



Attitudes, Behaviors, and Choices around Emerging Transportation Technologies



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Transportation Technologies

Automation

Mobility-on-Demand

Micro-mobility

Electrification

Connectivity

Transportation Future?

Automation

Mobility-on-Demand

Increase in VMT, Sprawl
and Decrease in Walk,
Bike, and Transit Use

Mobility for All and
Sustainability

Connectivity

Study Purpose

Collect a rich set of data across multiple jurisdictions that collects people's travel behavior, attitudes, socioeconomics, perceptions and potential behavior in response to

Mobility-on-demand and

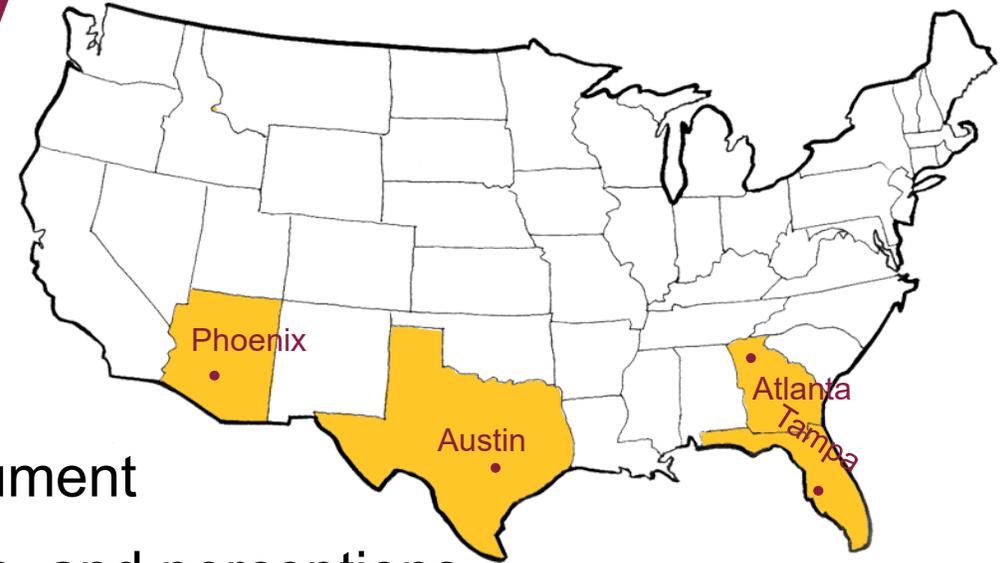
Autonomous Vehicles

Survey Team



TOMNET Transformative Transportation Technologies (T4) Survey

- Phoenix, Atlanta, Austin, and Tampa metro areas
- Summer and Fall 2019 (pre-pandemic)
- Random address-based sample with online instrument
- Inclusion of attitudes, stated preference questions, and perceptions and choices of Mobility-on-Demand and Autonomous Vehicles



	Phoenix, AZ	Atlanta, GA	Austin, TX	Tampa, FL	Total
Sample Size	1,027	944	1,127	260	3,358
%	30.6%	28.1%	33.6%	7.8%	100%

Survey Instrument



Attitudes
and
Preferences



Vehicles
You Have
and Where
You Live



Current
Travel
Patterns



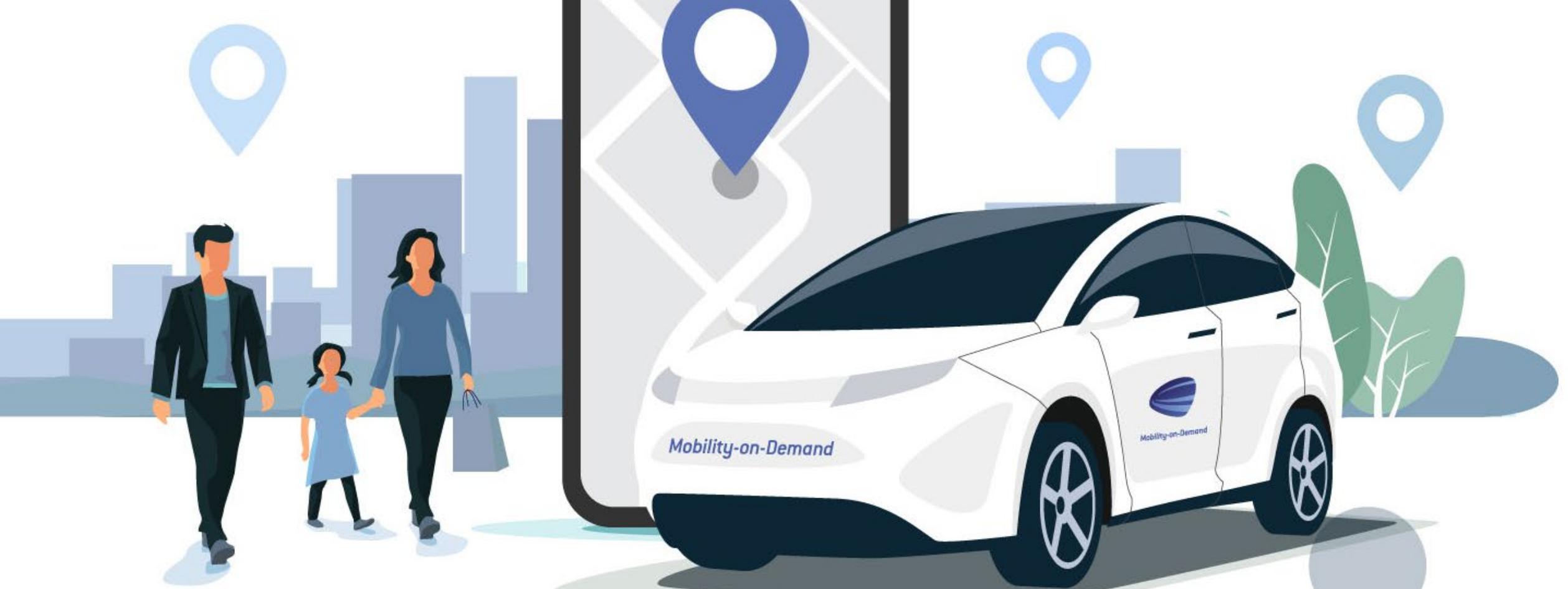
Mobility on
Demand
and Shared
Mobility
Services



