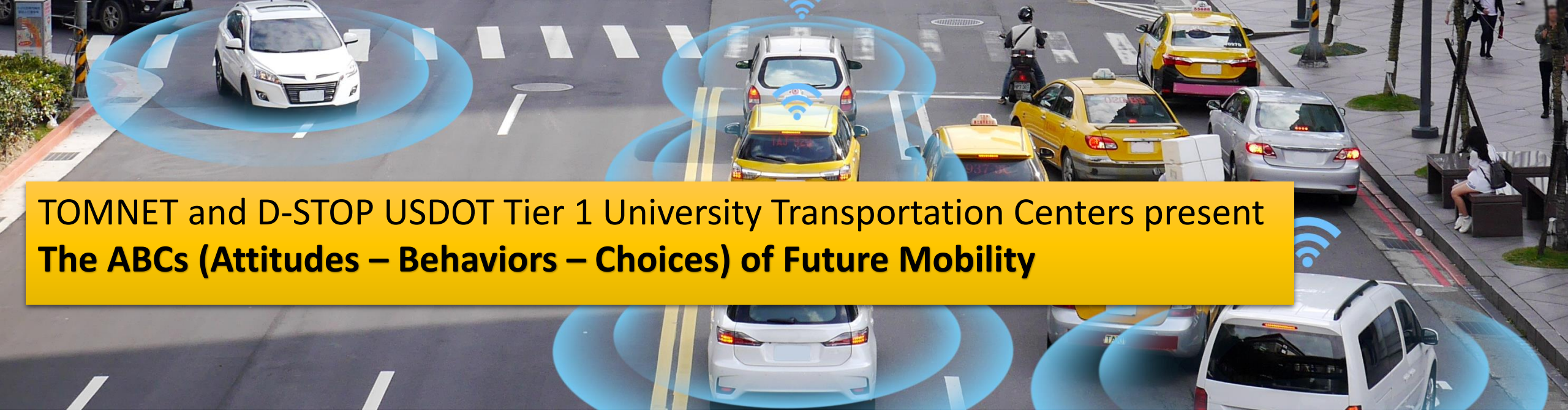

TOMNET and D-STOP USDOT Tier 1 University Transportation Centers present

The ABCs (Attitudes – Behaviors – Choices) of Future Mobility

People's Lifestyle Preferences, Attitudes, and Travel Patterns

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June 12, 2020

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CTR D-STOP

ASU Arizona State University

Georgia Tech

THE UNIVERSITY OF TEXAS AT AUSTIN

UNIVERSITY of SOUTH FLORIDA

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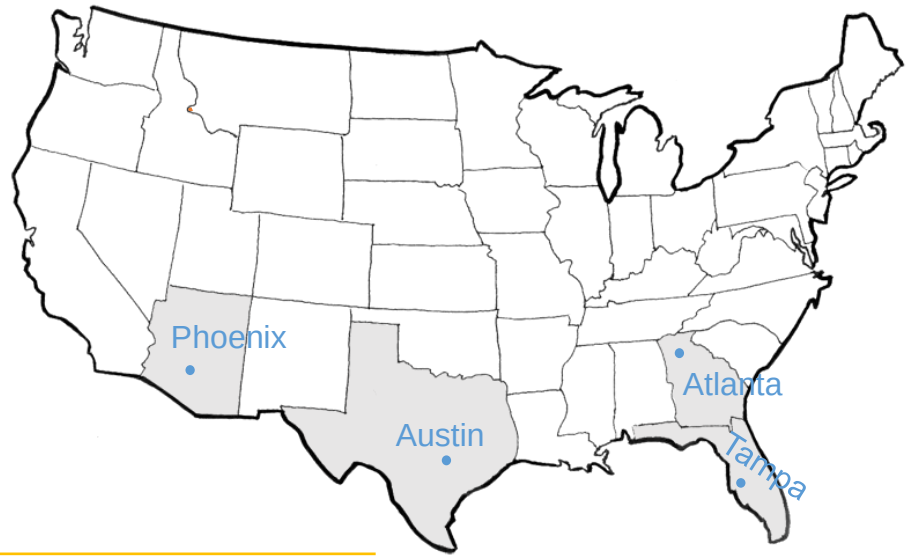
Full citation (APA style)

Menon, N., & Maness, M. (Producer). (2020). *People's Lifestyle Preferences, Attitudes, and Travel Patterns.* The ABCs (Attitudes – Behaviors – Choices) of Future Mobility. Available at https://www.tomnet-utc.org/leadership-webinar-series.html.

TOMNET D-STOP Transformative Technologies in Transportation Survey (T4 Survey)

- Phoenix, Atlanta, Austin, and Tampa metro areas
- Summer and Fall 2019
- Random address-based sample with online instrument
- Comprehensive attitudinal survey on MaaS 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

People's Lifestyle Preferences and Attitudes

- **T4 survey** → measured respondent's preferences, attitudes and opinions on transportation and life in general
- Information on 28 attitudinal constructs were elicited
- Respondent opinions collected in an ordered response Likert categories – *Strongly disagree* to *Strongly agree*

	Strongly disagree	*Somewhat disagree*	*Neutral*	*Somewhat agree*	*Strongly agree*
1. I like to be among the first to have the latest technology.	○	○	○	○	○
2. The government should raise the gas tax to help reduce the negative impacts of transportation on the environment.	○	○	○	○	○
3. I feel uncomfortable around people I do not know.	○	○	○	○	○
4. I prefer to do one thing at a time.	○	○	○	○	○
5. Most of the time, I have no reasonable alternatives to driving.	○	○	○	○	○
6. I am too busy to do many of the things I like to do.	○	○	○	○	○
7. Car crash deaths are an unfortunate but unavoidable part of a modern, efficient transportation system.	○	○	○	○	○
8. I am committed to an environmentally friendly lifestyle.	○	○	○	○	○
9. Having to wait can be a useful pause in a busy day.	○	○	○	○	○
10. I prefer to shop in a store rather than online.	○	○	○	○	○
11. Learning how to use new technologies is often frustrating for me.	○	○	○	○	○
12. I would be fine with renting out my car to people I do not know.	○	○	○	○	○

People's Lifestyle Preferences and Attitudes

I like trying things that are new and different
I try to make good use of the time I spend traveling
The reliability and quality of a car are more important than its brand
Having internet connectivity everywhere I go is important to me
I am committed to an environmentally-friendly lifestyle
I prefer to live close to transit, even if it means I'll have a smaller home and live in a more densely populated area
I prefer to live in a spacious home, even if it is farther from public transportation or many places I go

I like the idea of having stores, restaurants, and offices mixed among the homes in my neighborhood
Public transit is a reliable means of transportation for my daily travel needs
Most of the time, I have no reasonable alternatives to driving
Learning how to use new technologies is often frustrating for me
I like to be among the first people to have the latest technology
Sharing my personal information or location via internet-enabled devices concerns me a lot
I prefer to shop in a store rather than online
I would be fine with renting out my car to people I do not know
I feel uncomfortable around people I do not know
I prefer to do one thing at a time

