What's Normal Anyway?

Assessing the Pandemic's Long-term Effects on Travel Behaviors

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Teaching Old Models New Tricks

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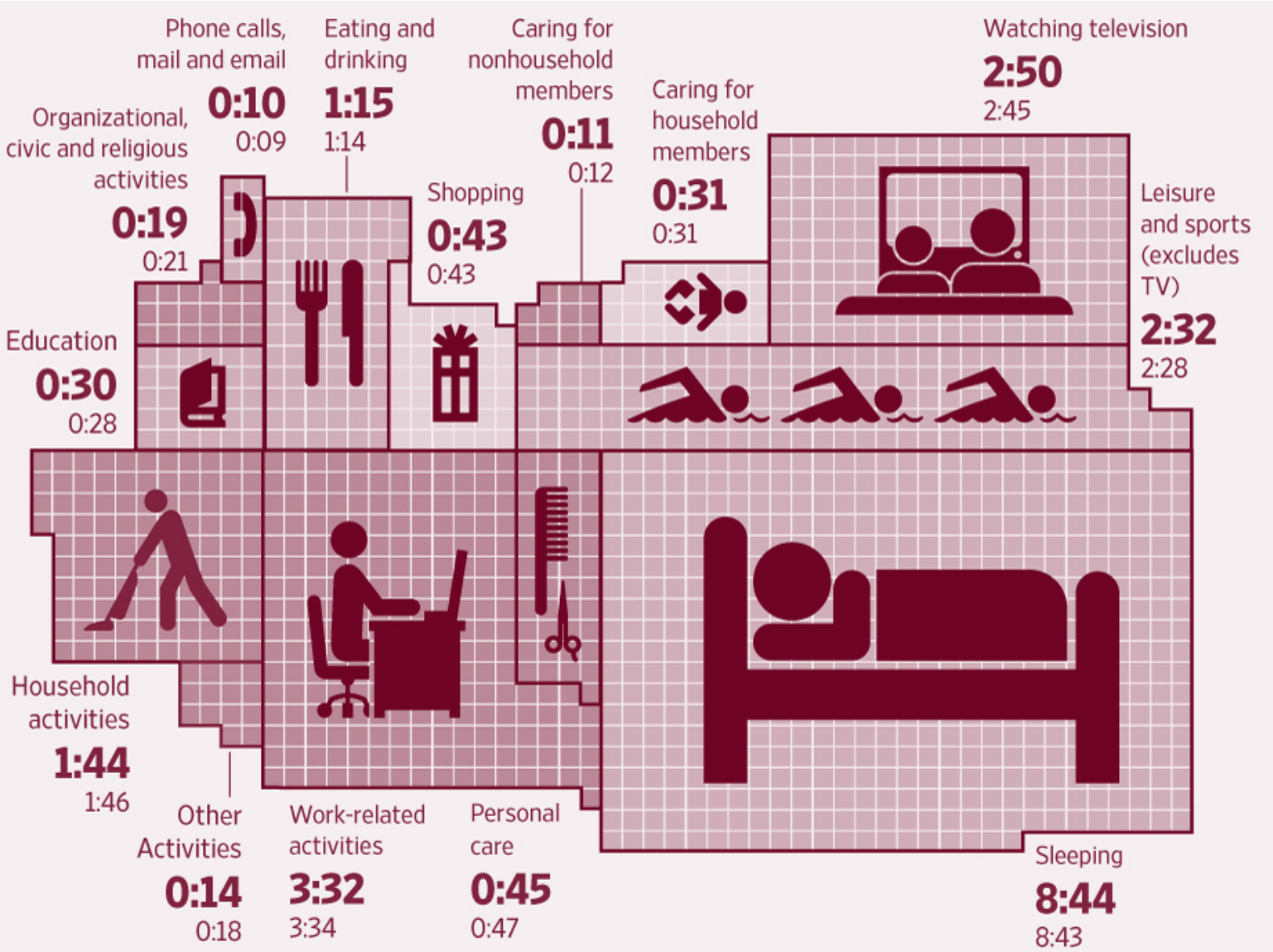
The Equity Challenge

American Time Use Survey

- Nationally representative **estimates of how people spend their time**
  - Sponsored by the **Bureau of Labor Statistics**
  - Conducted by the **U.S. Census Bureau** every year since 2003
- Randomly selected **individuals** (15+) **complete a 24-hour time use diary** for the previous day (4 am to 4 am)
  - **Time, location, and purpose of activities pursued** and **who they were with** during each activity
  - **Demographic information** is also available **for each respondent**
    - Including sex, race, age, educational attainment, occupation, income, marital status, and the presence of children in the household

American Time Use Survey

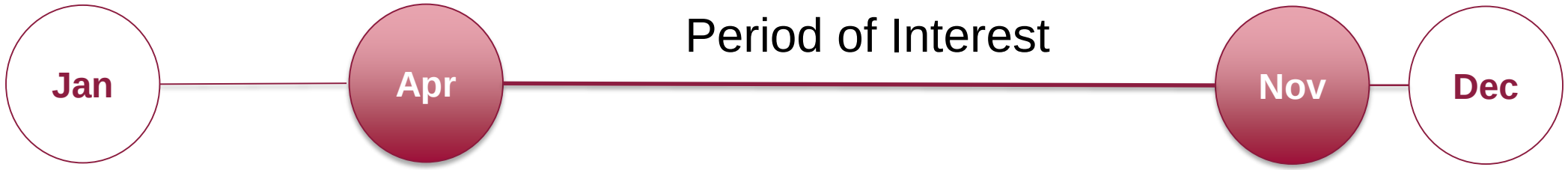


- Collected by the **Bureau of Labor Statistics** (BLS)
- Provides detailed **activity and time use data**
- Individuals reporting **all of their activities over the course of a day**, including travel episodes
- A **sample** of **~10,000 respondents** per year

American Time Use Survey

- Selected records from three years of ATUS data corresponding to the April – November time period in each survey year

