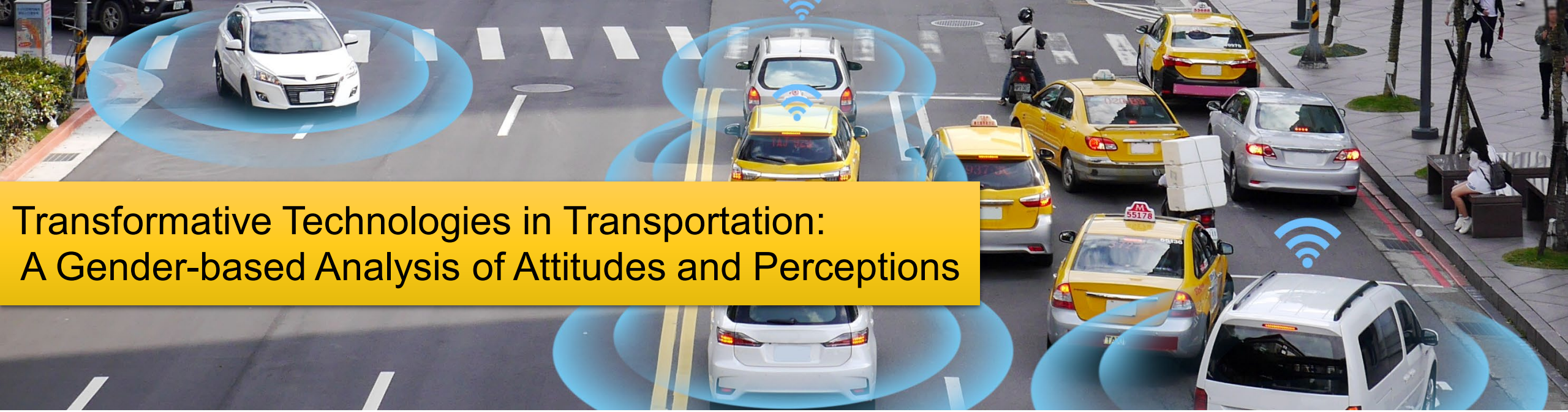

Transformative Technologies in Transportation: A Gender-based Analysis of Attitudes and Perceptions

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Arizona State University

Behavioral Processes: Qualitative and Quantitative Methods Subcommittee, AEP30(4)
Transportation Research Board
January 8th, 2021

TOMNET Transportation Center
Teaching Old Models New Tricks

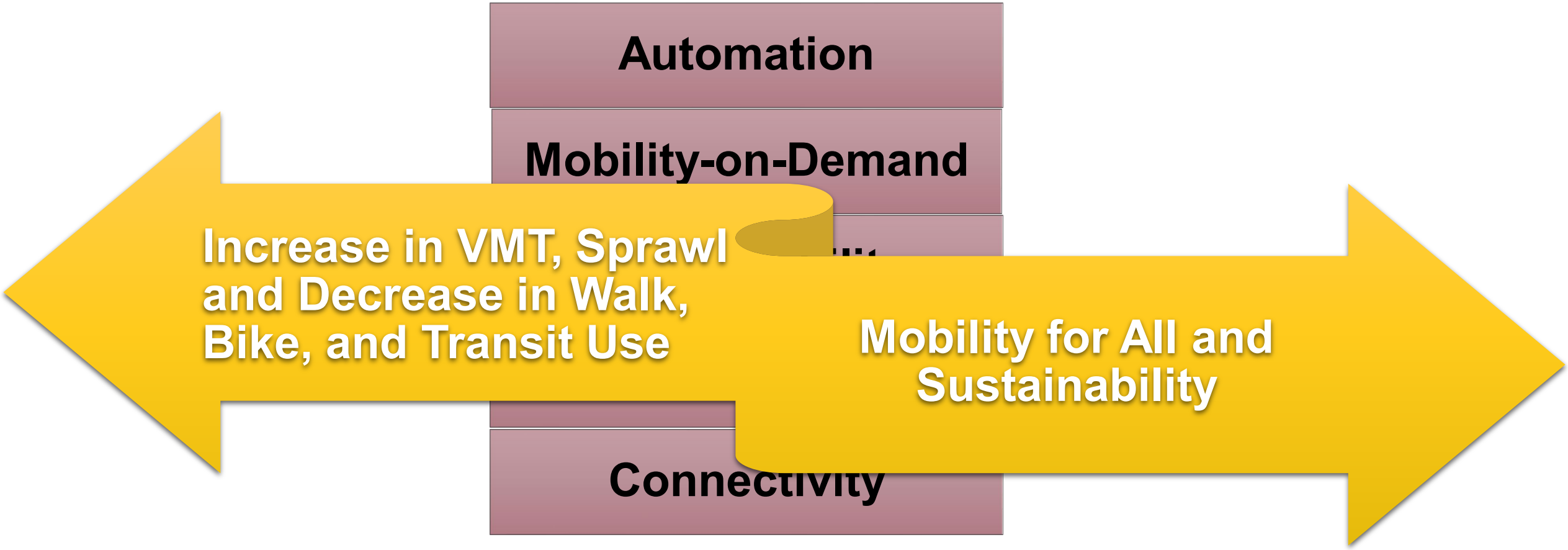
ASU Ira A. Fulton Schools of Engineering
Arizona State University

CTR D-STOP · Georgia Tech · The University of Texas at Austin · University of South Florida · University of Washington

Transportation Technologies

- Automation
- Mobility-on-Demand
- Micro-mobility
- Electrification
- Connectivity

Transportation Future?