People's Lifestyle Preferences and Attitudes

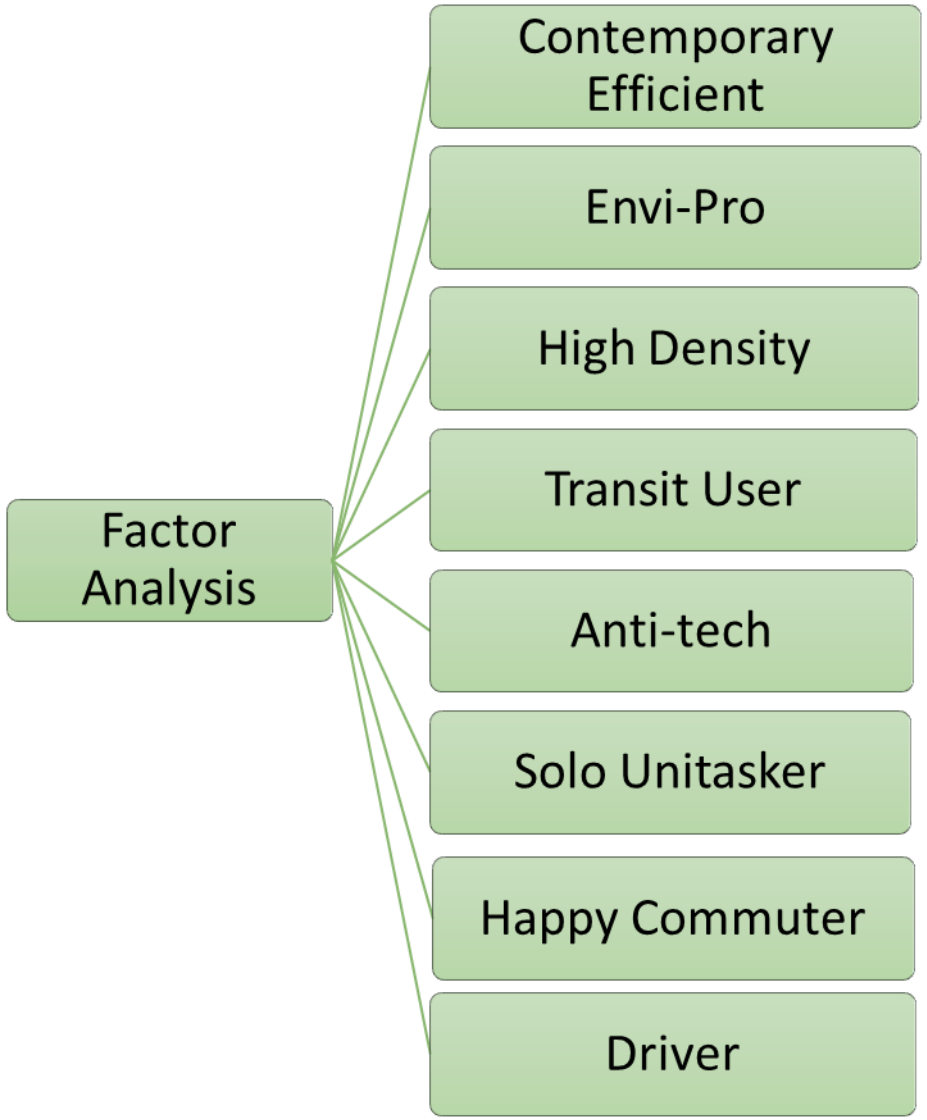
I am too busy to do many of the things I like to do
I tend to feel sick if I read while in a moving vehicle
The level of congestion during my daily travel bothers me
My daily travel routine is generally satisfactory
The time spent traveling to places provides a useful transition between activities
Having to wait can be a useful pause in a busy day
When traveling in a vehicle, I prefer to be a driver rather than a passenger
I definitely like the idea of owning my own car
Car crash deaths are an unfortunate but unavoidable part of a modern, efficient transportation system

Analyzing Respondent Attitudes and Preferences

- Data Imputation conducted for missing values among 28 attitudinal questions – mice package in R (with parallel imputation) → final sample size 3,339

- Factor Analysis → reduce the 28 attitudinal questions into a manageable number of factors (8)

- The eight factors explained about 50.4% of the total variance in the dataset – analysis was done on SPSS 26.0, Promax rotation with Kaiser normalization



- Likes trying new and different things
- Makes good use of travel time
- Car's reliability and quality over its brand

Contemporary Efficient

- Environmentally-friendly lifestyle
- Uses eco-friendly transportation modes
- Gas tax raise to reduce negative transport impacts on the environment

Envi-Pro

- Prefers living close to transit even with smaller home
- Doesn't mind non-spacious homes if closer to transit and places they go
- Likes mixed land-use neighborhoods

High Density

- Public transit is reliable for daily needs
- Has alternatives to driving most of the time

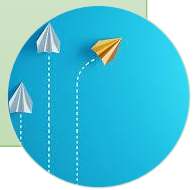
Transit User

- Learning new tech is frustrating
- Not among the first to have latest tech
- Concerned about sharing personal info or location via internet-enabled devices

Anti-tech

- Feels uncomfortable around strangers
- Prefer to do one thing at a time
- Too busy to do many things they like

Solo Unitasker



- Not bothered by the level of congestion
- Satisfied in daily travel routine
- Time spent traveling provides a useful transition to activities

Happy Commuter

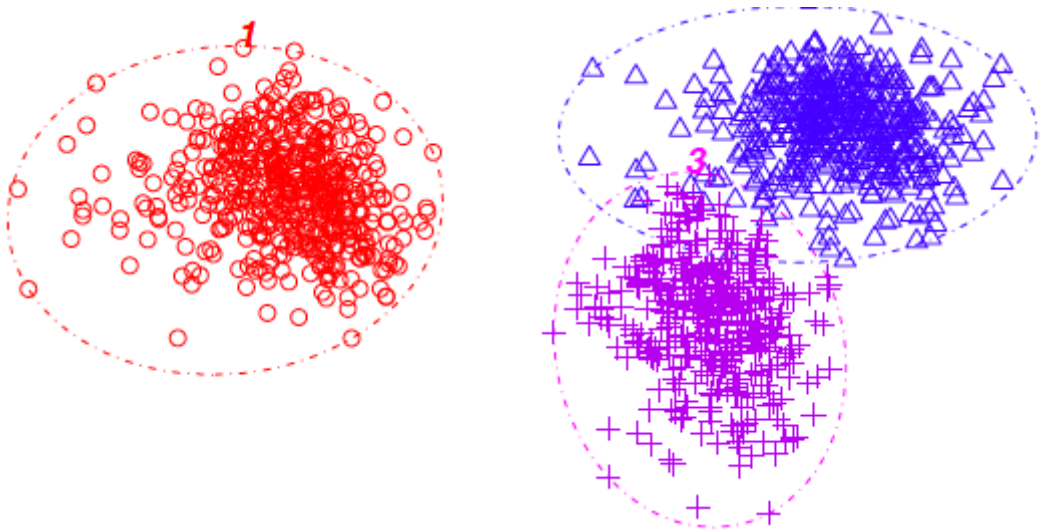
- Prefers to be a driver than a passenger, when traveling in a vehicle
- Prefers owing a car

Driver

Analyzing Consumer Segments – Cluster Analysis

- Cluster Analysis → restructure the data into groups, uncover respondent subgroups (clusters) with diverse characteristics
  - Current study: 3,339 respondents to be subdivided into groups based on 8 factors

- K-means clustering was applied using SPSS 26.0
  - Cluster distances estimated to assess the different clusters

