

# Household Travel Survey Data Collection: Meeting the needs of planning practice & research

12 December 2024

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Puget Sound Regional Council




*We are leaders in the region to realize equity for all. Diversity, racial equity and inclusion are integrated into how we carry out all our work.*

[psrc.org/equity](https://psrc.org/equity)

# Overview

- Level setting & context
- Household travel survey (HTS) program nuts & bolts
- Opportunities: improvements & collaborations



The banner features a dark blue header with icons for walking, cycling, driving, transit, and train, followed by the text "2023 PUGET SOUND REGIONAL Travel Study". Below this are two images: a ferry and a lighthouse on the left, and a cyclist on the right. The central text reads "TELL US HOW YOU GET AROUND". Below this are three more images: a person walking on a rainbow crosswalk, a scenic view of a bridge over water, and a bus stop with people. A dark blue banner at the bottom says "RECEIVE A GIFT CARD AS THANKS FOR YOUR TIME". Logos for the City of Bellevue, Puget Sound Regional Council, and Seattle Department of Transportation are at the bottom right.

2023 PUGET SOUND REGIONAL  
Travel Study

**TELL US HOW YOU GET AROUND**

RECEIVE A GIFT CARD  
AS THANKS FOR YOUR TIME

CITY OF BELLEVUE  
Puget Sound Regional Council  
Seattle Department of Transportation



# Specific perspective

- Metropolitan Planning Organization for the four-county Seattle, WA, USA region
  - State Growth Management agency
  - Federal Economic Development District
- Credits: Suzanne Childress plus other PSRC staff



# Additional sources of information

- Ad hoc HTS group of public agencies:
  - MetCouncil (Minneapolis–St Paul)
  - MTC (Bay Area)
  - NYC DOT (New York City)
  - PSRC (Puget Sound)
  - SANDAG (San Diego)
  - SCAG (Los Angeles)
- MWCOCG (Washington, DC)
- NC State University (Triangle Region)



# Who uses household travel survey data?

- Who considers HTS data to be important for their work?
- Who has used HTS data from the Central Puget Sound Region?

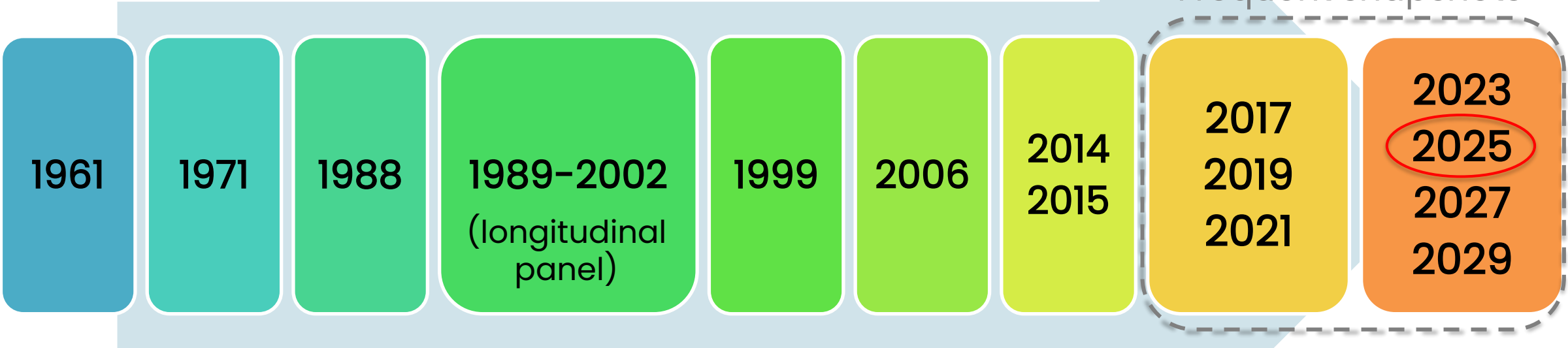
## Uses of PSRC HTS data:

- Analytics – patterns & trends
- Models – land use & travel
- Research?



# Evolution of travel studies in the PSRC Region

- Current mandated planning cycles**
- Regional Transportation Plan, 4yrs
  - Growth Management Plan, 10yrs



- HTS budgets (excl. PSRC labor, add-on partners)**
- 2017: US\$150,000
  - 2023: US\$500,000

Trip-based models

2<sup>nd</sup> gen ABM



# Multi-year HTS program goal

- Random (address-based) sampling
- Complex stratification (representation of people, places, & behaviors)
- Post-processing (data cleaning & weighting)

The surveys capture **regionally representative** data for activity/travel behavior of **residents** on a **typical weekday**.