Study Purpose

Collect a rich set of data across multiple jurisdictions that includes people's travel behavior, attitudes, socioeconomics, perceptions and potential adoption of, and response to, **Mobility-on-demand, Shared, and Autonomous Vehicles**

TOMNET: Teaching Old Models NEw Tricks

MISSION: To bring attitudinal information into real-world transportation planning and forecasting

- A Tier 1 University Transportation Center
- Authorized November 2016
- 5-year funding

Arizona State University

Georgia Tech

University of South Florida

University of Washington

Survey Team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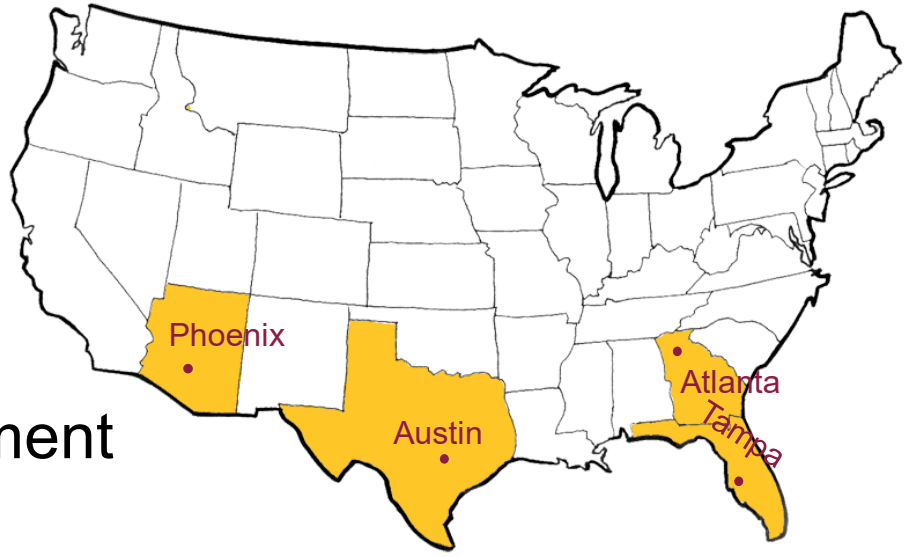
TOMNET Transformative Transportation Technologies (T4) Survey



- Phoenix, Atlanta, Austin, and Tampa metro areas
- Summer and Fall 2019 (pre-pandemic)
- Random address-based sample with online instrument
- Comprehensive attitudinal survey on MoD and AV
- Weighted to better represent Census distributions

