

TRANSPORTATION SURVEYS FOCUSED ON TRAVEL BEHAVIOR IMPACTS OF THE PANDEMIC

COVID-19 Literature Review Project

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National Capital Region
Transportation Planning Board

Background

The COVID-19 pandemic had a significant impact on travel patterns and behavior in the U.S. and the world.

The purpose of this project was to examine how pandemic travel trends were being captured by travel surveys conducted by MPOs, universities and federal/state governments.

These surveys provide a comprehensive picture of how household and individual travel behavior has changed during the pandemic and how it will impact people's travel choices in the future.



Overview of the Project

A literature review focusing on travel surveys measuring the impacts of COVID-19 on transportation and travel behavior in U.S. states and metro areas.

- A reference list/matrix of surveys focused on COVID-19 and collect relevant resources
- A summary of the types of COVID-19 surveys
- For five surveys representing best practices in survey design and methodology, a summary of overall findings from COVID-19 surveys



Literature Scan

Study Name	Agency	Funding Source/Partners	Survey Design	Survey Region	Field Date	Sample Size	Weighting Approach	Topics Covered
COVID-19 Transportation Insights Panel: A Sequential Study of the Impacts of the COVID-19 Pandemic on Travel Behavior	Metropolitan	Partnership with Southern California Association of University Transportation Centers, National Science Foundation, Center for Teaching Old Models, New Tricks at Arizona State University, Knowledge Exchange	Cross-sectional, multiple survey waves every 1-2 weeks	L - CA 48 Cities Study	August, October, December 2020	each wave via national online panel; 15,000+ respondents surveyed to date	region to allow for cross-wave analysis; weighting controls include regions, household-level, and person-level	Travel modes, travel replacement, long-distance travel, teleworking, perceptions about COVID-19 risk, future teleworking, attitudes about travel, demographic and employment information
Longitudinal Analysis of COVID-19 Impacts on Mobility: An Early Snapshot of the Emerging Changes in Travel Behavior	Metropolitan	Partnership with Southern California Association of University Transportation Centers, National Science Foundation, Center for Teaching Old Models, New Tricks at Arizona State University, Knowledge Exchange	Longitudinal (3 waves), Opinion Panel	in US and 2 in Canada; C - CA 48 Cities Study	May to July 2020	1,100 participants tracked		Attitudes and preferences on transportation, impacts of COVID-19 on lifestyle, employment status, household organization, online and in-person shopping, current travel choices, use of emerging transportation services, household vehicle ownership, household and individual demographic information
COVID-19 and the Future Survey	Chicago	University of Colorado Boulder	waves	Entire U.S.		(wave)	Not available	Demographics, work, study, shopping and dining, transportation, general attitudes
Voices of the Region Survey	Metropolitan	MHFCOG	Cross-sectional	TRB Planning Region		3,497 completed		Employment status, telework, commute to work, grocery visits, online shopping, delivery services, perception of COVID-19 health risks, recreation, attitude towards new/proposed COVID-19 policies transit and air travel
A Comprehensive Study of the Impacts of COVID-19 Pandemic on Activity-Travel Behavior in Chicago	Illinois at Chicago		revealed preference survey	Chicago Metropolitan Area	April 25-June 2, 2020	915 valid responses	Not available	Change in daily travel habits, mode share, transit usage, telecommuting, online shopping, opinion longitudinal questions about improvements to transportation infrastructure, broader opinion questions, transportation equity
Assessing the Impacts of COVID-19 on Activity-Travel Choices: A Survey in the Greater Los Angeles Area	University of Southern California		Cross-sectional	Greater Los Angeles Area	July 15-29, 2020	118 respondents	Not available	Health and exposure risk, risk perceptions, air travel shopping habits and attitudes, economic impacts, working from home
Assessing the Impacts of COVID-19 on Activity-Travel Choices: A Survey in the Greater Los Angeles Area	University of Southern California		Cross-sectional	Greater Los Angeles Area	July 15-29, 2020	118 respondents	Not available	Frequency of meal preparation/eating methods, frequency of visiting methods, frequency of non-grocery shopping methods, frequency of grocery shopping methods, working from home

The initial task of the project was conducting a literature scan of COVID-19 transportation surveys:

- Copies of survey instruments/questionnaires
- Research papers, memos, presentation slides, technical reports
- TRB 100th Annual Meeting (January 21-29, 2021)

Based on the review of these materials, a list of surveys were compiled in a matrix which included information on:

- Funding partners, survey design, survey region, field date, sample size, weighting approach, and data items covered

The list of surveys was vetted based on robustness of survey design, sampling methodology, and overall comprehensiveness



“Top 5” COVID-19 Transportation Surveys

Survey Name	Agency	Agency Type	Multiple Waves	National Geographic Coverage	Random Sampling Approach
COVID-19 Transportation Insights Panel	Resource Systems Group, Inc. (RSG)	Private consulting firm	✓	✓	✓
UC Davis COVID-19 Mobility Study	University of California Davis (UC Davis)	Academia	✓	✓	✓ Plus convenience sample add-on survey
COVID-19 and the Future Survey	Arizona State University-University of Illinois at Chicago (ASU-UIC)	Academia	✓	✓	✓
Travel Behavior Inventory COVID-19 Panel Survey	Metropolitan Council (Met Council)	MPO (Twin Cities region)	✓	Regional	✓
COG/TPB Voices of the Region Survey	Metropolitan Washington Council of Governments (COG)	MPO	Single	Regional	✓



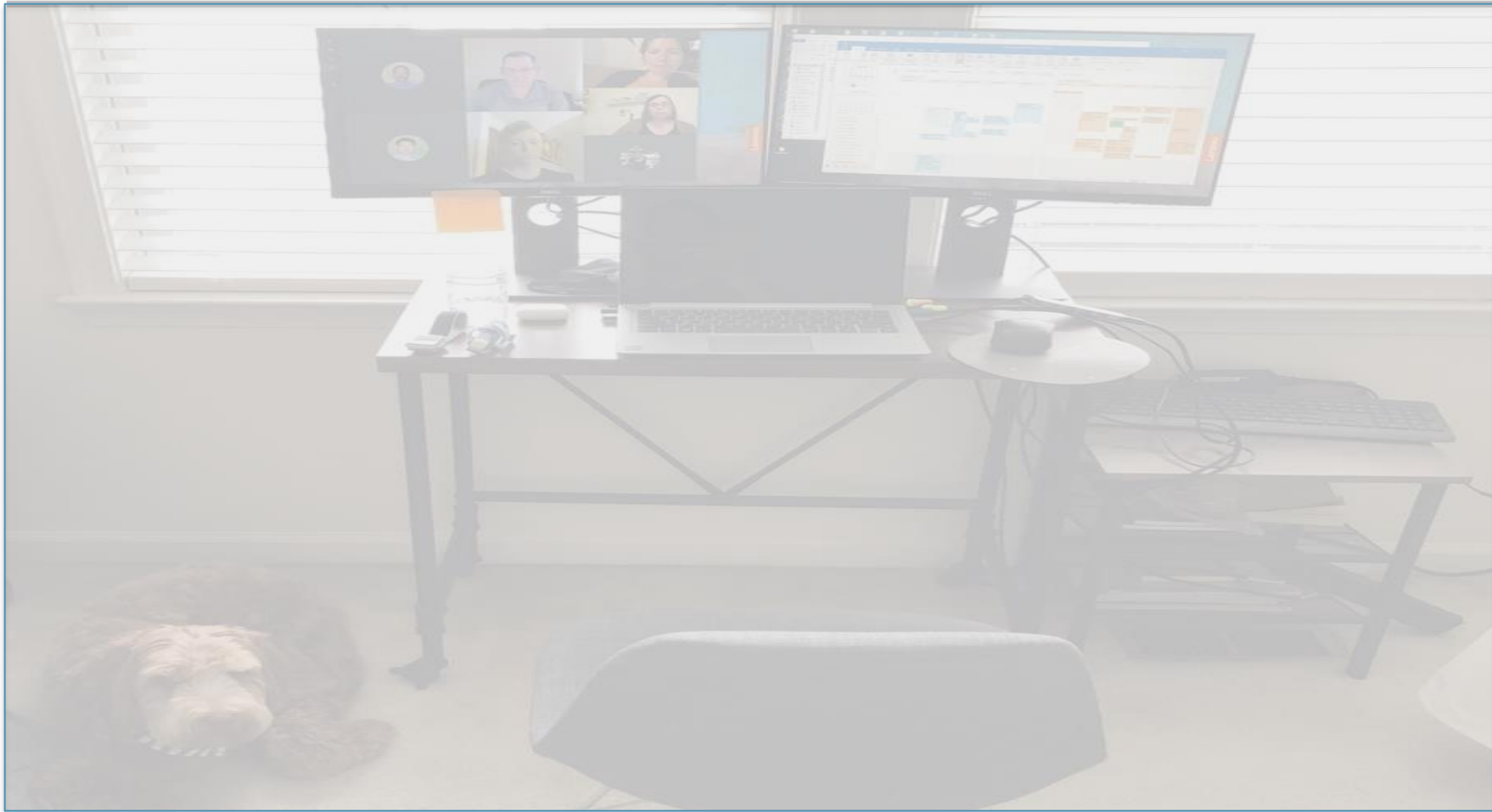
Key Findings of Survey Design and Methods – Sampling Approaches