Data representing Mon-Thu

Other people/travels (unhoused people, visitors, pass-throughs, freight) not captured



# 2017, 2019, & 2023 samples & design

## Representative samples

### 2017 sample

- 3,275 households
- Redmond & Seattle add-ons

### 2019 sample

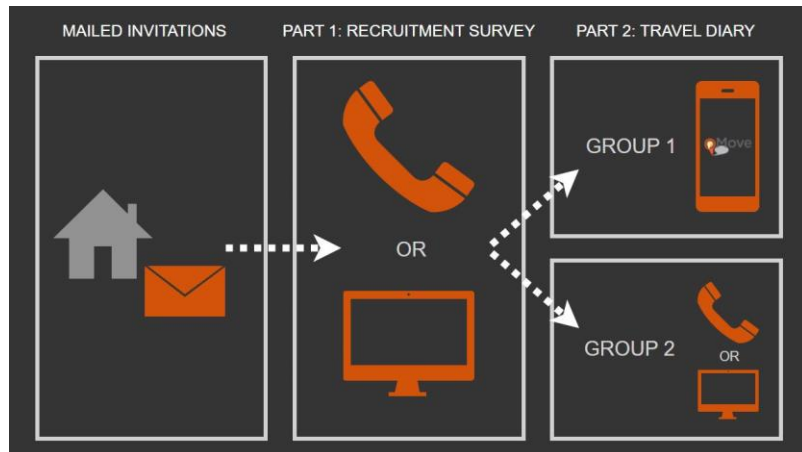
- 3,044 households
- Seattle add-on

### 2023 sample

- 3,661 households
- Bellevue & Seattle add-ons

## Two-part survey

1. Household (HH) info
2. Travel diary



## Two groups

### *Group 1:*

Smartphone  
up to 7 days

### 2017

695 HHs  
(21%)  
34,193 trips  
(66%)

### 2019

1,047 HHs  
(34%)  
59,853 trips  
(82%)

### 2023

855 HHs  
(23%)  
38,100 trips  
(71%)

### *Group 2:*

Online/phone  
1 day only

2,580 HHs  
(79%)  
17,468 trips  
(34%)

1,997 HHs  
(66%)  
13,002 trips  
(18%)

2,806 HHs  
(77%)  
13,002 trips  
(29%)





# Highlights from the 2023 HTS

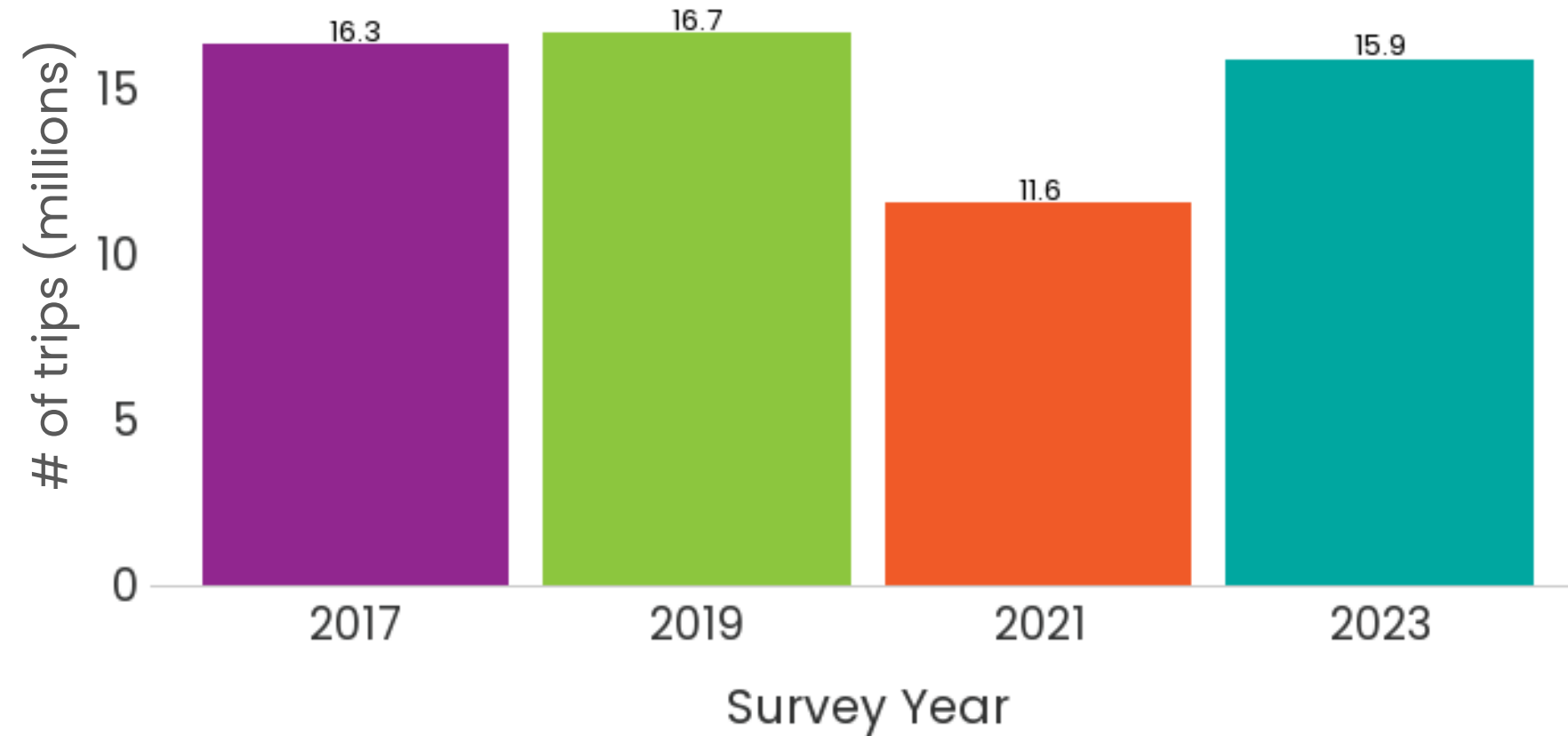


- Overall travel
- Work location
- Walking
- Disability status
- Regional Growth Centers
- Package deliveries
- Transit access



# Overall travel

Total trips in region on average weekday



Number of trips made on an average weekday in 2023 is nearly back to pre-pandemic level.