	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

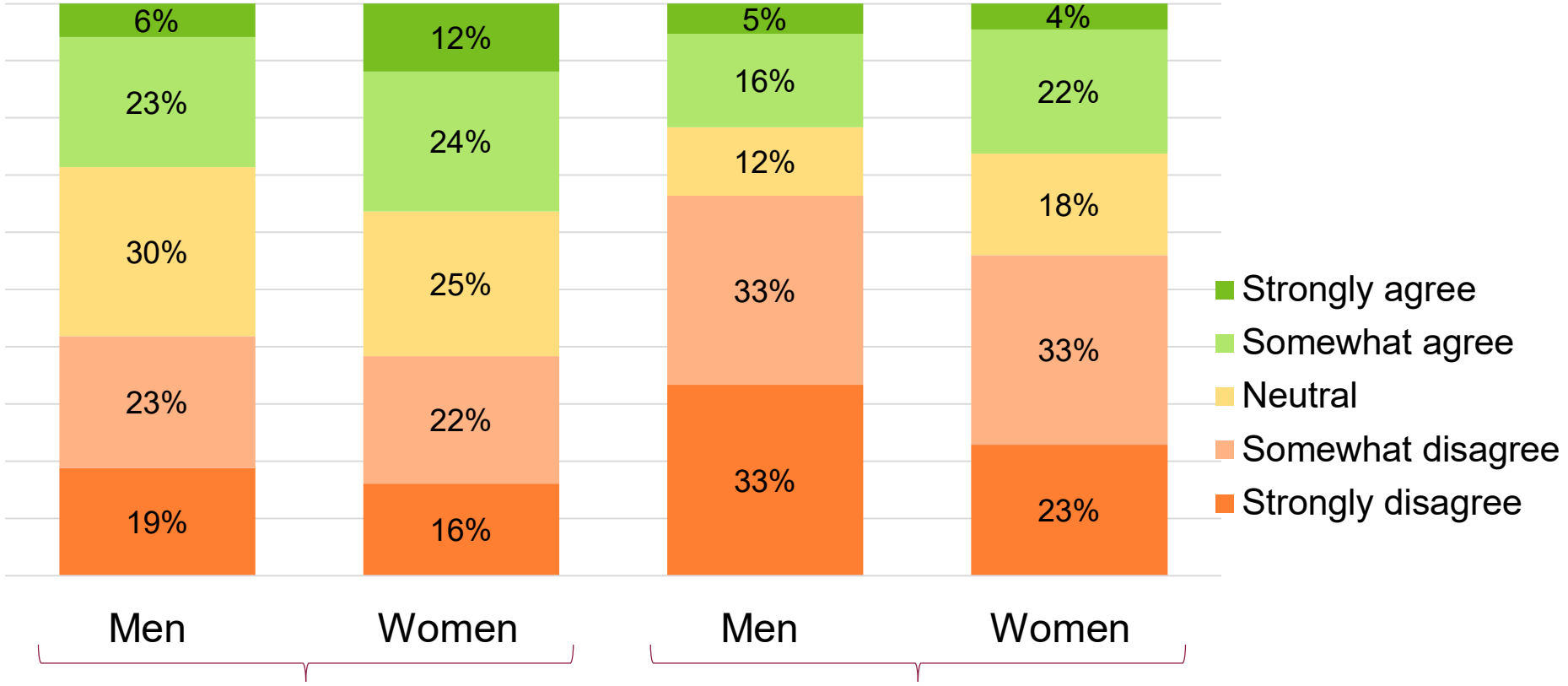
Background Information

Attitudinal Differences

A Gendered Perspective

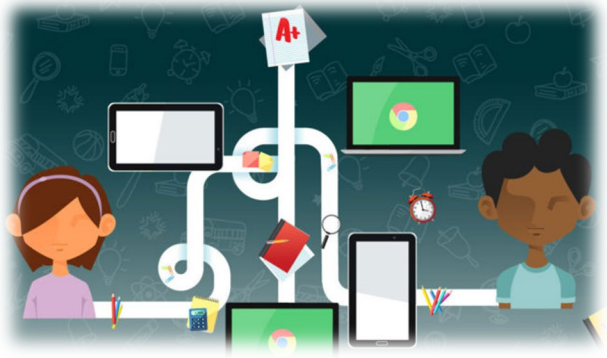
Picture source: URBACT, 2020

General Attitudes



I feel **uncomfortable** around people I do not know

Learning how to use new technologies is **frustrating**

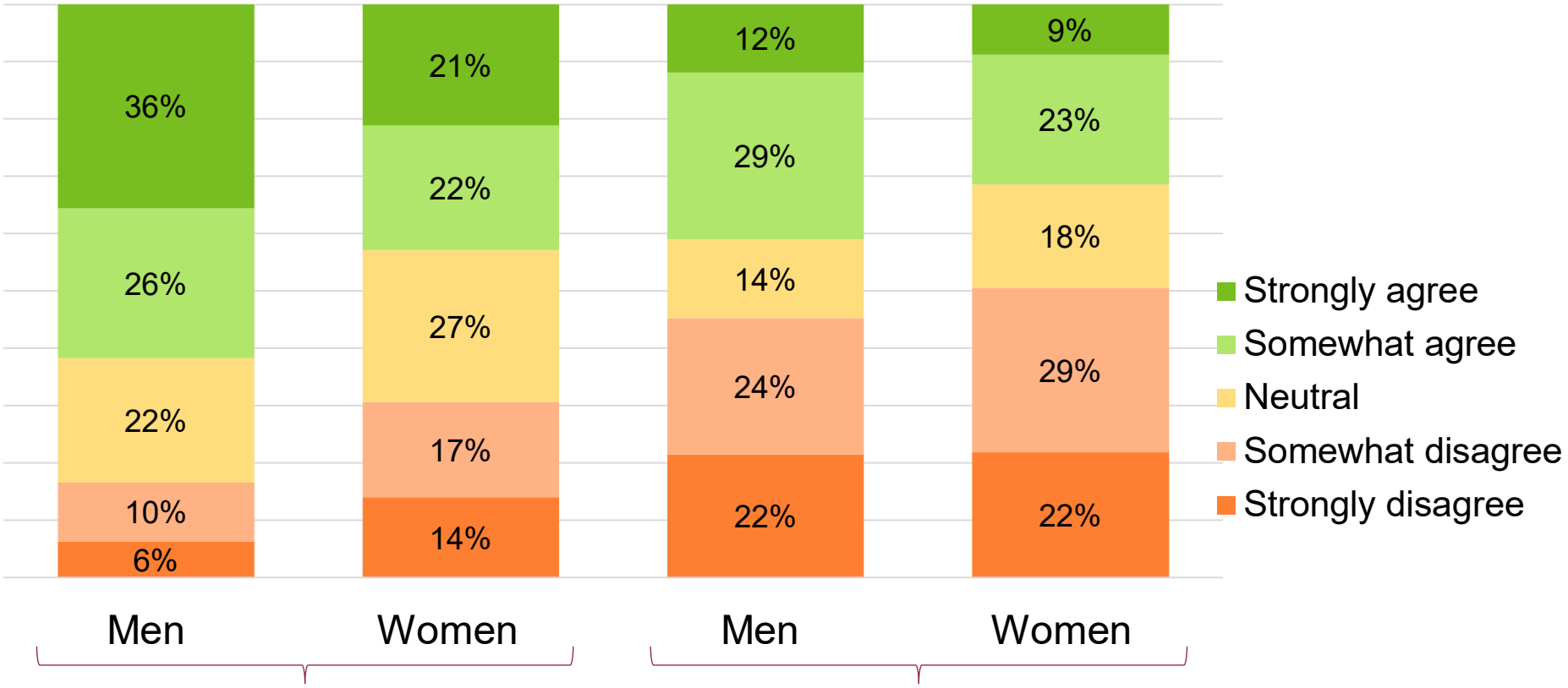


Picture: Samsung

- Women are more likely to feel uncomfortable around unfamiliar people
- Men appear less likely to find technology frustrating

Men N=1633, Women N=1714

Transportation Attitudes



When traveling in a vehicle, I prefer to be a **driver**

Car crash deaths are an unfortunate but **unavoidable** part of a modern, efficient transportation system.

- Women are less likely to prefer being a driver
- Men are more likely to agree that car crashes are unavoidable

Picture: Smartrak

Men N=1619, Women N=1703

Travel Behavior Differences

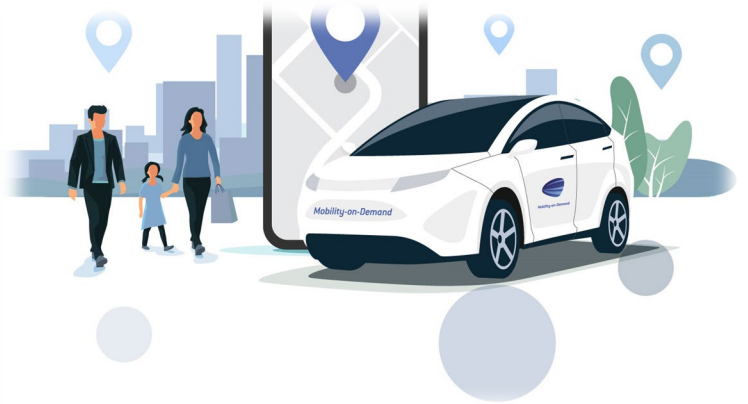
	Men	Women
Miles Driven in a Week (median)	51-75 mi	26-50 mi
Main Commute Mode: Drive Alone	69%	74%
Main Commute Mode: Bus	10%	8%
Main Commute Mode: Walk or Bike	7%	4%
Commute Time (median)	22 min	20 min
Ridehailing User (at least monthly)	17%	14%

