



2024 Pacific NW Regional Economic Conference, Bend Oregon

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

Becky Knudson

Senior Transportation Economist

Transportation Planning Analysis Unit

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Today's Topic Includes:

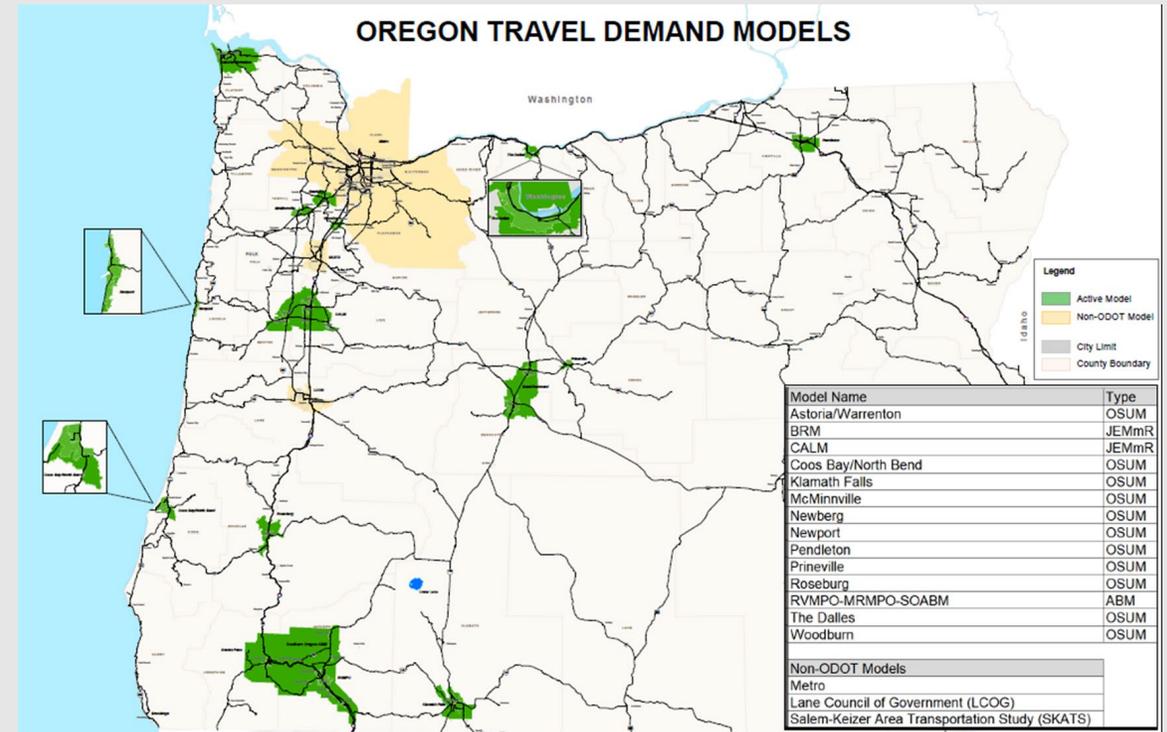
- Who needs the data
- What a Travel Survey is
- How the data is collected
- How the data will be used