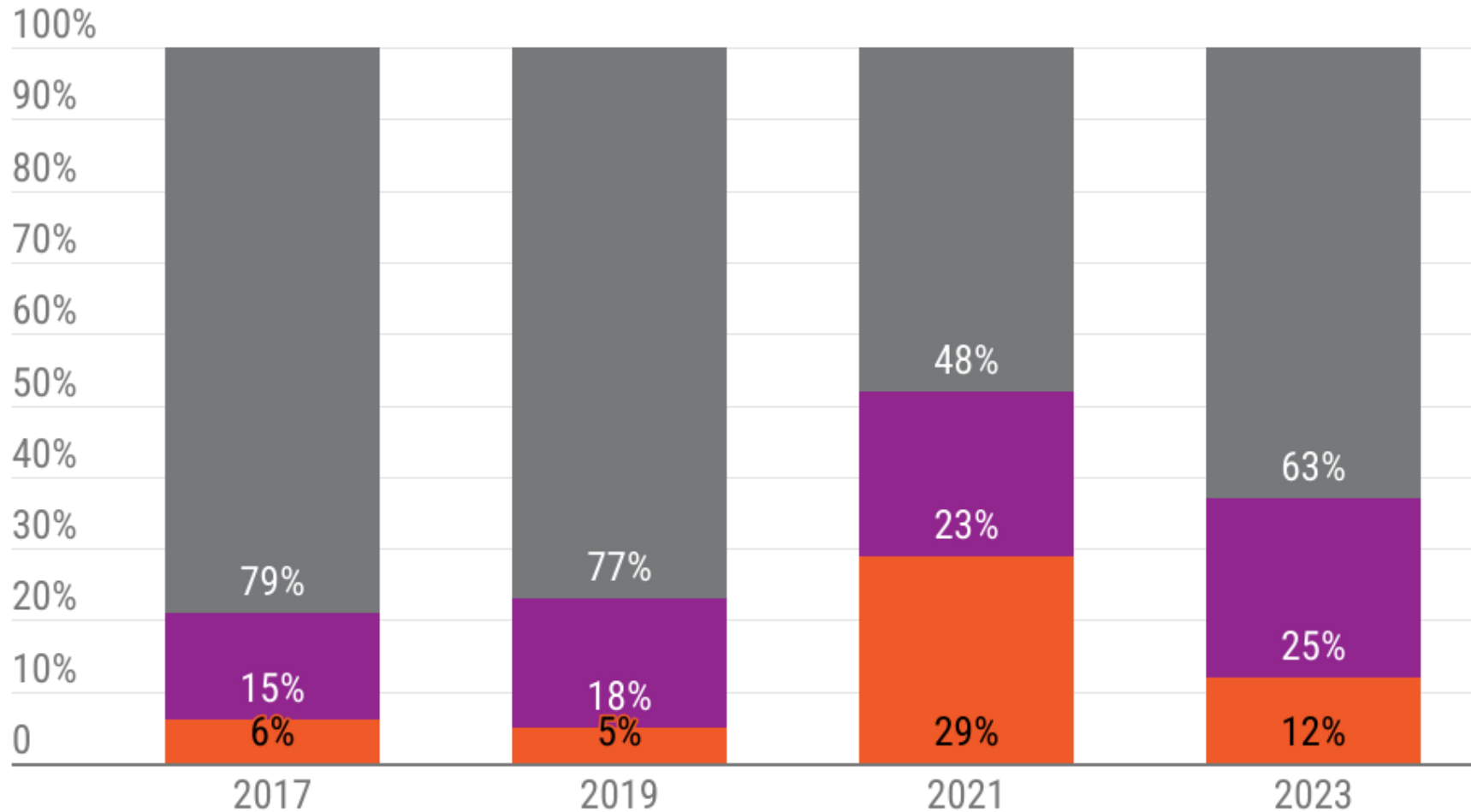


# Work location

Share of workers regionally

See [8/27 TDM](#) for related analyses by industry, income, race/ethnicity, age, gender, geography

● Fully At Home ● Hybrid ● Fully in Person



Most workers work fully in person away from home (63% in 2023).

Fully at home workers peaked at 29% in 2021.

Hybrid workers increased after COVID-19 & remain high in 2023.