Autonomous
Vehicles



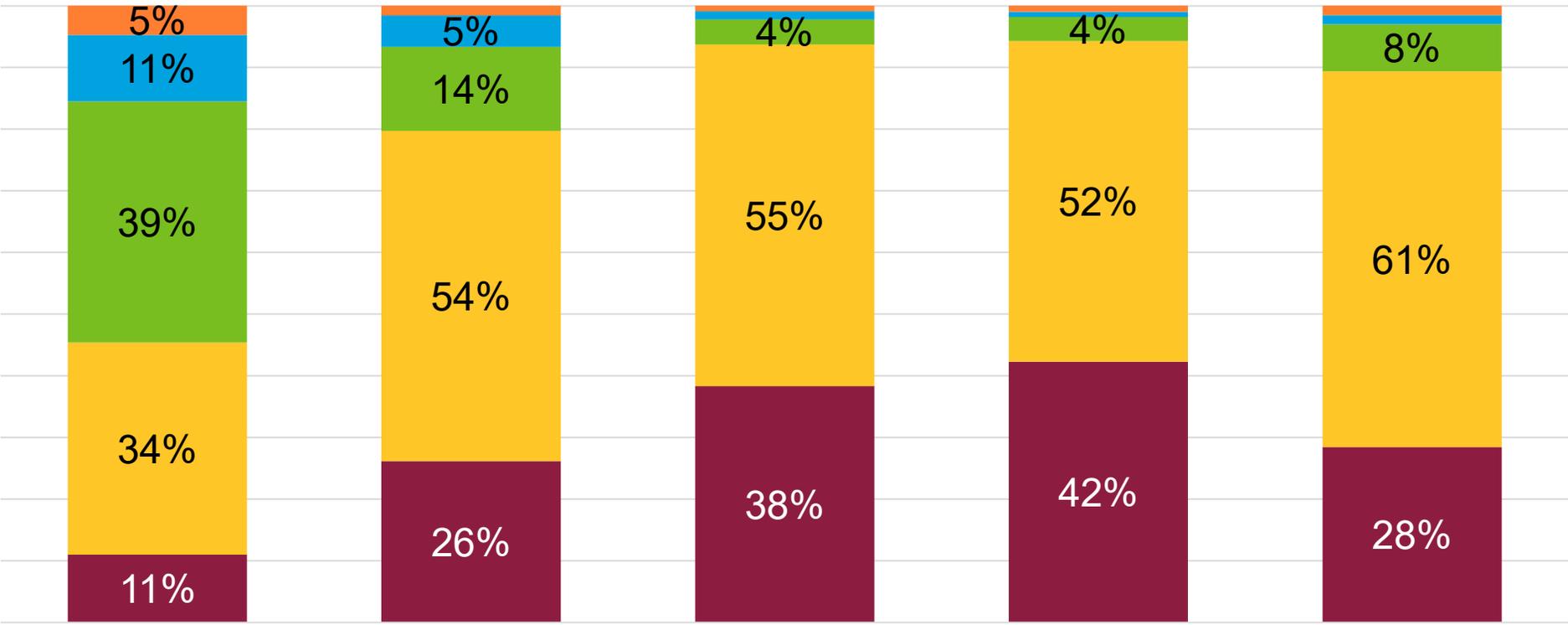
Background
Information



Mobility on Demand

Ridehailing and Micromobility

MoD Familiarity and Usage (N=3,358)



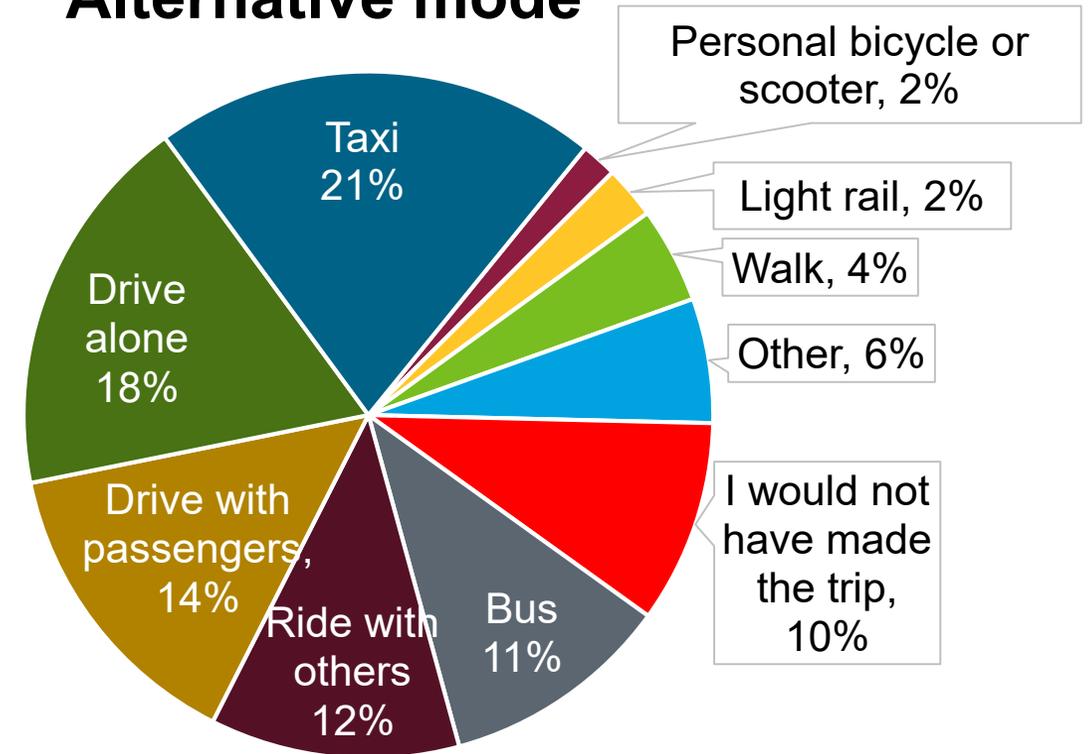
- Use it weekly
- Use it monthly
- Use it rarely
- Familiar but not an user
- Not familiar

Private ridehailing (e.g., Uber, Lyft) Shared ridehailing (e.g., uberPOOL, Lyft Share) Carsharing (e.g., Zipcar, Share Now) Bikesharing (e.g., Jump, Grid) E-scooter sharing (e.g., Lime, Bird)

Last Ridehailing Trips Attributes (N=1,885)

- 54% waited less than 5 min
- Average travel time 21 min
- 47% weekday daytime
- 25% weekend nighttime
- Top trip purposes:
 - Social/recreational 25%
 - Main commute location 15%
 - To access airport 14%

Alternative mode



Ridehailing: Willingness to Share

Last actual ridehailing trips* (N=1,219)

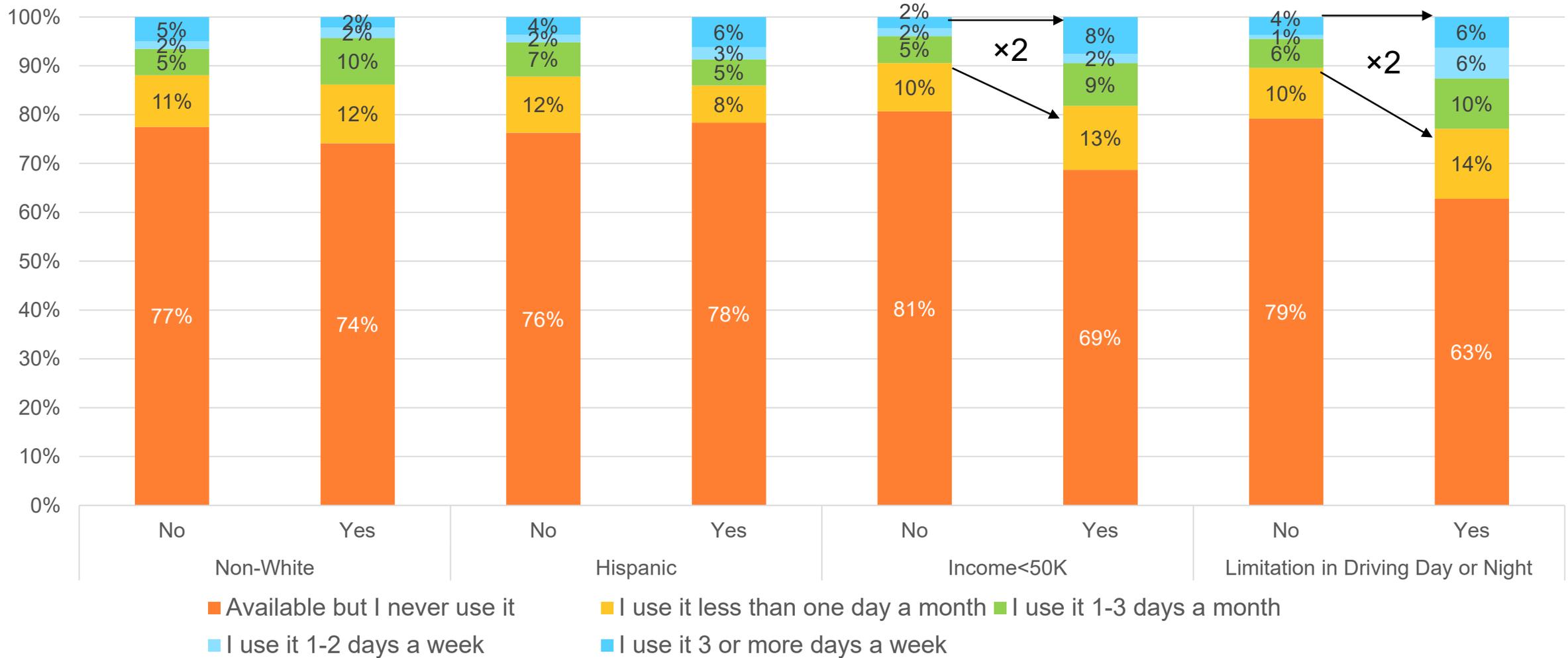
- 12% chose to share
- Low income chose to share twice more than high income
- Women chose to share 1.5 times more than men
- Frequent users chose to share 1.4 times more than infrequent users



