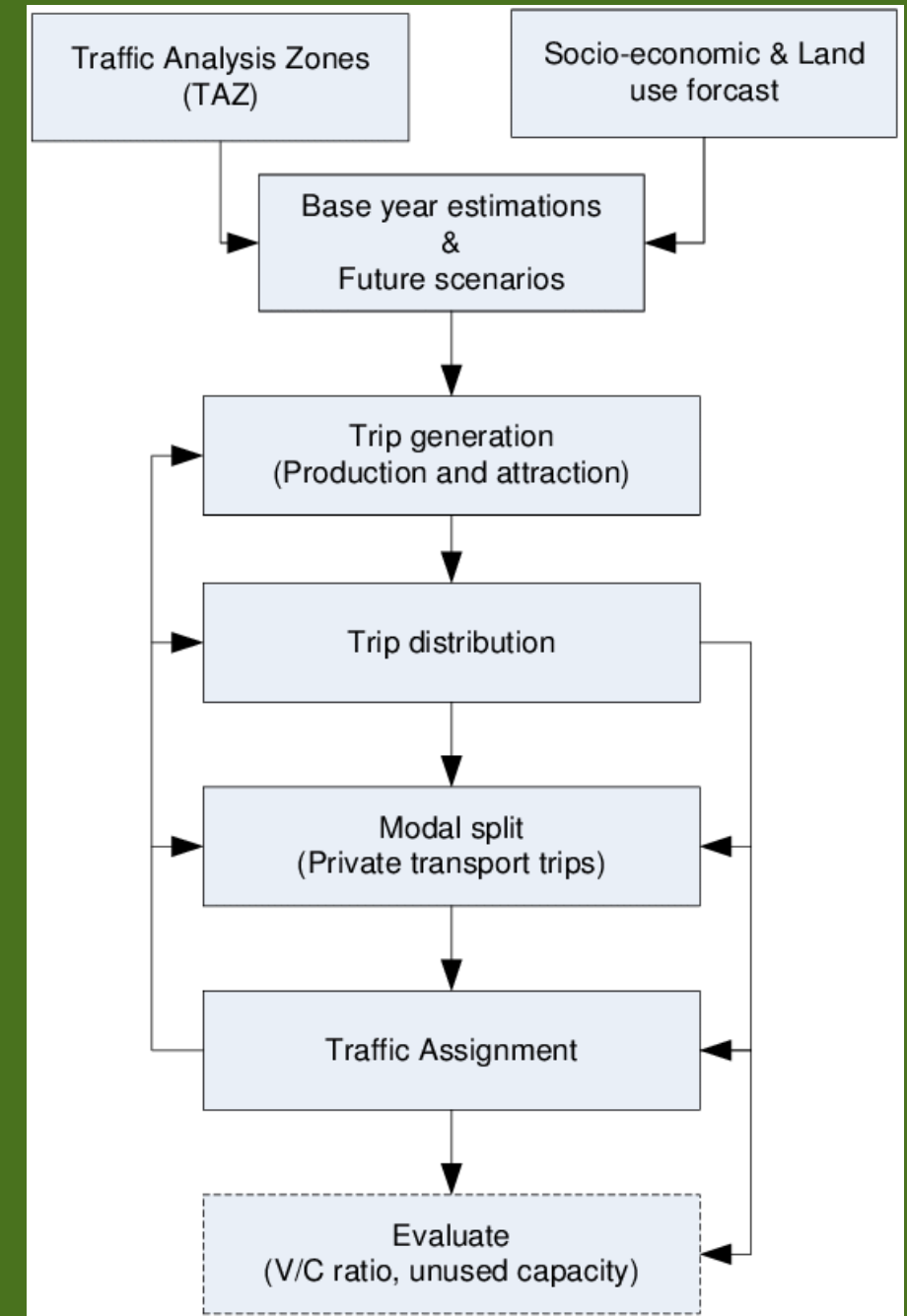
OREGON HOUSEHOLD  