Picture: Clipartmax

Transportation Transformations

A Gendered Perspective

Ridehailing Services Usage

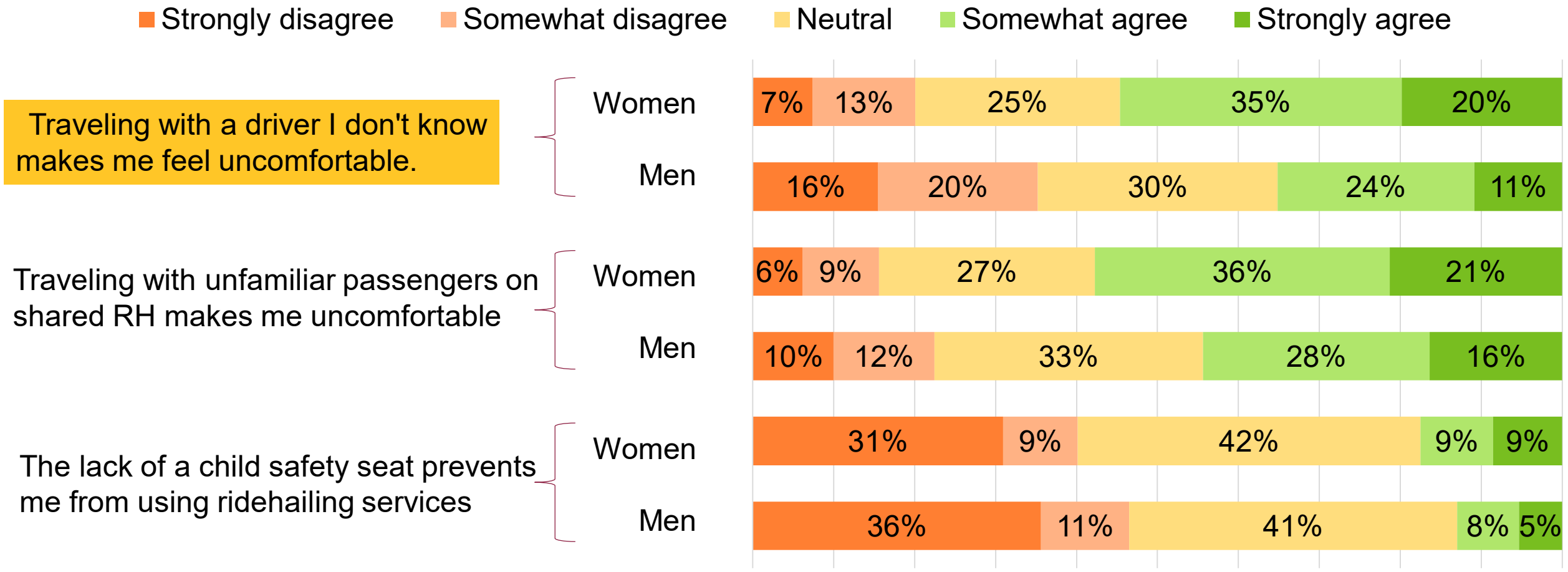


Last actual ridehailing trips

- **Women chose to share 1.5 times more than men**
- No significant differences on ridehailing trip purposes
- While 7% of men said they would not have made the trip if ridehailing were not available, 11% of women would not have traveled
- Median monthly ride-hailing expenditure for men was $10 - $29 in the month prior to the survey, while women median expenditure was $1 - $9

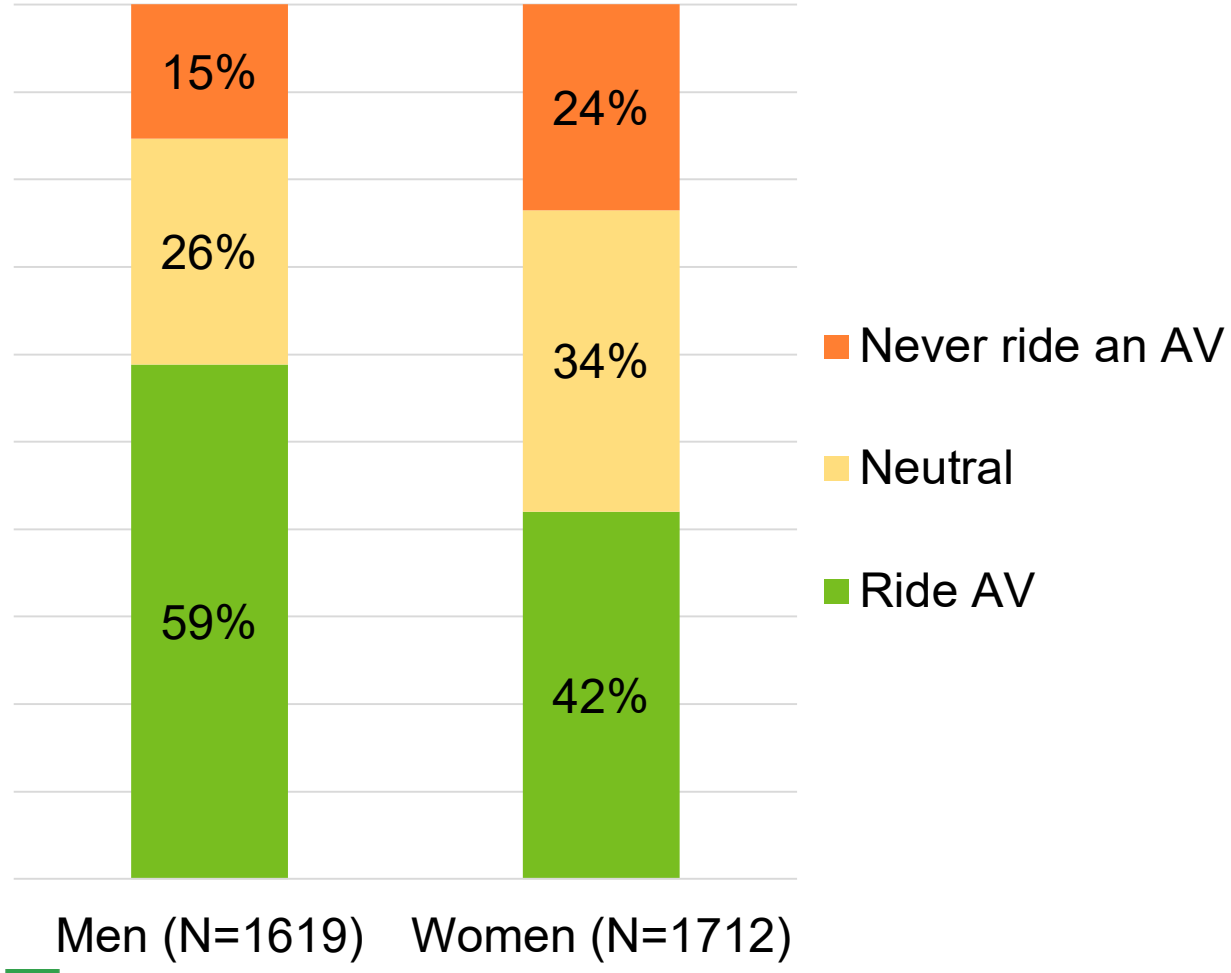
Men N=917, Women N=963
Picture: facebook.com/mobilityondemand