**Shared ridehailing only for Austin and Atlanta*

Ridehailing Use for Commute:

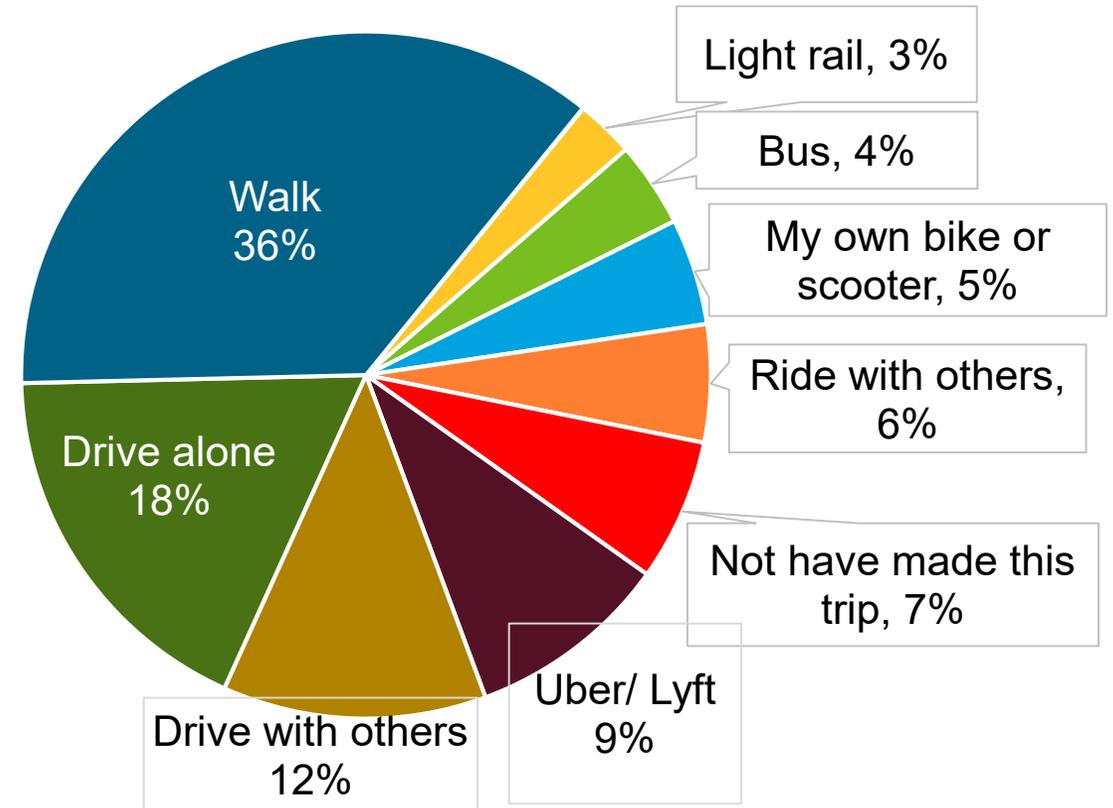
Where system is available and among familiar people

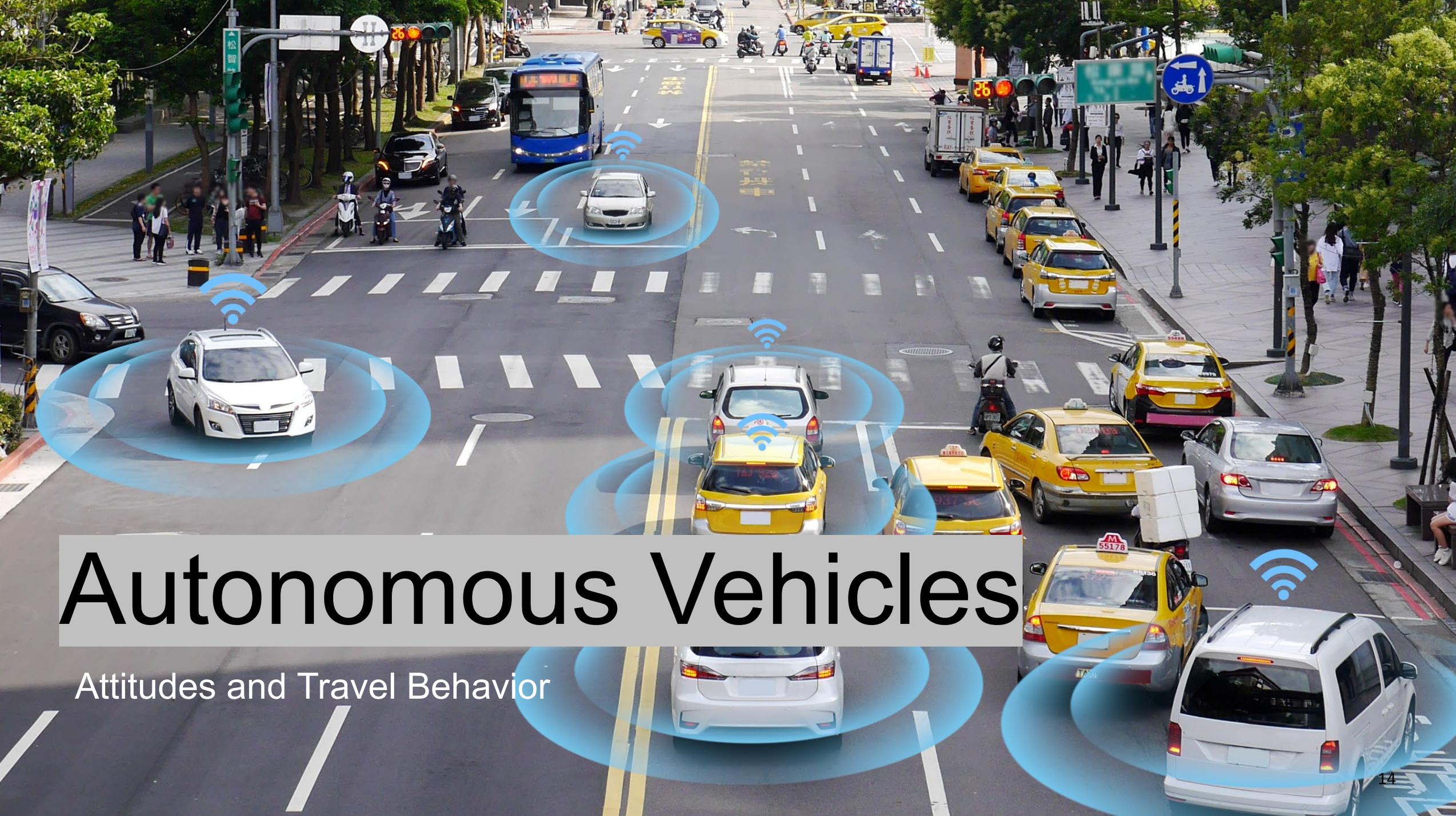


Micromobility Trips (N=380 users)

- 76% used e-scooter service
- 62% of trips were between 1 to 2 mi
- 38% weekday during daytime
- Top trip purposes:
 - 22% to commute location
 - 19% for shopping and errands
 - 7% just to enjoy the new service