- Conducted in multiple waves to capture changes in travel patterns and behavior during the pandemic
- Employed both cross sectional and longitudinal approaches
- Mixed-method approach including both probability samples based on random sampling and non-probability convenience samples were used for some surveys
- Panel frame surveys were used in some surveys to obtain input from hard to reach populations

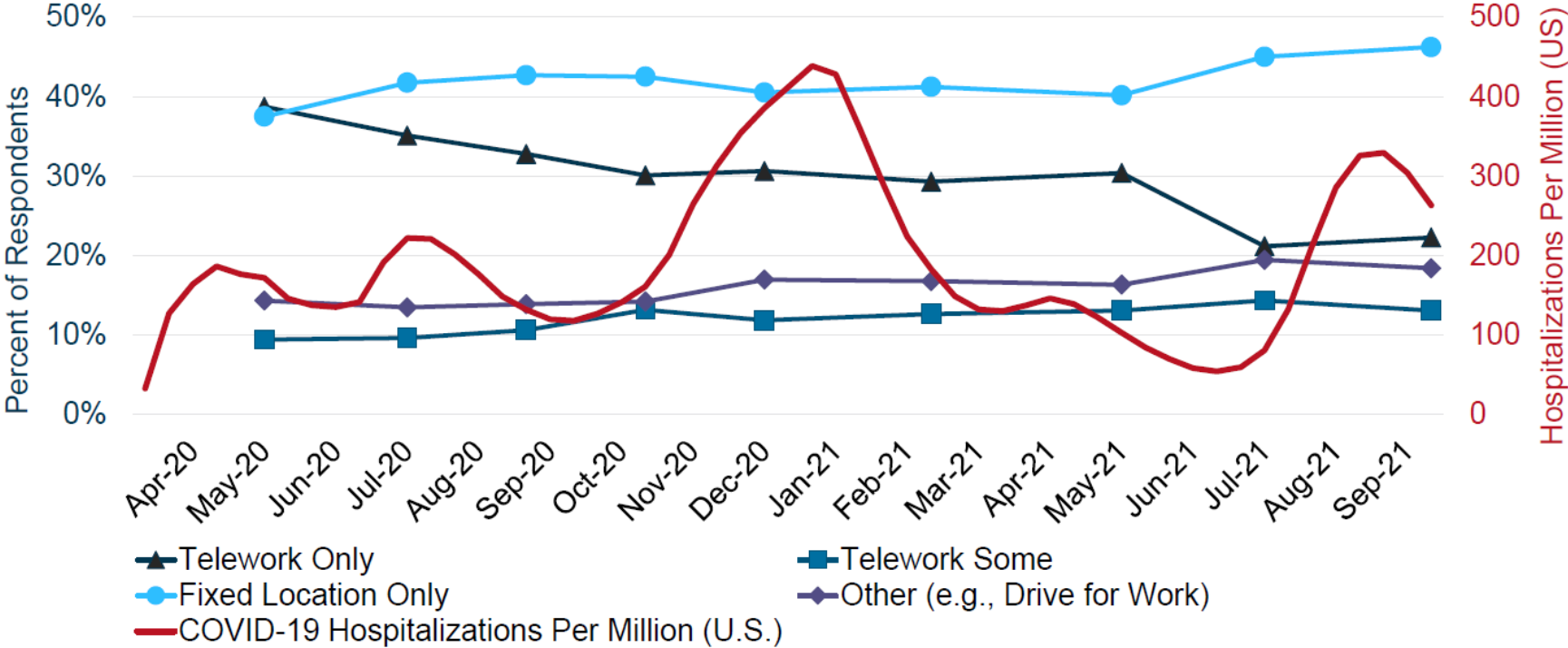
Key Findings of Survey Design and Methods – Data Items

- Collected demographic information to compare travel patterns and trends across sociodemographic groups
- Primary focus on travel patterns and behavior questions, including travel modes, travel replacement, long distance travel, and teleworking
- Attitudinal and stated preference questions about transportation and pandemic impacts (e.g., preferred travel modes in a post-pandemic period)
- Trip substitution and replacement questions such as online shopping and home delivery services

