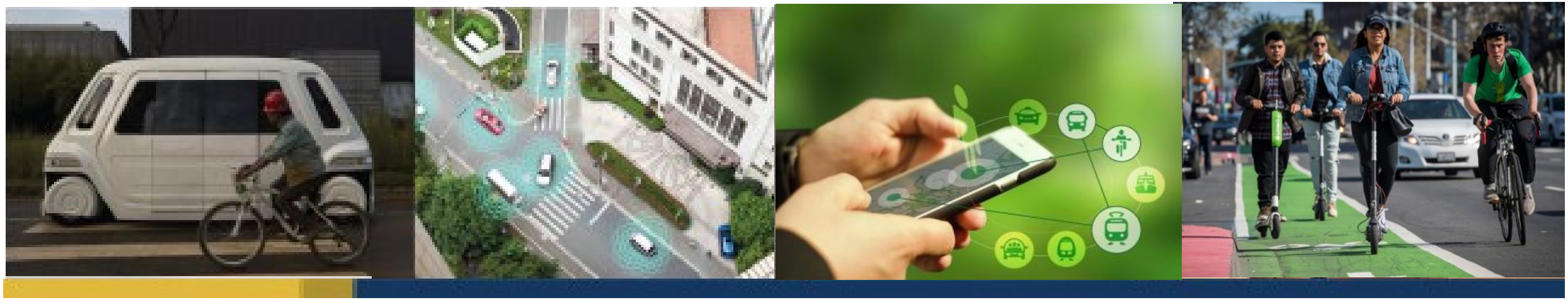


Propensity towards Ownership and Use of Automated Vehicles: Who Are the Adopters? Who Are the Non-adopters? Who Is Hesitant?

Tho V. Le, Giovanni Circella, and Grant Matson

Presented at the 2020 *Transportation Research Board Meeting*

UCDAVIS INSTITUTE OF TRANSPORTATION STUDIES

Washington D.C., Jan 14, 2020

3 REVOLUTIONS SHARED·AUTOMATED·ELECTRIC

California Mobility Panel Study

Survey: 2018
N = 2,336 California residents

Survey questions:

If self-driving vehicles were available, how likely would you be to own a personal self-driving vehicle and/or use self-driving services (such as a driverless taxi)?

I would…		*Very unlikely*	*Somewhat unlikely*	*Neither unlikely nor likely*	*Somewhat likely*	*Very likely*
Ownership	a. Be one of the first people to buy a self-driving vehicle.	☐1	☐2	☐3	☐4	☐5
Ownership	b. Eventually buy a self-driving vehicle, but only after these vehicles are commonly used.	☐1	☐2	☐3	☐4	☐5
Usage	c. Use a driverless taxi alone or with others I know.	☐1	☐2	☐3	☐4	☐5
Usage	d. Use a driverless taxi or shuttle with other passengers who are strangers to me.	☐1	☐2	☐3	☐4	☐5

Methodology

- Kmeans clustering

$$\sum_{i=1}^{n} \min_{j} \left(\| x_i - \mu_j \| \right)^2$$

minimize the within-cluster sum-of-squares (wcss)

$$\mu_j = \frac{1}{|S_j|} \sum_{x_j \in S_j} x_j$$

update the centroid μ_j

where data point x_i

candidate cluster centroids $\mu_j, j = [1, |K|]$

S_j is a set of data points for each j^{th} cluster

- Elbow method for identifying the optimal cluster number.