Alternative mode



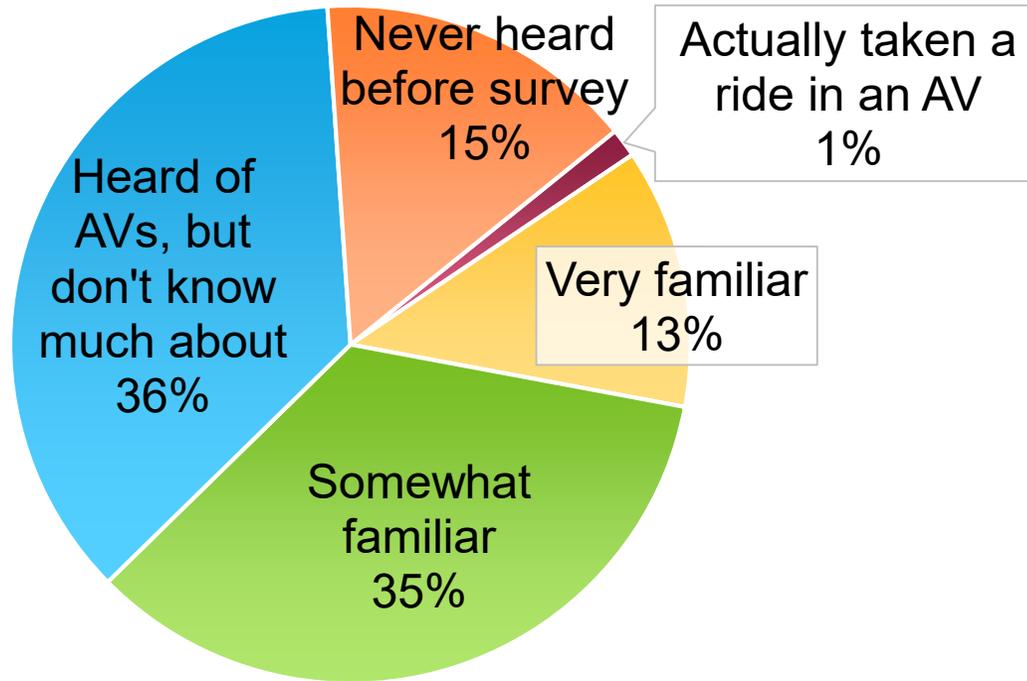


Autonomous Vehicles

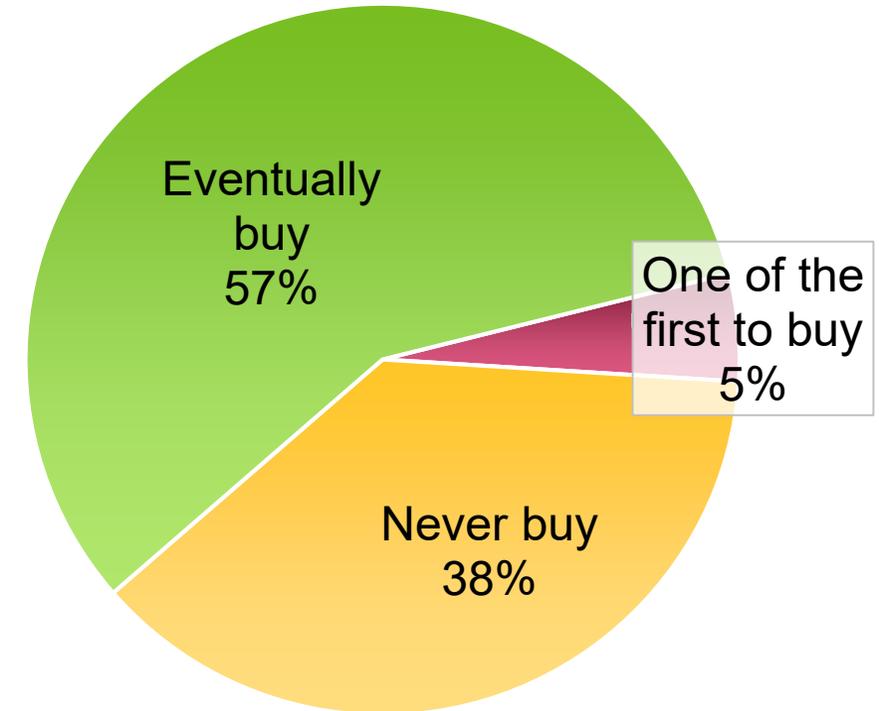
Attitudes and Travel Behavior

Autonomous Vehicles (N=3,356)