<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



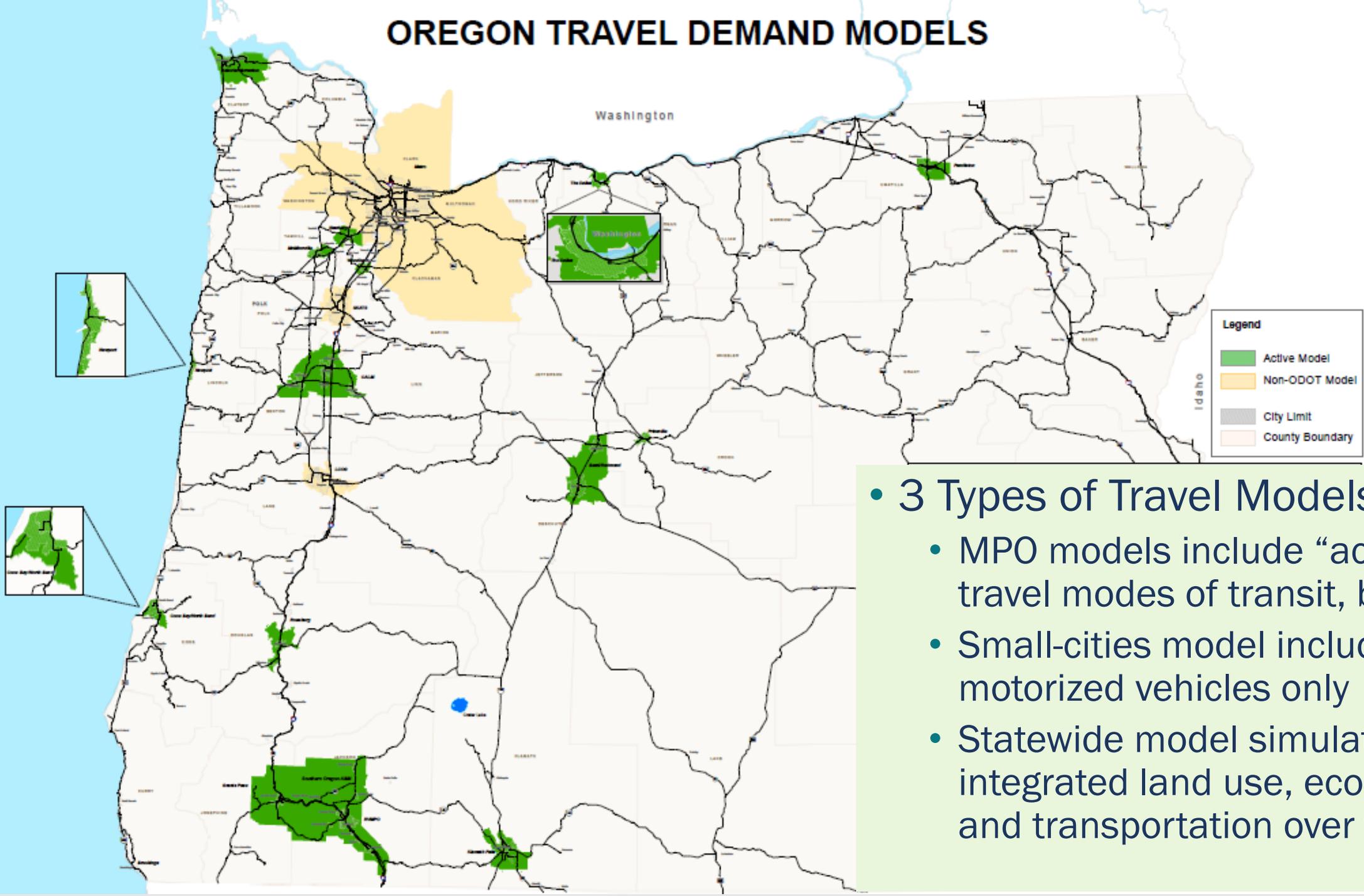
Household Travel Surveys Inform Forecast Models