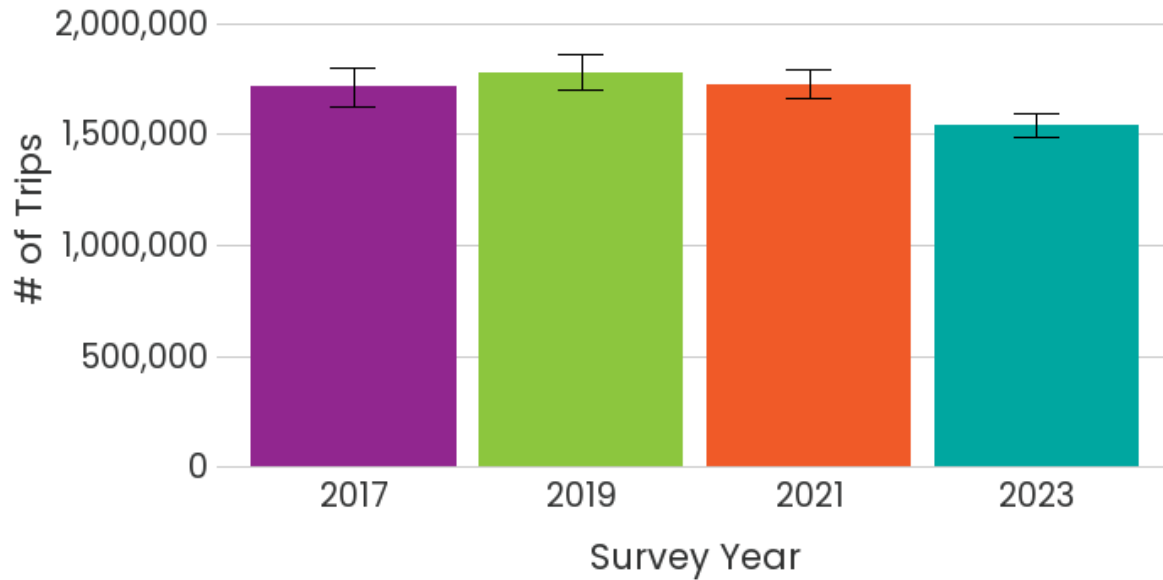


# Walking

Number & share of trips in region

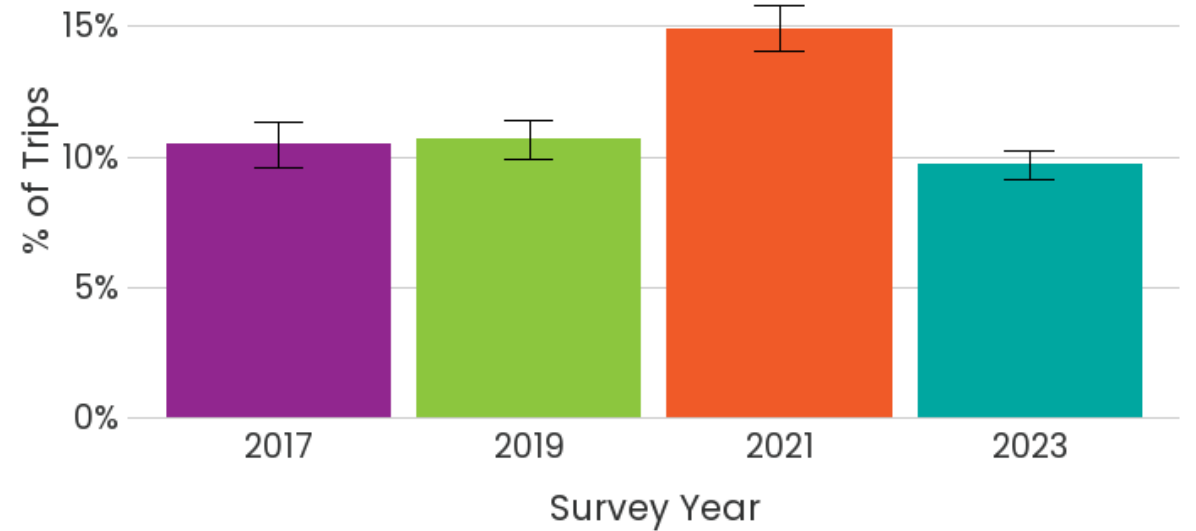
See [9/10 BPAC](#) for walk/bike analyses by geography, purpose, & demographics

## Walk Trips - Estimate



Total number of walking trips on an average weekday decreased from 2021.

## Walk Trips - Share



Share of trips made by walking in 2023 is closer to pre-pandemic years.