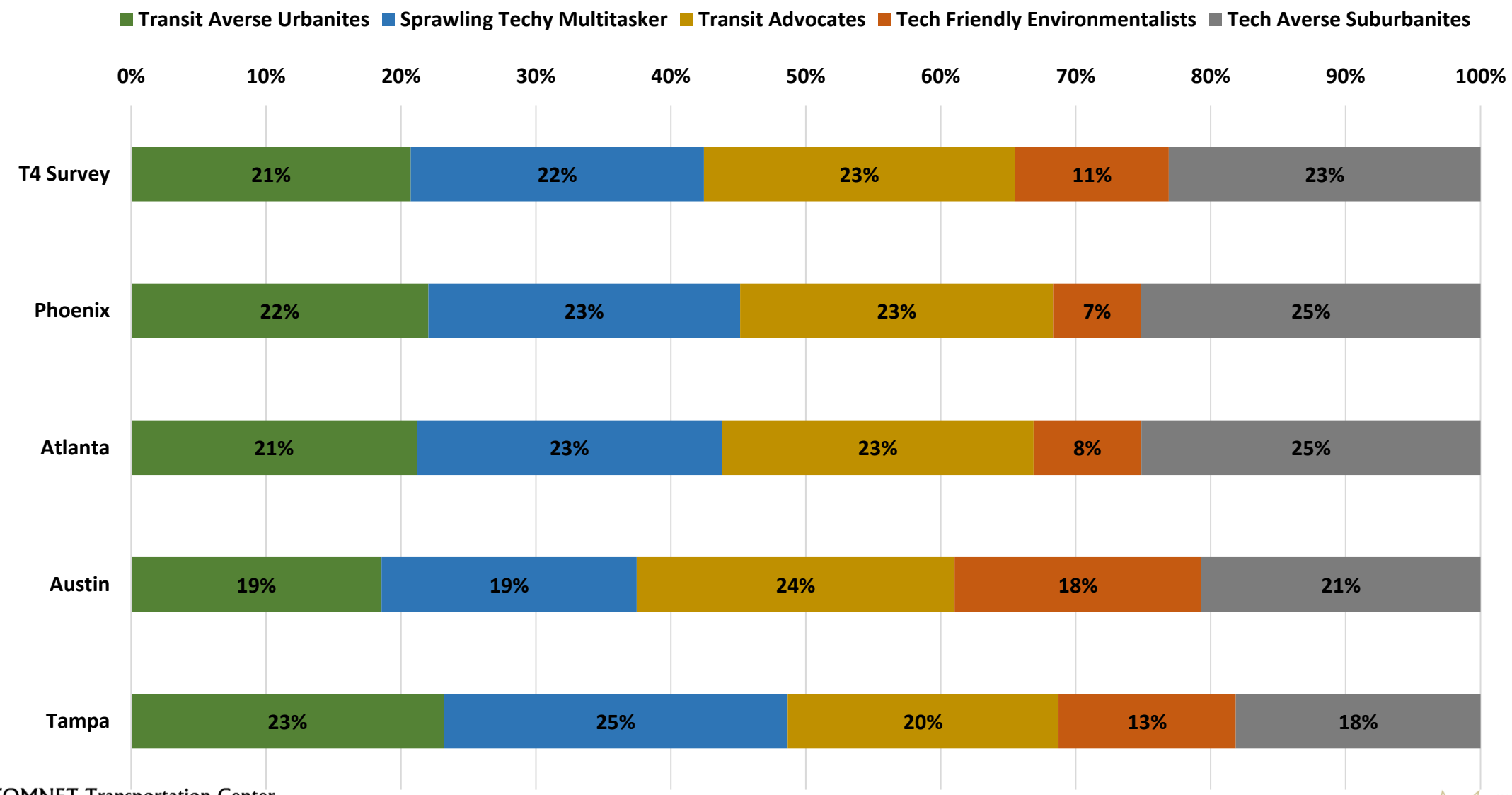


Results – Cluster Analysis

N=3,339

Factors\Clusters	Tech Averse Urbanites (N=743)	Sprawling Techy Multitasker (N=815)	Transit Advocates (N=606)	Tech Friendly Environmentalists (N=332)	Tech Averse Suburbanites (N=843)
Contemporary Efficient (Factor 1)	0.02181	0.39825	0.3305	-1.31497	-0.12395
Envi-Pro (Factor 2)	0.06139	-0.38697	0.06976	0.38323	0.11892
High Density (Factor 3)	1.09712	-0.69073	0.28631	0.28074	-0.61557
Transit User (Factor 4)	-0.64715	-0.16614	1.32848	0.79572	-0.53737
Anti-tech (Factor 5)	-0.10042	-0.48705	0.21473	-0.62793	0.65232
Solo Unitasker (Factor 6)	-0.13579	-0.65519	0.38911	-0.02859	0.48466
Happy Commuter (Factor 7)	-0.15312	0.25119	-0.0886	0.07504	-0.07375
Driver (Factor 8)	0.34435	0.07814	0.29363	-1.28274	-0.08494

Cluster Composition – Metro Area



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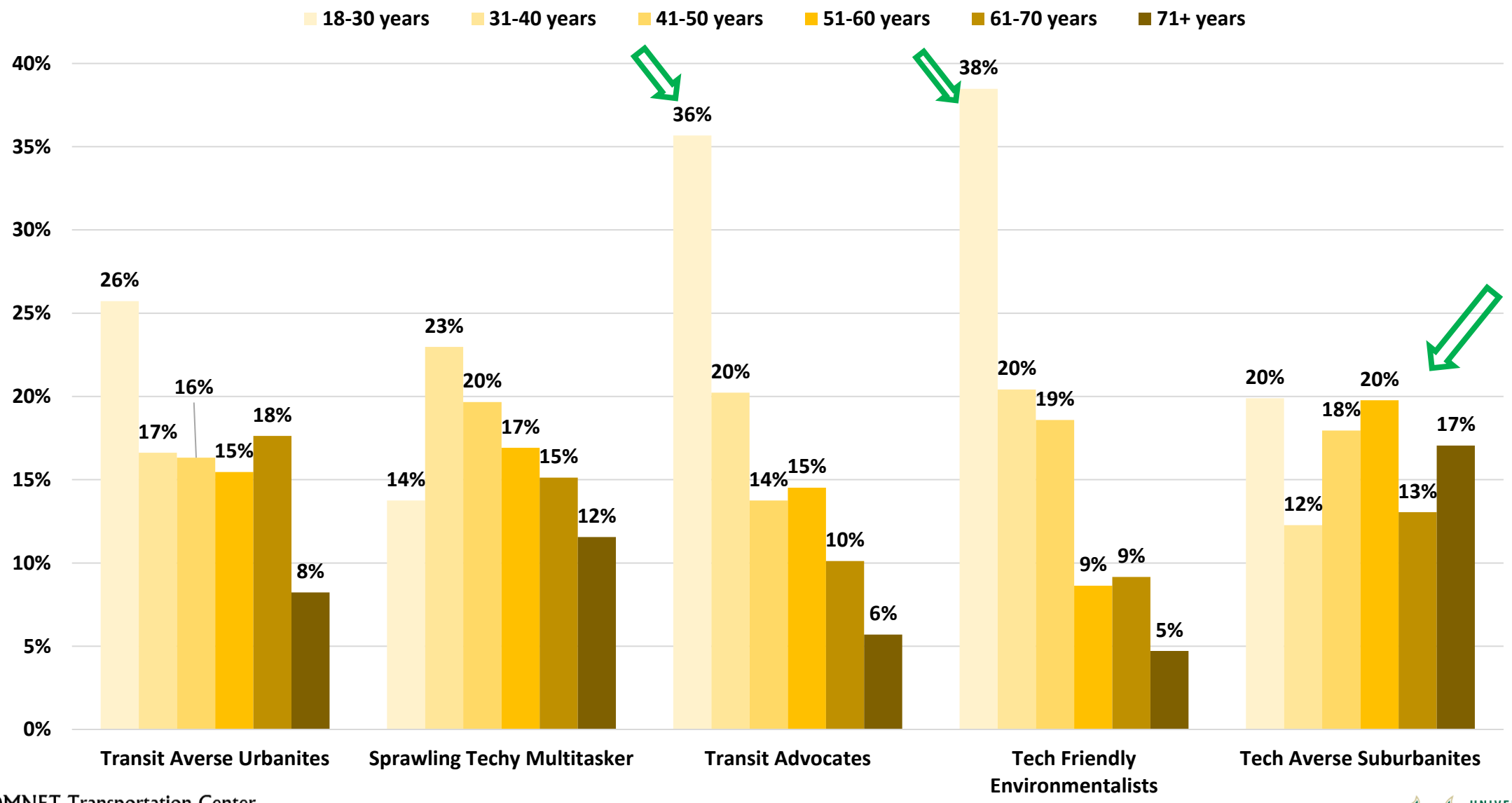
Cluster Composition – Age