FAMILIARITY

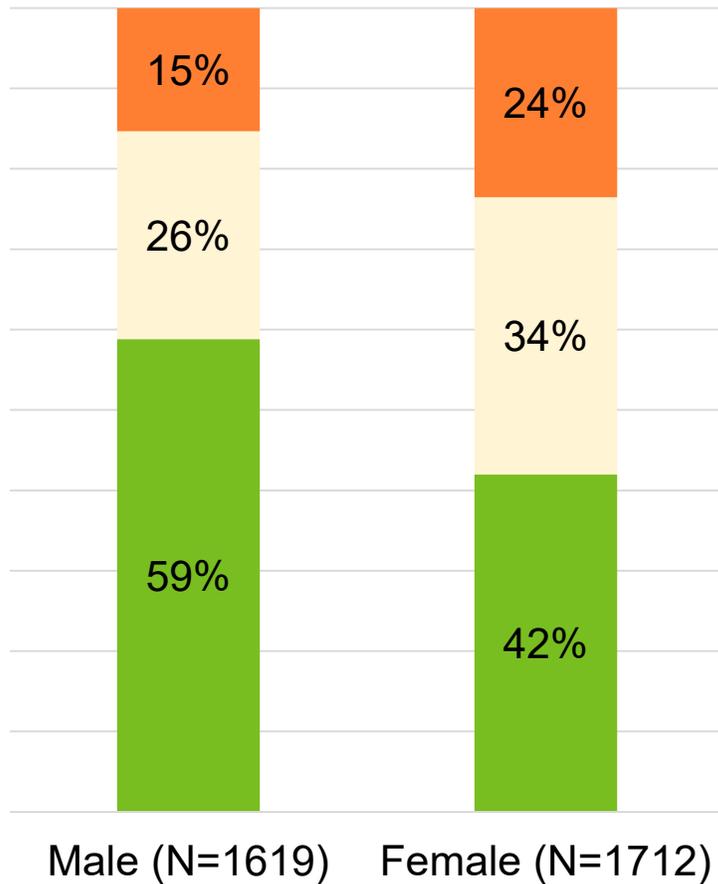


WILLINGNESS TO BUY

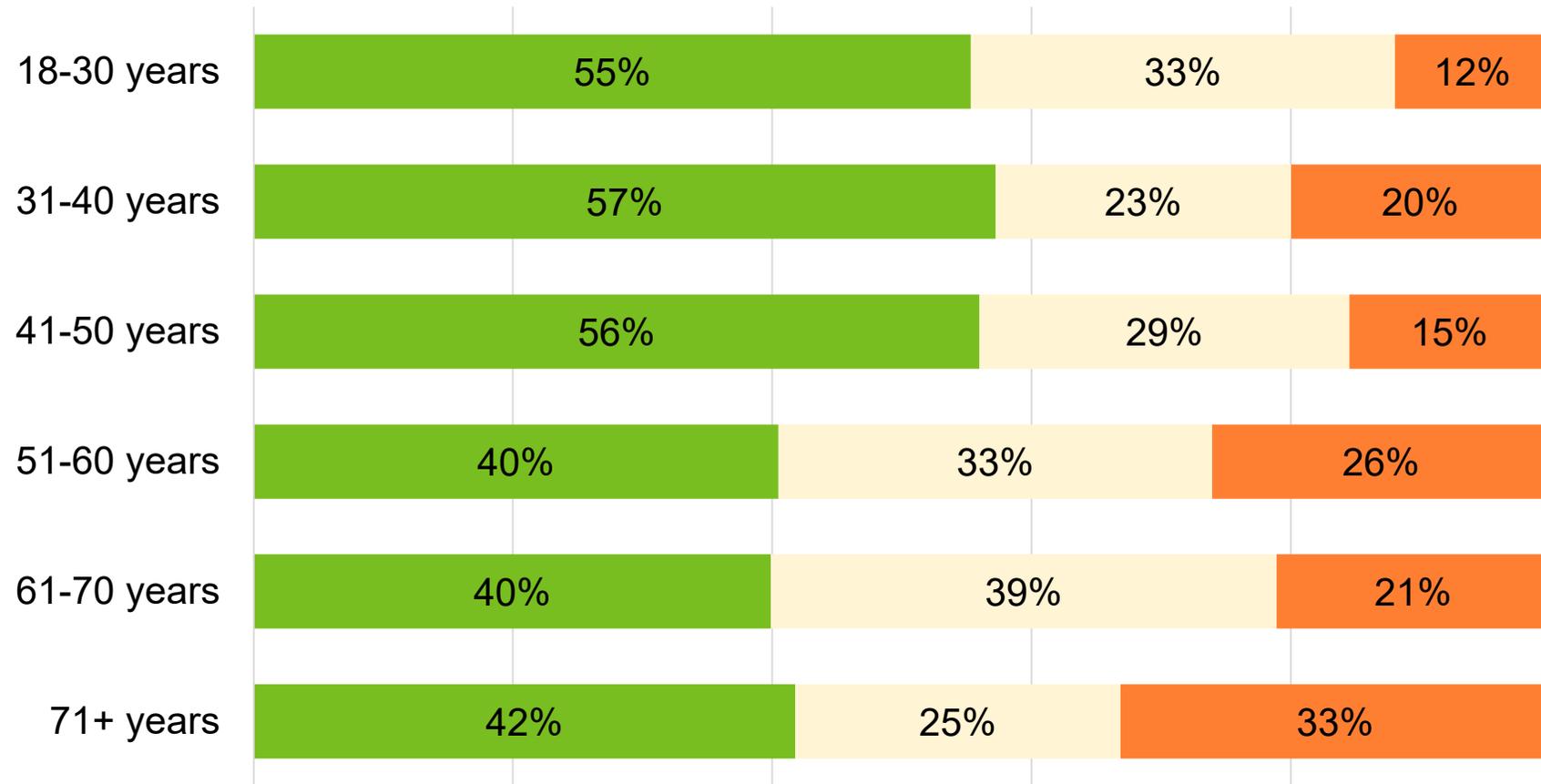


Role of Age and Gender

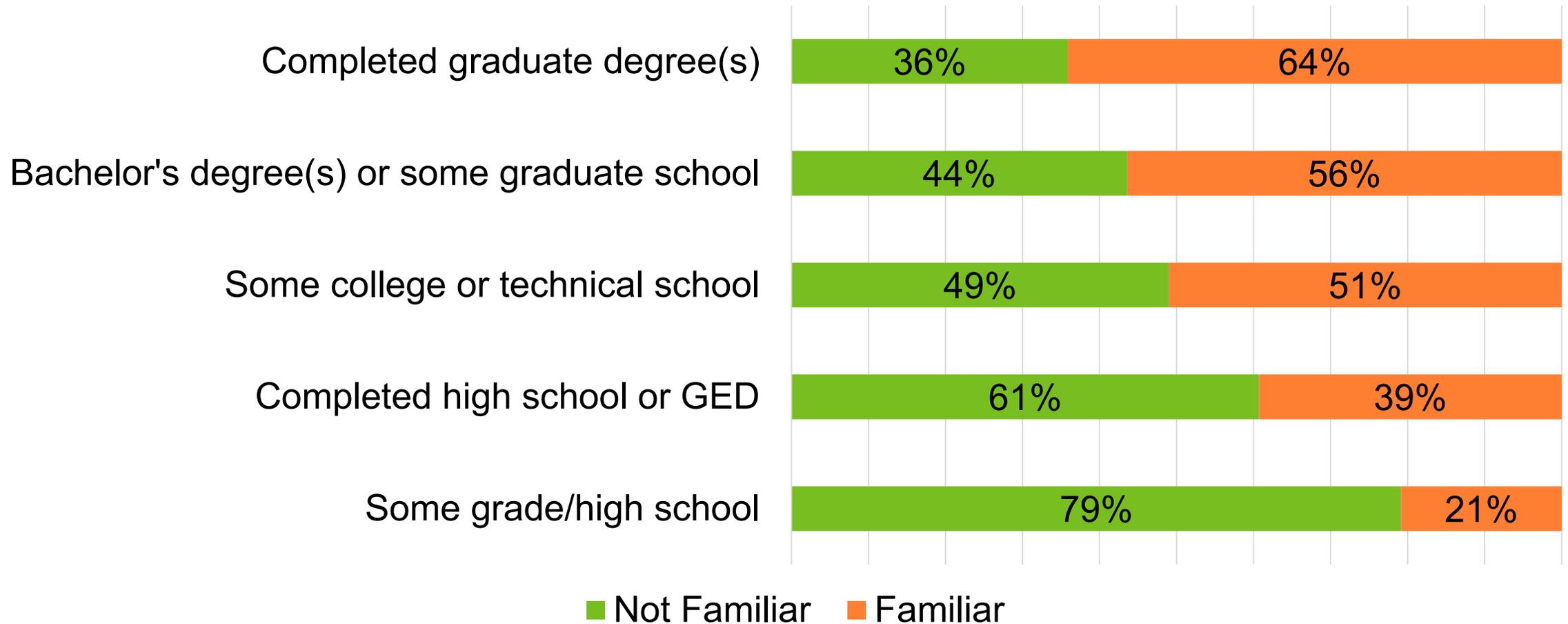
■ Never ride an AV
 ■ Neutral
 ■ Ride AV