Key Findings on Teleworking and Work from Home

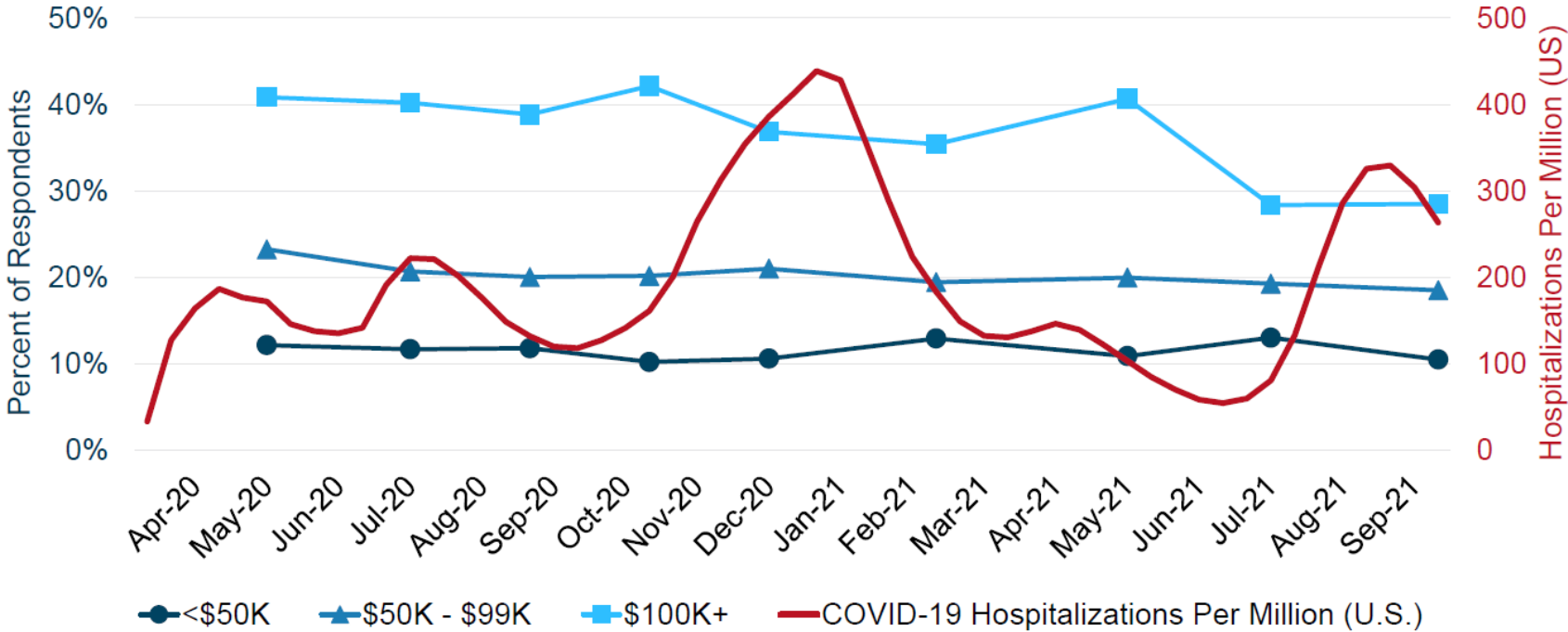


Teleworking Trends by Partial/Full Time Telework Status



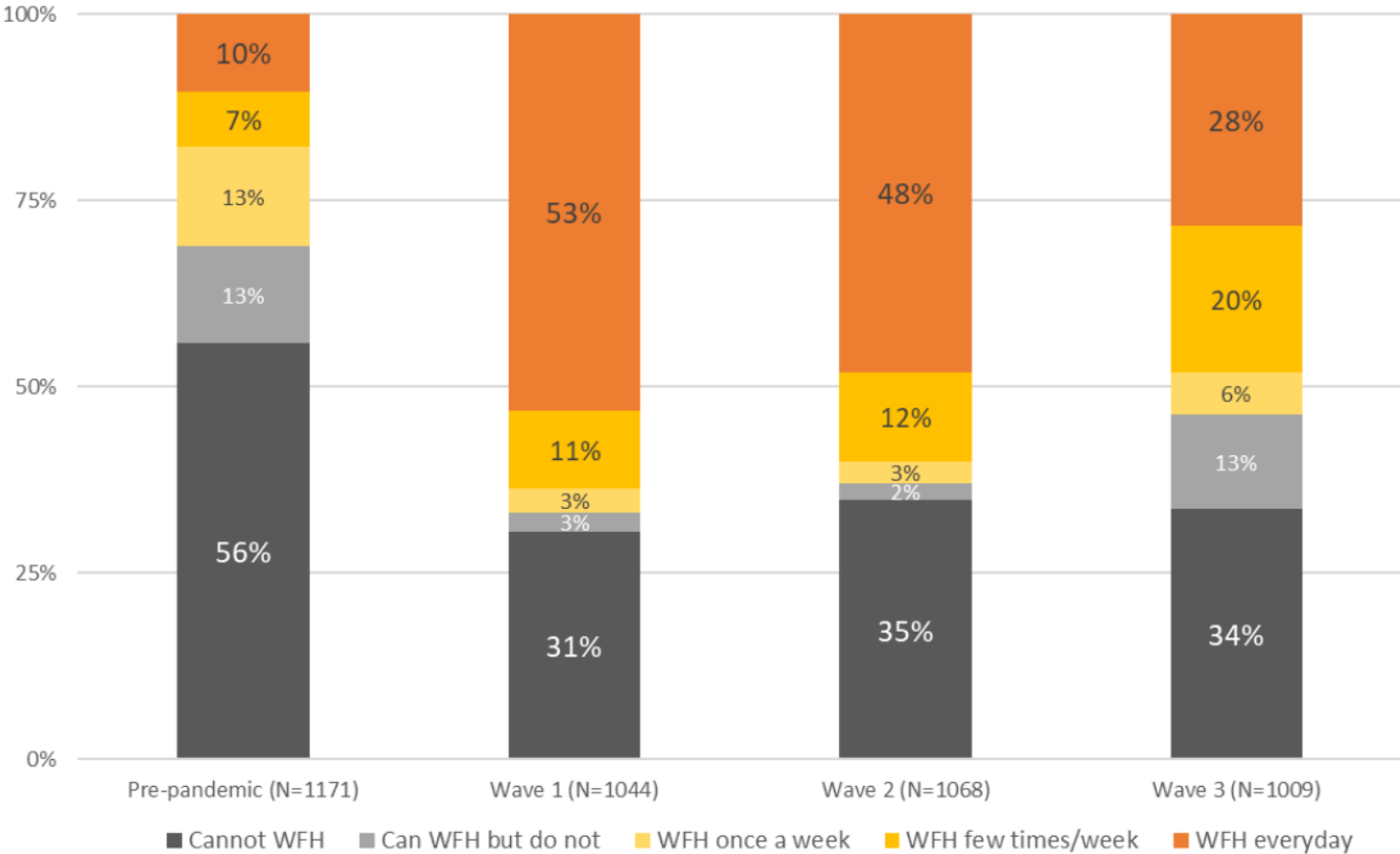
Source: Resource Systems Group (RSG)

Teleworking Trends by Income Group



Source: Resource Systems Group (RSG)

Evolution in Work from Home (Pre-Pandemic to Wave 3)



Wave 1:
Apr to Oct
2020

Wave 2:
Nov 2020
to May
2021

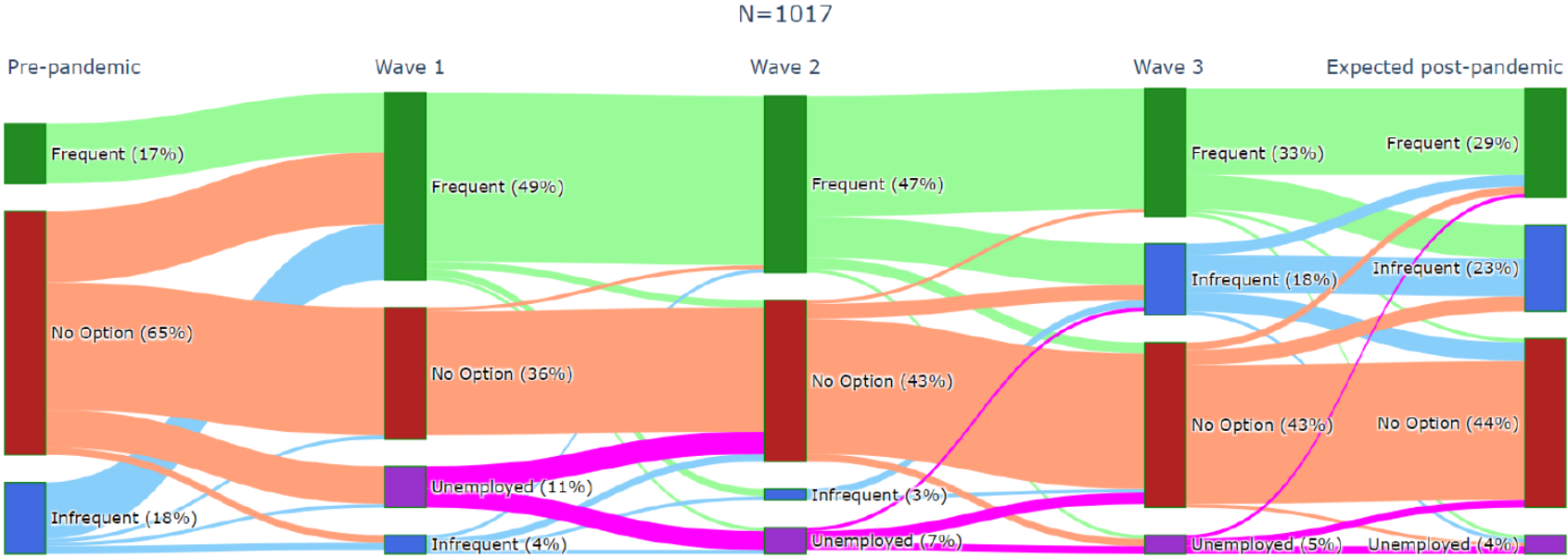
Wave 3:
Oct to Nov
2021

Source: TOMNET Transportation Center (ASU-UIC)



Work from Home Frequency (Pre-Pandemic to Wave 3)