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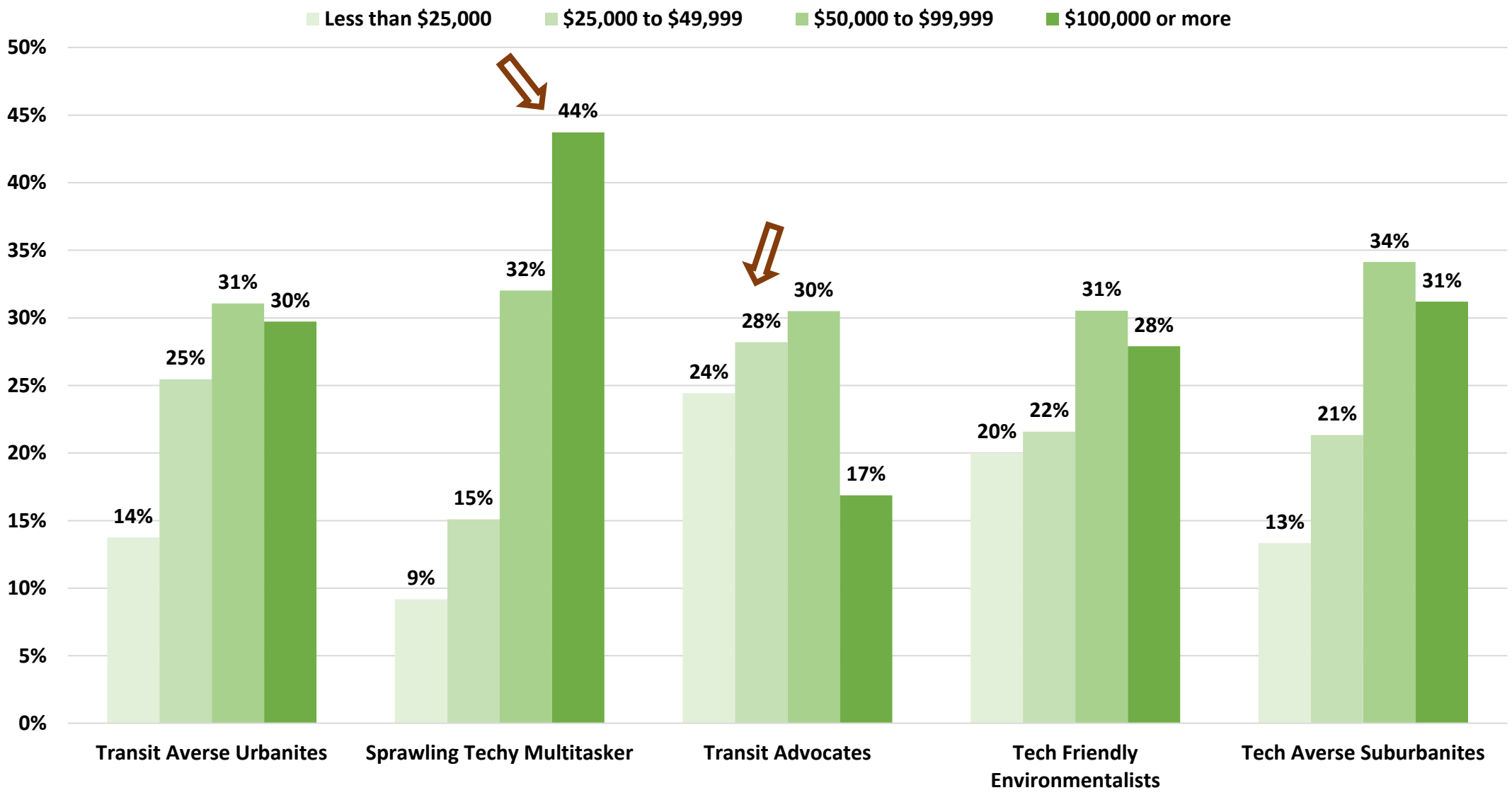
Cluster Composition – Household Income



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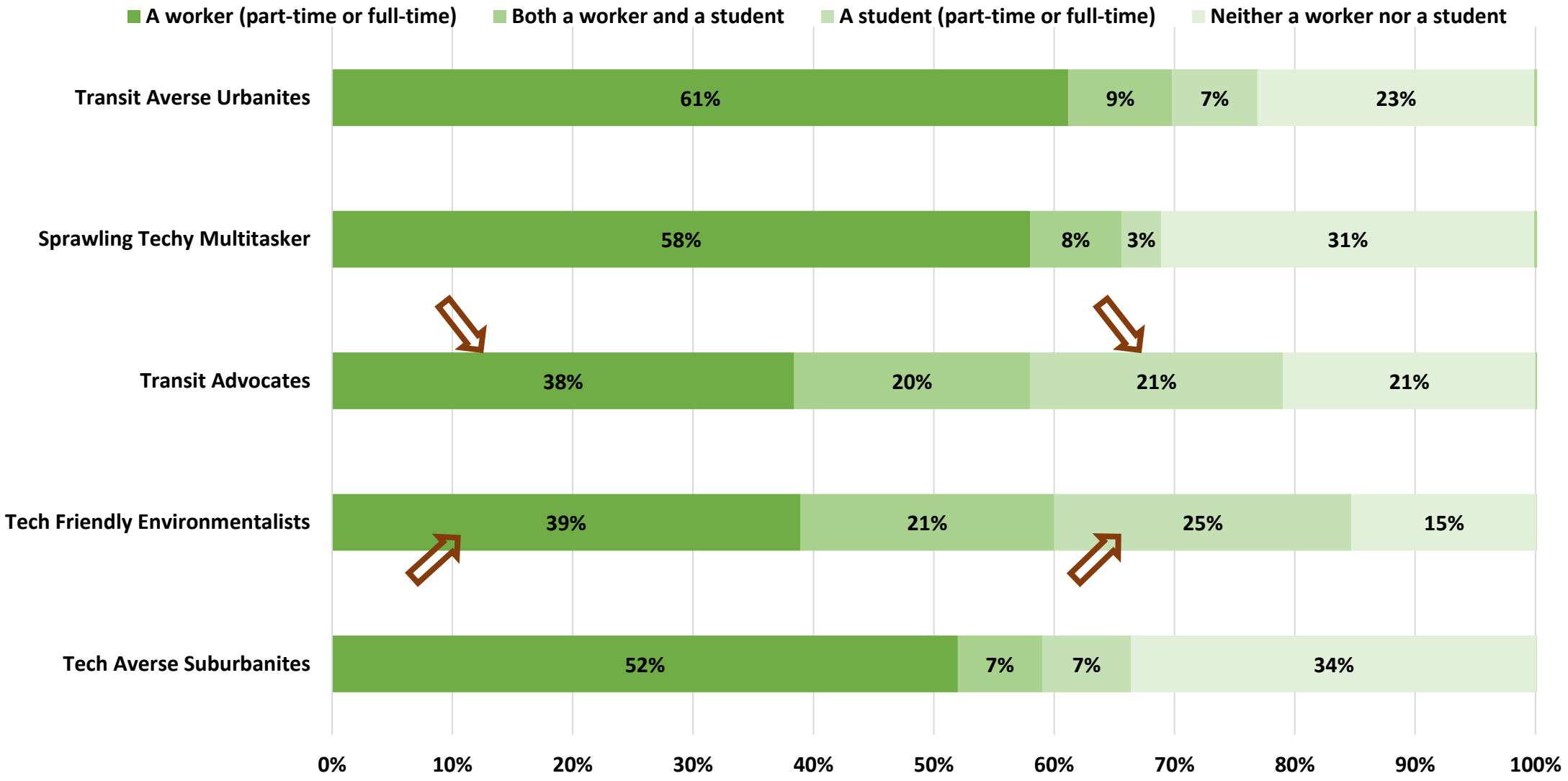
Cluster Composition – Employment Status