■ Ride AV
 ■ Neutral
 ■ Never ride an AV

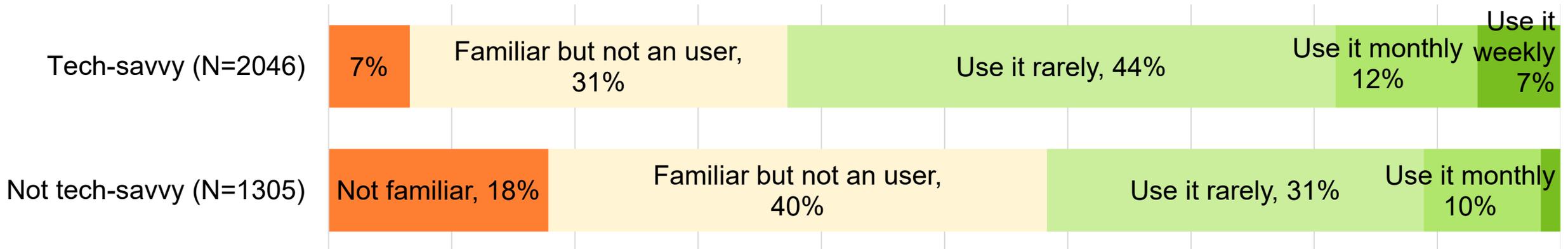


Role of Education in AV Familiarity

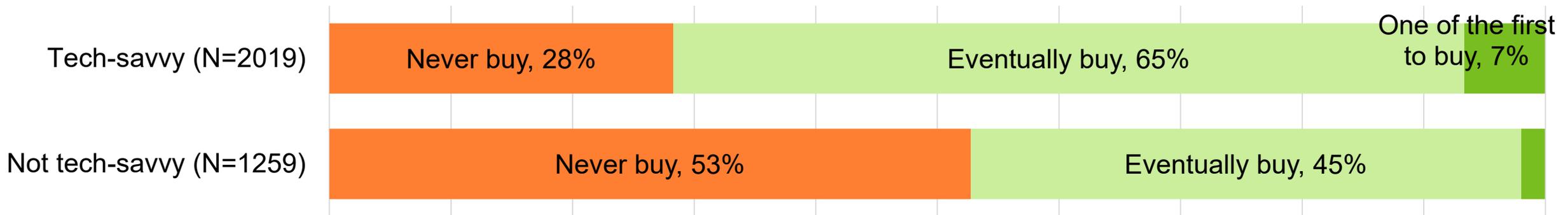


Role of Tech-Savviness

Use of Private Ridehailing



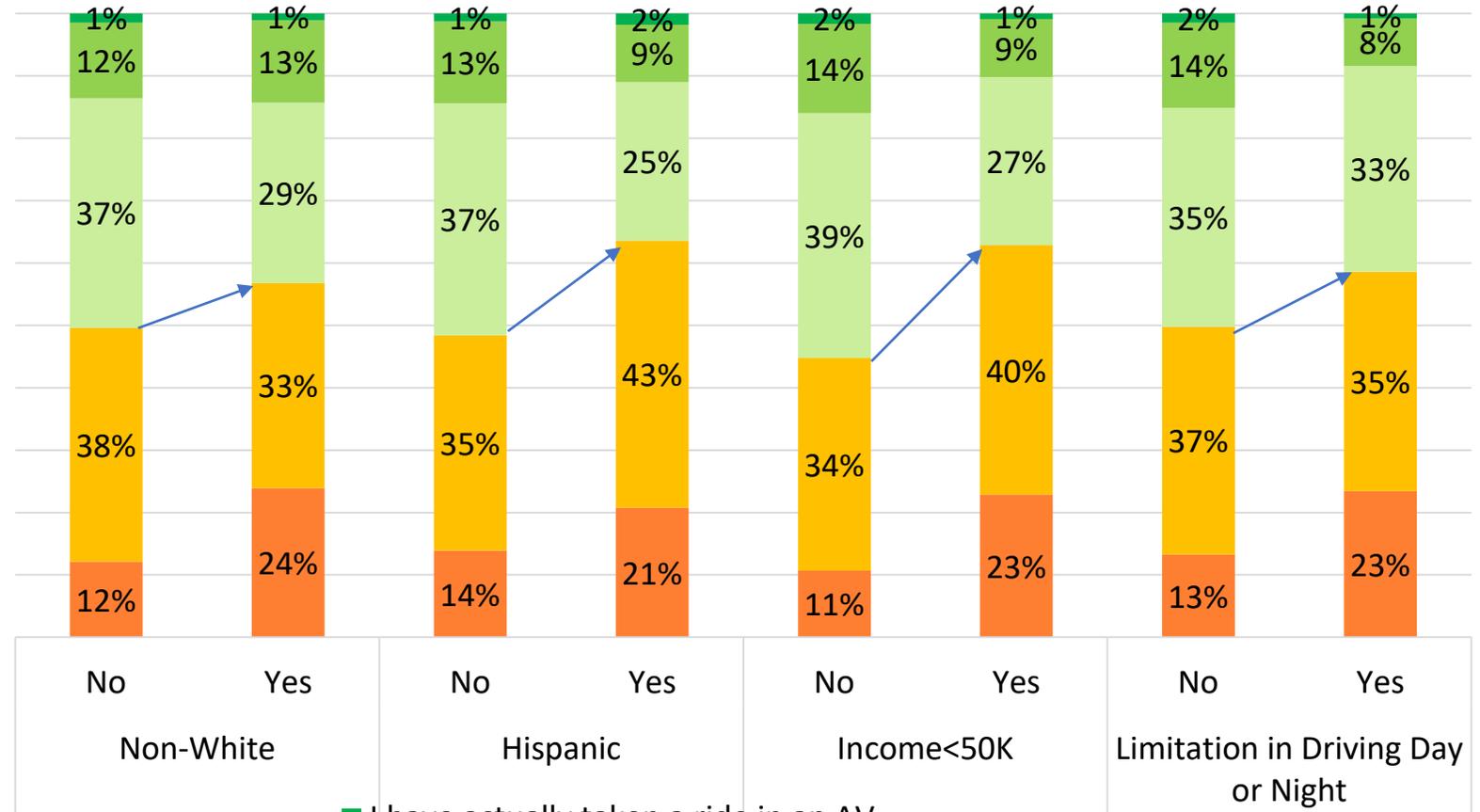
Willingness to Buy AV



AV Familiarity

Minorities are reflecting significantly lower familiarity toward AVs (N=3284).

They remained more neutral to other AV perception and choice questions.

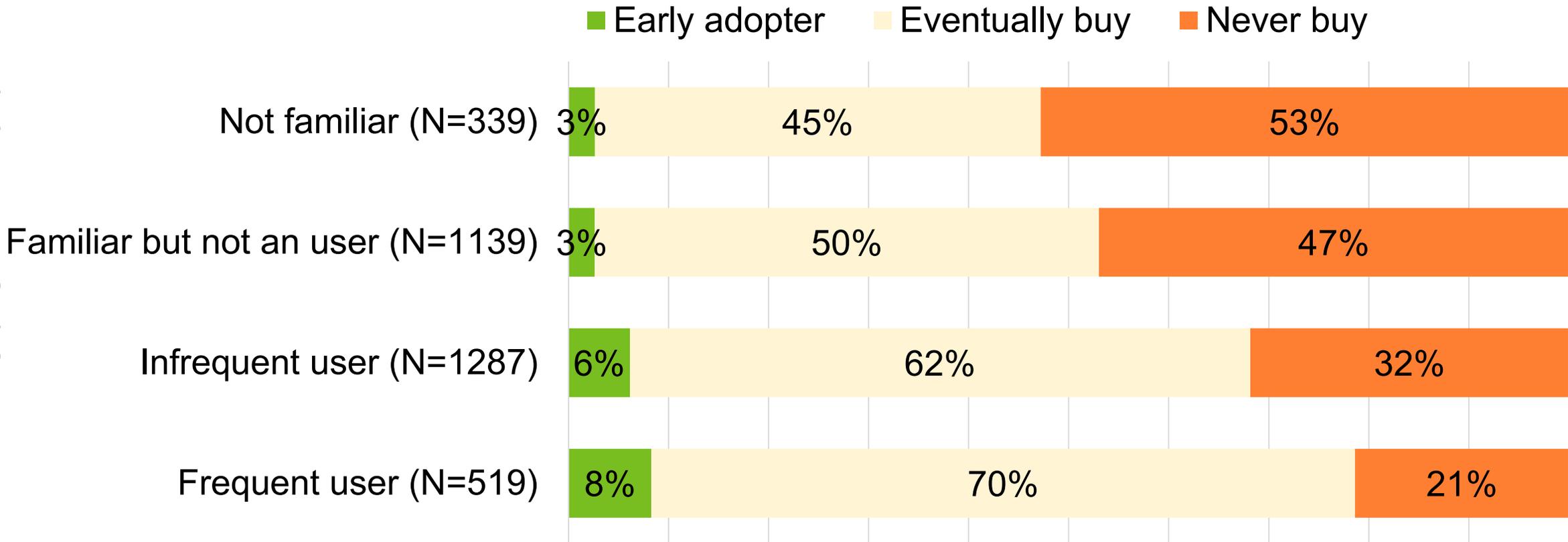


- I have actually taken a ride in an AV.
- I am very familiar with AVs.
- I am somewhat familiar with AVs.
- I have heard of AVs, but don't know much about them.
- I had never heard of AVs before taking this survey.

AV Adoption and Ridehailing Use

Willingness to Buy Autonomous Vehicles

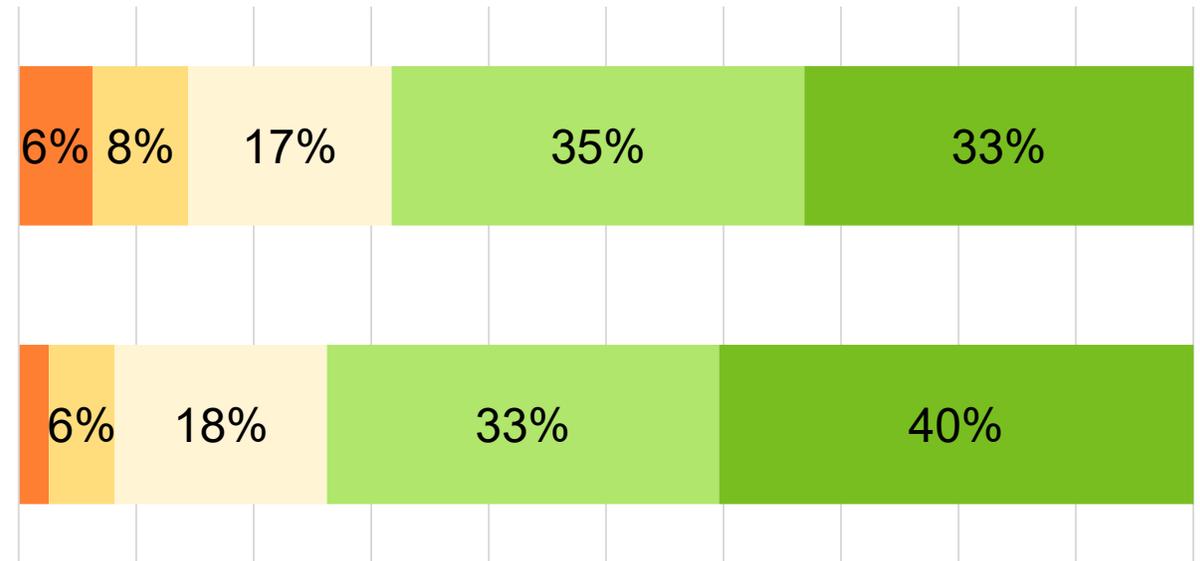
Familiarity and Use of Private Ridehailing (e.g., Uber, Lyft)