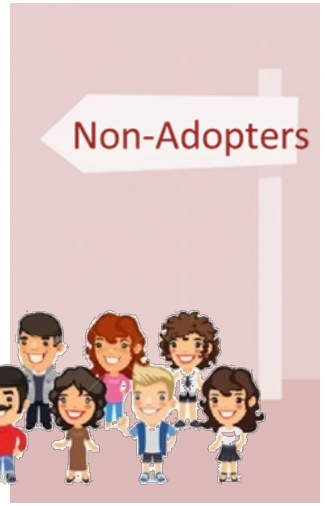
Variables

- Socio-demographic characteristics
- Household size
- Residence type and housing tenure
- Attitude towards AVs
- Attitudinal variables
- Key life-events
- Current travel choices for commute trips
- Current travel choices for leisure/ shopping/ social trips
- Current travel characteristics
- Propensity towards AV adoptions

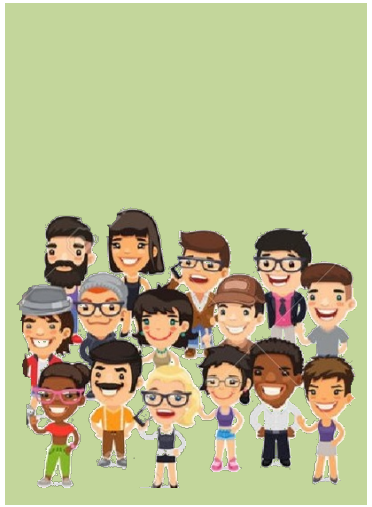
Who are the adopters?

Tech mavens/ Travelers

Multitaskers/
Environmentalists/
Impaired drivers



Car enthusiasts



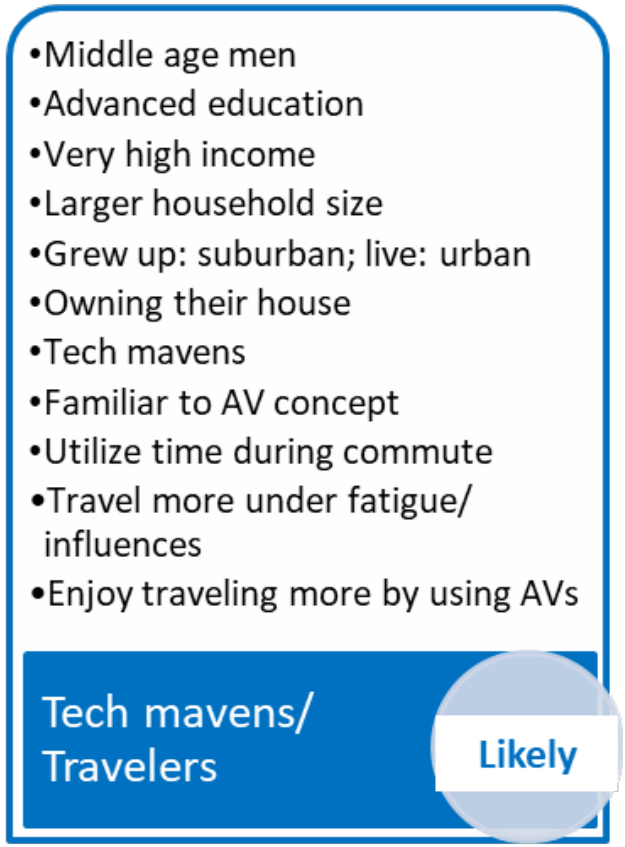
Captive Car-users

Life in Transition

Suburban Dwellers

Public/ Active Transport Users

Who are the adopters?



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Who are the adopters?

- Middle age men
- Advanced education
- Very high income
- Larger household size
- Grew up: suburban; live: urban
- Owning their house
- Tech mavens
- Familiar to AV concept
- Utilize time during commute
- Travel more under fatigue/ influences
- Enjoy traveling more by using AVs

Tech mavens/ Travelers — Likely

- Younger men
- Advanced education
- Tech mavens
- Grew up/live: urban
- Own their house
- Driving impaired
- Frequently use public transport
- Familiar to AV concept
- Utilize time during commute
- Travel more under fatigue/ influences
- Environmentally-friendly lifestyle