- 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

OREGON TRAVEL DEMAND MODELS



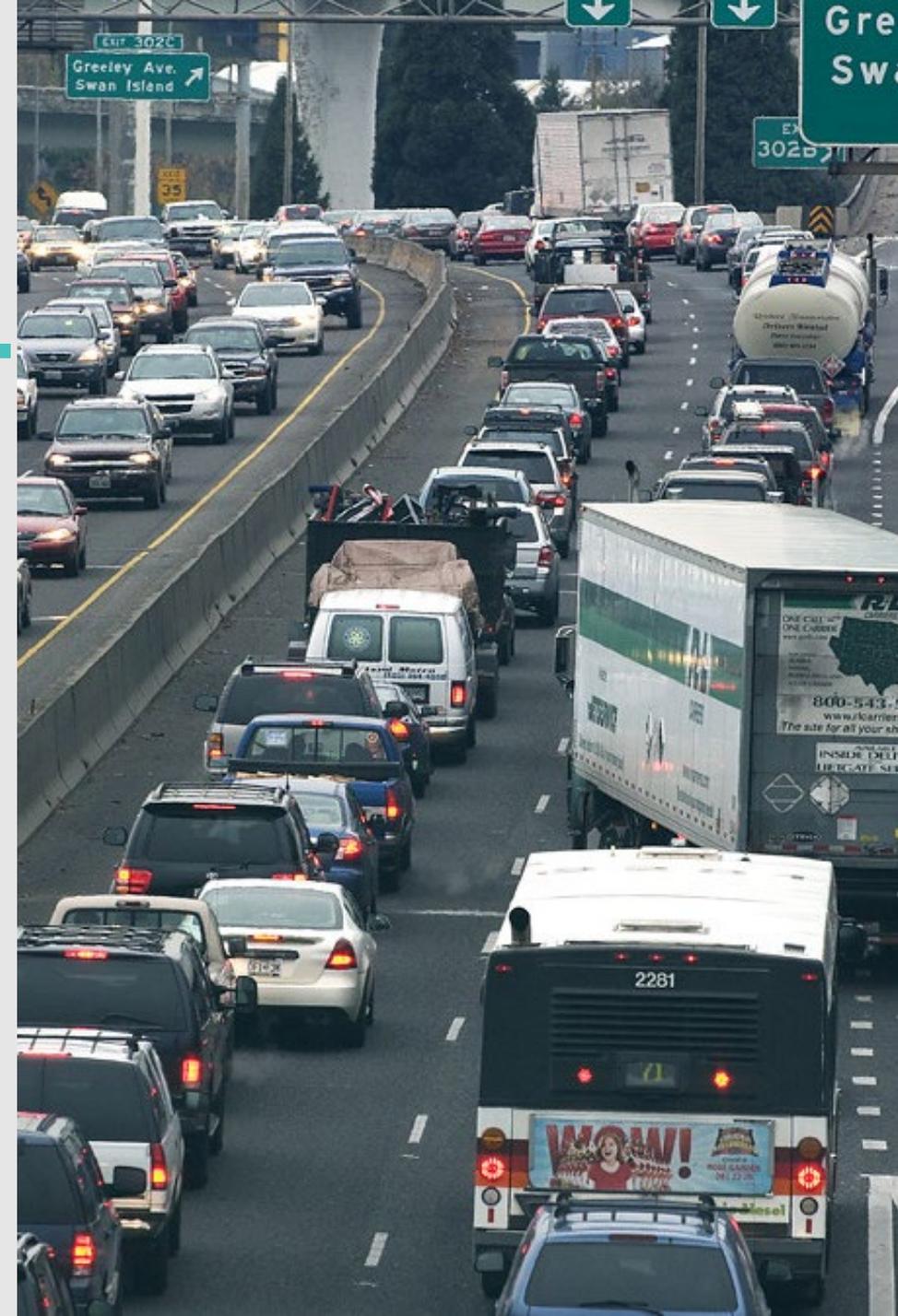
- 3 Types of Travel Models

- 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.

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