AV: Safety Concerns

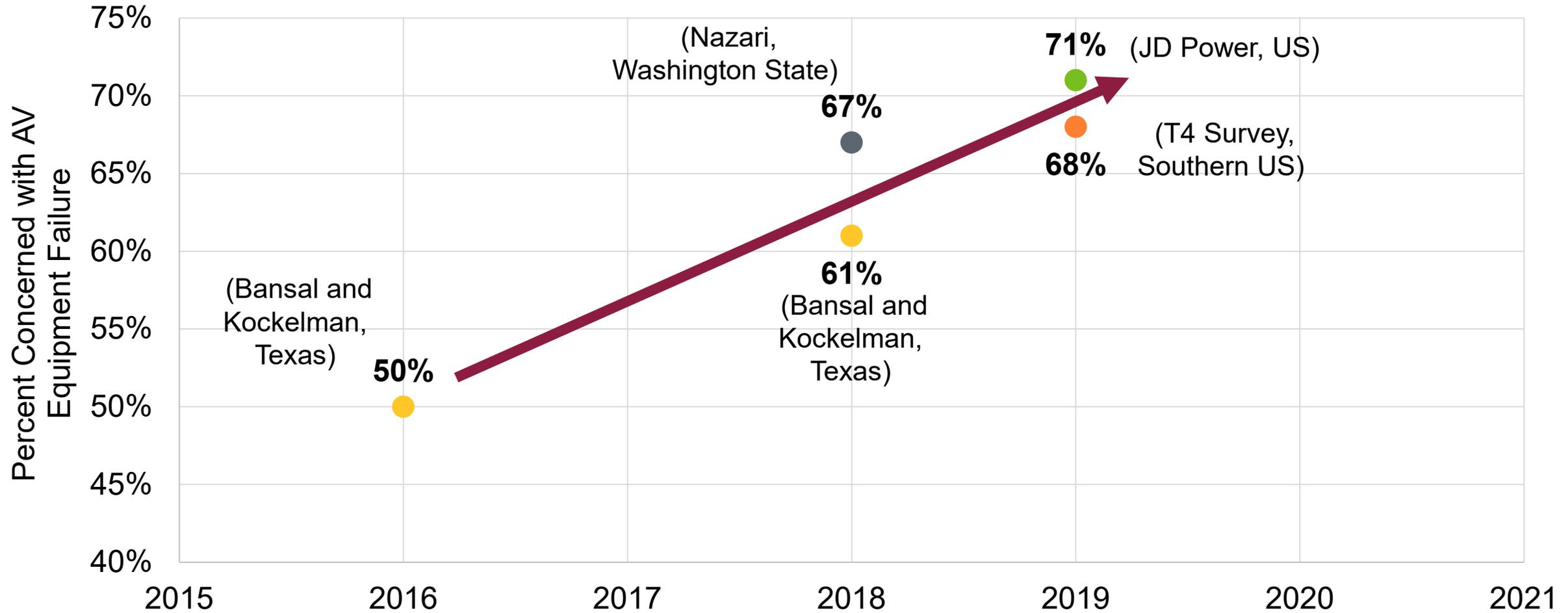
Strongly disagree Somewhat disagree Neutral Somewhat agree Strongly agree

I am concerned about the potential failure of AV sensors, equipment, technology, or programs. (N=3331)



I want the ability to take control of the AV at any time during the ride. (N=3331)

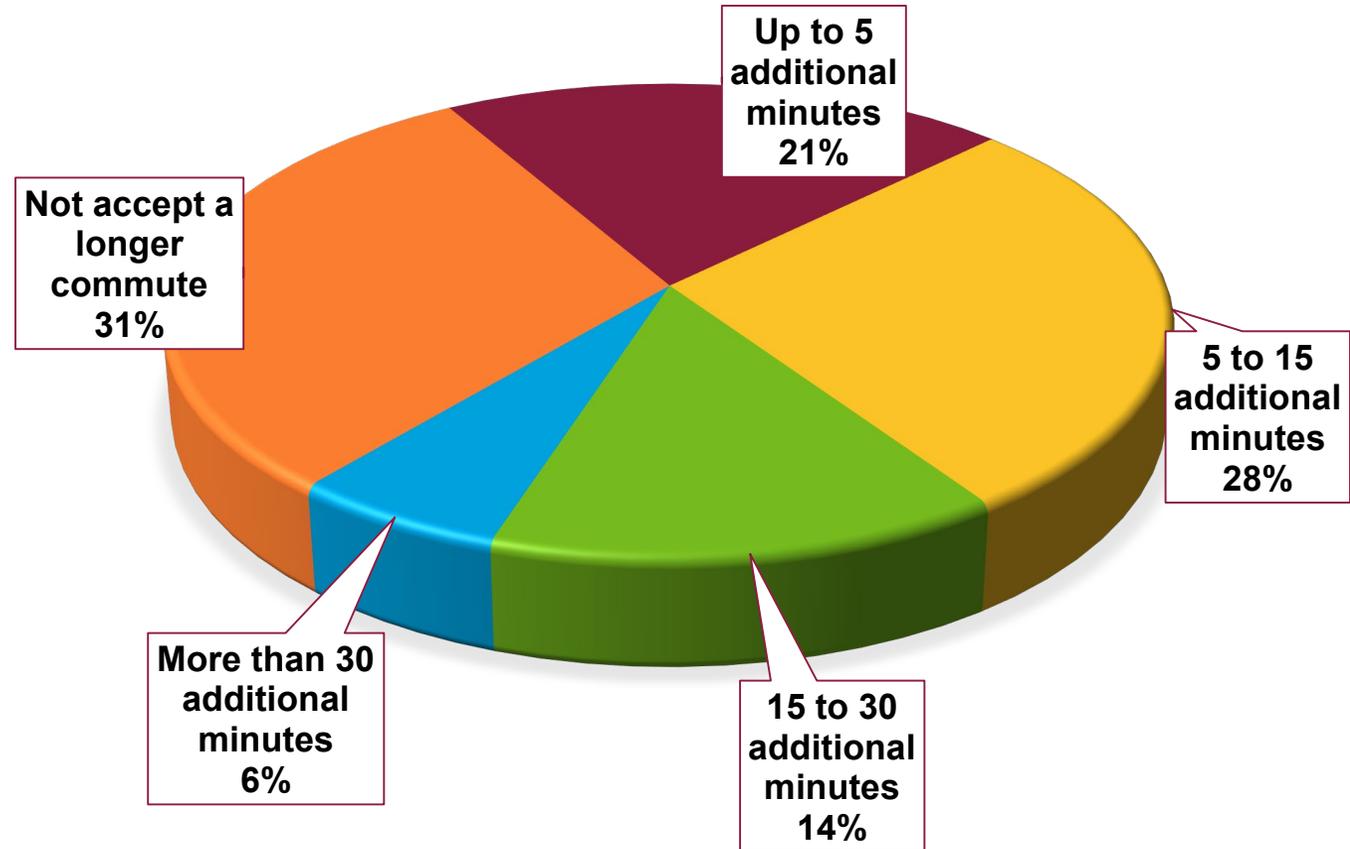
AV Technology: Concern of Equipment Failure



AV Future: Additional Commute Time (N=2,221)

How much longer would you be willing to commute in an AV, compared to your current commute?

Average: ~ 9 min



AV Future: Zero-occupant VMTs

(N=3,356)

Disagree Neutral Agree

I would feel comfortable having an AV pick-up/drop-off children without adult supervision.



I would send an AV to pick-up groceries/laundry/food orders by itself.



AVs would save me time and money for parking by dropping me off and parking themselves.