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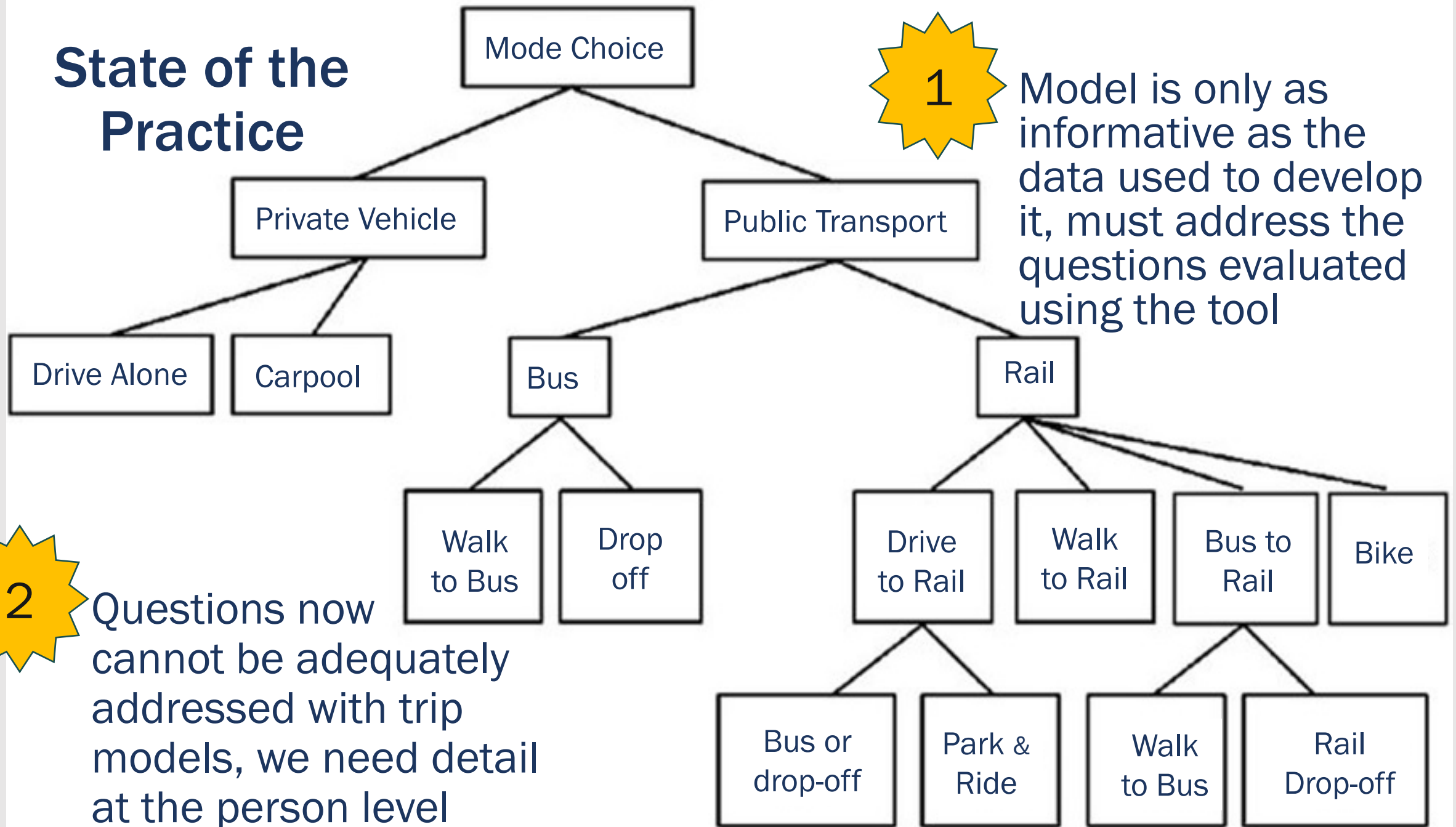