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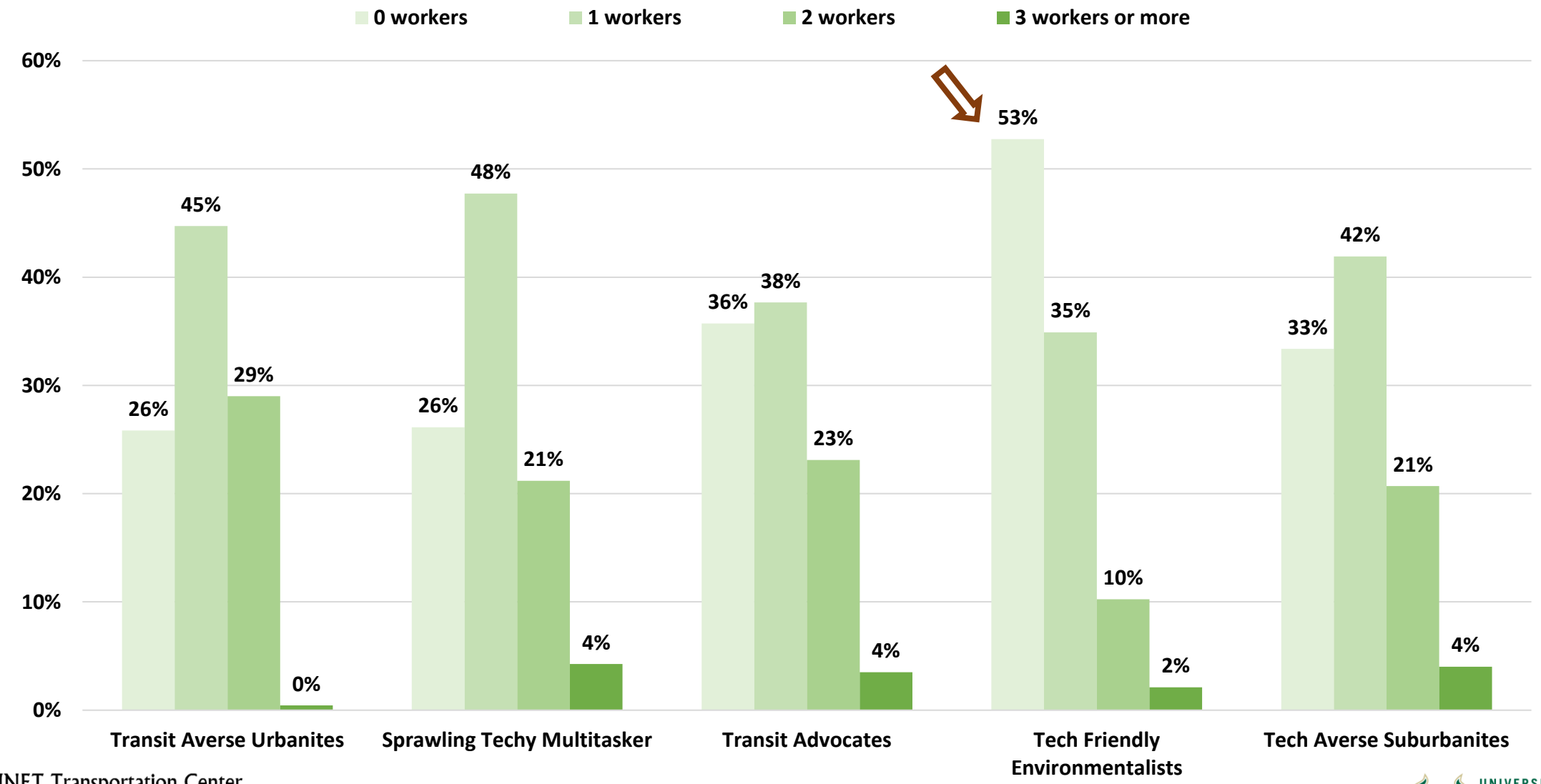
Cluster Composition – Workers in Household



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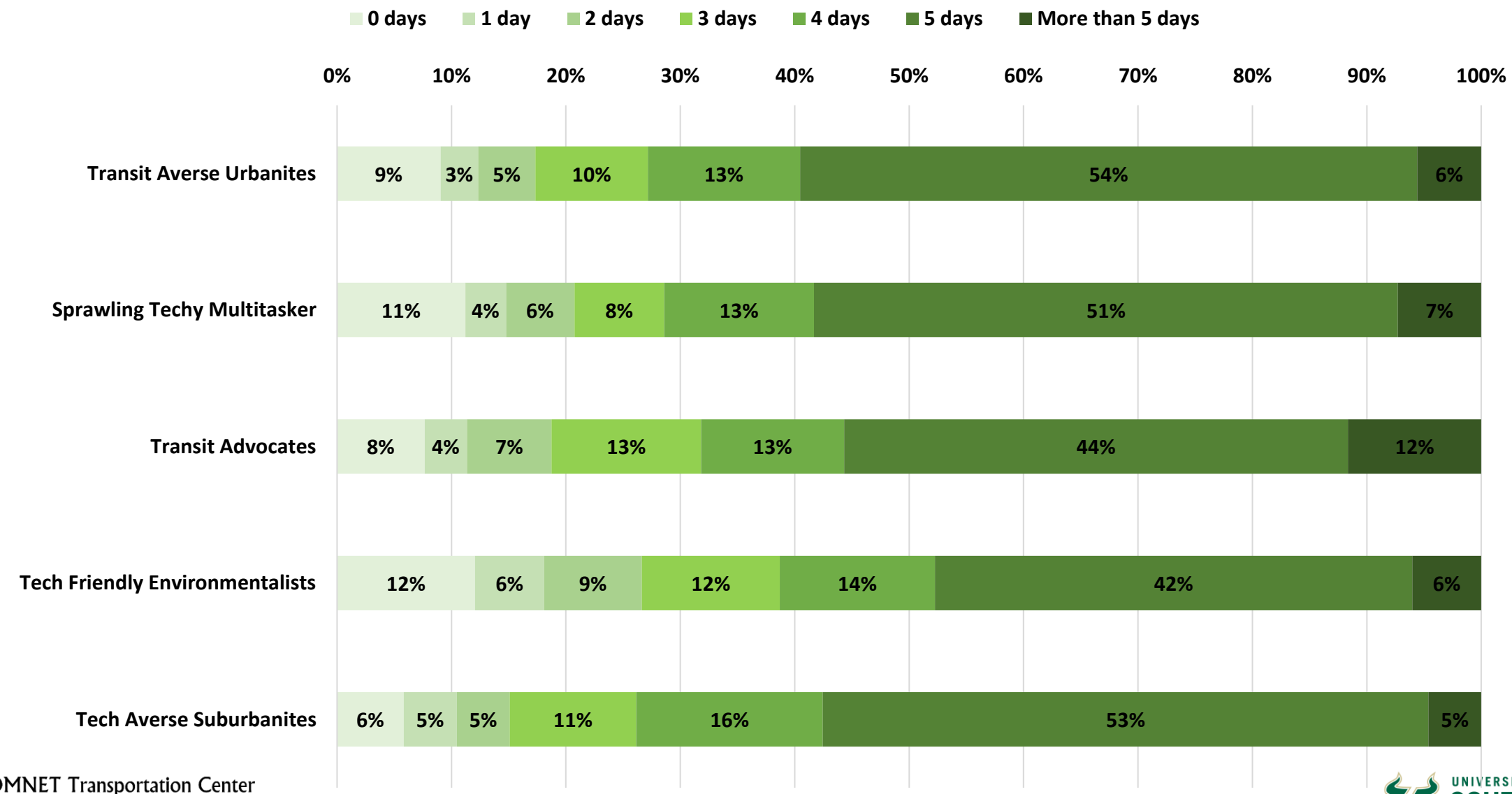
Cluster Composition – Commuting Frequency