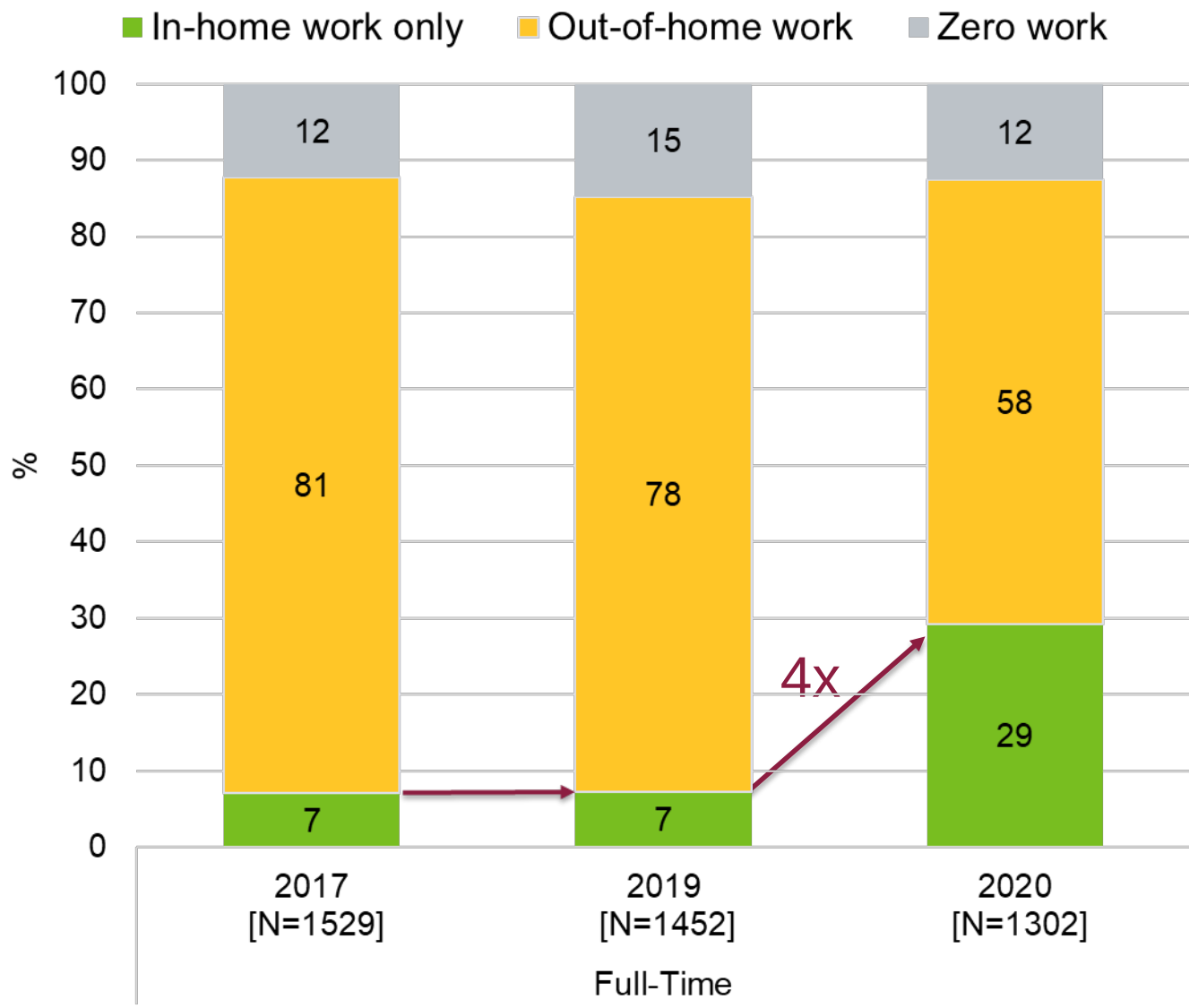
2017 – 2019 – 2020



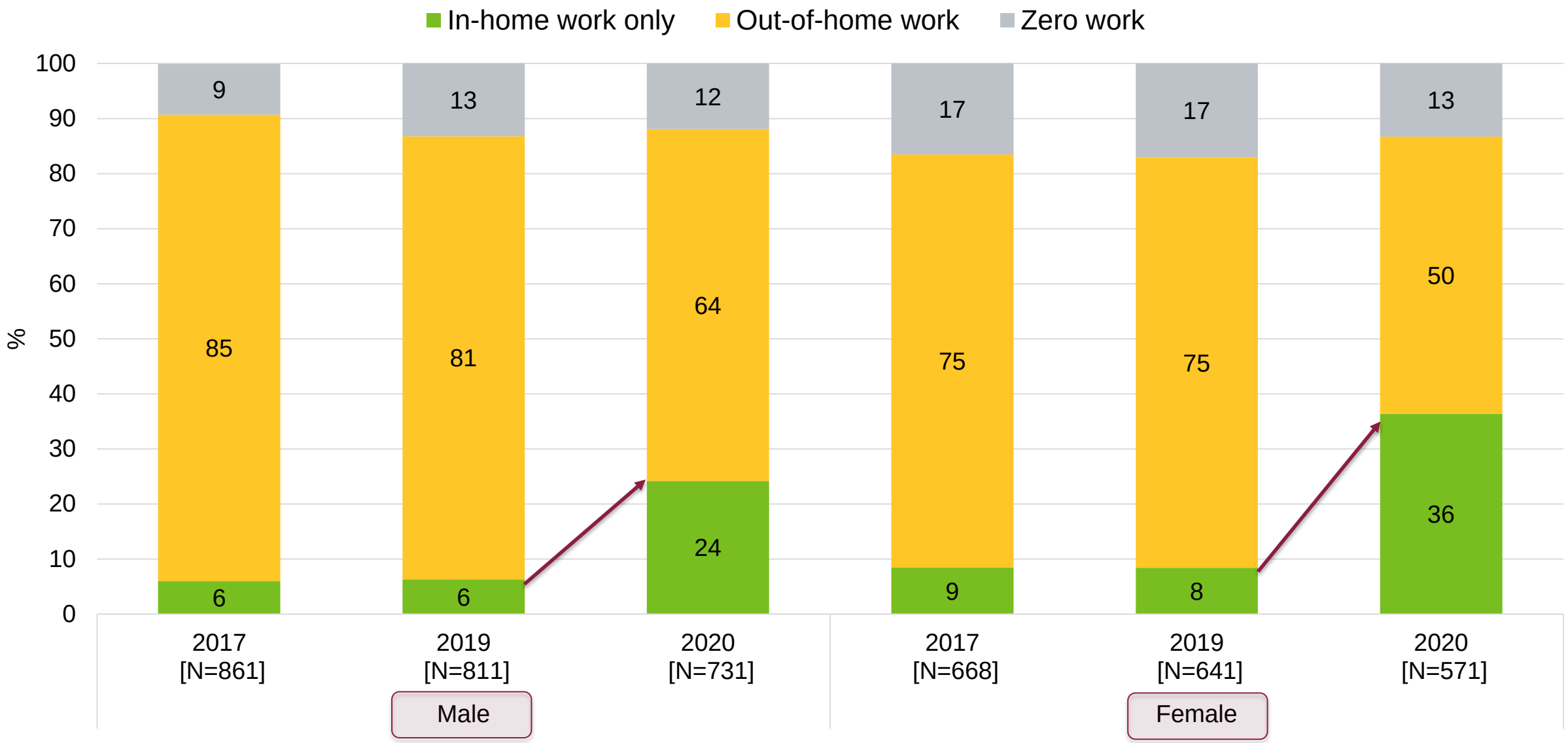
American Time Use Survey

- Weekdays only
- Weighted statistical analysis
- Workers (18+): Full-time vs Part-time
- Percent of **In-home work only,** **Out-of-home work,** **Zero work**
    - Gender
    - Age
    - Income
    - Race
    - Education

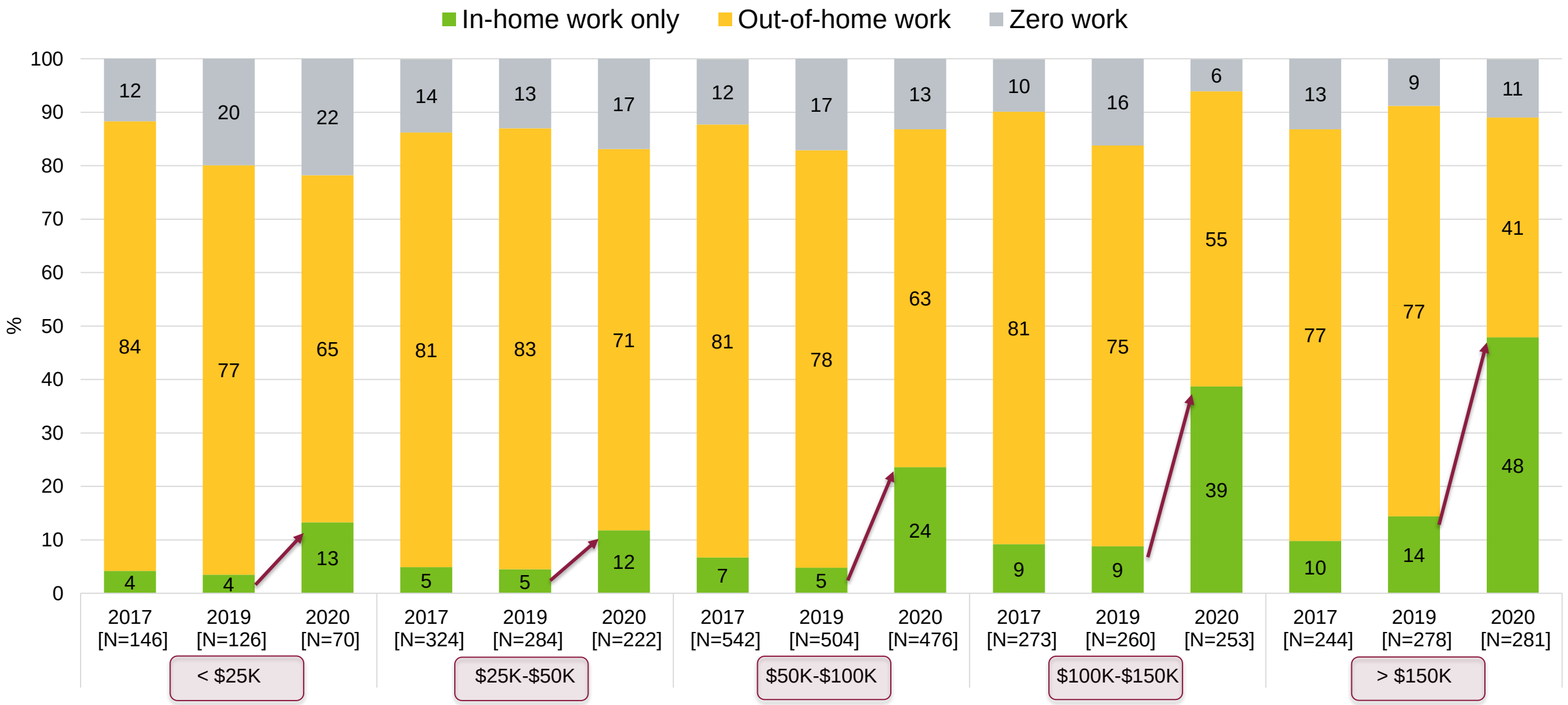
Percent of full-time workers who reported in-home only, out-of-home, zero working



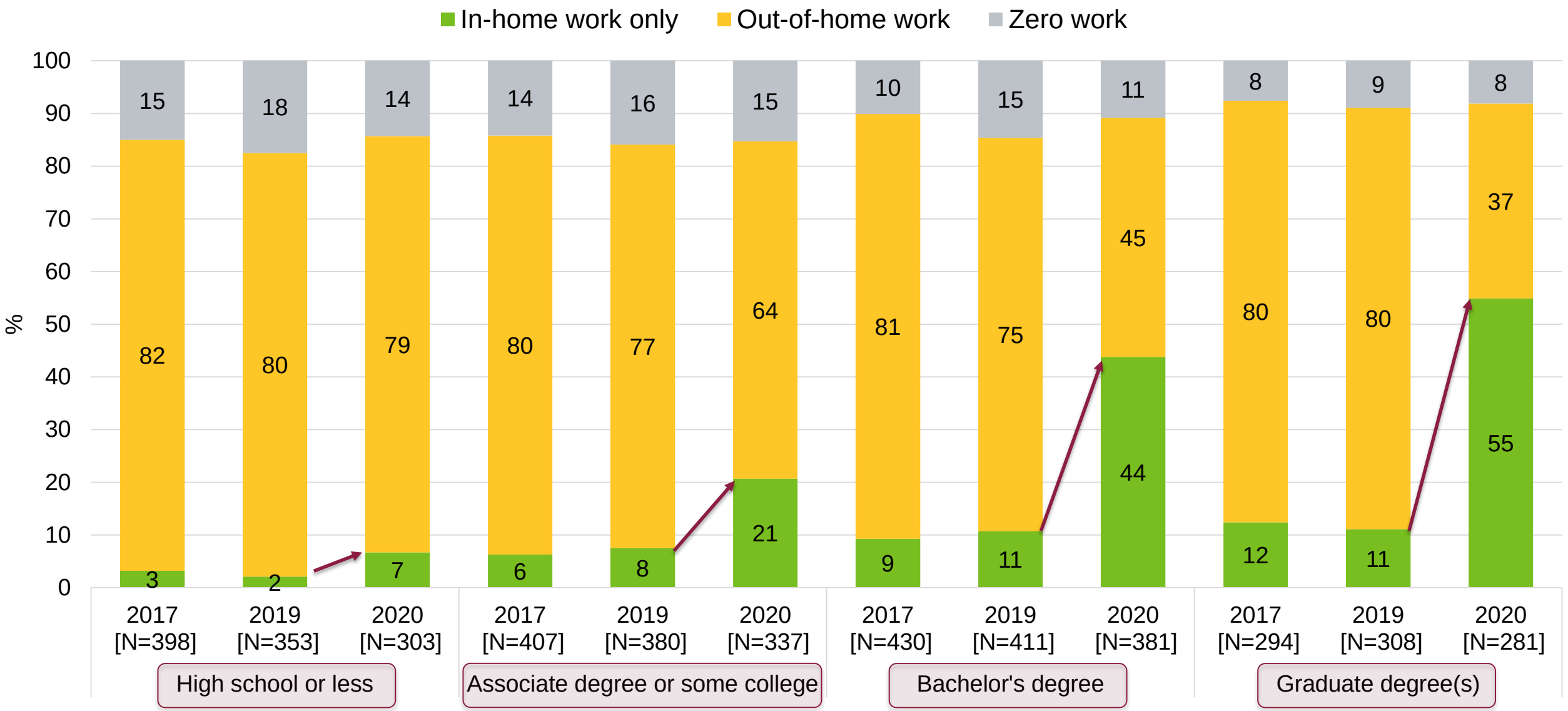
GENDER: Percent of full-time workers who reported in-home only, out-of-home, zero working