## How the Data is Used

- Estimate demand equations
- Probability based travel prediction
- Current models predict trips
- Next generation of models simulate person-level behavior for entire population, predict person activity

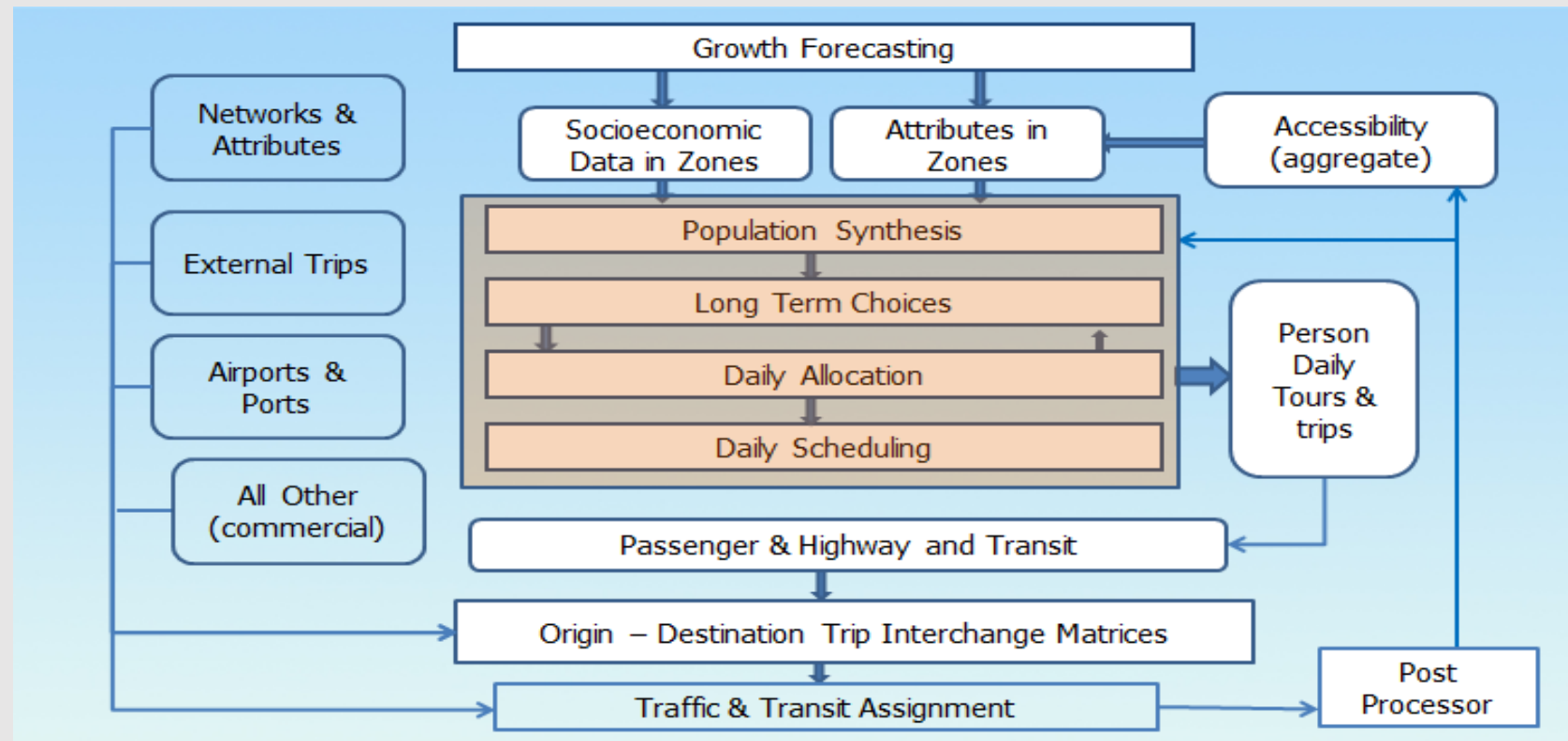


# State of the Practice



# Simulating Person Activity and Derived Travel

- ✓ Activity-Based Models are based on the premise that travel demand is derived from people's daily activity patterns
- ✓ These models predict which activities are conducted when, where, duration, for and with whom, and the travel choices made to complete them.



Activity Simulation Schematic – Southern California Assoc. of Governments

# Final Data Set Expected Early 2025

Final summary report will  
be posted online





**OREGON**  
TRAVEL STUDY

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# Questions?

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