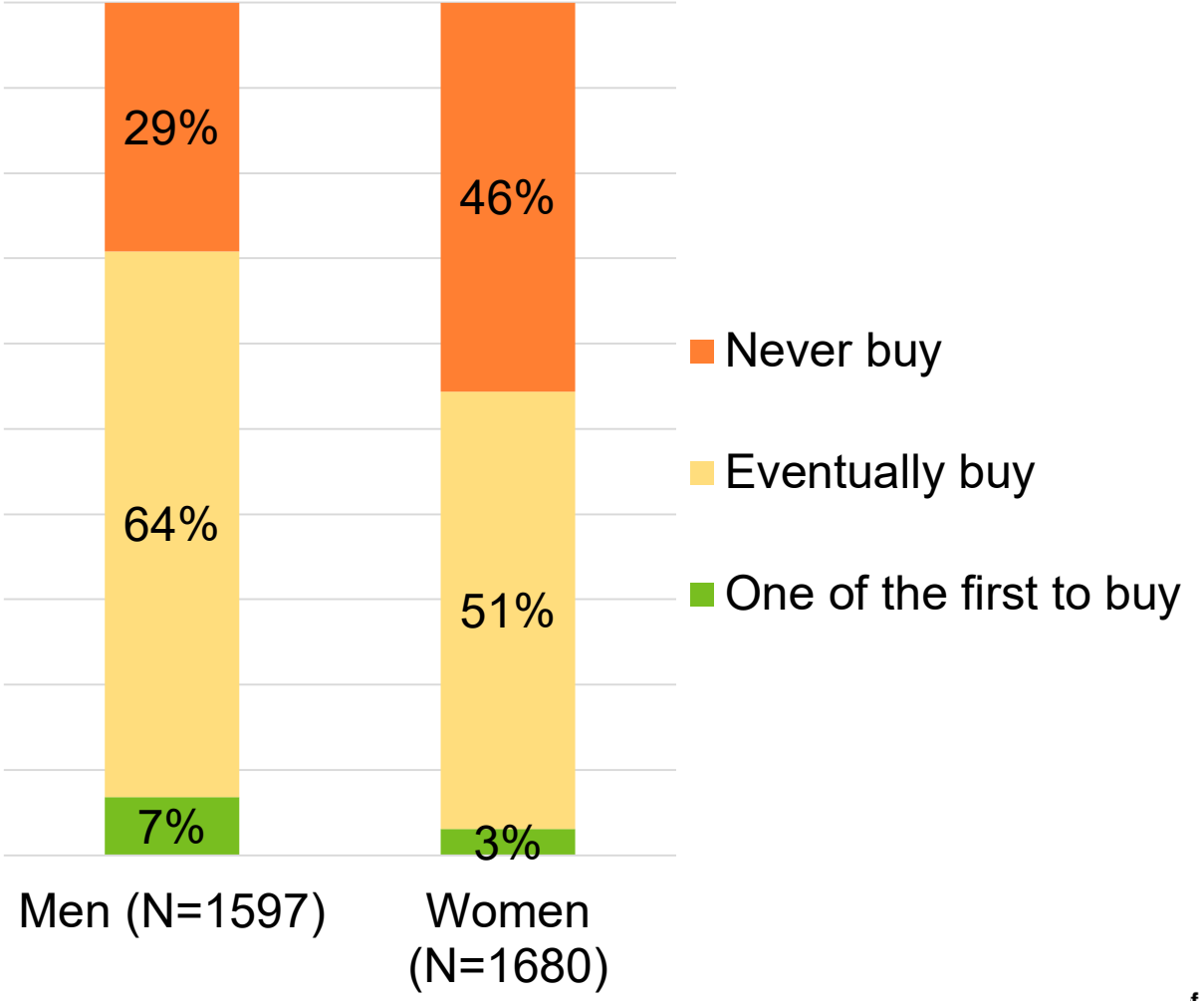
Perceptions Towards Ridehailing Services