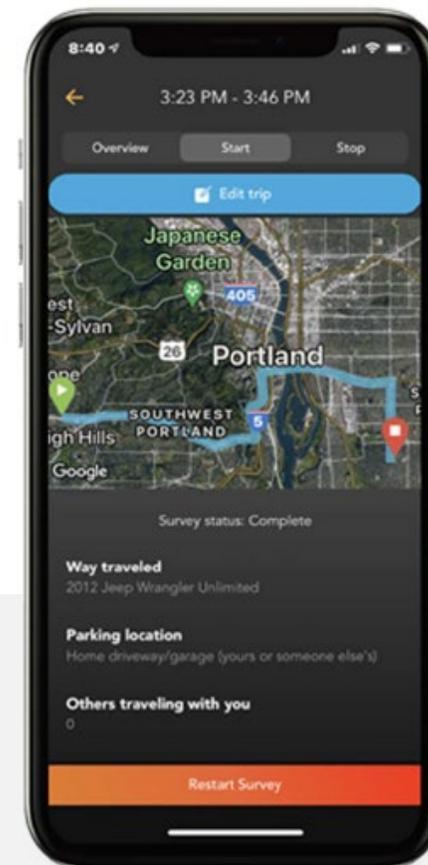
Smartphone app-based data collection provides:

- ✓ 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.

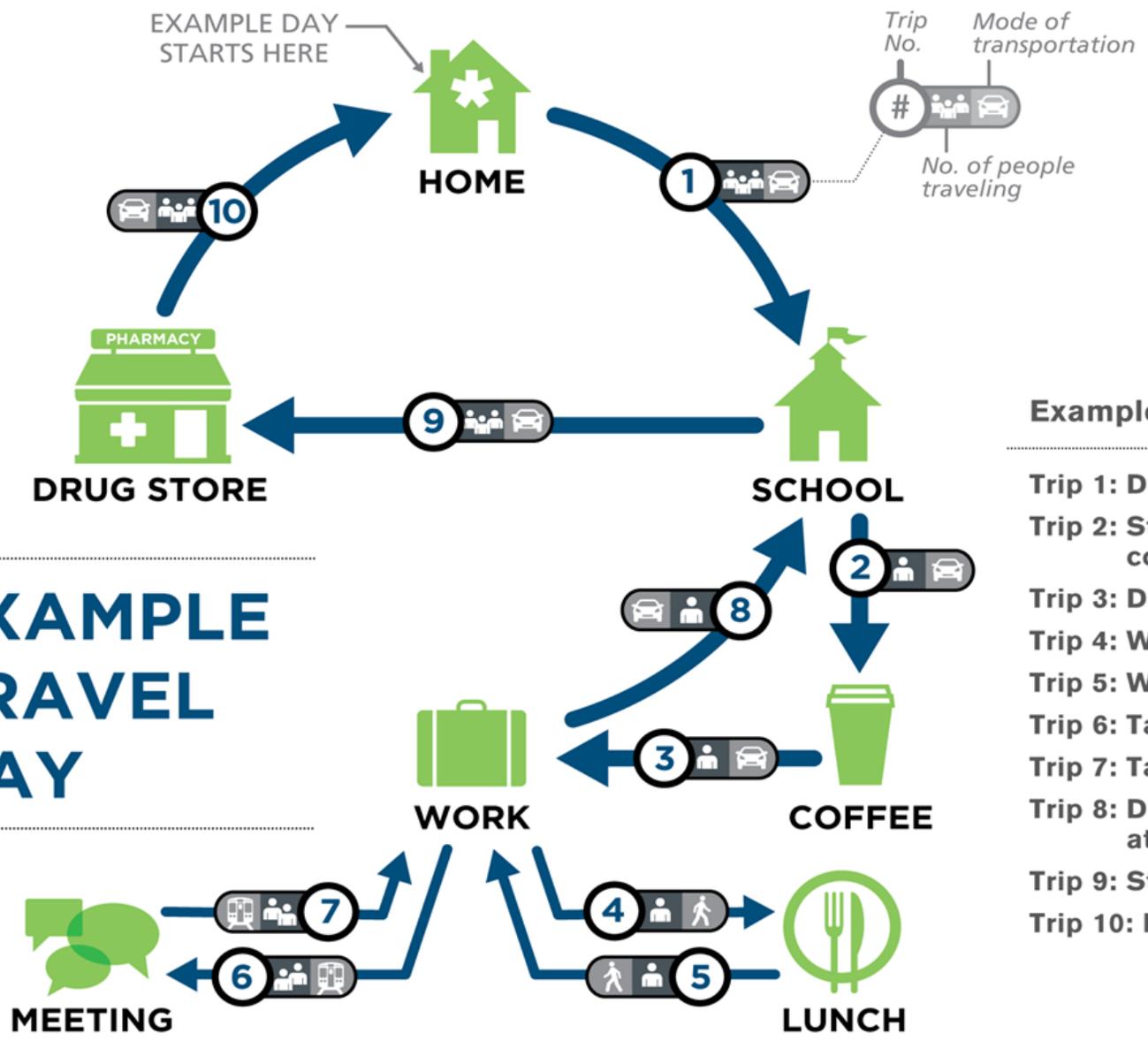
Efforts to improve equity and representation