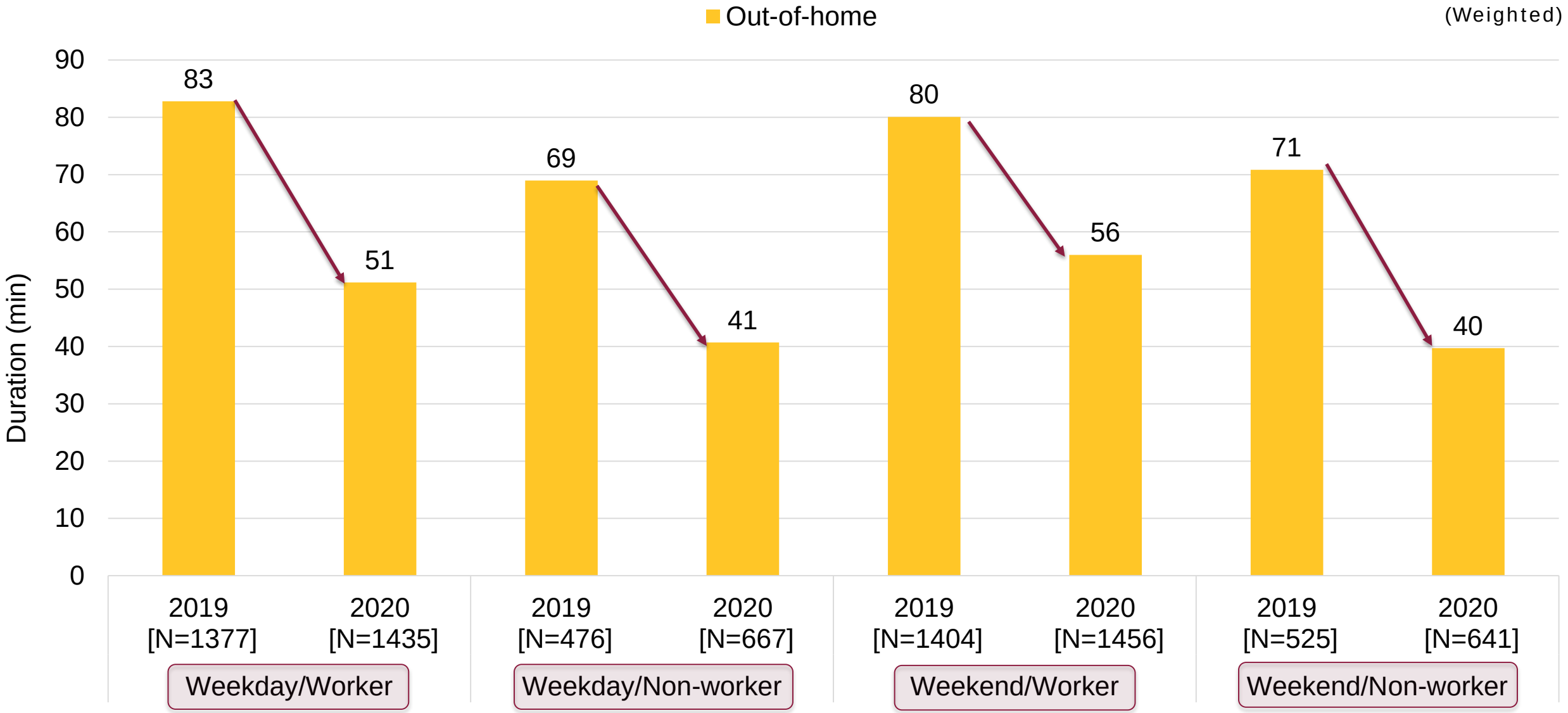
INCOME: Percent of full-time workers who reported in-home only, out-of-home, zero working



EDUCATION: Percent of full-time workers who reported in-home only, out-of-home, zero working



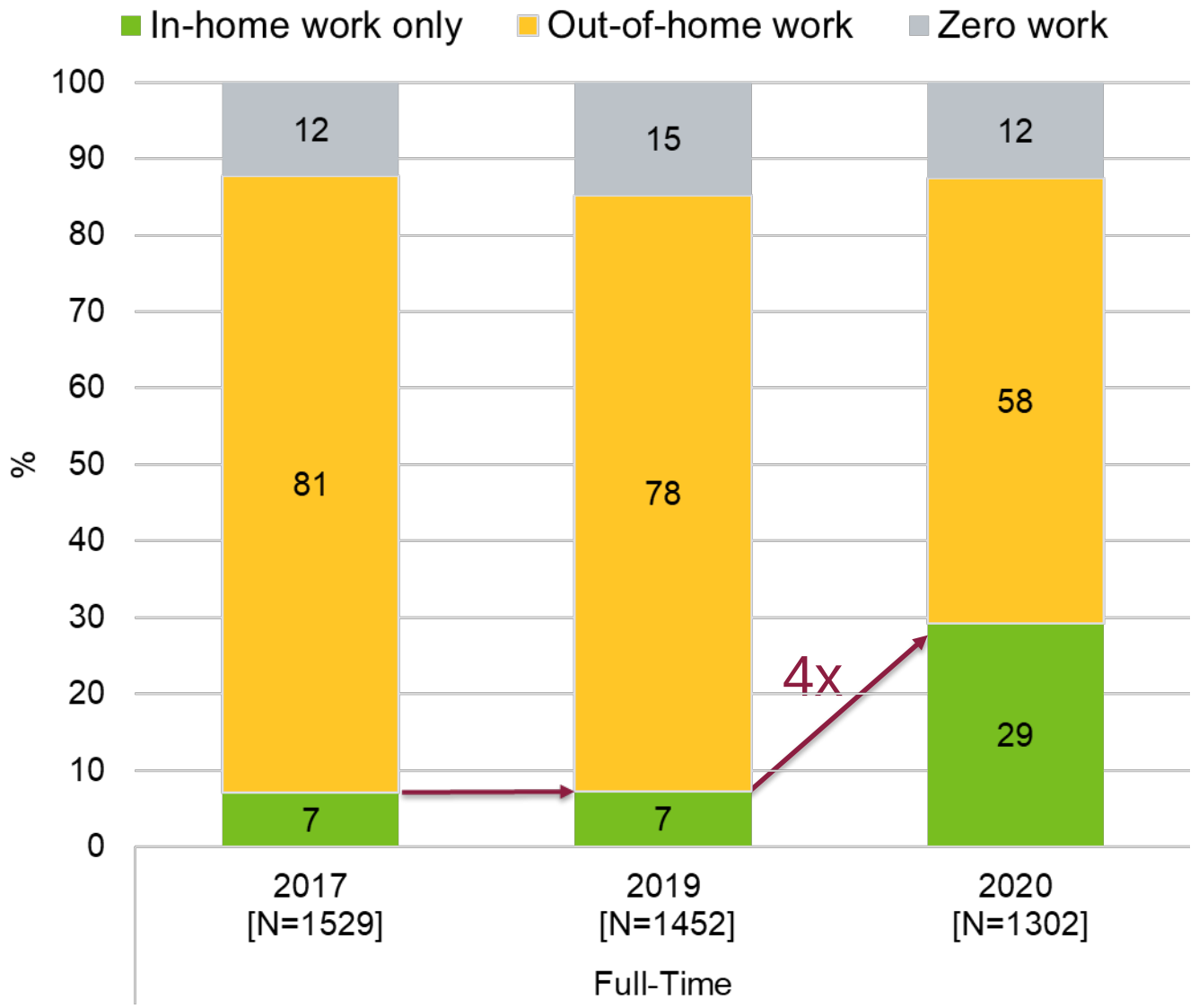
TRAVEL ACTIVITIES:
out-of-home daily travel duration



The Measurement Challenge

American Time Use Survey

Percent of workers who reported in-home only, out-of-home, zero working



Current Population Survey (CPS)

- CPS is administered by the **Bureau of Labor Statistics**
- **New questions added** to CPS to understand **the effects of the pandemic** on the labor market

Work from home statistics reported monthly based on the following measure:

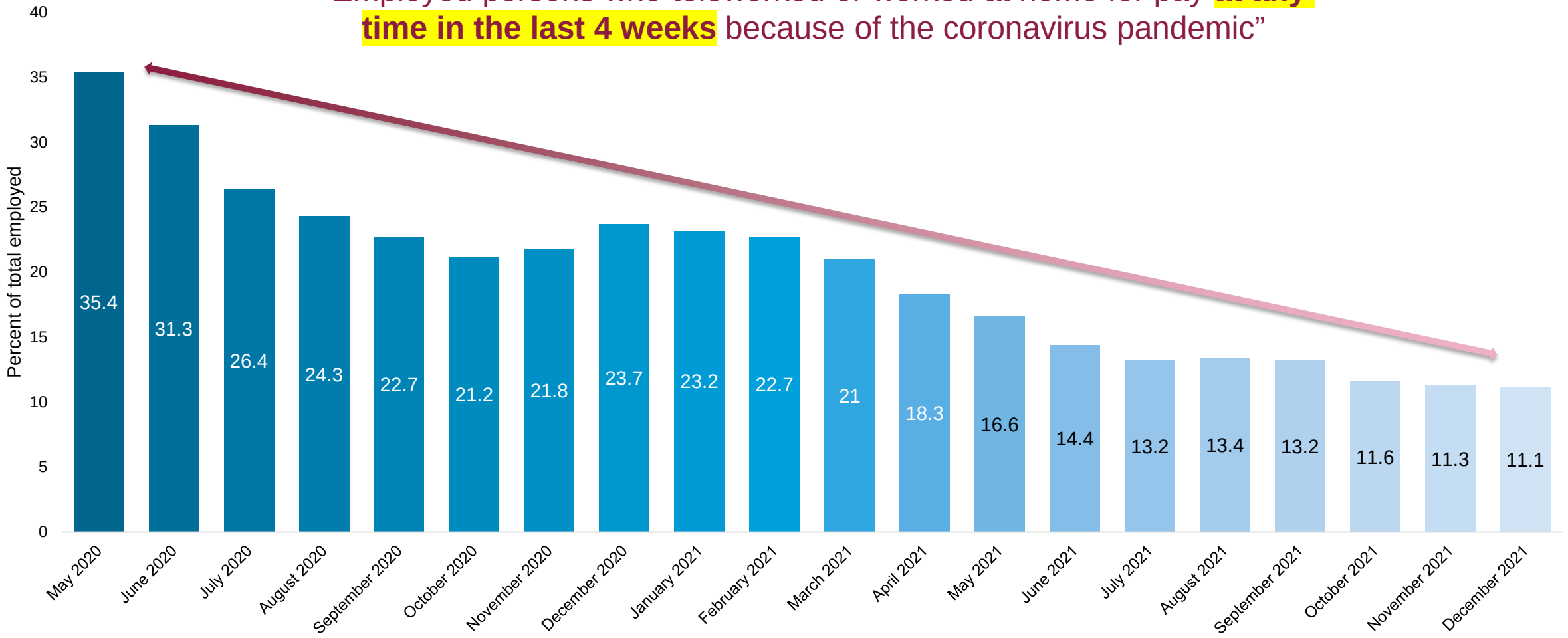
"Employed persons who teleworked or worked at home for pay at any time in the last 4 weeks **because** of the coronavirus pandemic"