Men N=1619, Women N=1703

Willingness to Ride and Buy AVs





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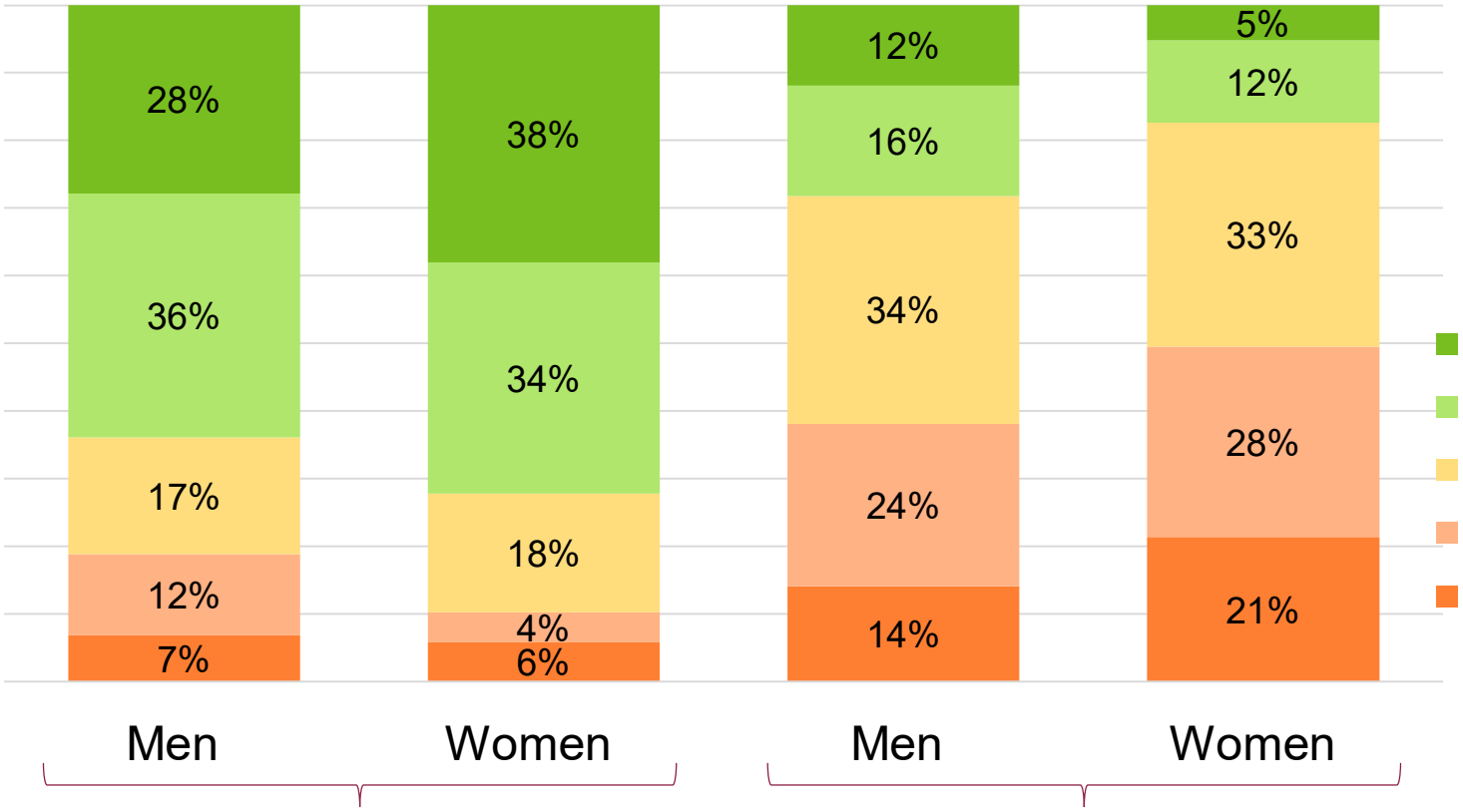
Autonomous Vehicles:
Safety Perceptions



I am **concerned** about the potential failure of AV sensors, equipment, technology, or programs.

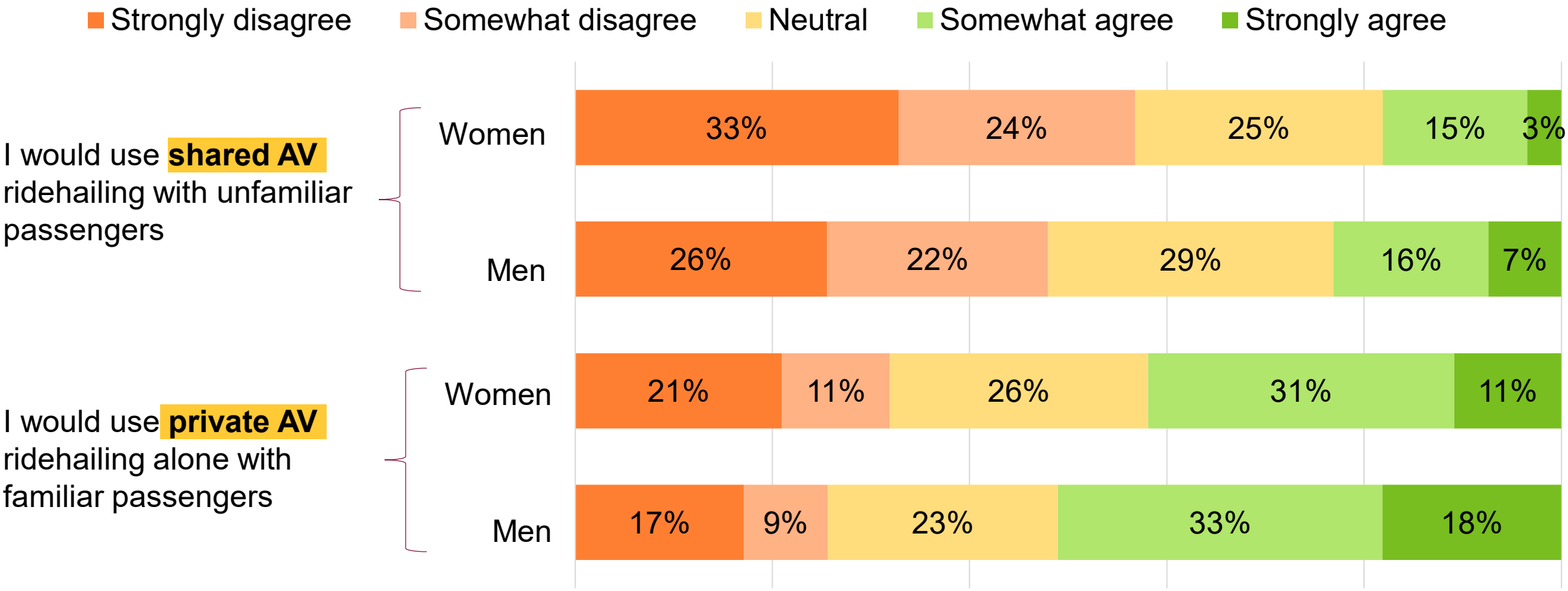
AVs would make me feel **safer** on the street as a pedestrian or as a cyclist.