Work from home frequency



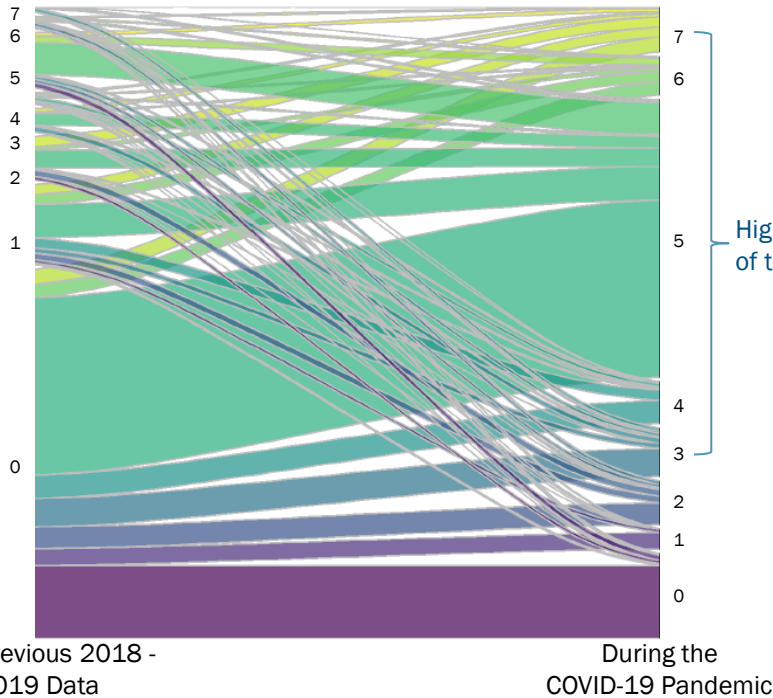
“Frequent” = twice/week or more

“Infrequent” = once/week or less

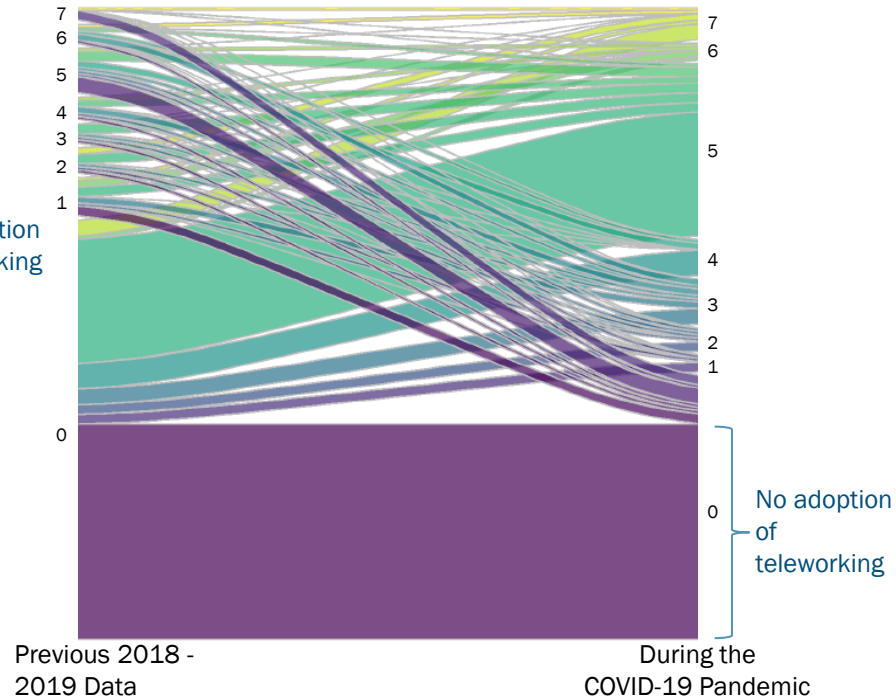
Source: TOMNET Transportation Center (ASU-UIC)

Days Working from Home by Income

Higher Income respondents
(HH Income \geq \$75K)



Lower Income respondents
(HH Income $<$ \$75K)



Notes:

1. Based on the longitudinal dataset of participants from the 2018 California Mobility Study and the 2019 “8 Cities” 3R Study (May to July 2020)
2. Numbers on Y-axis denote days teleworked per week.

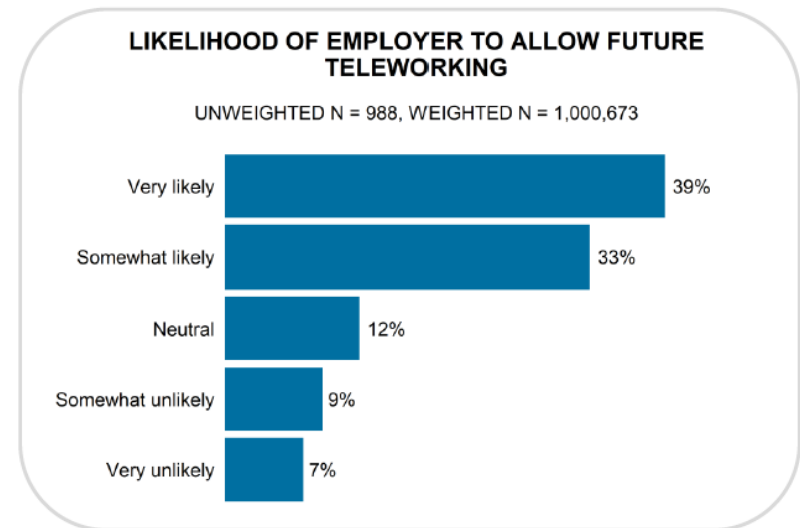
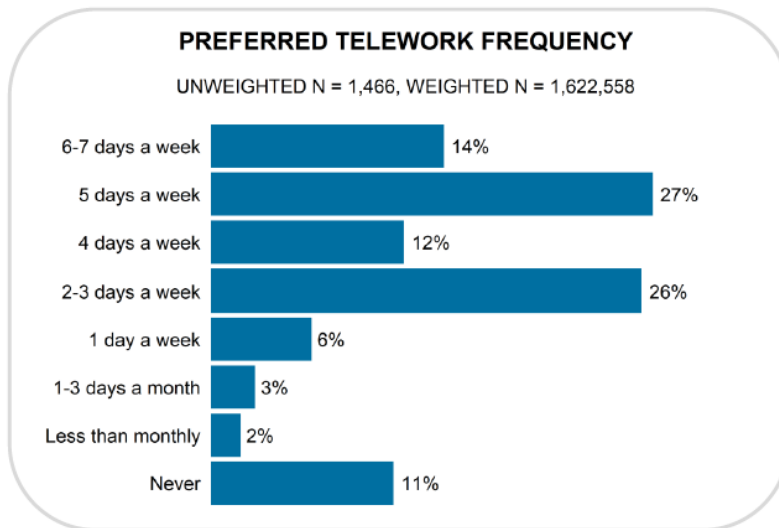
Source: UC Davis Institute of Transportation Studies



Future Teleworking Preference and Likelihood (Met Council Survey)

41% of residents who are employed, furloughed, or looking for work would prefer to telework at least 5 days per week in the future, a decrease from 47% in the summer wave.

11% would prefer not to telework in the future.



Source: Metropolitan Council (Twin Cities MPO)