- These questions were asked **beginning in May 2020** and will remain in the CPS until further notice
- Approximately 155 million workers 16+ in December 2021

Current Population Survey (CPS)

Teleworking because of the coronavirus pandemic (%)

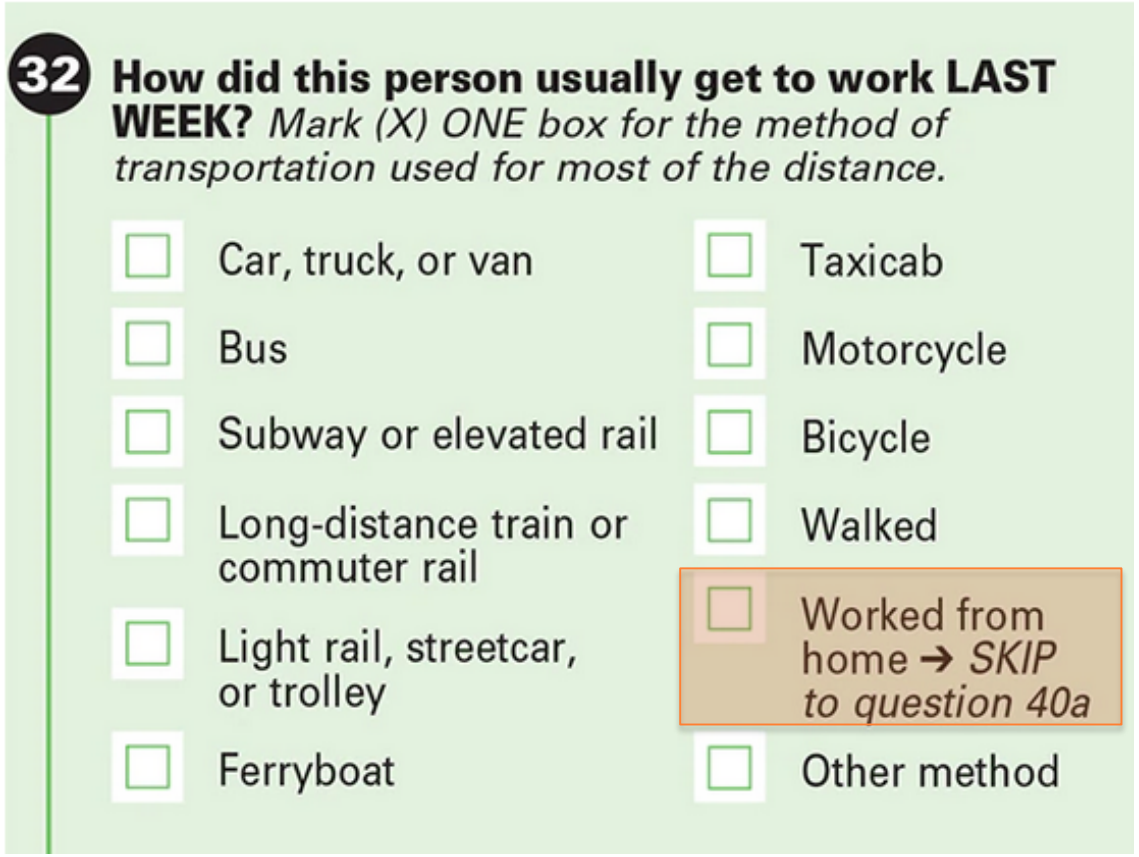
"Employed persons who teleworked or worked at home for pay **at any time in the last 4 weeks** because of the coronavirus pandemic"



American Community Survey (ACS)

- Annual survey of sample of US Population conducted by **Census Bureau**
- The respondents report:
  - Ancestry, age, citizenship, **commuting / journey to work**, educational attainment, income, language proficiency, migration, disability, employment, and housing characteristics.

WFH information available through the following question:

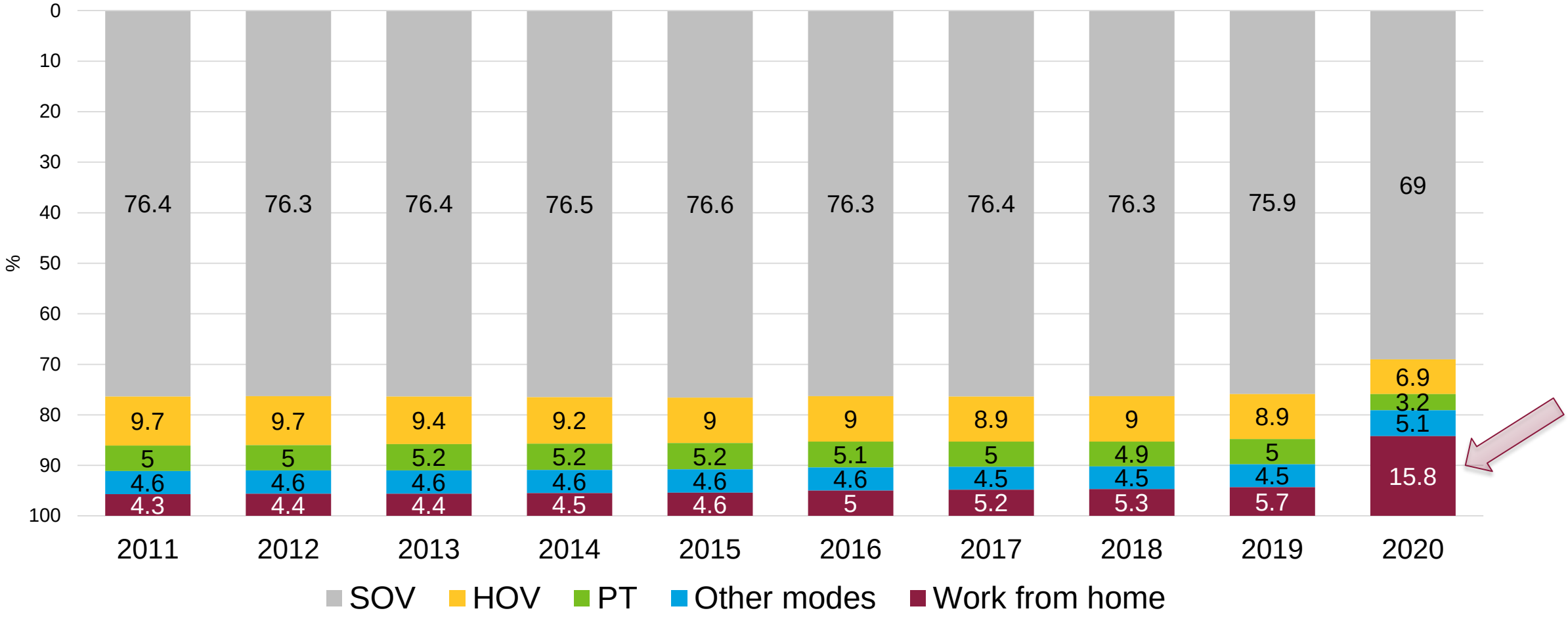


32 **How did this person usually get to work LAST WEEK?** *Mark (X) ONE box for the method of transportation used for most of the distance.*

- ☐ Car, truck, or van
- ☐ Bus
- ☐ Subway or elevated rail
- ☐ Long-distance train or commuter rail
- ☐ Light rail, streetcar, or trolley
- ☐ Ferryboat
- ☐ Taxicab
- ☐ Motorcycle
- ☐ Bicycle
- ☐ Walked
- ☐ Worked from home → *SKIP to question 40a*
- ☐ Other method

American Community Survey (ACS)

Means of transportation to work (last week)



Sample sizes approximated 200,000 persons through 2016 and around 170,000 persons starting in 2017.

Household Pulse Survey (HPS)

- Specifically designed by the U.S. Census Bureau in response to the pandemic
- A short-turnaround instrument that provides valuable data to aid in the pandemic recovery
- Measuring the impacts of pandemic on households from a social and economic perspective
- A total of six data collection instances since April of 2020

Questions asked to derive WFH information vary!