Picture: Redshift Autodesk

- Women are more concerned about autonomous vehicle failure
- Men view pedestrian/ bicyclist safety improvement potential of AVs more favorably.

Men N=1639, Women N=1713

Ridehailing Services and Autonomous Vehicles

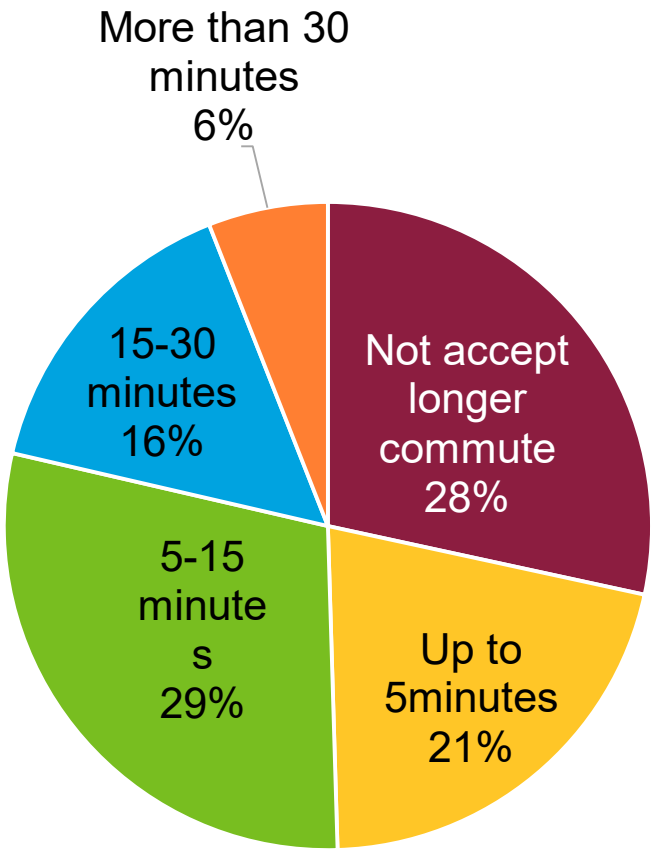


Men N=1632, Women N=1711

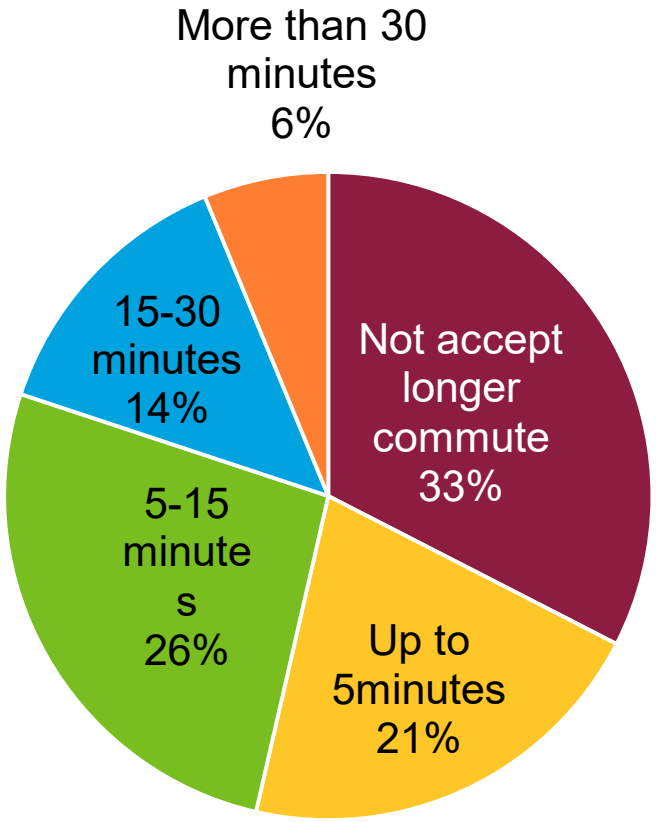
Autonomous Vehicles:
Changes in Commute

How much longer would respondents accept their **ONE WAY COMMUTE** to be once AVs become available?