Multitaskers/ Environmentalists Impaired drivers — Likely

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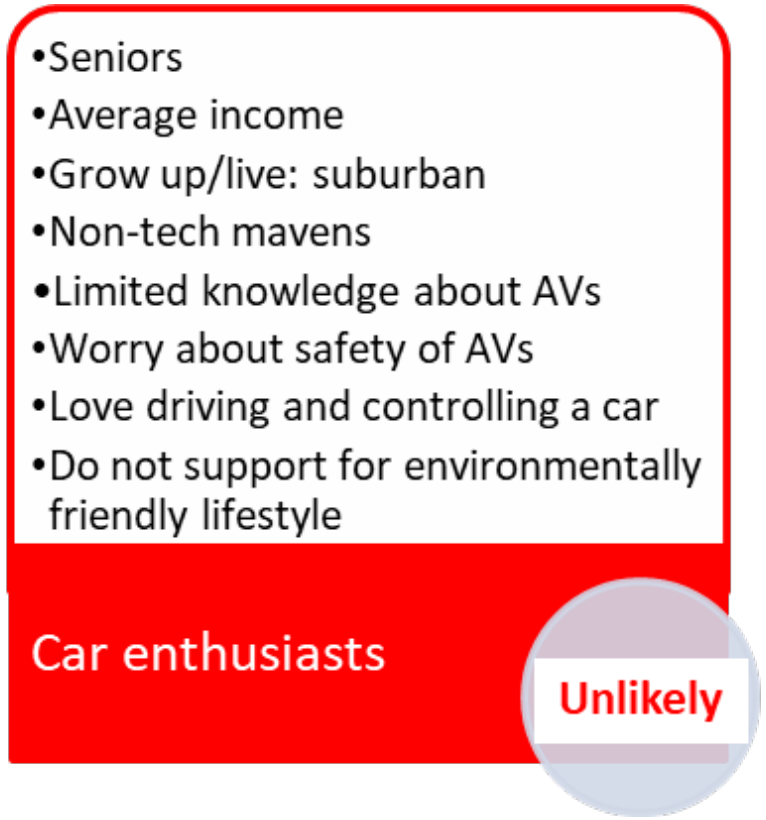
Who are the non-adopters?



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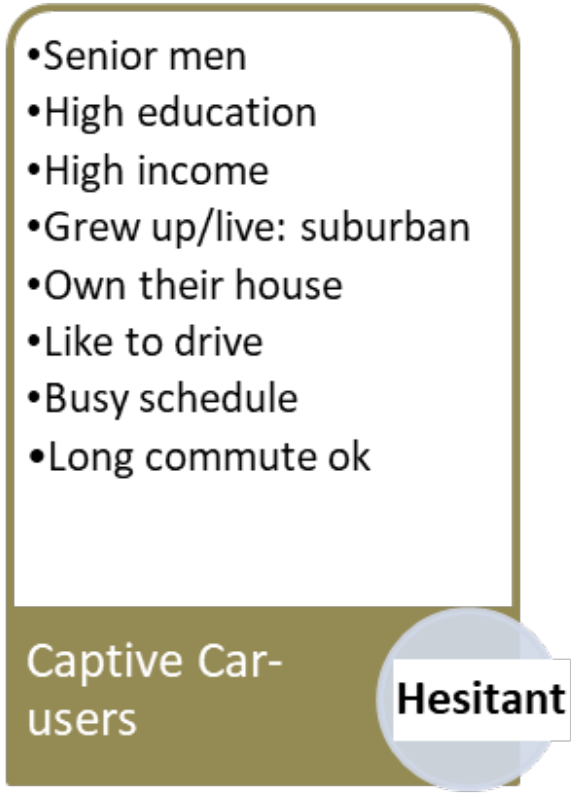
Who is hesitant?