SPN5 In the **last 7 days**, have you or your household done any of the following…

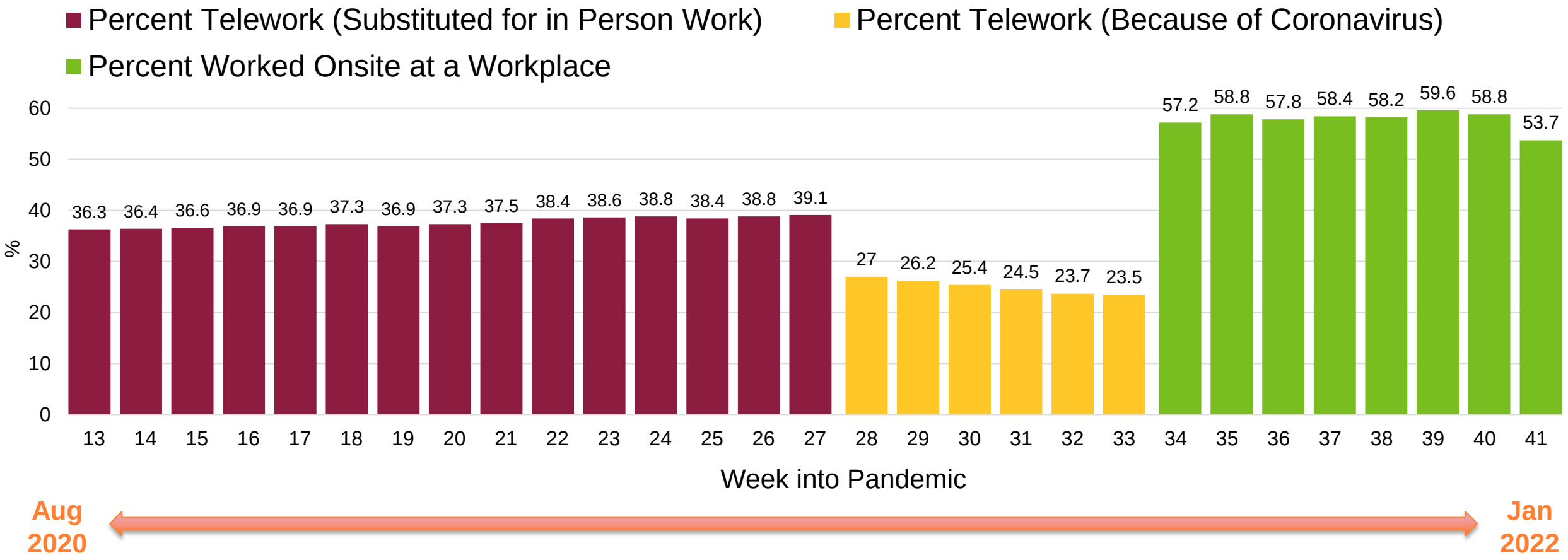
	Yes	No
Worked onsite at a workplace	○	○
Teleworked or worked from home	○	○

Latest

Weeks 13-27	Adults in households where at least one adult has substituted some or all of their typical in-person work for telework because of the coronavirus pandemic
Weeks 28-33	Adults in households where at least one adult has teleworked because of the coronavirus pandemic in the last 7 days
Weeks 34-41	Adults in households where someone worked onsite at a workplace in the last 7 days

Household Pulse Survey (HPS)

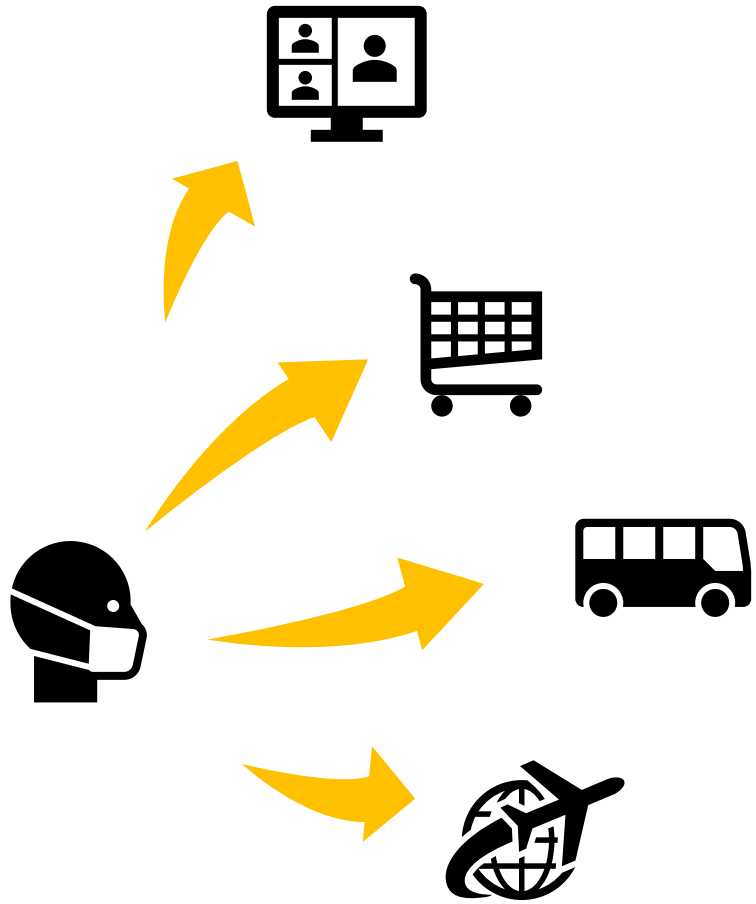
Teleworking and Onsite-Working



Aug 2020 ⟷ Jan 2022

COVID Future Survey

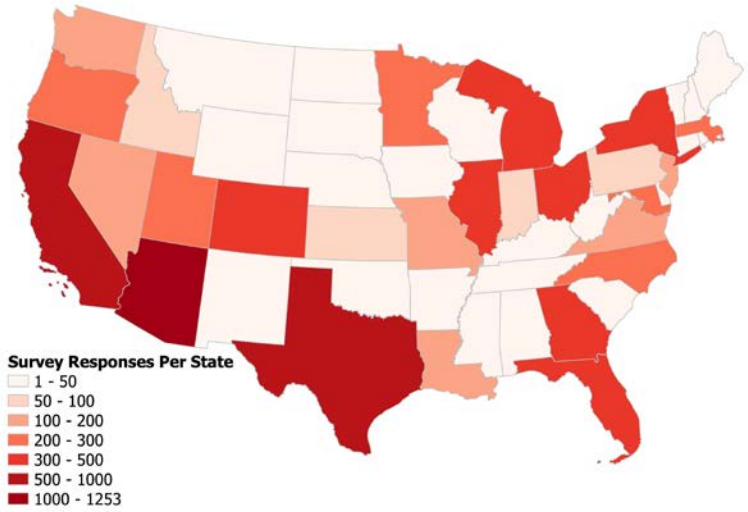
Respondent attitudes, lifestyle, work from home, mode use and travel patterns, e-shopping, and air travel **before, during, and after (expected/stated)** the pandemic



COVIDFuture Survey

www.covidfuture.org

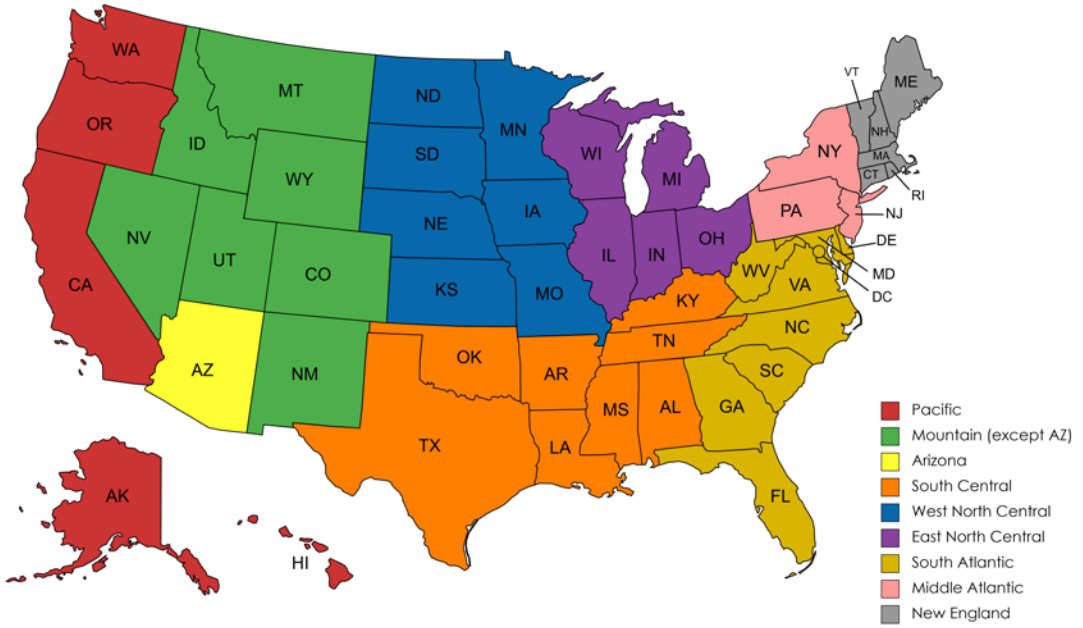
- Online longitudinal survey implemented in Qualtrics
- Recruited through online panel, random email address, and convenience sample
- Three waves of data collection planned.
  - Wave 1 (N = 9,912, April 2020 to October 2020)
  - Wave 2 (N = 3,093, November 2020 to May 2021)
  - Wave 3 (N = 2,860, October 2021 to November 2021)
- Wave 1 data has been released to the public.
  - Published in Nature Scientific Data Volume 8. Article number: 245 (2021)
  - Summary of wave 1 have been published in PNAS, July 6, 2021, 118 (27)



“Stayers” sample:

Responded to all three waves

Age	Unweighted (N=1,924)	Weighted (N=1,924)
18-29	2%	21%
30-44	15%	25%
45-59	25%	24%
60+	58%	30%
Gender		
Male	23%	49%
Female	77%	51%
Education		
High School or less	5%	39%
Some College	22%	31%
Bachelor's or higher	73%	30%
Vehicles in HH		
0	3%	9%
1	29%	23%
2	46%	37%
3+	22%	31%
HH Income		
<$35k	9%	19%
$35k-$99,999	44%	42%
$100k or more	47%	39%



- Weighted the panel data to be representative of the US population.
- Used Census divisions (U.S. Census Bureau, 2020) for weighting.
- Using PopGen 2.0, we controlled for:
  - Age
  - Education level
  - Gender
  - Ethnicity
  - Household income
  - Number of household vehicles
  - Employment status

The COVID Future Survey

Pre-Pandemic Actual

Before the COVID-19 pandemic, did you have the option to work from home, at least some of the time?

- Yes
- No

Before the COVID-19 pandemic, how often did you usually work from home?

- Never
- A few times/year
- A few times/month
- Once/week
- A few times/week
- Every day

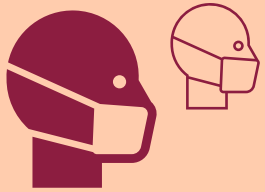
During Pandemic Three Waves

In the past 7 days, did you have the option to work from home?

- Yes
  - all of the time or some of the time (wave 3 only)
- No

In the past 7 days, how many days did you work from home?

