

Adoption of New Technologies and Their Environmental Impacts

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Ridehailing Users in the U.S. : Overview

About 10% of U.S. residents (aged 16+) used ridehailing services in the past 30 days



Source: Hongwei Dong, using 2017 NHTS data





Adoption of Ridehailing: 2015-2018



Source: California Mobility Panel Study, 2015-2018 data



 $0.0\% \quad 10.0\% \quad 20.0\% \quad 30.0\% \quad 40.0\% \quad 50.0\% \quad 60.0\% \quad 70.0\%$



I used it in the past, but not anymore

It's familiar but I've never used it

I am not familiar with it

Investigating Differences Across Groups of Users

Latent-class adoption model to investigate differences in the use of ridehailing:



Adoption Rate: 47%

- *Higher-educated independent millennials* who live *in more central areas* and in households *without kids*
- The adoption rate significantly increases as the *rates of technology adoption* and *frequency of long-distance leisure travel by plane* increase.



Adoption Rate: 27%

- *Most affluent* individuals, predominantly *dependent millennials* or *older Gen Xers,* who live with their *families*.
- Technology adoption rate, household income, and frequency of non-car business long-distance trips affect the adoption.



Adoption Rate: 5%

- *least affluent* and *less educated* individuals, who live in *rural* neighborhoods and *do not work nor study*.
- Adoption rate is affected by the characteristics of the *built environment*, including *transit accessibility* and *land-use mix*.

Source: California Mobility Panel Study, 2015 data

For more details:

Alemi, F., G. Circella, S. L. Handy and P. L. Mokhtarian (2018) "Exploring the Latent Constructs behind the Use of Ridehailing in California", Journal of Choice Modelling, 29, 47-62.

Research Question:

How does the use of ridehailing affect the use of other modes?

Investigating Differences Across Groups of Users

Latent-class analysis to investigate the impacts of ridehailing on other travel modes:



Source: California Mobility Panel Study, 2015 data

For more details:

Circella, G. and F. Alemi (2018) "Transport Policy in the Era of Shared Mobility and Other Disruptive Transportation Technologies", in Advances in Transport Policy and Planning, Volume 1, edited by Yoram Shiftan and Maria Kamargianni, Chapter 5, 119-144, Elsevier.

What Would You Have Done if Ridehailing Was Not Available?



Source: California Mobility Panel Study, 2018 online data, N=1,260

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Research Question:

When (and where) ridehailing trips are made, and how do they affect congestion?

Temporal-Spatial Patterns of Taxi/Ridehailing Trips

Temporal distribution of taxi/ridehailing trips vs. auto trips:





Year 2017 - Year 2009 - - Year 2001

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Source: Hongwei Dong, using 2017 NHTS data

□ Spatial distribution of taxi/ridehailing trips vs. auto trips:







Source: Hongwei Dong, using 2017 NHTS data

"People won't have as many vehicles because they'll share one and own one."

Jim Hackett, Ford CEO

Need for better investigate evolving patterns in urban mobility



2. ANNUAL INVESTIGATION OF NATIONWIDE MOBILITY TRENDS: "THE PULSE OF THE NATION" ON 3R

We plan to launch an annual data collection in selected regions of the US, to investigate the rapid changes in the adoption and frequency of use of shared mobility services, including ridehailing, carsharing, bikesharing, escooter sharing and their impacts on the use of other means of transportation, in various parts of the US and among different groups of users. The survey will also include a stated preference component to investigate respondents' preferences towards various subscription plans and the factors affecting individuals' multimodality and the adoption of Mobility as a Service solution, i.e. under what conditions/circumstances individuals are more likely to ditch their own private vehicles and use a combination of non-motorized and motorized modes for various trip purposes. We plan to continuously monitor the changes in attitudes and preferences toward the use of AVs among various population groups, as we get closer to the actual deployment of this transportation technology. This study will shed light on various topics, including the evolving impacts of new shared mobility services on various components of travel behavior and vehicle ownership, the factors affecting the propensity to use MaaS solution packages (i.e. combination of travel modes) instead of driving a private vehicle, and the changes in attitudes toward autonomous vehicles and the use of shared vs. privately-owned AVs.













Research Question – 1:

Which groups of travelers might be more inclined to rely on MaaS and not own a vehicle?

Research Question – 2:

What factors can encourage travelers to share rides with strangers?



Additional references:

- Alemi, F., G. Circella, P. Mokhtarian and S. Handy (2018) "On-demand Ride Services in California: Investigating the Factors Affecting the Frequency of Use of Uber/Lyft", Presented at the Transportation Research Board 97th Annual Meeting, Washington DC, January 2018.
- Alemi, F., G. Circella and D. Sperling (2018) "Limitations to the Adoption of Uber and Lyft in California and Impacts on the Use of Other Travel Modes", Presented at the Transportation Research Board 97th Annual Meeting, Washington DC, January 2018.
- Circella, G., F. Alemi and P. Mokhtarian (2017) "Exploring the Impact of Shared Mobility on California Millennials and Older Adults' Travel Patterns", Presented at the 2017 International Choice Modeling Conference, Cape Town (South Africa), April 2017.