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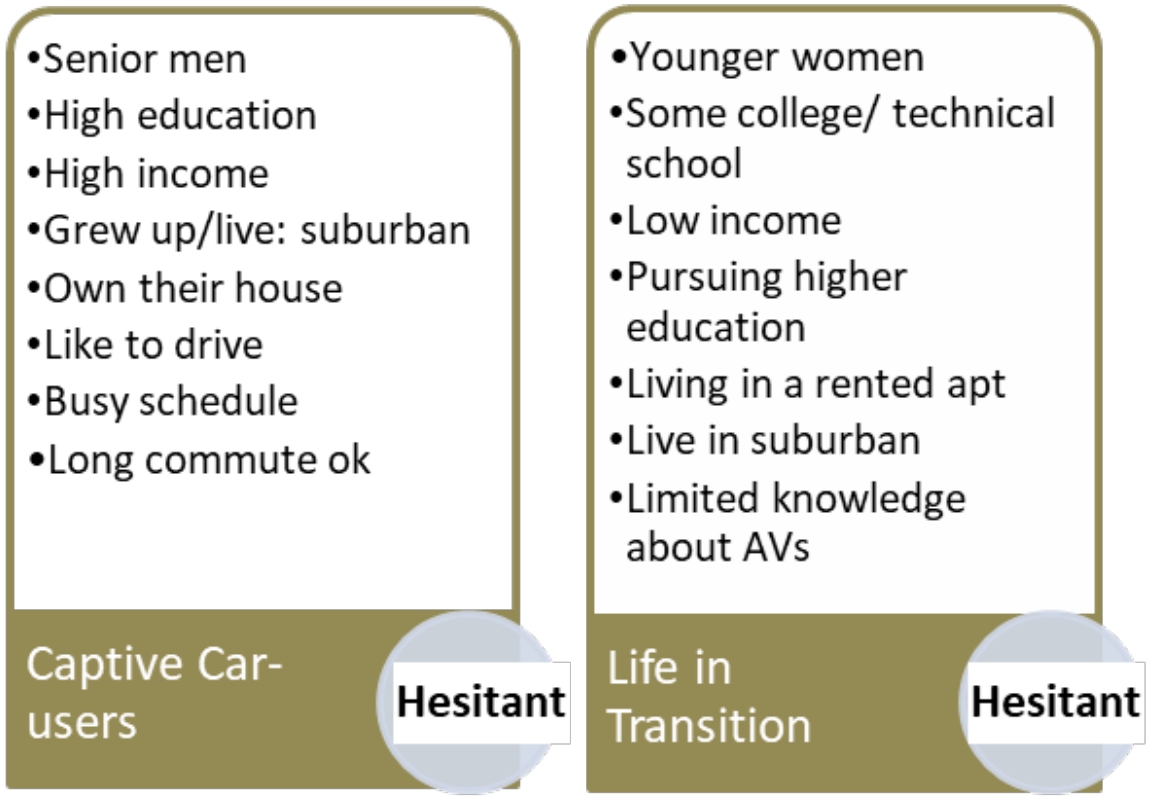