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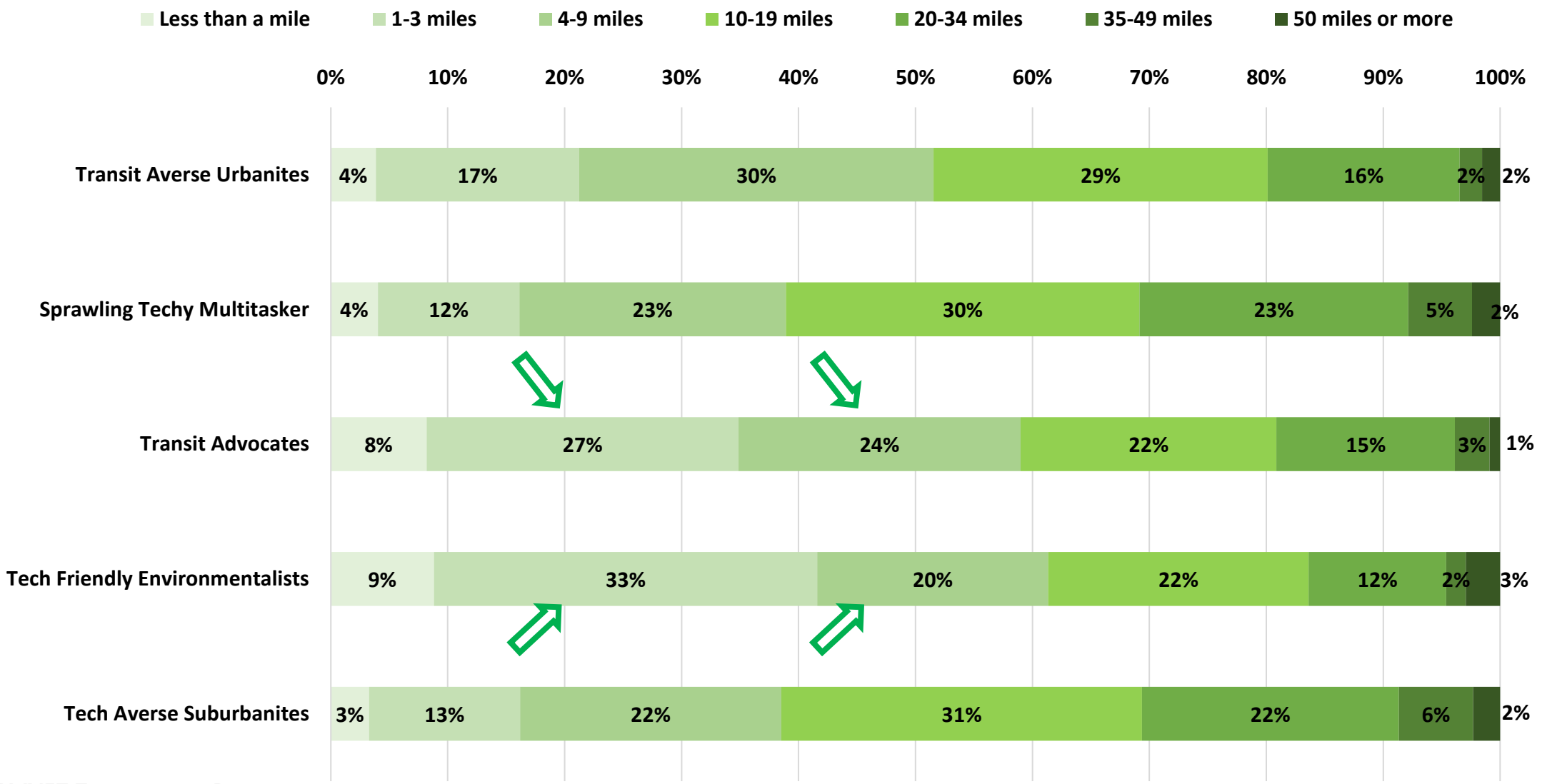
Cluster Composition – Commute Distance



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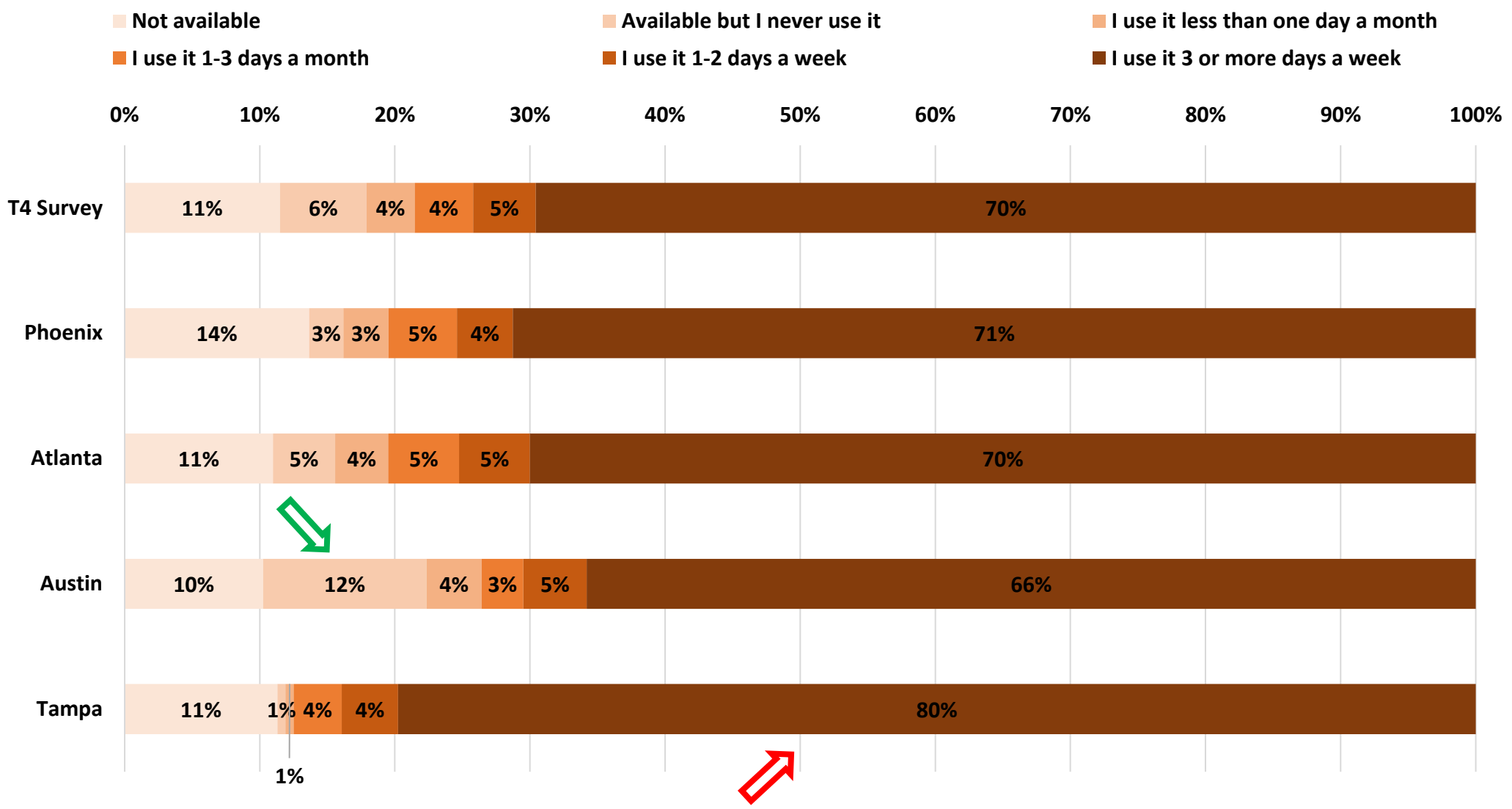
Driving Alone for Commute by Metro Area



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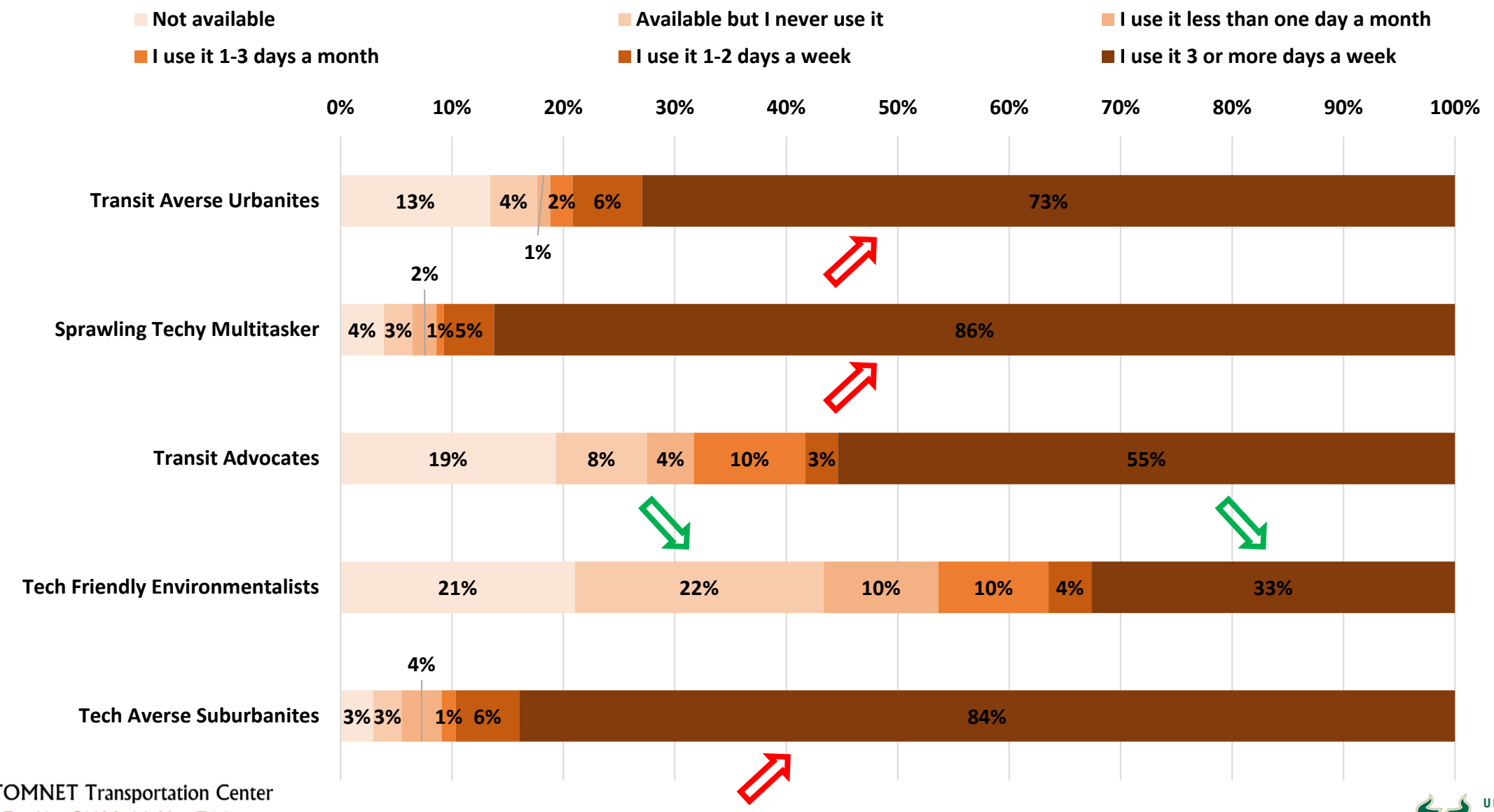
Cluster Composition – Driving Alone for Commute