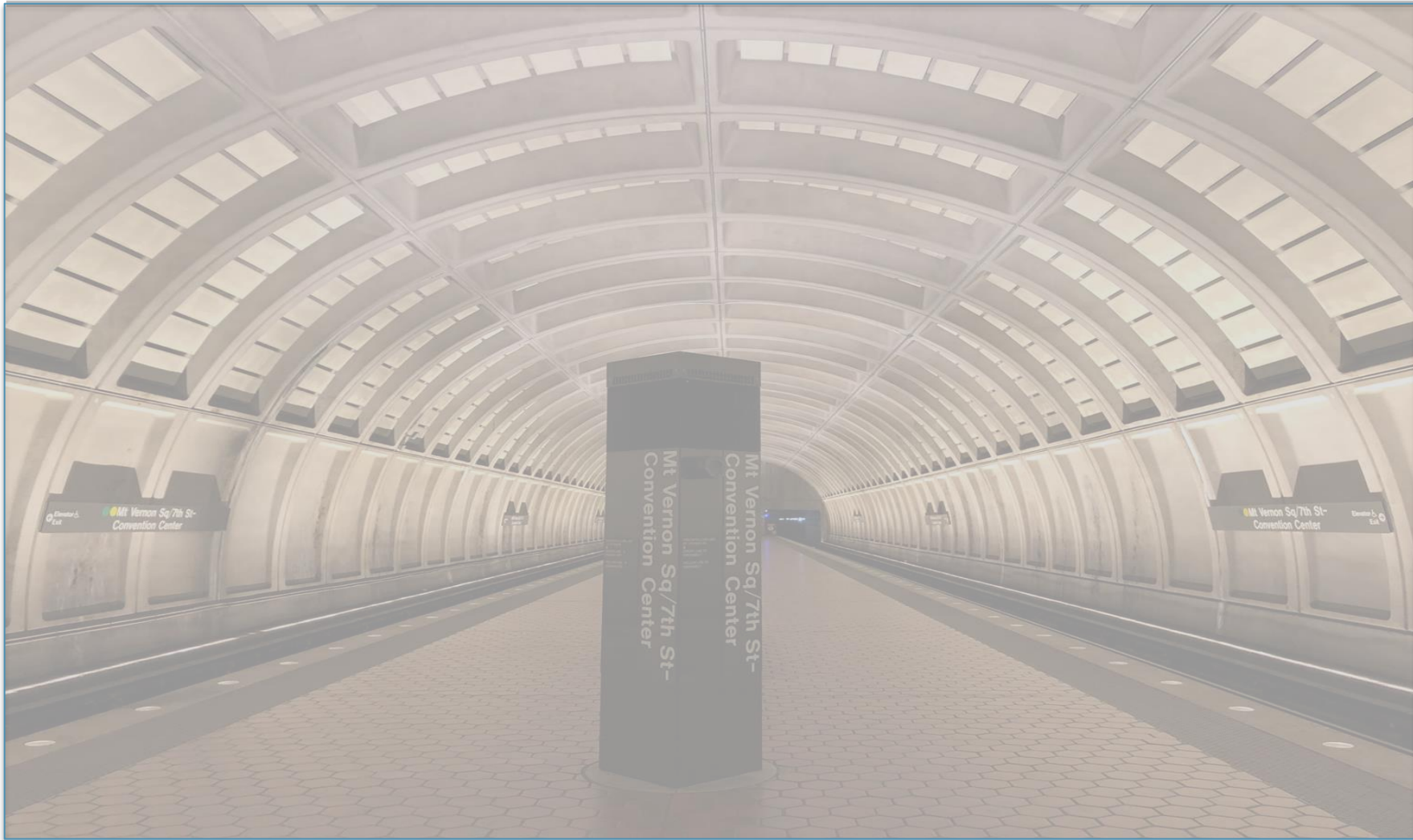


Summary of Teleworking Trends and Findings

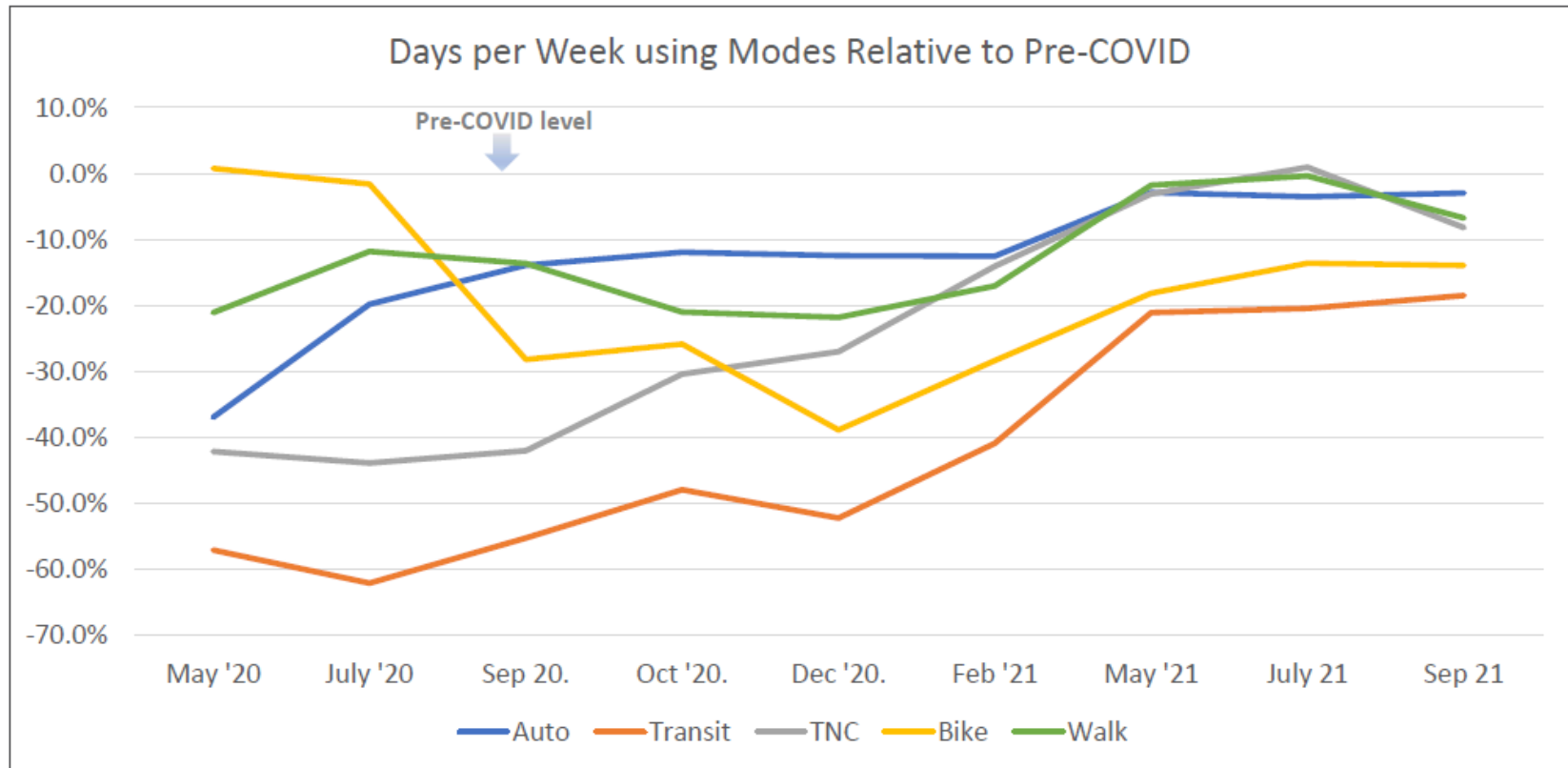
- Teleworking rates were highest at the beginning of the pandemic and declined in mid-2021
- Full-time teleworking was highest in early/mid 2020 and declined into 2021, while part-time teleworking increased in 2021
- Teleworking will be more prevalent in a post-pandemic “new normal” period; most people with telework compatible jobs are expected to telework a few days a week
- The pandemic is likely to have long-term impacts on teleworking trends, as more employers are offering flexible or “hybrid” work schedules