Photo: Brian Tietz for Transdev

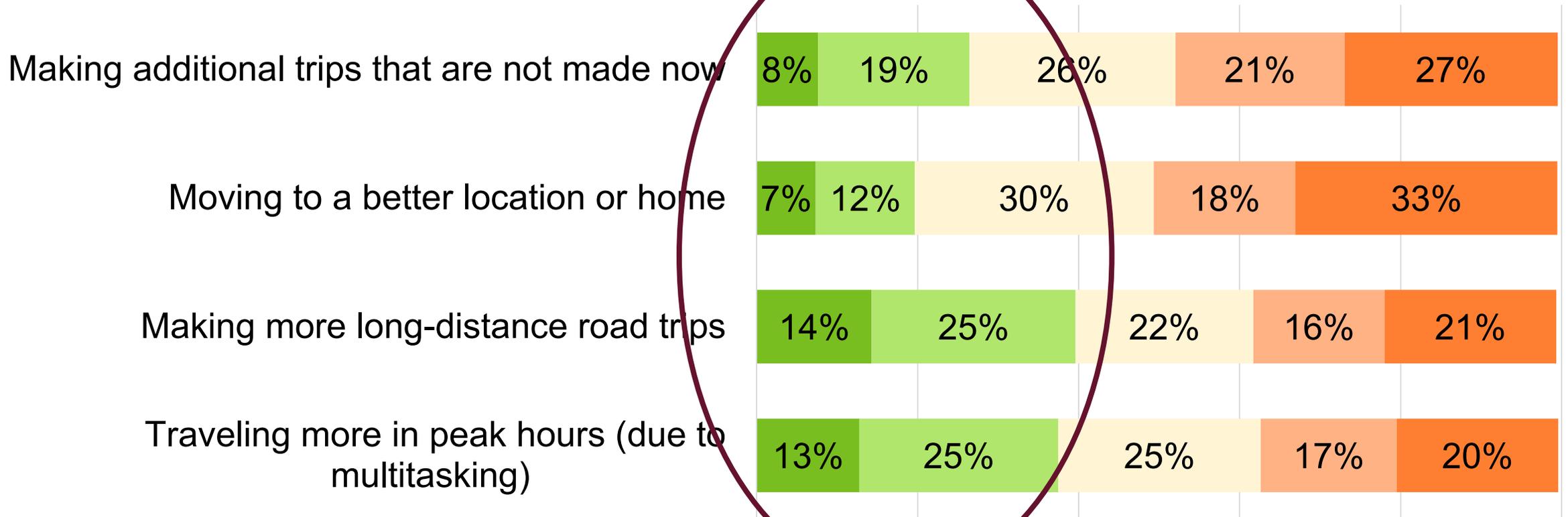
Photo: Ross D. Franklin, STF / Associated Press



AV: Travel Impacts

(N=3,358)

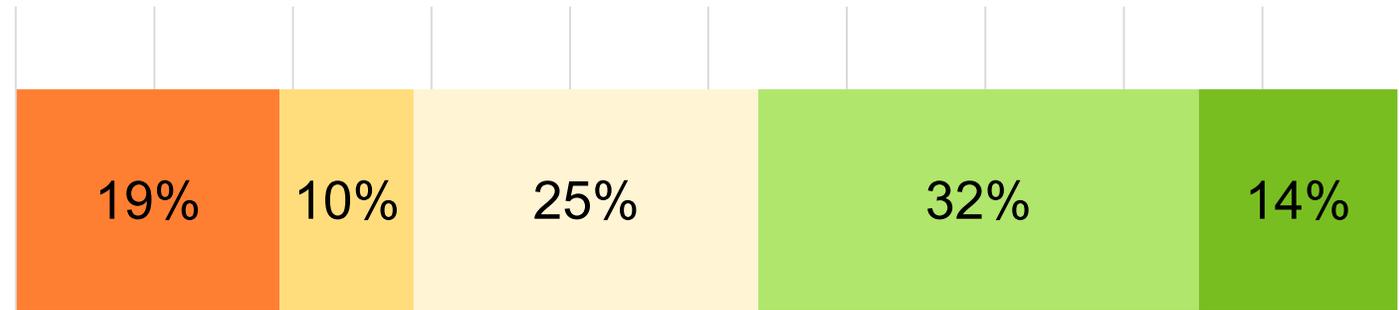
■ Very likely ■ Somewhat likely ■ Neutral ■ Somewhat unlikely ■ Very unlikely



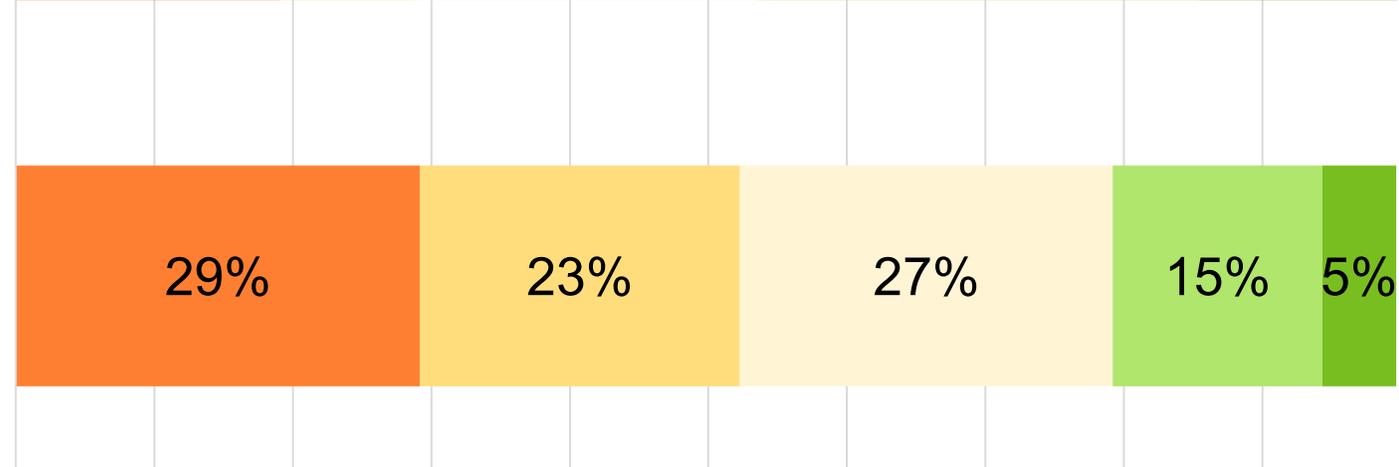
AV Future: Willingness to Share

Strongly disagree Somewhat disagree Neutral Somewhat agree Strongly agree

I will use AV ridehailing services alone or with coworkers, friends, or family. (N=3358)



I will use AV ridehailing services with other passengers I don't know. (N=3358)



POST-COVID Behaviors (N= 8723 across US)

www.covidfuture.org

Work-from-home

25% of workers **expect to increase** their WFH frequency

Personal Air Travel

13% expect to increase*

36% expect to decrease*

Business Air Travel

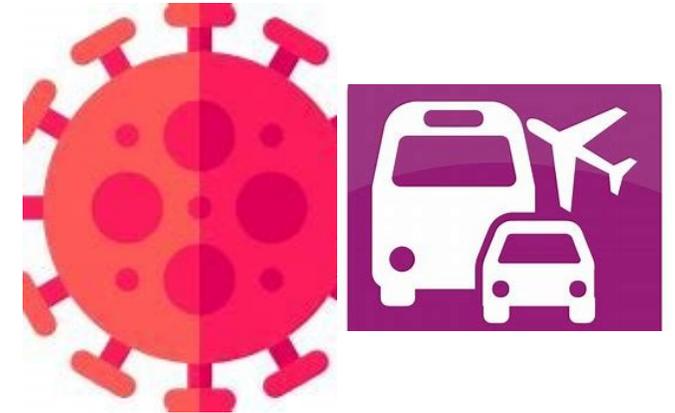
12% expect to increase**

40% expect to decrease**

Online Shopping

21% **expect to increase** online non-grocery shopping

16% **expect to increase** online groceries for delivery



Concluding Thoughts

T4 Survey paints a challenging picture around adoption of Autonomous Vehicles:

- Low adoption/trust
- No (very low) true sharing
- More non-commute VMT
- Replacing some active modes, carpool, and transit trips
- Low familiarity and willingness to use among minority groups

Attitudes have a key role in shaping adoption pathways. We must proactively work to influence and shape attitudes and perceptions. More work in public education and awareness domains to enhance public trust in AV technology as well as sustainable and equitable use of the technology is highly recommended.

In addition, we recommend:

- Complex interrelationship between **technology and pandemic impacts** should be studied more
- Investment in integrated mobility platforms
- Implementing regulations toward environment
- Cost competitiveness of sharing vs private modes
- **Need more pilots especially among minority groups!**





Picture source: ThinkStock

Thank you!

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For more information:

<https://tomnet-utc.engineering.asu.edu/t4-survey/>