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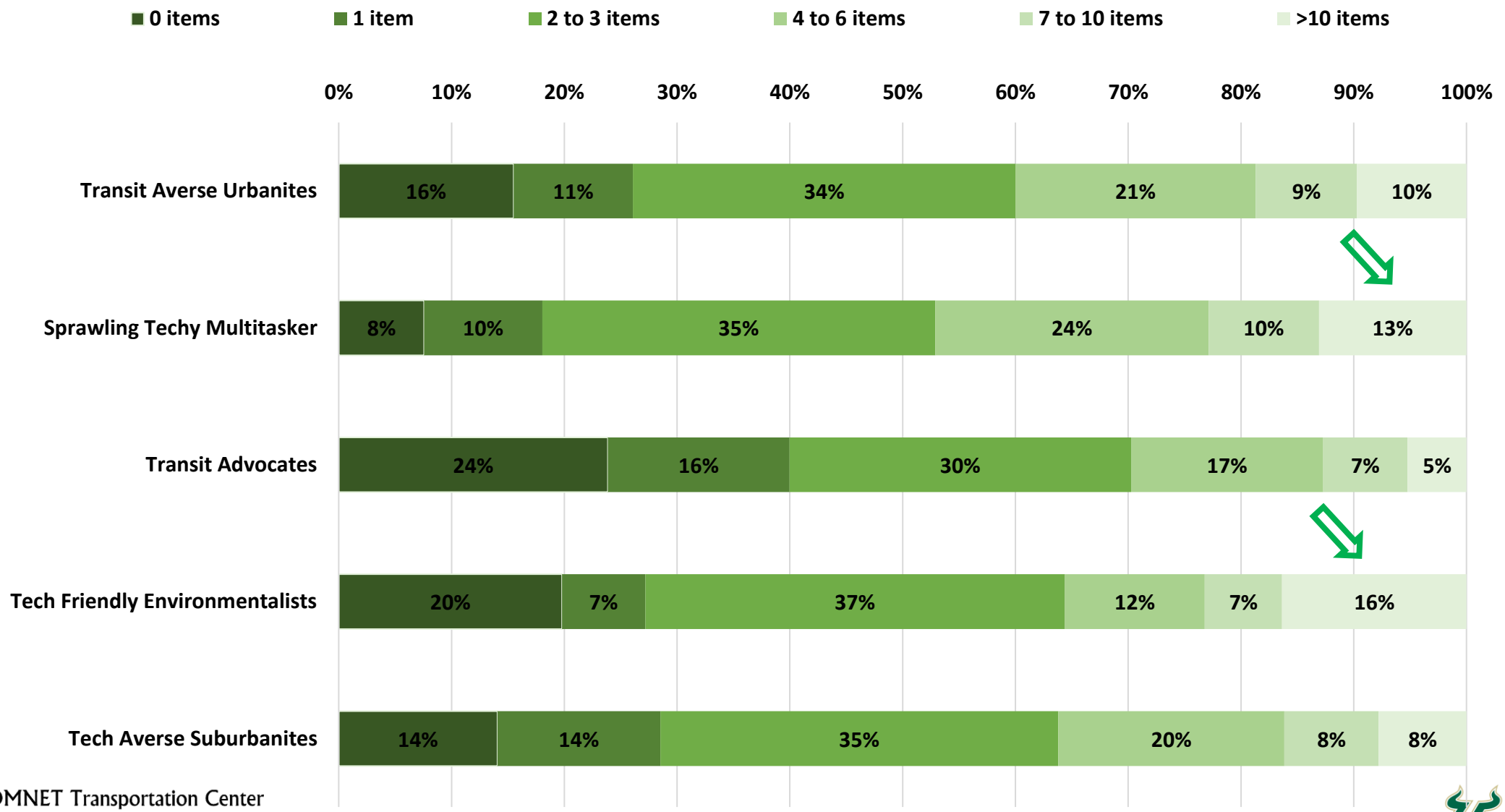
Cluster Composition – E-Shopping Behavior



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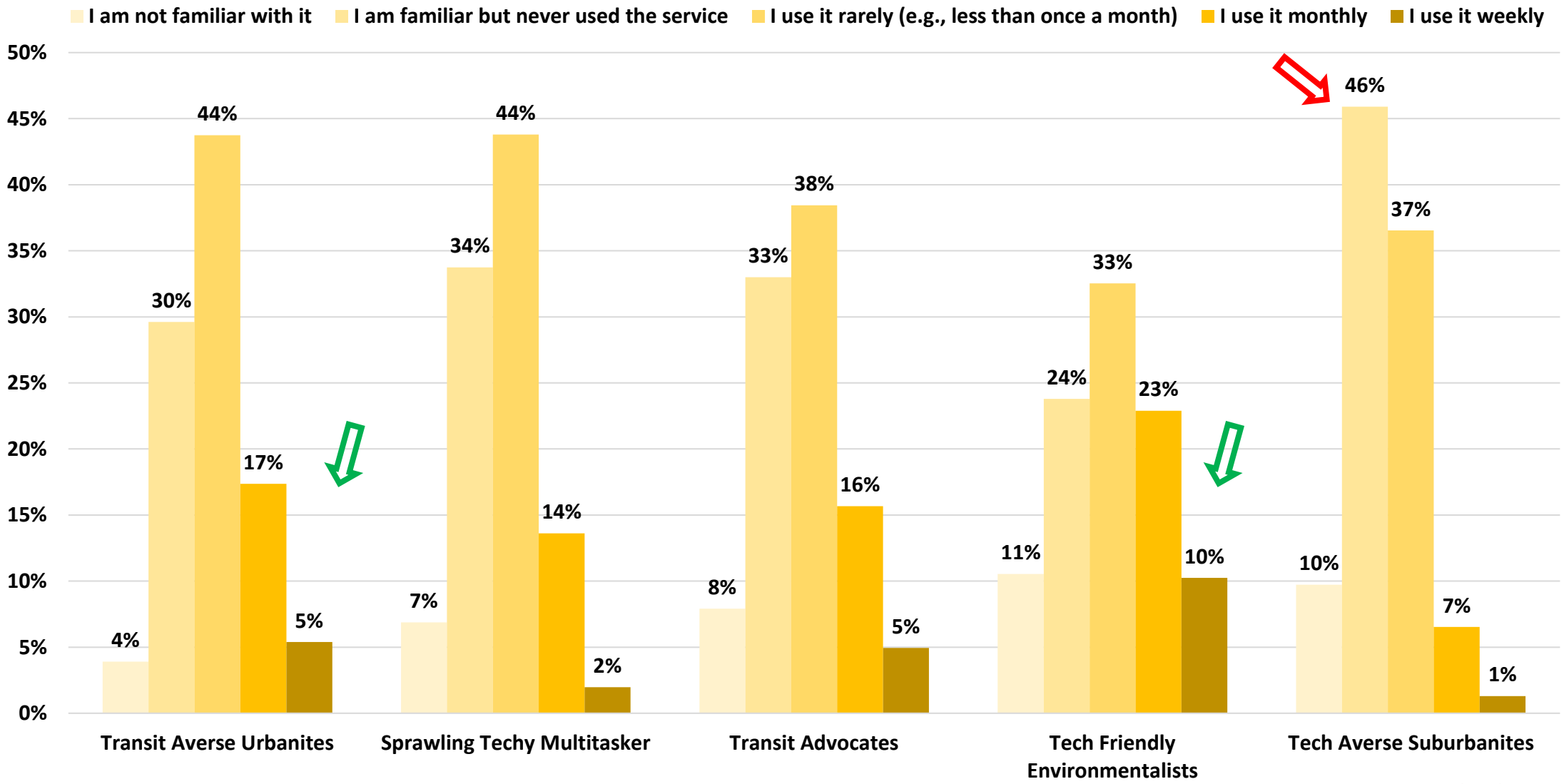
Cluster Composition – Uber/Lyft Familiarity/Use