Key Findings on Travel Mode



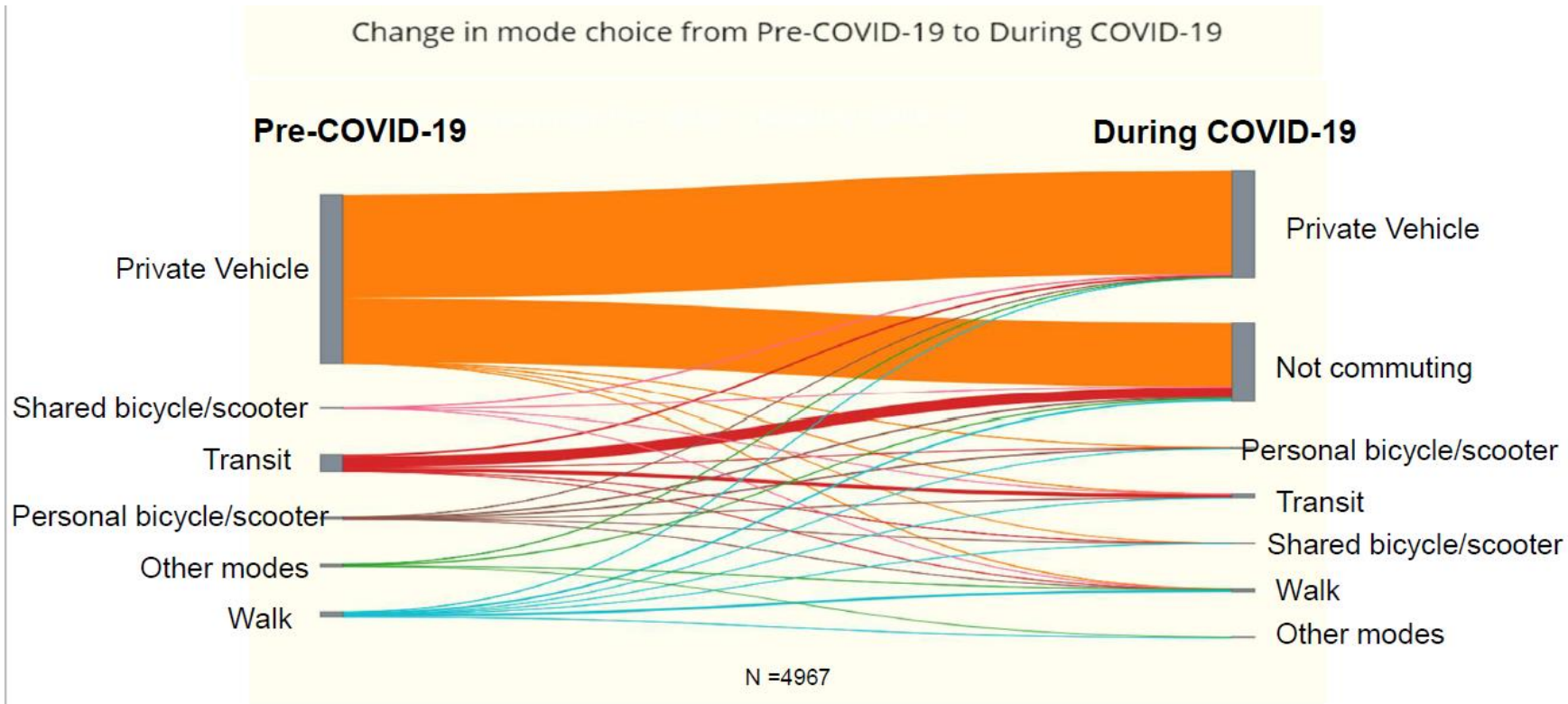
Days Per Week Using Travel Mode



Source: Resource Systems Group (RSG)

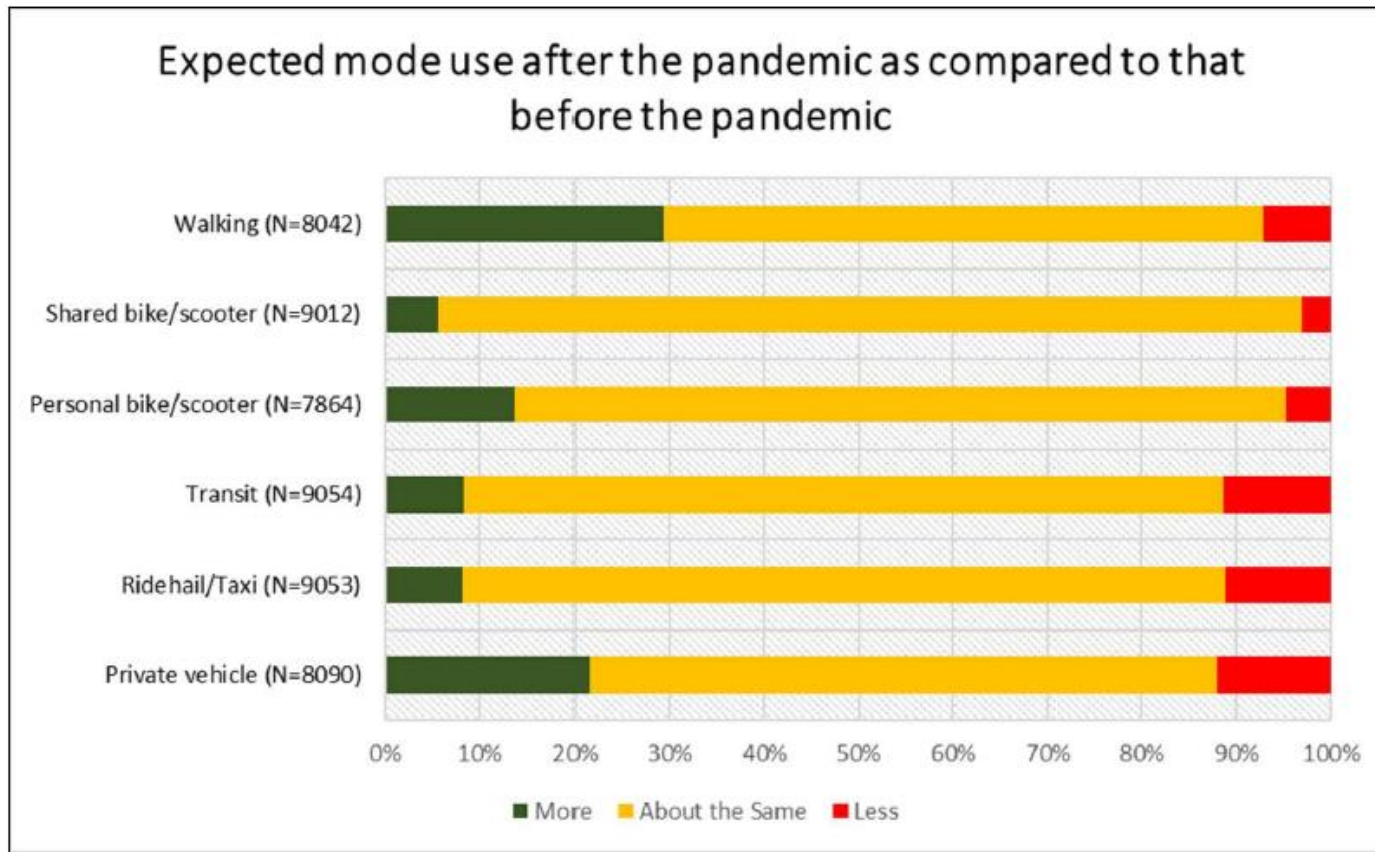


Change in Mode Choice from Pre-COVID-19 to During COVID-19



Note: Based on the first wave of respondents from April to October 2020.
 Source: TOMNET Transportation Center (ASU-UIC)