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

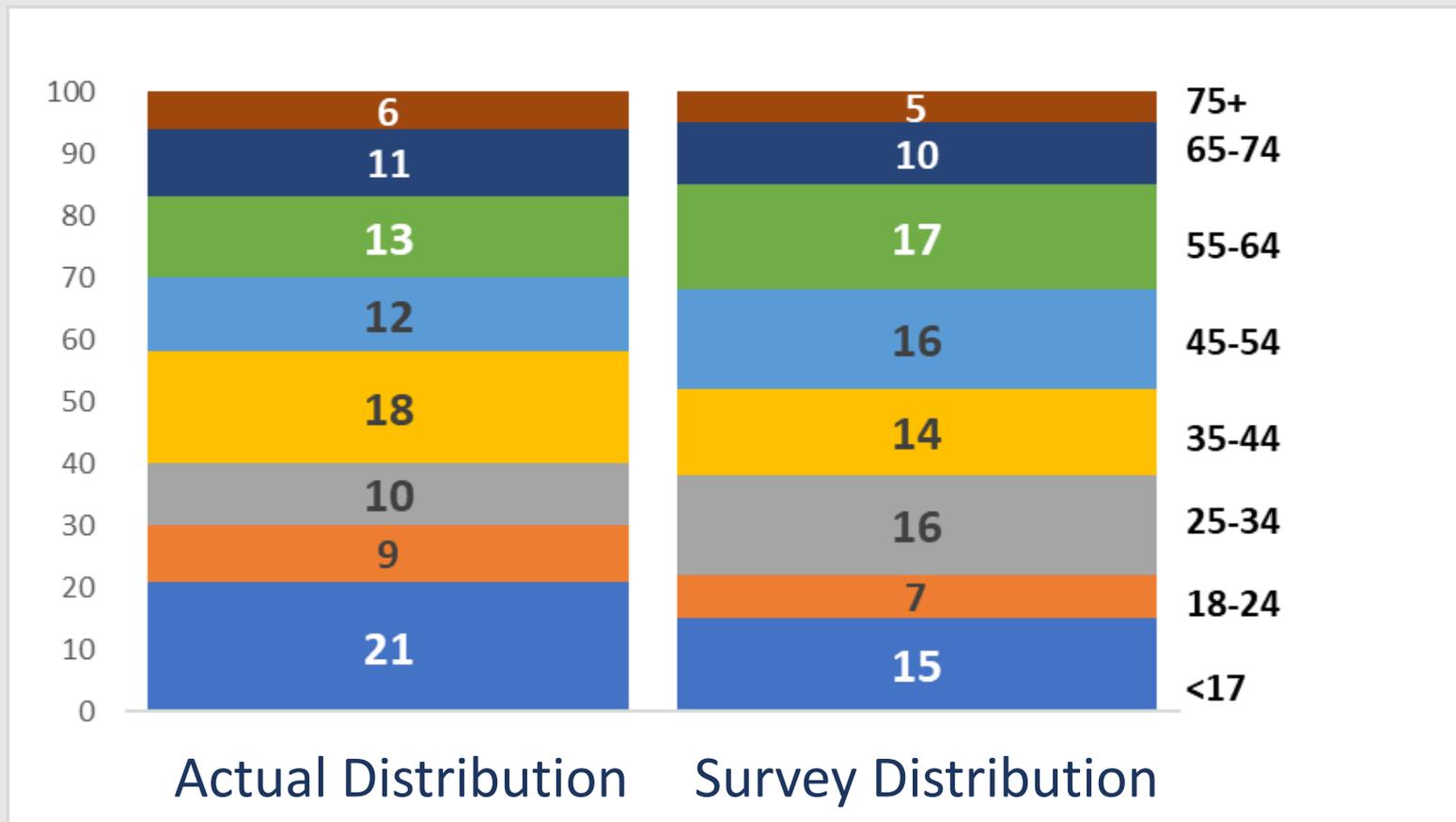


Example Travel Day Trips

- 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

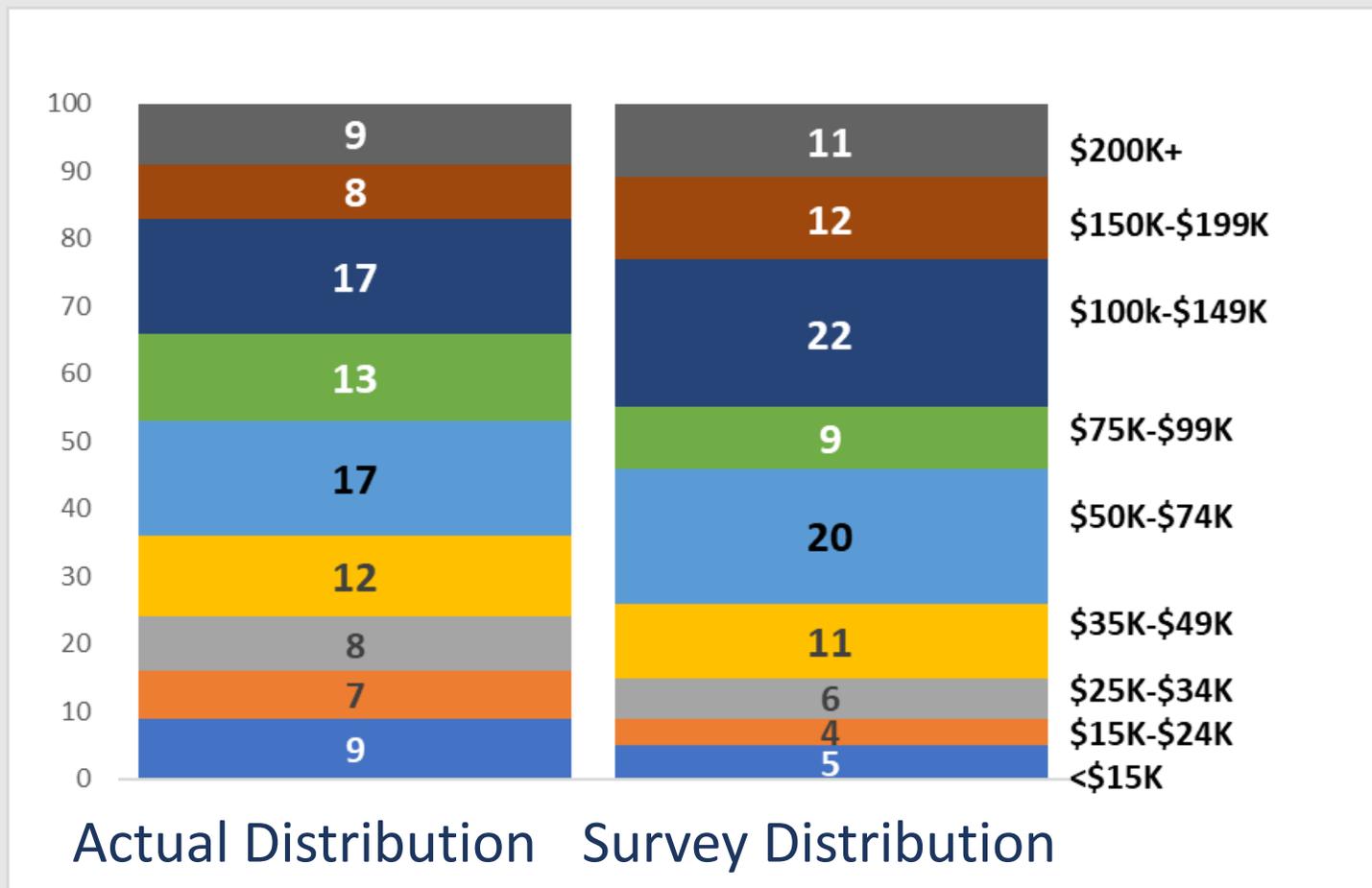
Example: Sampling by Age



- 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



- 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 Modeling Statewide Collaborative
300 Box 250, Gladstone, OR 97027

OREGON
TRAVEL STUDY

PO Box 250, Gladstone, OR 97027

Oregon Modeling Statewide Collaborative
300 Box 250, Gladstone, OR 97027

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 invited 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.

GET STARTED TODAY INVITATION ACCESS CODE: XXXXXXXXXX

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 sus viajes. El participante puede a través del sistema de transporte o su teléfono móvil. Después de haber completado la encuesta, le enviaremos un regalo de regalo como agradecimiento. Para registrarse, visite OregonTravelStudy.com o llame al 1-888-205-7905.