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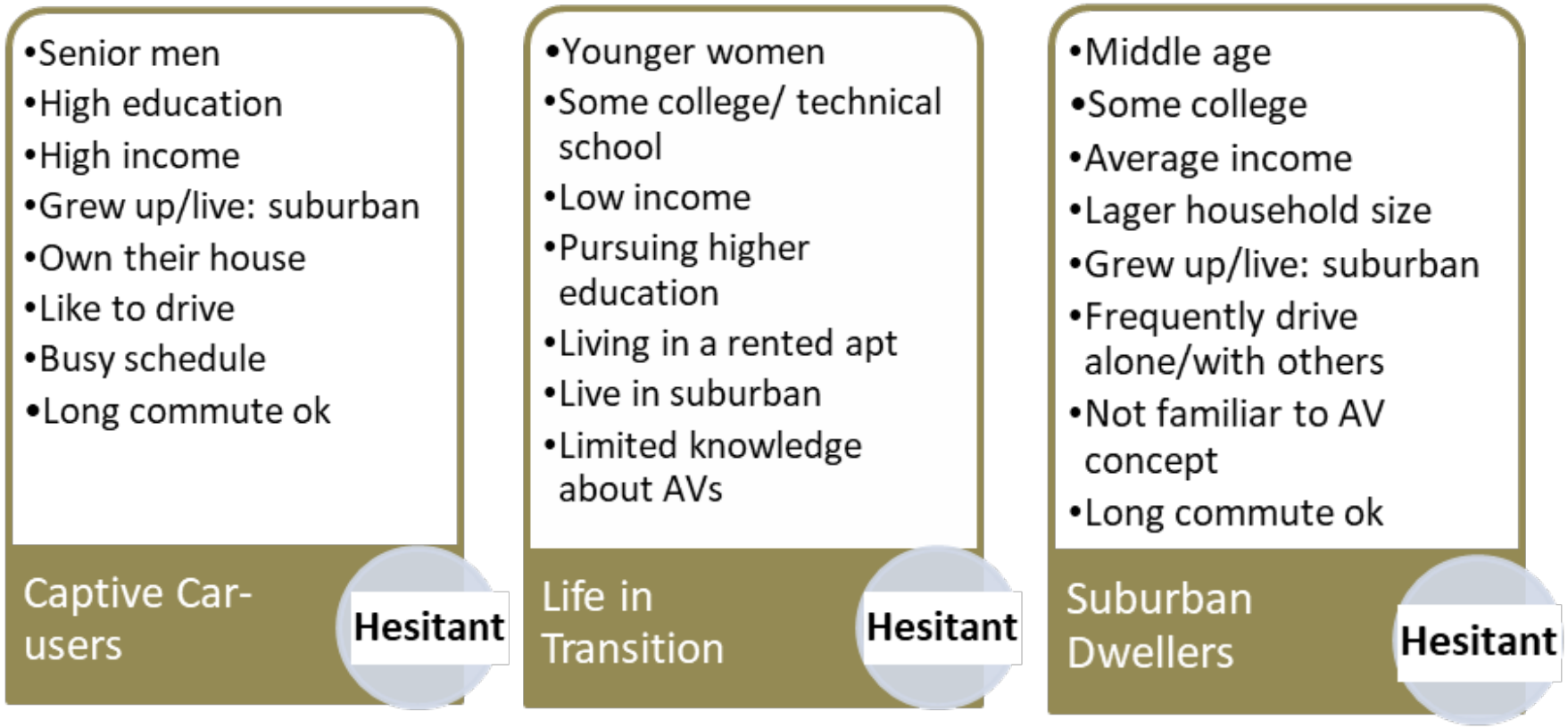