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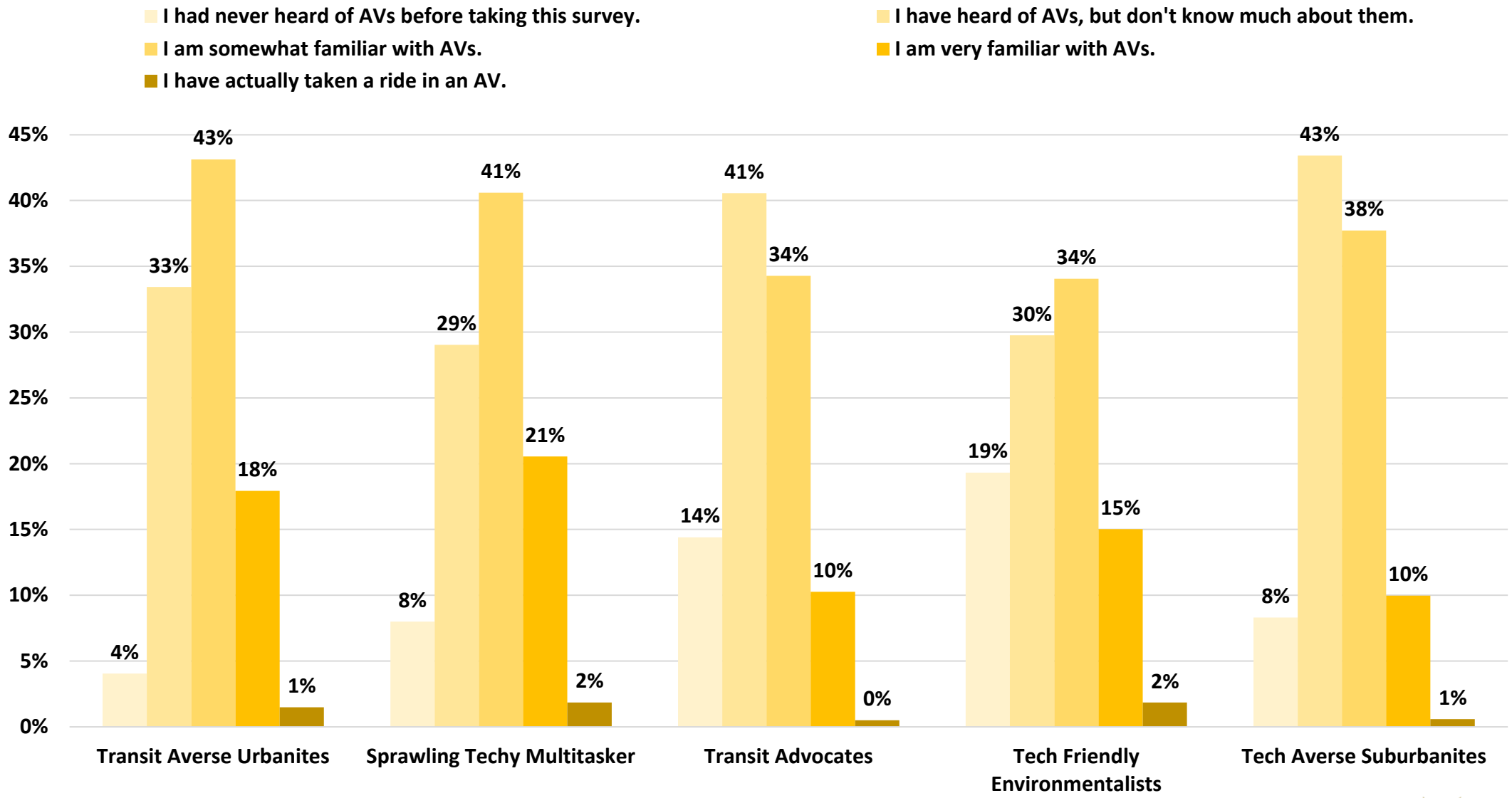
Cluster Composition – Familiarity with AVs



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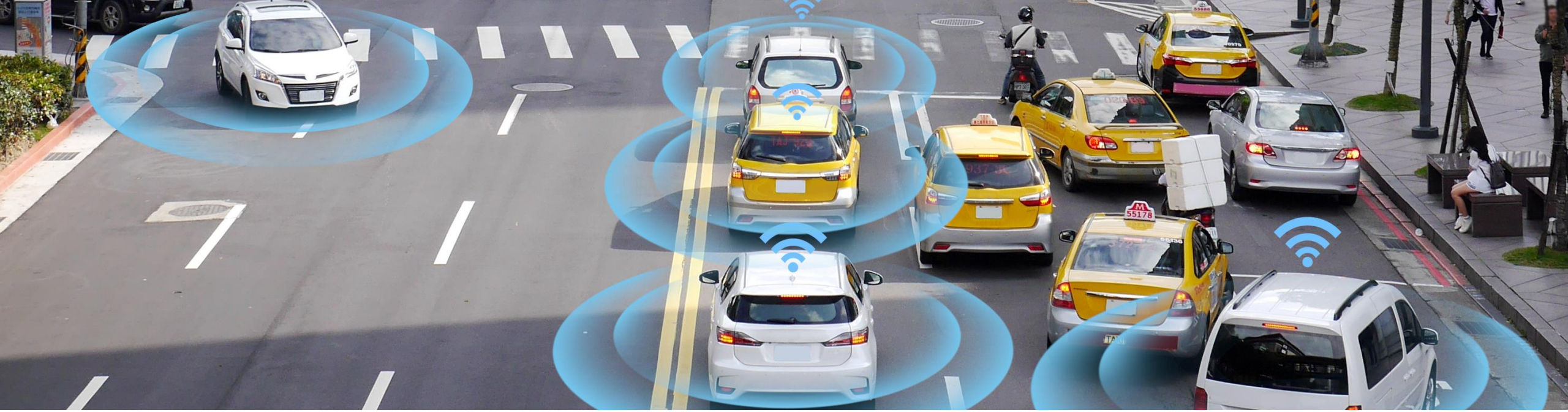
Cluster Analysis – Summary Results

Attribute	Tech Averse Urbanites (N=743)	Sprawling Techy Multitasker (N=815)	Transit Advocates (N=606)	Tech Friendly Environmentalists (N=332)	Tech Averse Suburbanites (N=843)
Age					
Household Income					
Employment Status					
Workers in Household					
Commuting Frequency					
Commute Distance					
Using Drive Alone for Commute					
E-Shopping Behavior					
Ridehailing Familiarity/Use					
Familiarity with AVs					



Thank you!

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