# Mode share by disability status

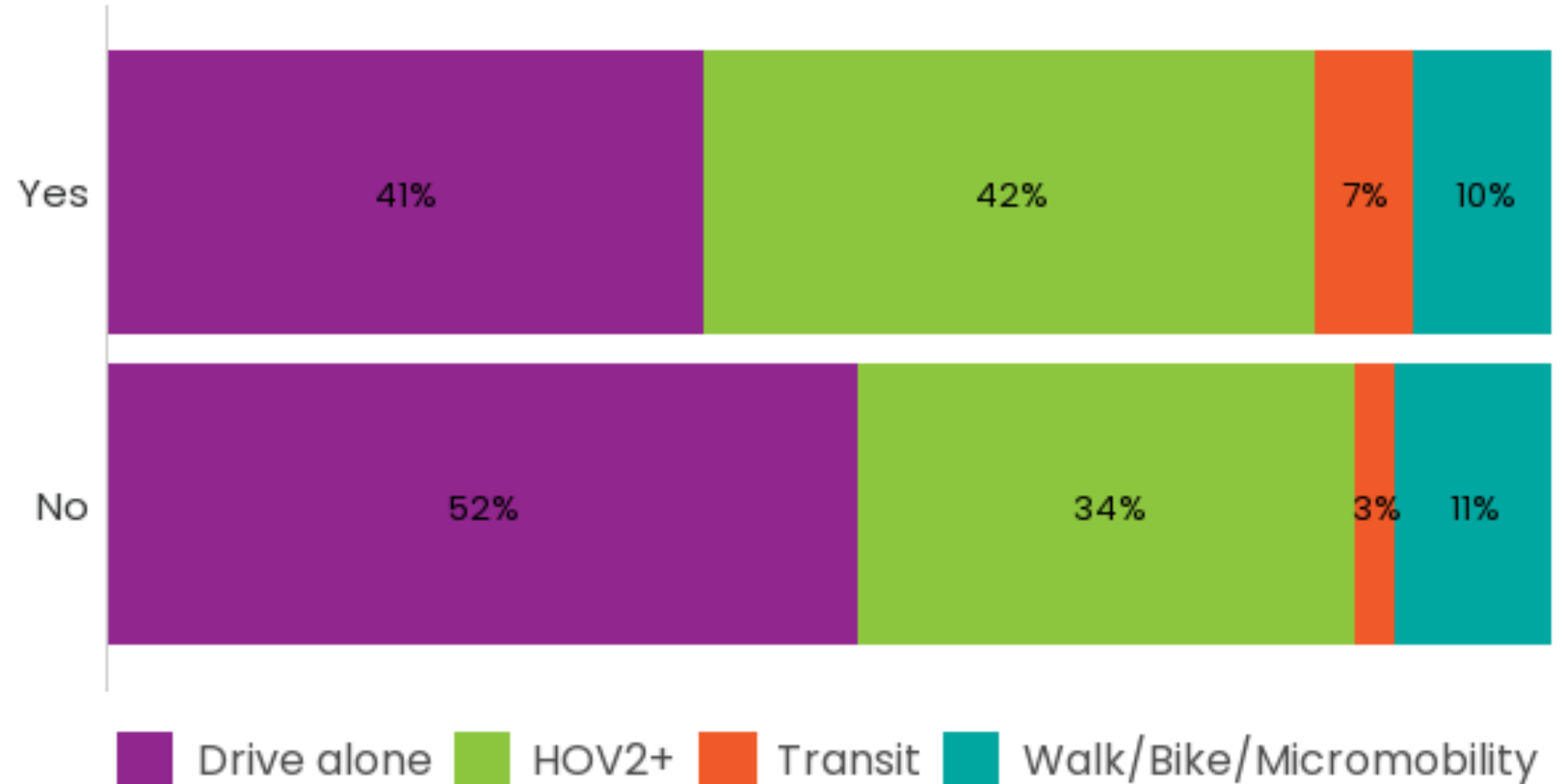
2023 only

See [9/18 CMAC](#) for travel analyses on priority populations by purpose & demographics

New question on disability in 2023 survey.

A similar proportion of trips between groups involve driving, but those with disabilities are more likely to travel with someone else.

Transit use for those with disabilities is double that of the rest of the population.



# Average weekday vehicle miles travel

Per resident by home location, 2023 only

See [9/20 RTOD](#) for travel in Regional Growth Centers & High-capacity Transit communities

Home Location	Vehicle Miles Travel (VMT) per resident
Region	15.5
All Regional Growth Centers (RGC)	10.2
Not in RGC/In Urban Growth Areas (UGA)	15.2
Outside UGA	24.8

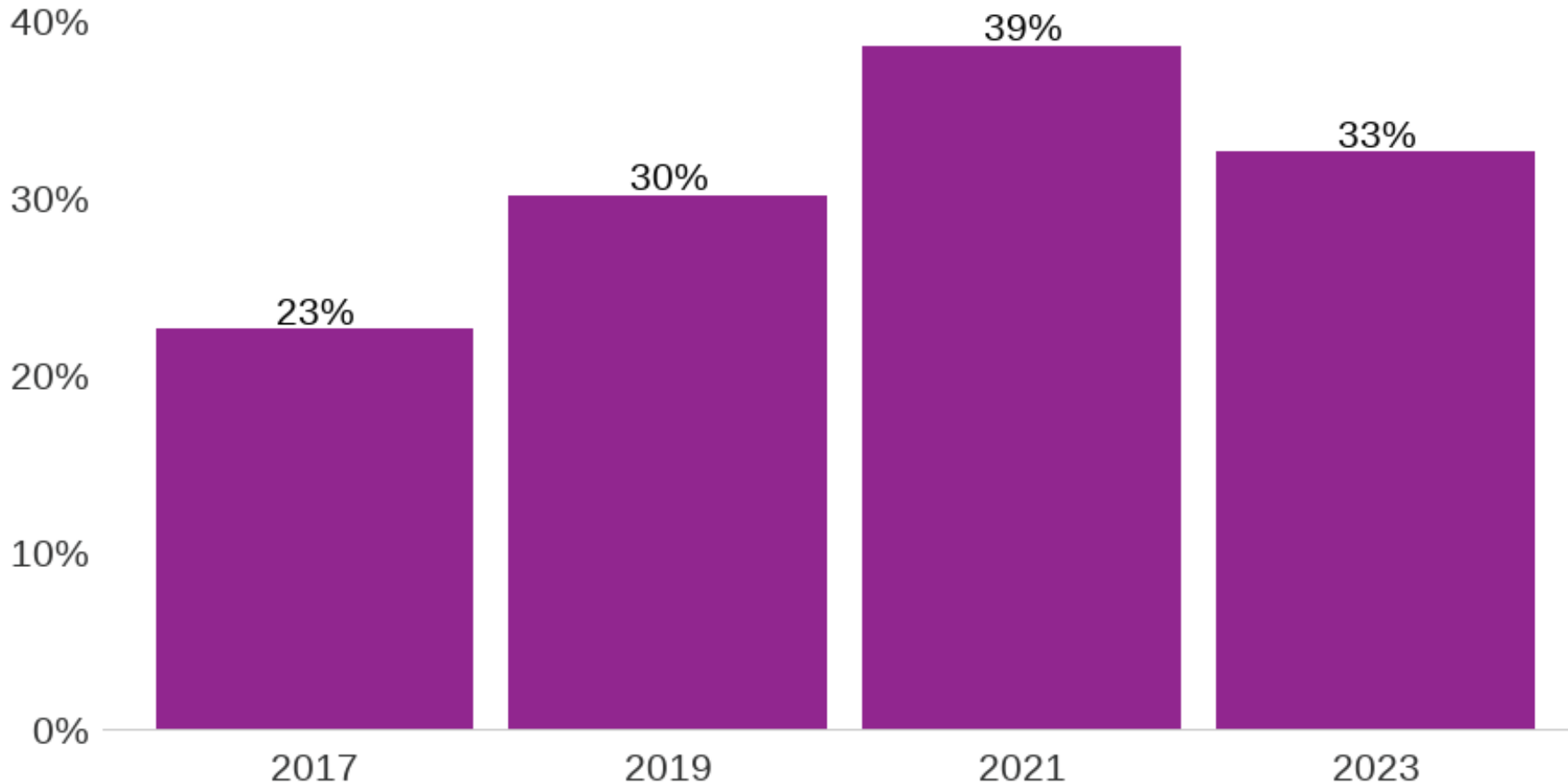
People who live in regional growth centers have the lowest VMT per resident in the region.