- (0 to 7)



**Additional options added in Wave 3*

Post-Pandemic Expectation

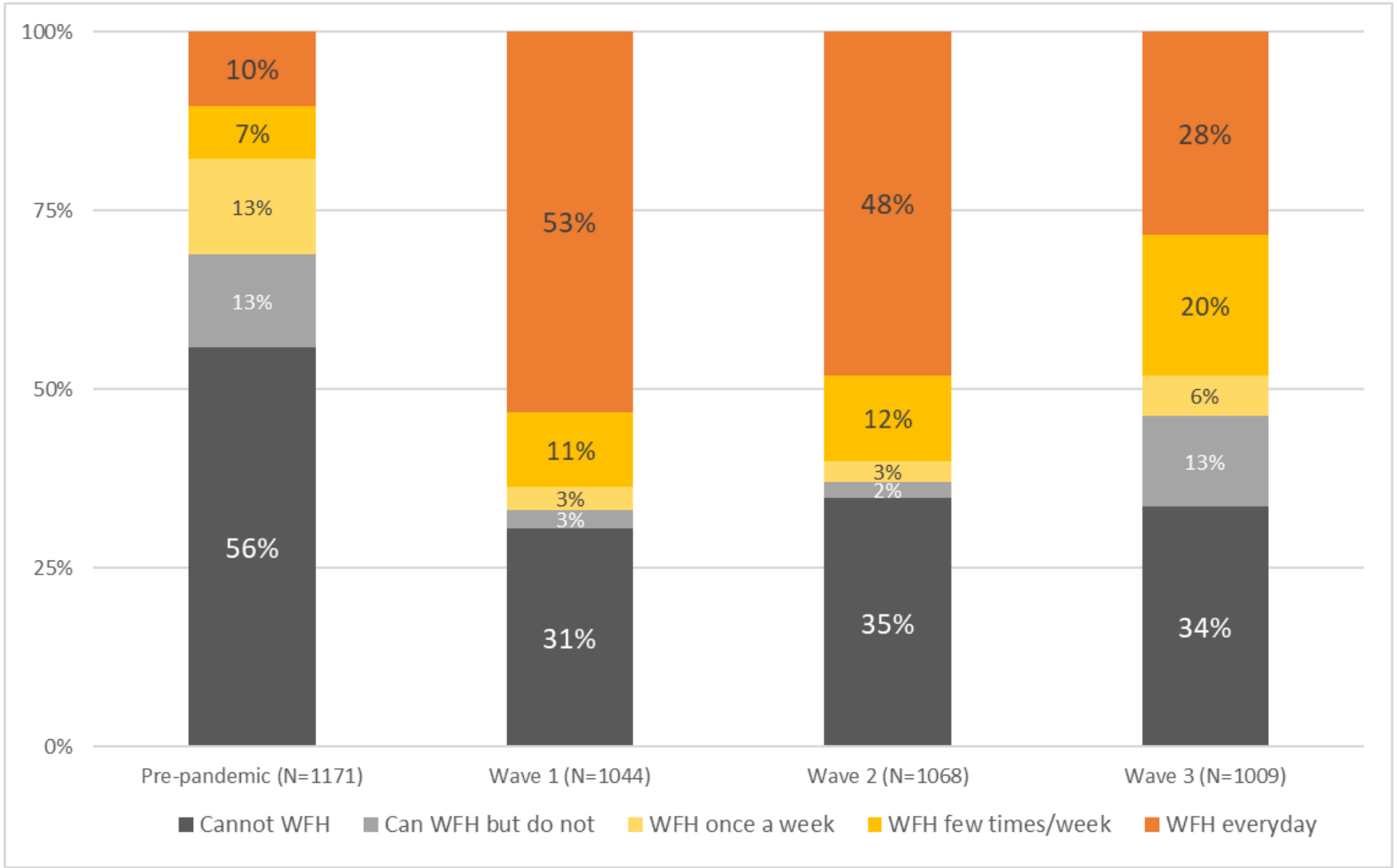
After COVID-19 is no longer a threat, do you expect to be able to work from home, at least some of the time?

- Yes
- No

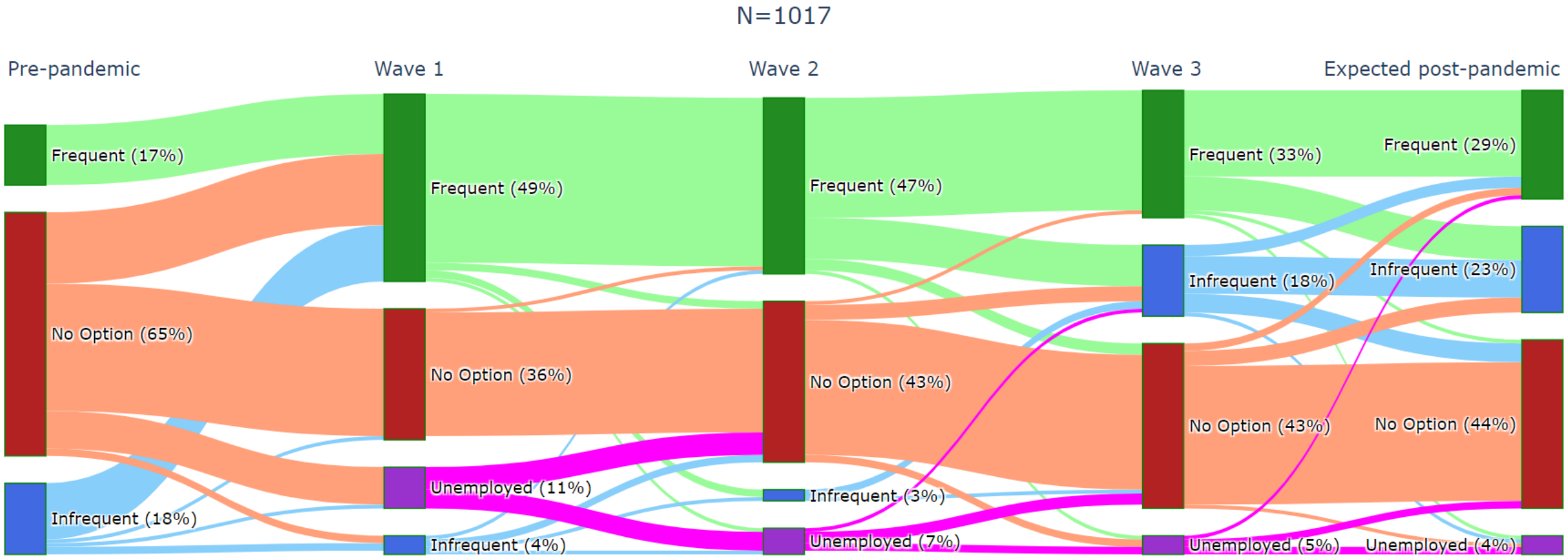
After COVID-19 is no longer a threat, how often might you work from home?

- Never
- A few times/year
- A few times/month
- A few times/week
- Every day

Evolution in Work from Home (WFH)