Expected Mode Use After the Pandemic Compared with Pre-Pandemic

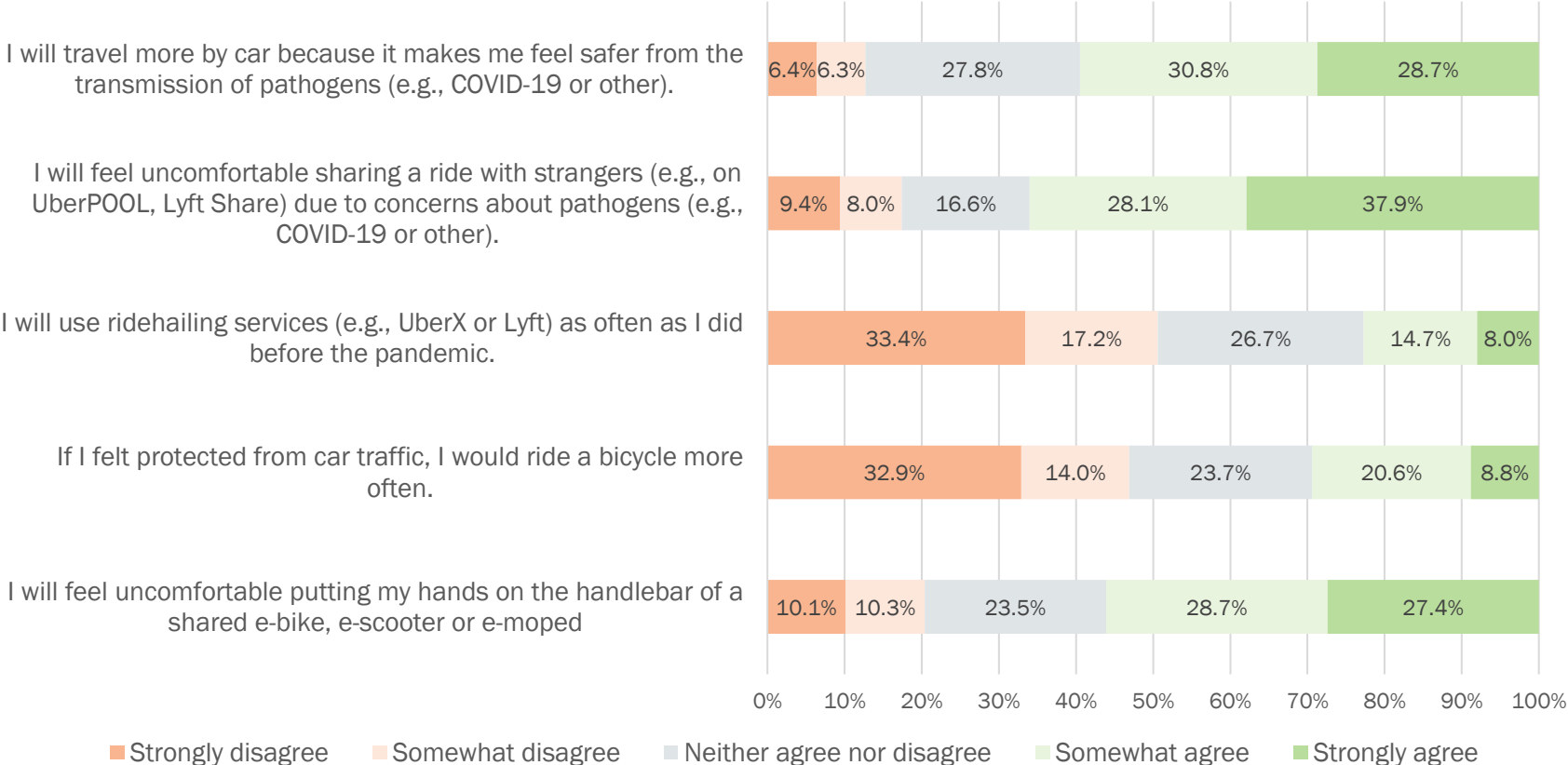


Note: Based on the first wave of respondents from April to October 2020.

Source: TOMNET Transportation Center (ASU-UIC)



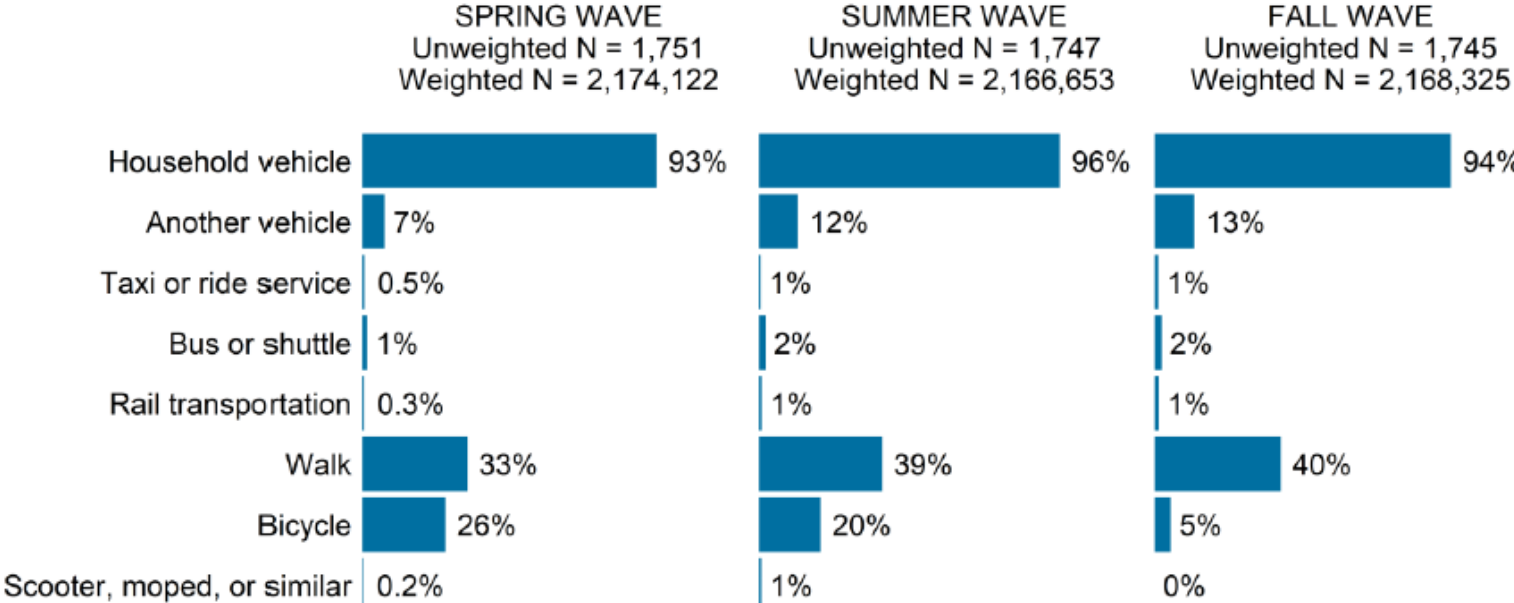
Changes in Travel Mode Preference During the Pandemic



Note: Based on the online opinion panel in 17 regions in the U.S. (May to July 2020)
 Source: UC Davis Institute of Transportation Studies

Travel Mode Used in the Last 7 Days (Met Council Survey)

MODES USED IN THE LAST 7 DAYS



*Note: Respondents could select more than one answer to this question.
 Note: This figure only includes respondents who completed all three panel surveys.*

Source: Metropolitan Council (Twin Cities MPO)

Summary of Travel Mode Findings

- The start of the pandemic marked a sharp decline in trip overall, especially for public transit trips
- Auto travel by private vehicle has largely recovered to pre-pandemic levels
- Public transit usage is expected to remain below pre-pandemic levels in the foreseeable future
- The usage of shared modes such as taxi and ridehail will likely be lower in a post-pandemic period



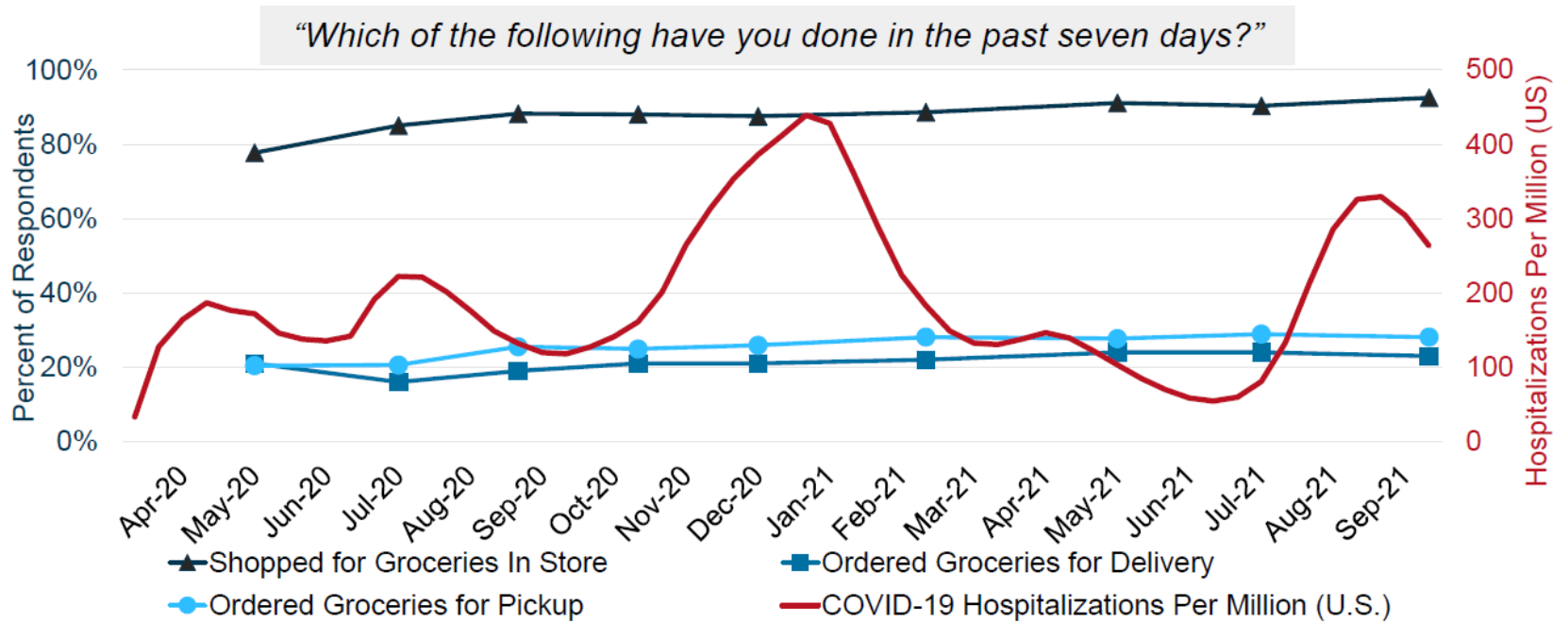
Key Findings on Grocery Delivery and Pickup

freshdirect.