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

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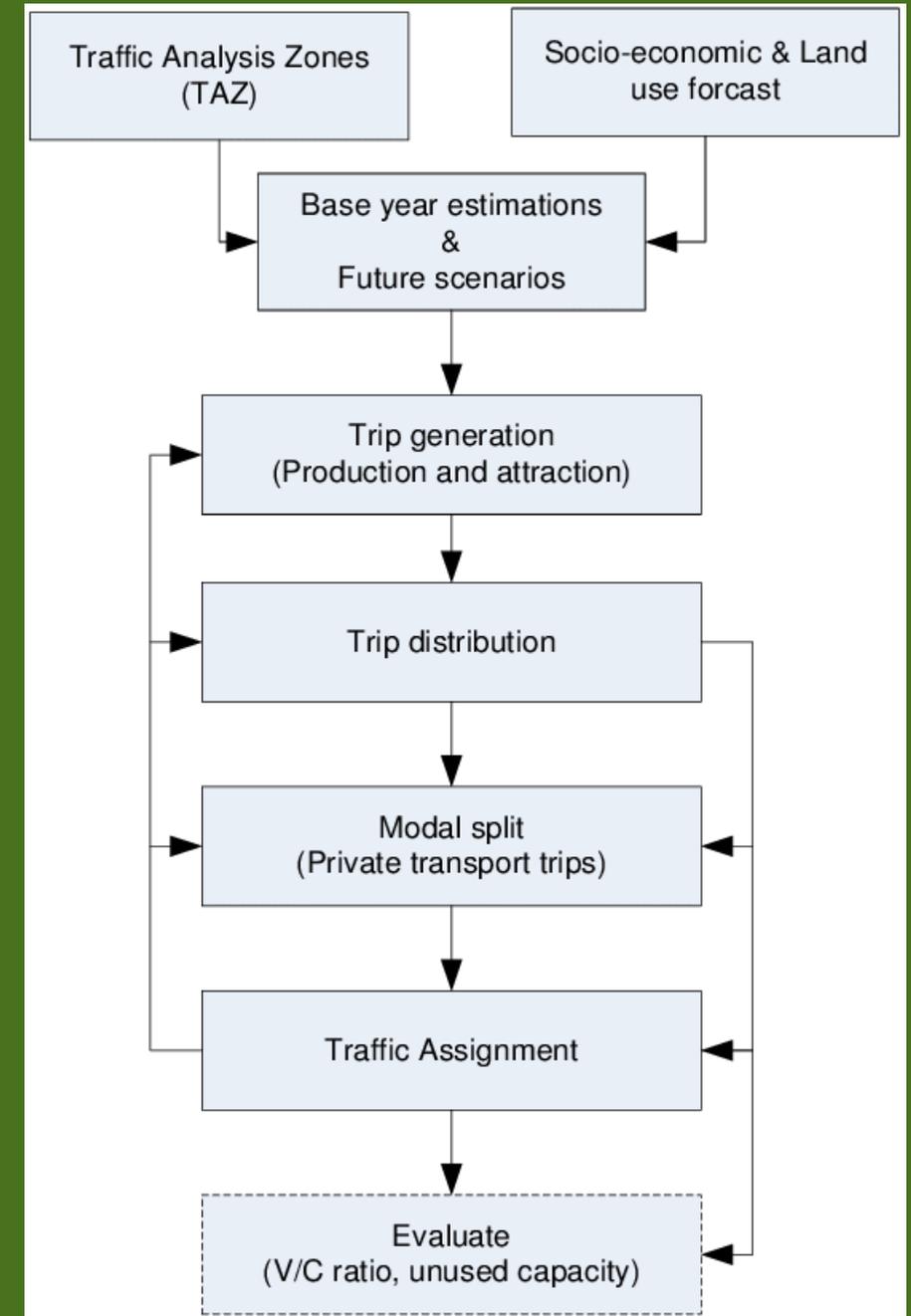
OREGON HOUSEHOLD
ACTIVITY SURVEY