Work from home frequency



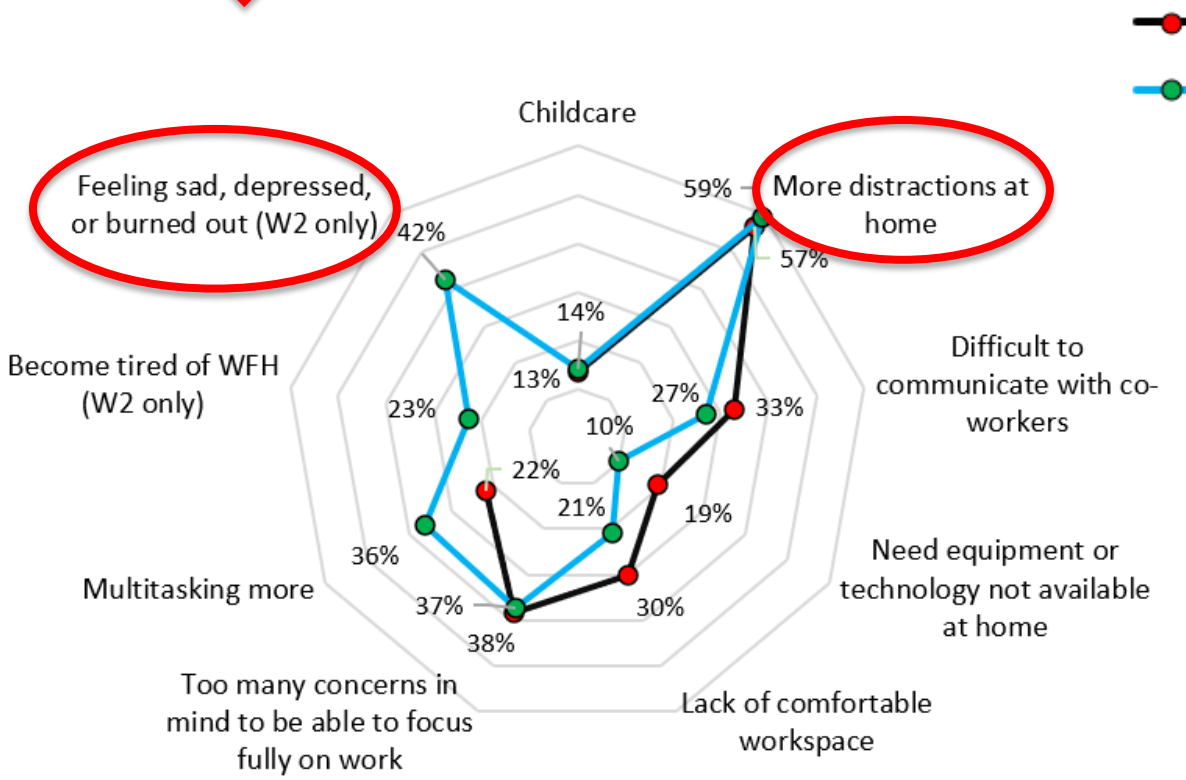
"Frequent" = twice/week or more

"Infrequent" = once/week or less

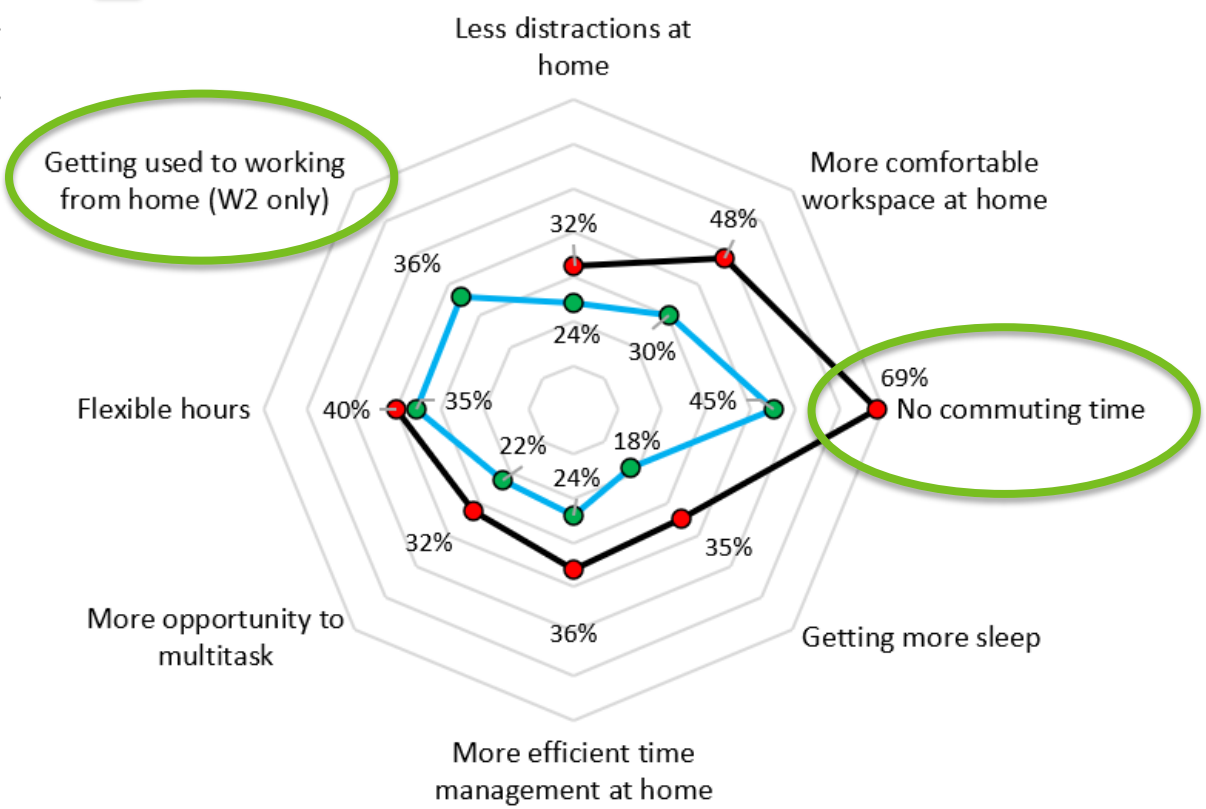
The Response Reliability Challenge

Reasons for changes in WFH

decrease



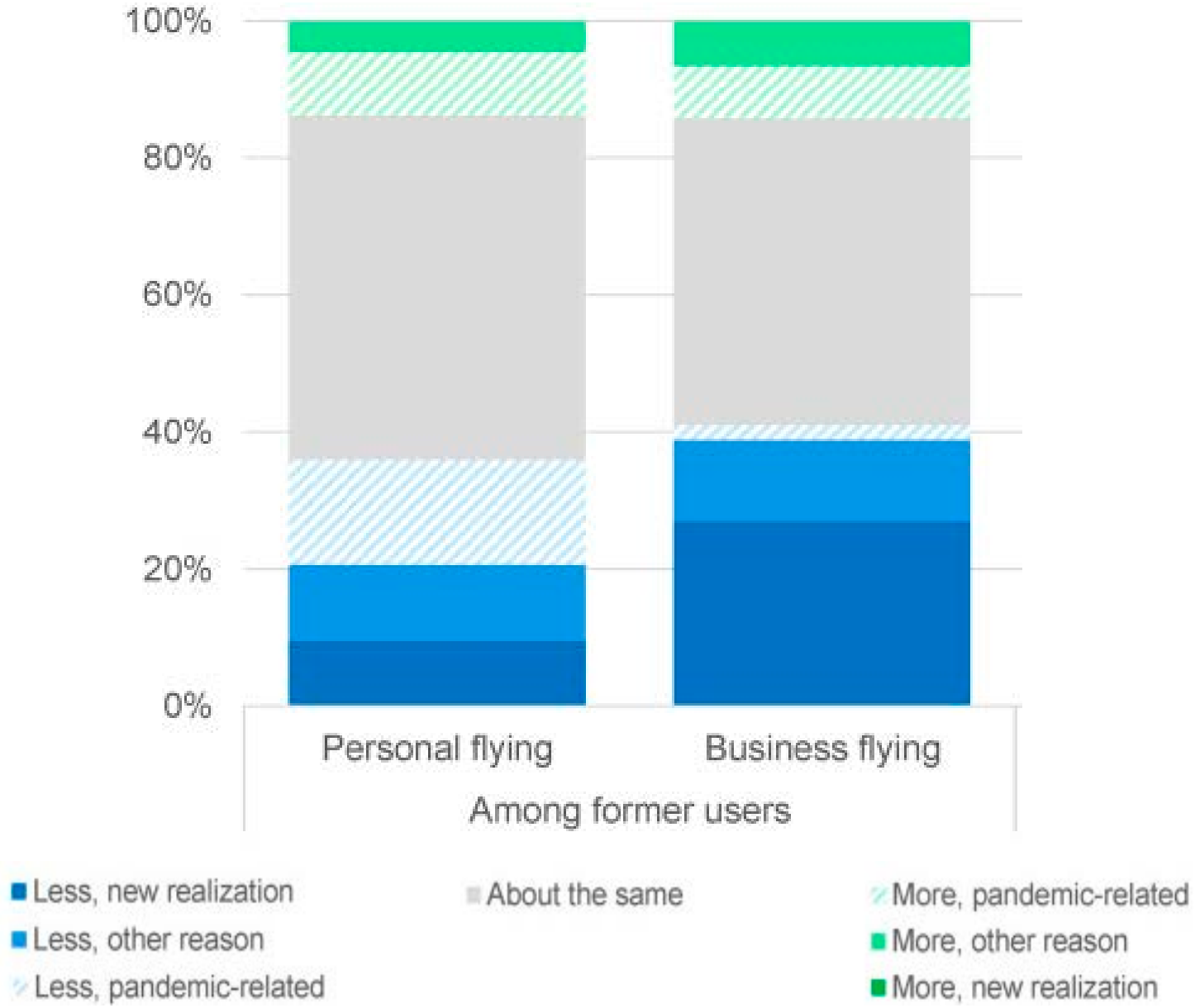
increase



Expected Change in Post-pandemic Air Travel

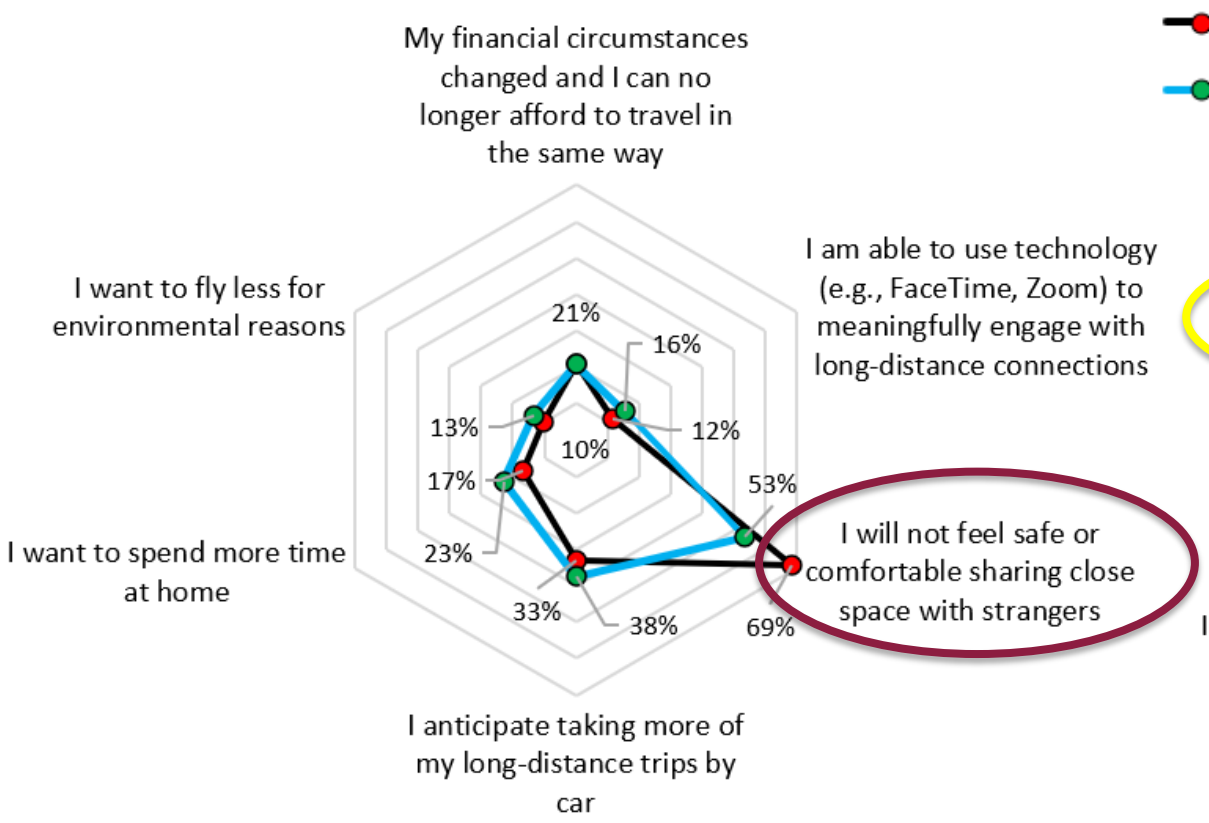
Expected decrease in air travel seems more likely to be long-lasting for business than personal trips

Infrequent flyers, women, and older population are more likely to decrease their air travel