 instacart



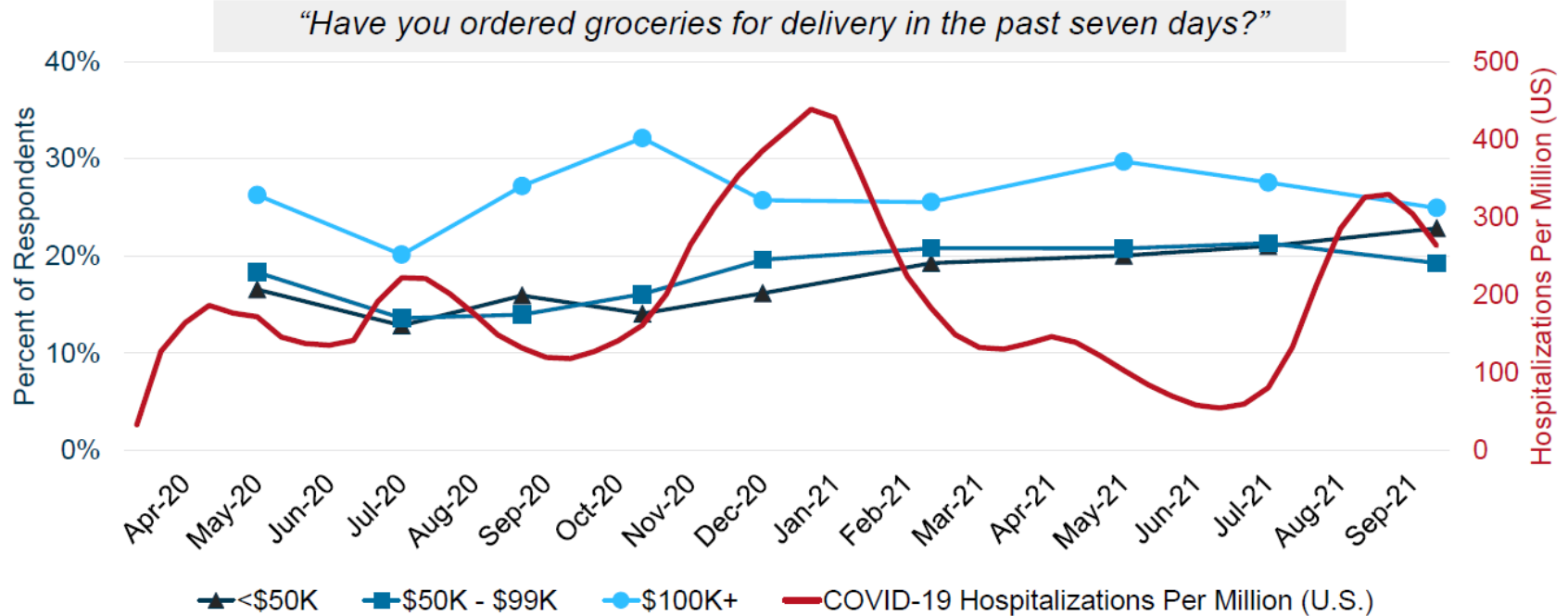
Grocery Delivery and Pickup



Source: Resource Systems Group (RSG)



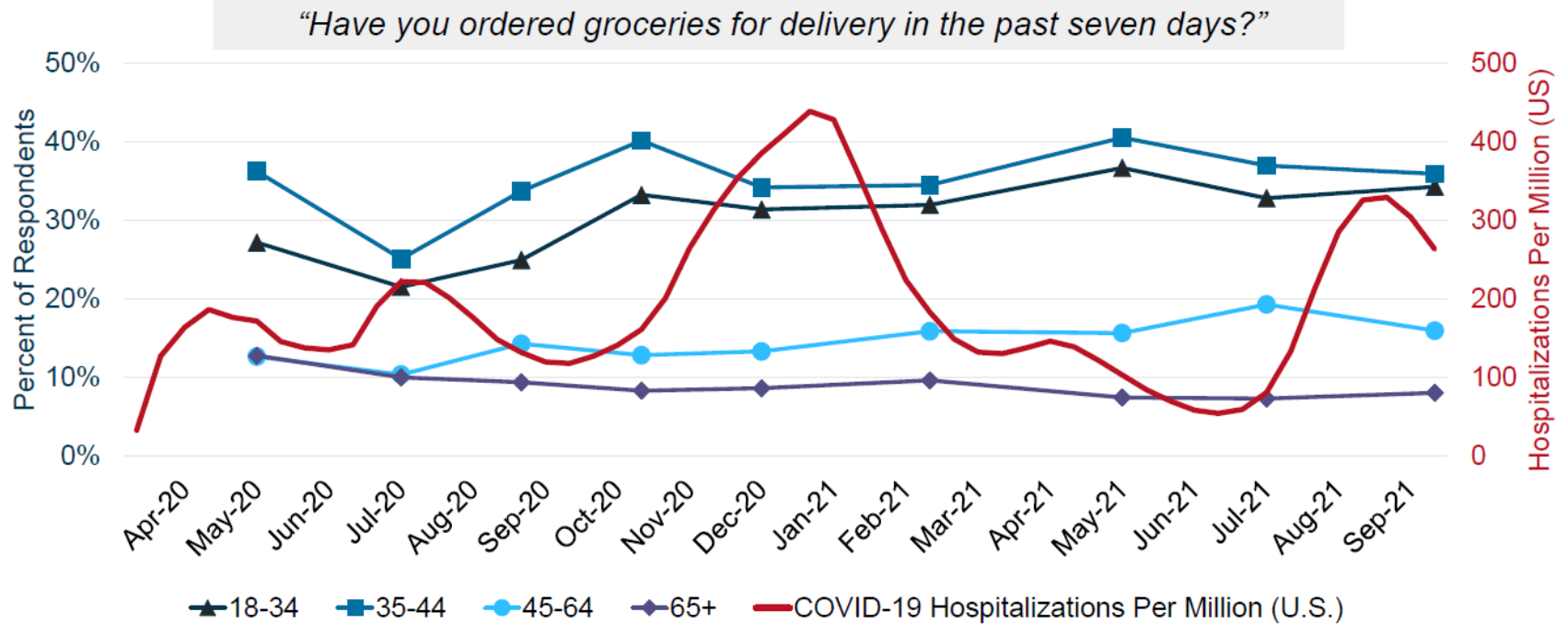
Grocery Delivery by Household Income



Source: Resource Systems Group (RSG)



Grocery Delivery by Age Group



Source: Resource Systems Group (RSG)



Summary of Grocery and Delivery Services Findings

- Grocery delivery services increased during the pandemic, but varied by household income and age group
- Higher income households earning more than \$100,000 are more likely to order groceries for delivery than middle (\$50,000 - \$99,999) or lower income (less than \$50,000) households
- Younger age groups (35-44 and 18-34) are more likely to order groceries for delivery than older age groups (45-64 and 65 and older)



How This Literature Review May Inform Future COG/TPB Surveys

- The pandemic had a significant impact on travel patterns which poses challenges in a post-pandemic period:
 - Rapid changes in travel patterns and behavior
 - Increasing costs and declining response rates
- Multiple waves and more frequent data collection
- Sampling methodology including mixed-methods and non-probability sampling approaches
- Consider panel frame surveys
- Attitudinal and stated preference questions



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