# Home package delivery

Share of households receiving packages on average weekday

See [10/9 FAC](#) for analyses on deliveries & other travel demands induced by residents



Home package deliveries peaked in 2021.

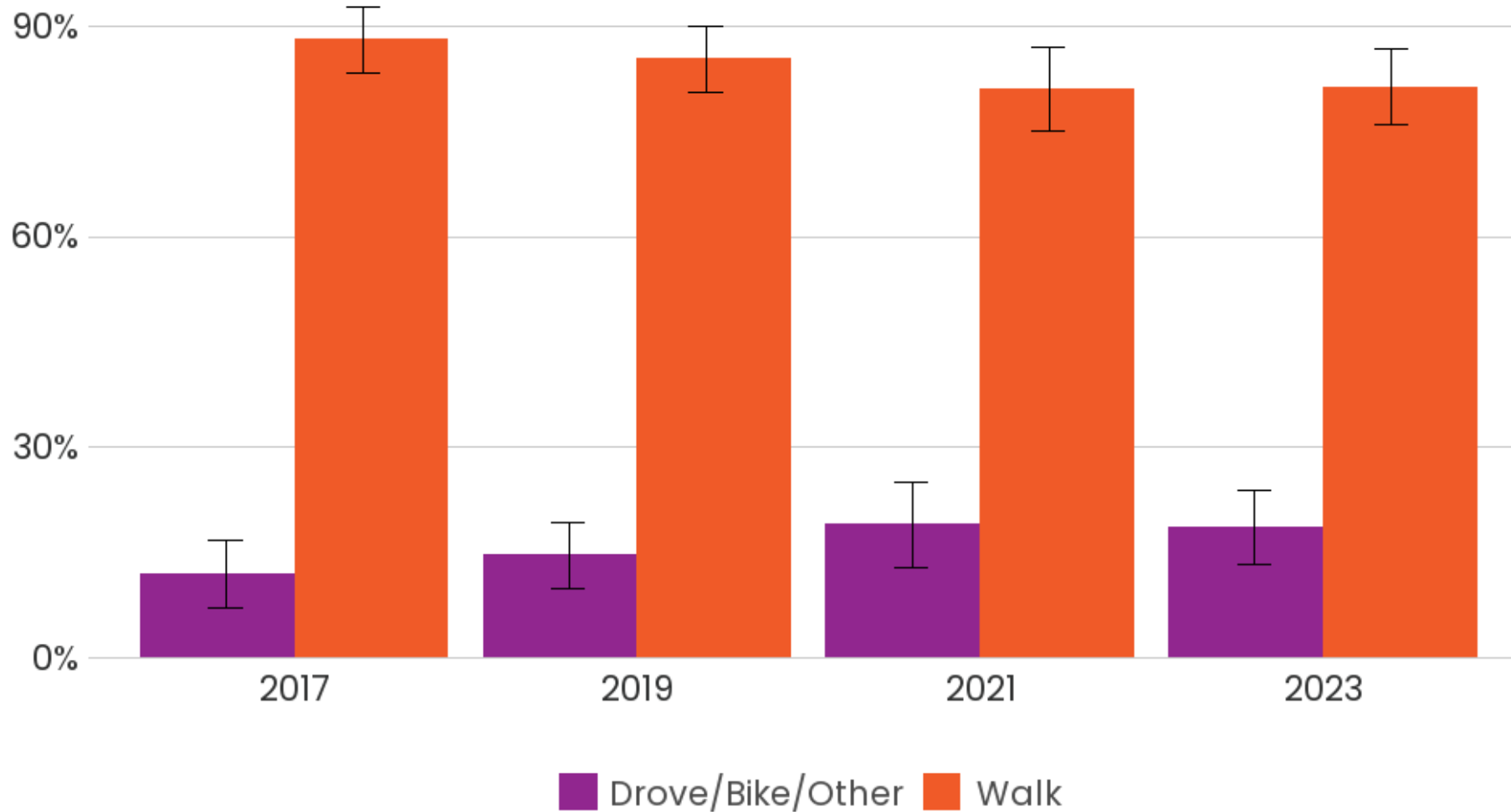
A third of regional households got packages on an average weekday in 2023.