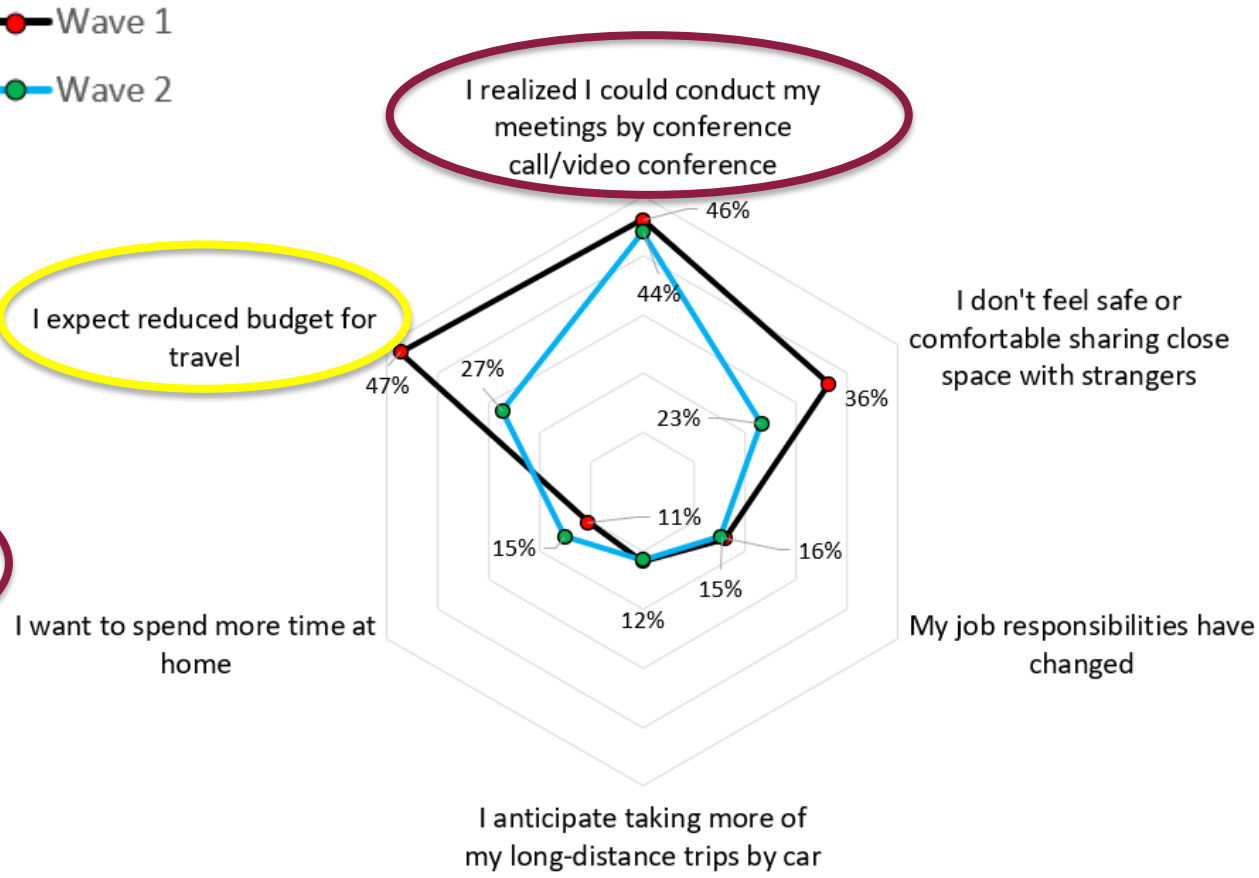


Changes in air travel

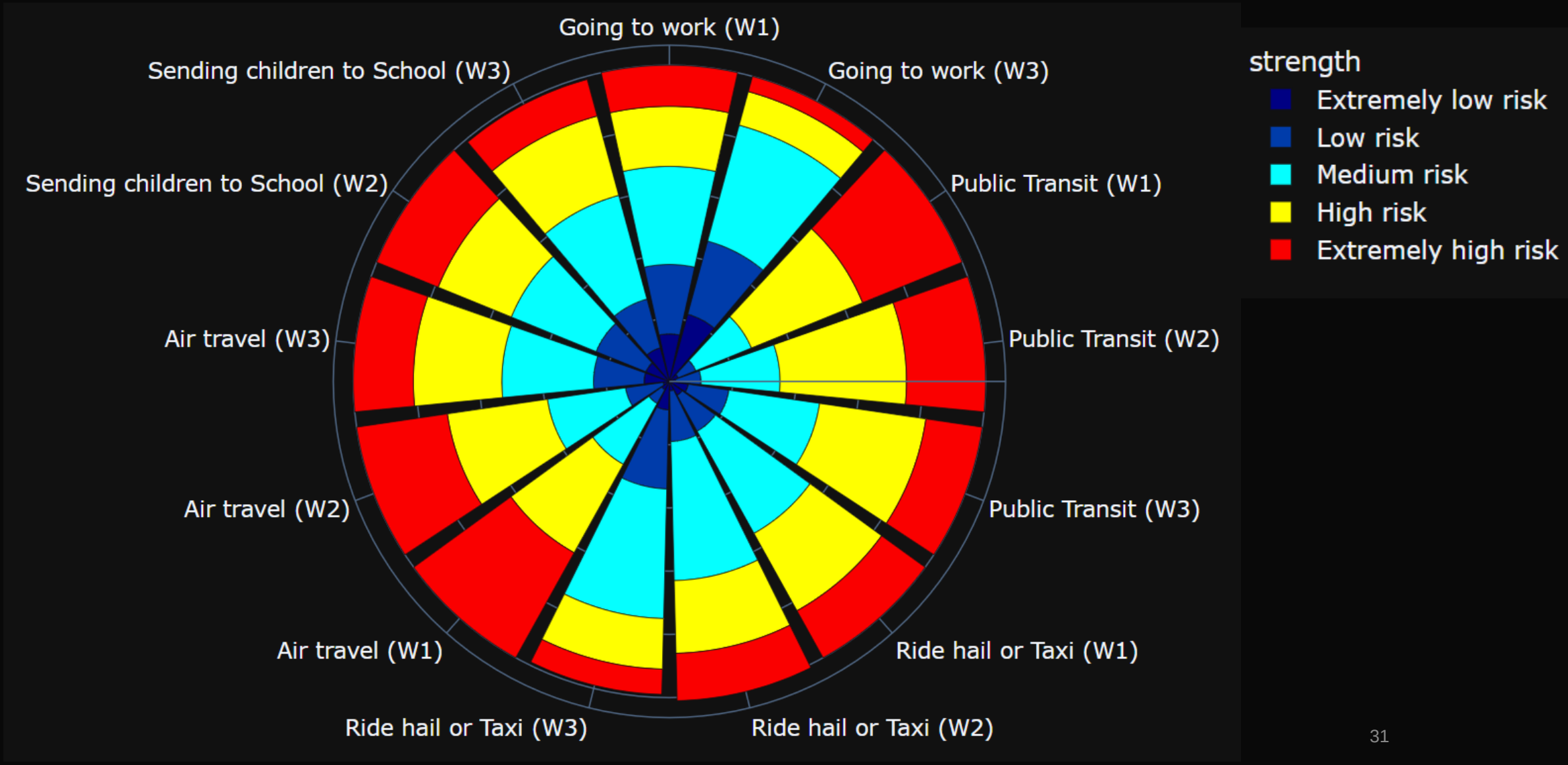
leisure/personal



business

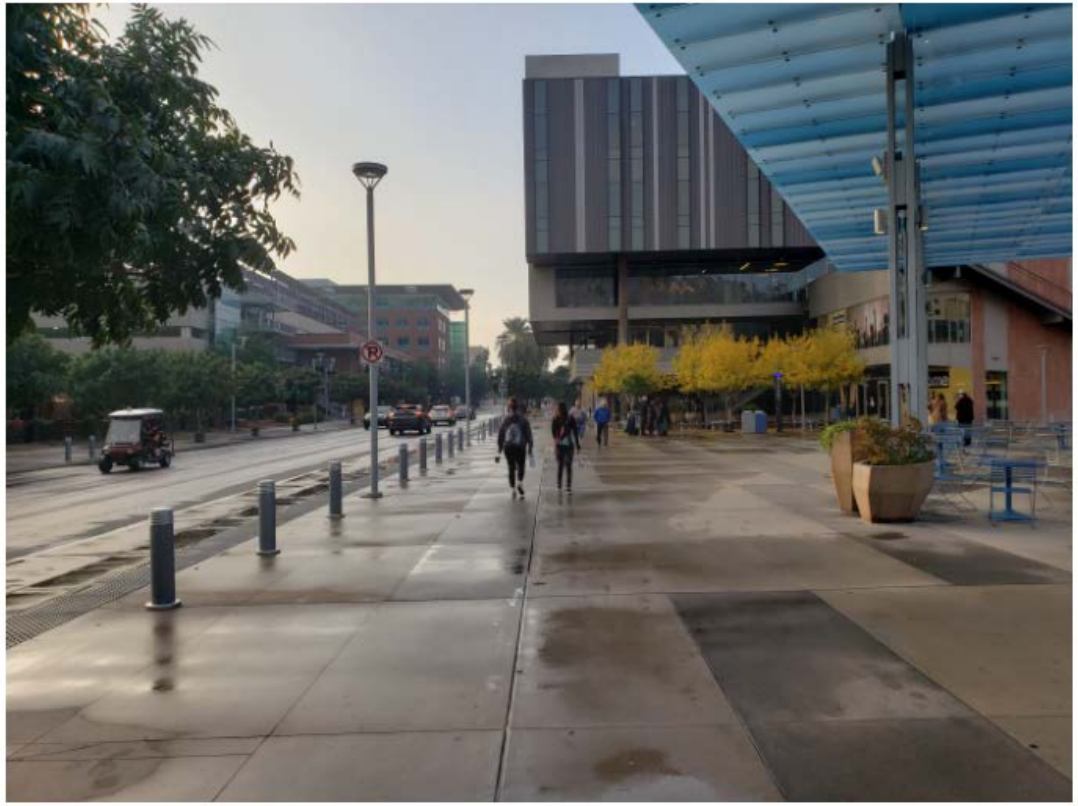


Activity Risk Perception



Will expectations of change become actual change in the long term?

Time will tell, but data like these are the best indicators we have right now.



Traffic is Light at Arizona State University Campus in the Wake of COVID-19 (Courtesy: ASU)

The Long View: COVID-19 Impacts on Human Activity-Travel Patterns

Part 1: Will We See a Massive Shift to Remote Working and Learning — Don't Count On It

Read *Part 2: Will We See a Future of Less Traffic and Reduced Physical Participation in Activities — Don't Count On It*

Apr 20, 2020

The Long View: COVID-19 Impacts on Human Activity-Travel Patterns

Part 2: Will We See a Future of Less Traffic and Reduced Physical Participation in Activities — Don't Count On It

In Part 1 of this two-part series, we explored how and why people may not adopt remote work and school arrangements on a mass scale in a post-COVID-19 era.

What Does this Mean for Transportation?

- Safety
- Mobility
- Efficiency
- Equity
- Climate
- Resiliency
- … *more?*

Thank you!

Ram M. Pendyala, ram.pendyala@asu.edu

on behalf of **The Glorious COVID Future Survey Team**

For more information, please visit: www.covidfuture.org

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TOMNET Transportation Center
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