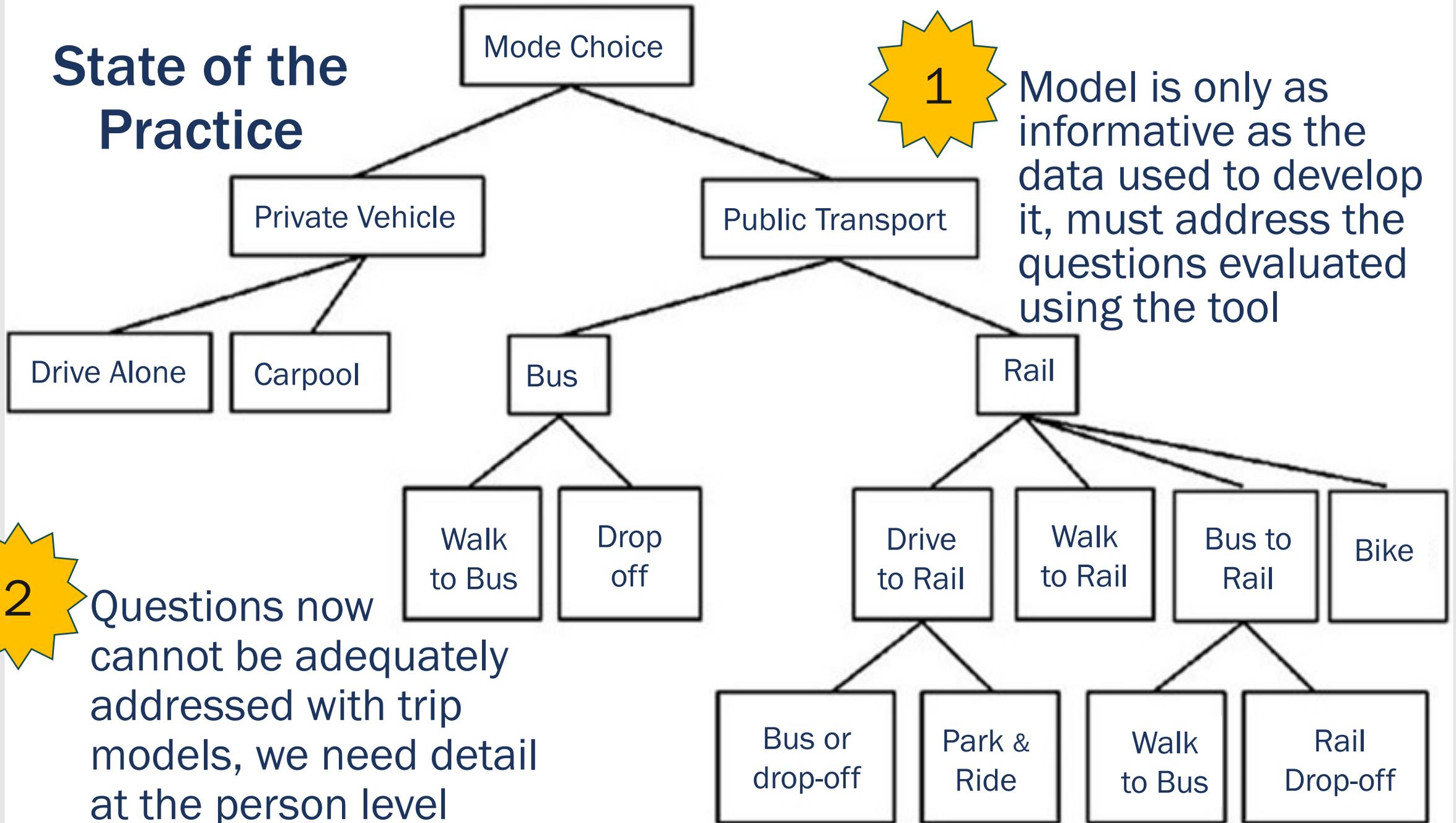


How the Data is Used

- 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

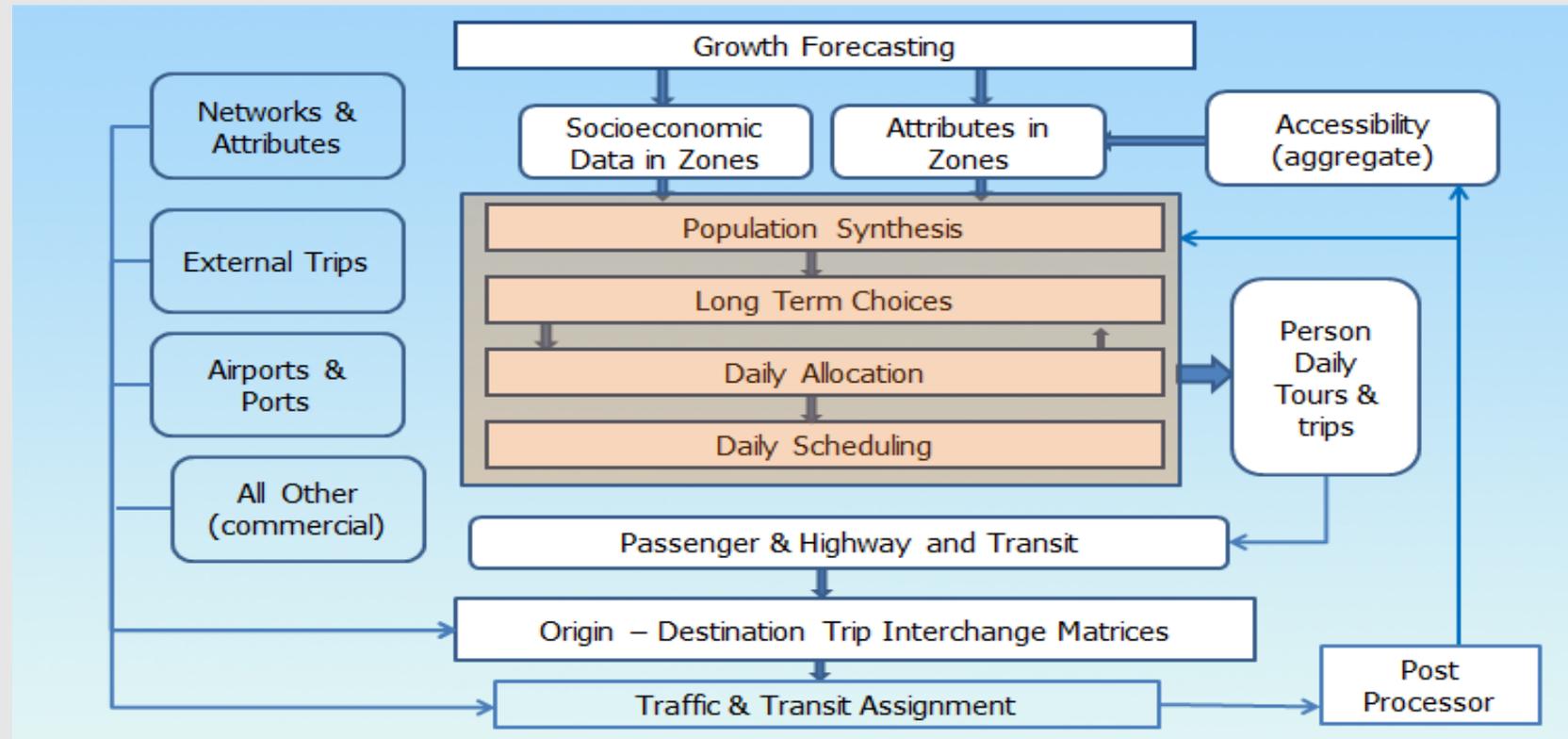


State of the Practice



Simulating Person Activity and Derived Travel

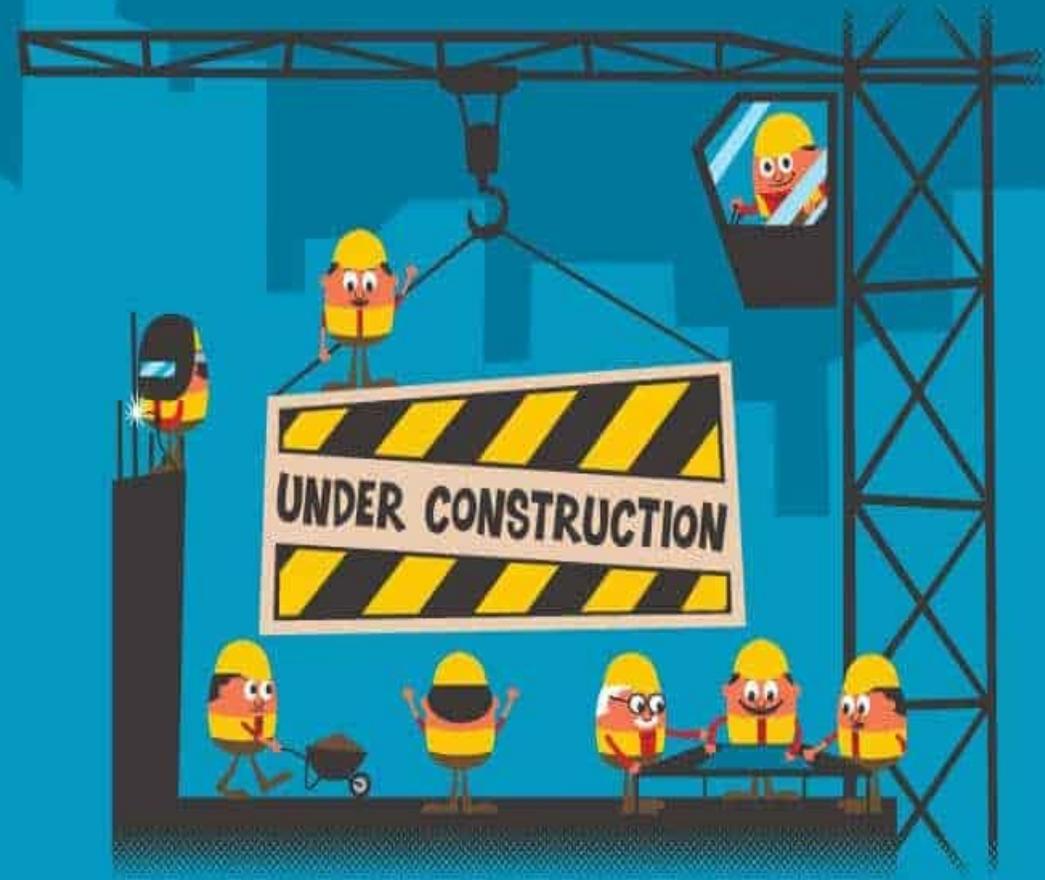
- ✓ Activity-Based Models are based on the premise that travel demand is derived from people's daily activity patterns
- ✓ These models predict which activities are conducted when, where, duration, for and with whom, and the travel choices made to complete them.



Activity Simulation Schematic – Southern California Assoc. of Governments

Final Data Set Expected Early 2025

Final summary report will
be posted online





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Questions?

Becky Knudson
Senior Economist
Oregon Department of
Transportation

rebecca.a.knudson@odot.Oregon.gov