# Transit access mode

Share of transit trips accessed by walk & other modes

See [10/23 TOC](#) for analyses on transit behaviors



Most people walk to transit. In 2017, 88% accessed transit by walking. In 2023, it had dropped to 81%, but the decrease is within the margin of error.





# 2024 presentations of 2023 HTS findings

- **Transportation Demand Management group** ([8/27 presentation](#) on workplaces, commutes, telework)
- **Bicycle Pedestrian Advisory Committee** ([9/10 presentation](#) on walk, bike, roll)
- **Coordinated Mobility & Accessibility Committee** ([9/18 presentation](#) on people with disabilities, older adults, youth, people with lower income)
- **Regional Transit-Oriented Development Committee** ([9/20 presentation](#) on travel in Regional Growth Centers, High-Capacity Transit communities)
- **Freight Advisory Committee** ([10/9 presentation](#) on deliveries & other travel demands induced by residents)
- **Transit Operator Committee** ([10/23 presentation](#) on transit behaviors)



# Outstanding methodological issues



Survey sampling design

Data collection procedure

Post process

Capturing variations



# Probabilistic-based sampling

- Very low response rates
  - What assumptions are valid & what are not?
  - What biases are introduced or amplified, & are they being adequately addressed?
- Mix with non-probabilistic-based sampling?



# Data collection procedure

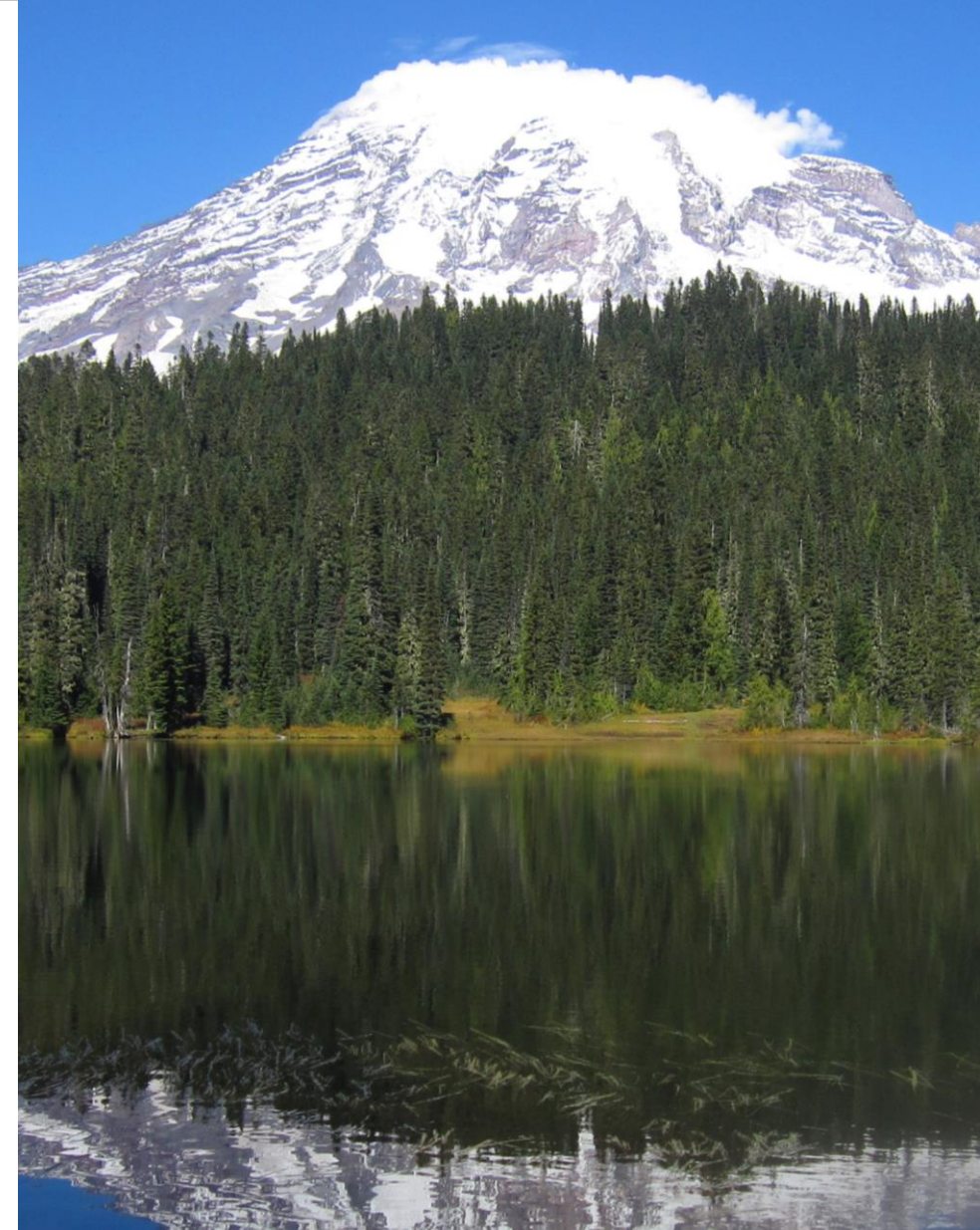


- Questionnaire & survey instrument
  - Wording/phrasing of questions
  - Survey platforms (e.g., online, smartphone, landline telephone)
- Communications
  - Awareness campaigns
  - Translation: written & verbal services
- What biases are introduced/magnified? How do they impact representation?