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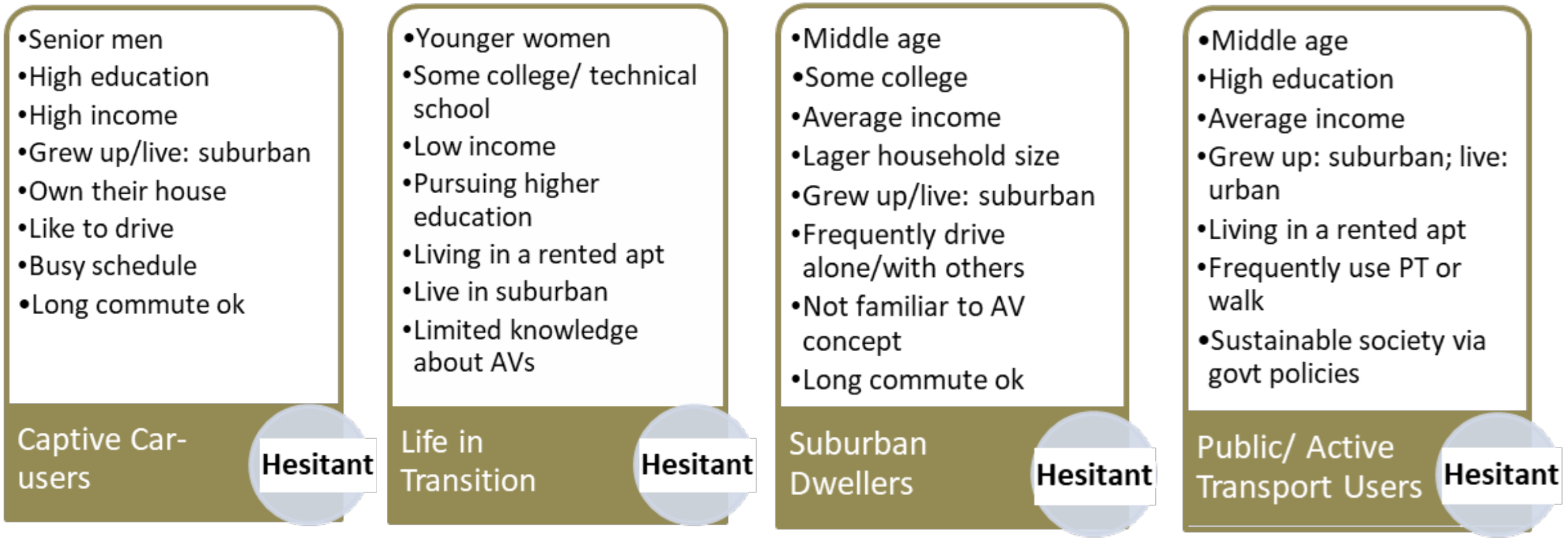

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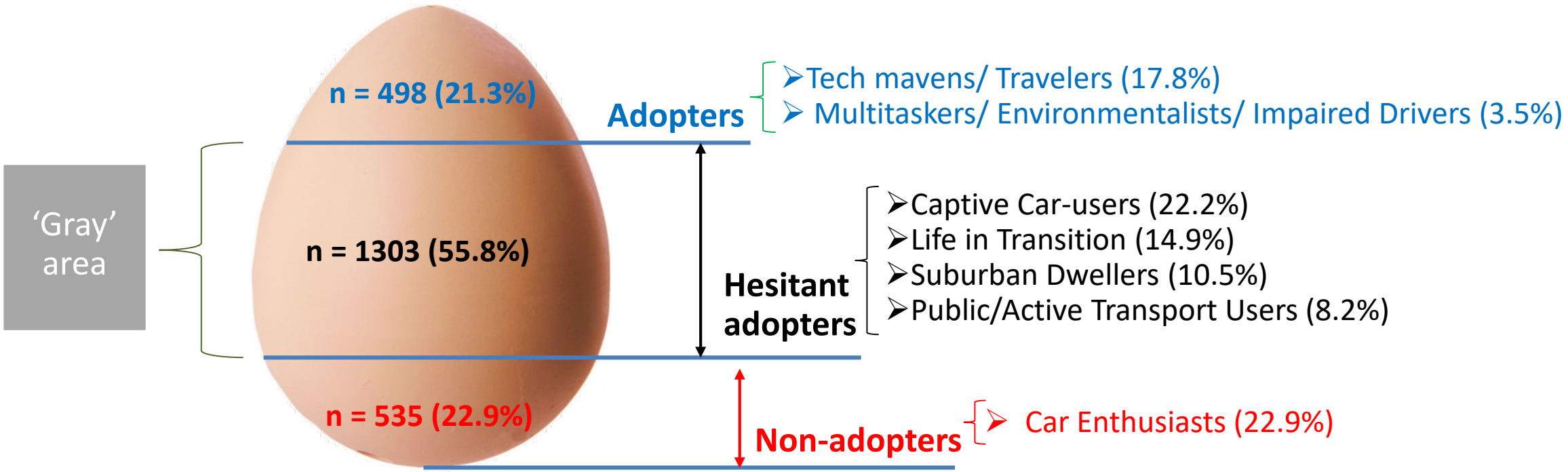
Will the ‘gray’ area be potential markets?



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Thank you!

Questions and comments

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