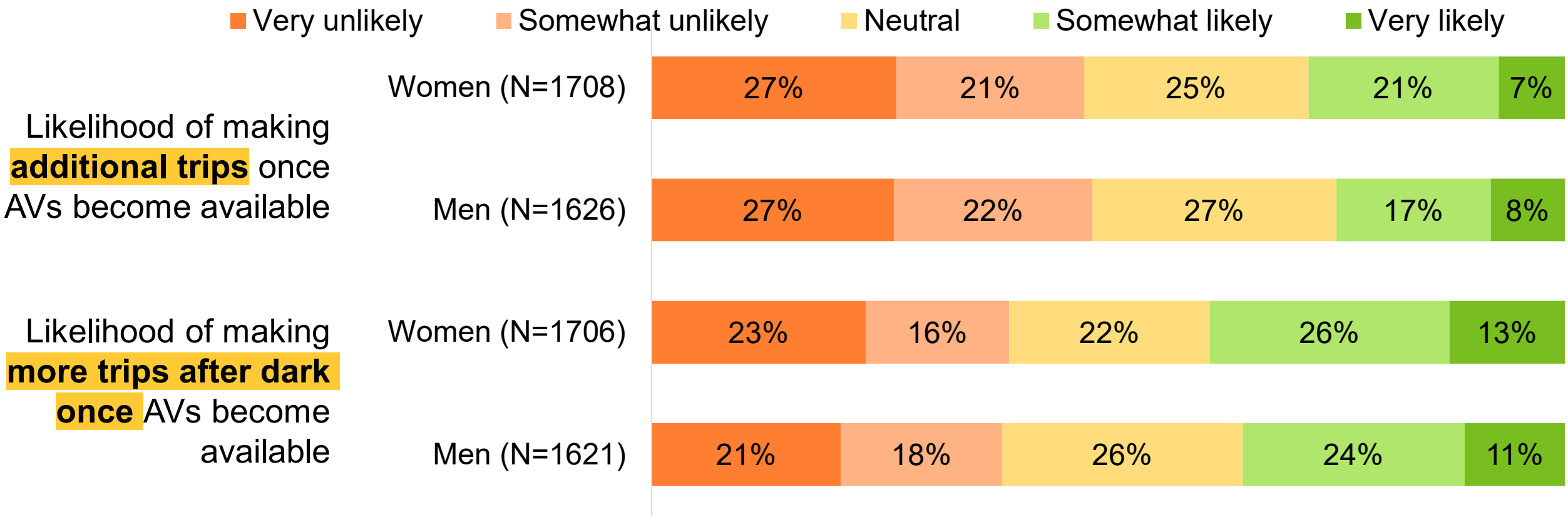
Men (N=1155)



Women (N=1060)

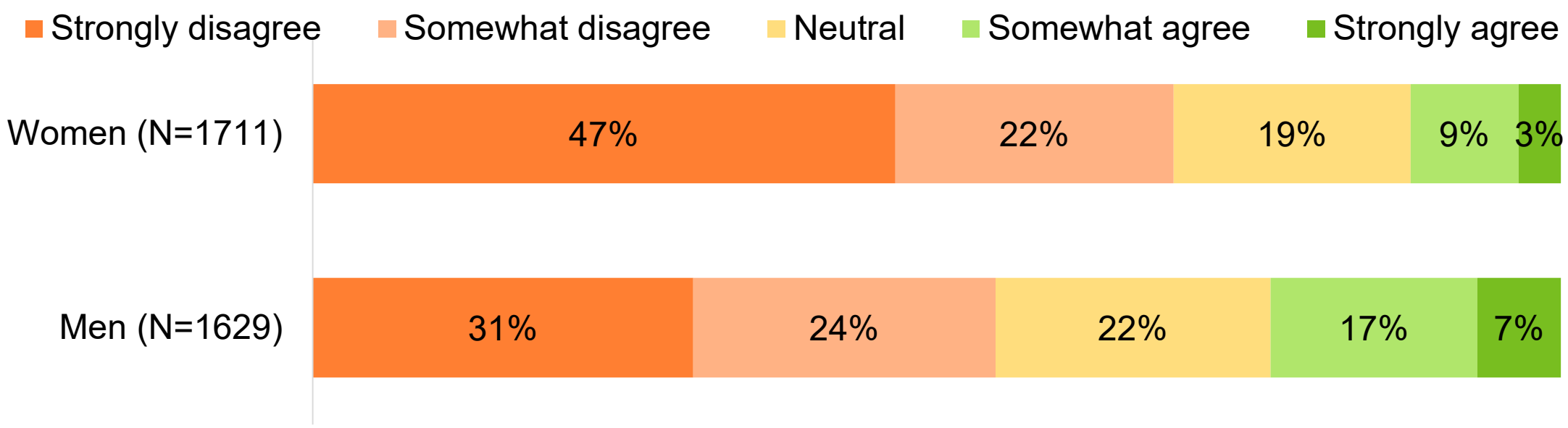


Autonomous Vehicles: Travel Behavior Impacts



Autonomous Vehicles:
Expected Use

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



Key Takeaways

Picture: imgbin

We found:

- Women indicate they are less willing to share and more wary of unproven technology.
- But in reality, even though women's usage of ride-hailing services is slightly less than men overall, **their level of sharing is 1.5 times greater!**
- Women express a lower level of willingness/interest to ride or buy autonomous vehicles and share rides in an AV ride-hailing setting. **Is the presence of a human driver important/reassuring?**

We recommend:

- Develop safety protocols and targeted campaigns for enhancing women's experience with shared and automated transport services.
- Special services such as female-only services may enhance shared/automated mobility adoption among women.
- More research to untangle stated intentions versus actual behaviors

Thank you!

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Full citation: Capasso da Silva, D., Khoeini, S. , & Pendyala, R.. ” Transformative Technologies in Transportation: A Gender-based Analysis of Attitudes and Perceptions”. Presented at Behavioral Processes: Qualitative and Quantitative Methods Subcommittee, AEP30(4); Transportation Research Board; January 2021.

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