# Data cleaning & weighting

- How much cleaning is sufficient? What are the benefits? What problems may be introduced?
- Weighting is often a black box, used without questions (to calibrate & validate models)
  - How are results sensitive to assumptions/ thresholds?
  - What are the impacts on representation of people, places, & behaviors?



# Capturing variations



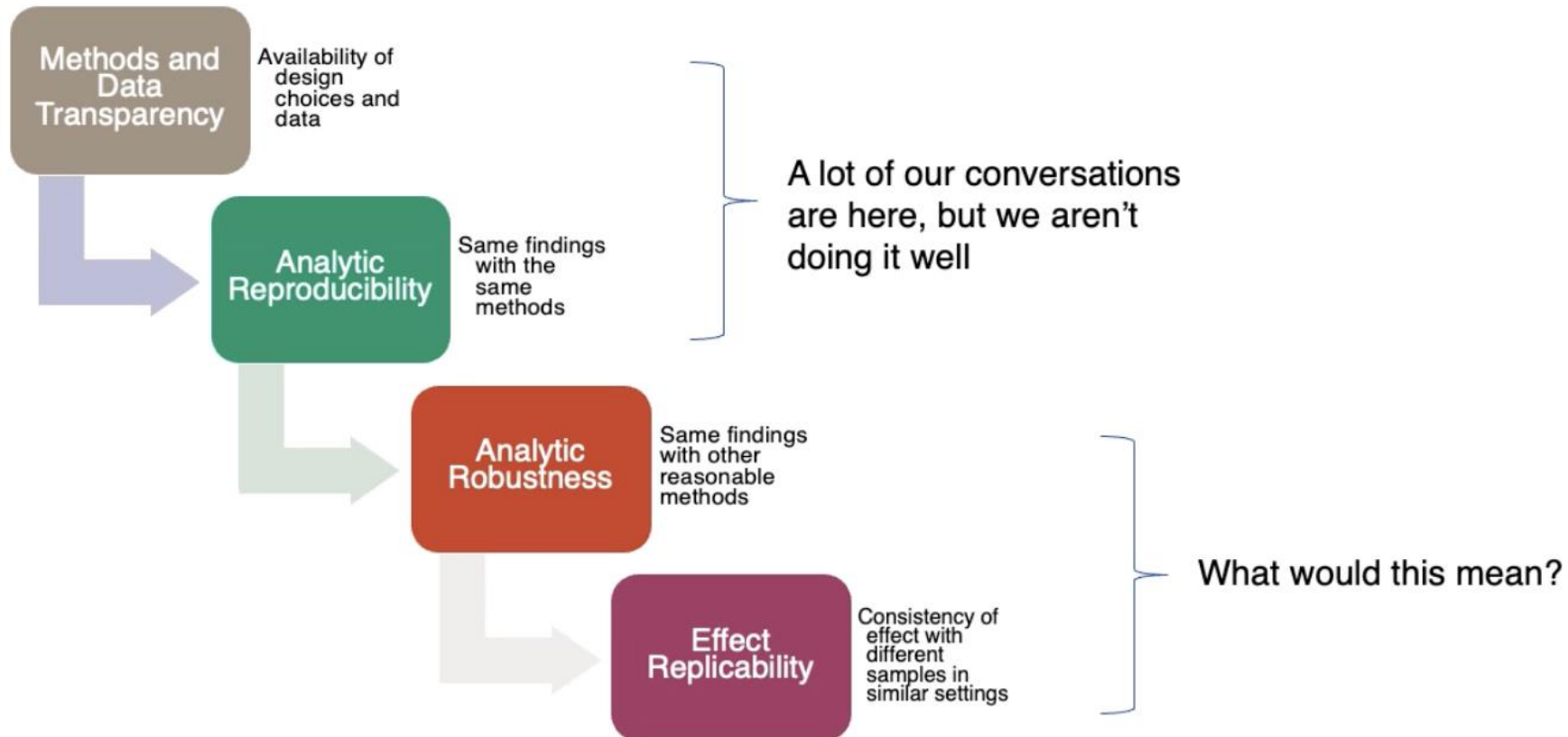
- Week-long surveys are not common
- Existing practice of travel modeling & transportation planning still fixated on “average weekday peak periods”
- Struggle to answer basic questions (e.g., shopping trip substitution, intersection of travel, e-commerce, commuting, & teleworking)
- Longitudinal panel survey – useful data? Lead to future modeling systems?



# Homework

## Elements of Credibility

BYU Civil & Construction  
Engineering



LeBel EP, McCarthy RJ, Earp BD, Elson M, Vanpaemel W. A Unified Framework to Quantify the Credibility of Scientific Findings. *Advances in Methods and Practices in Psychological Science*. 2018;1(3):389-402.





# Thank You!

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