

# Trends in Taxi Usage and the Advent of Ridehailing, 1995–2017

Matthew Wigginton Conway, Deborah Salon, and David King  
School of Geographical Sciences and Urban Planning  
Arizona State University

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# Introduction

- ▶ Ridehailing (e.g. Uber, Lyft) was introduced just after the 2009 NHTS
- ▶ It is very similar to taxis, but has some differences
  - ▶ Contracted with smartphone
  - ▶ Uses “regular” cars without special markings or modifications
  - ▶ More loosely-regulated
  - ▶ Generally cheaper



# Summary

- ▶ The usage of for hire vehicles (taxis and ridehailing) in the US has doubled since 2009
- ▶ Ridehailing has achieved remarkable market penetration, almost 10%
- ▶ The geography of for-hire vehicles has vastly expanded since 2009
- ▶ There are significant built-environment correlates of ridehailing
- ▶ The demographics of ridehailing users are not the same as taxi users or the general population

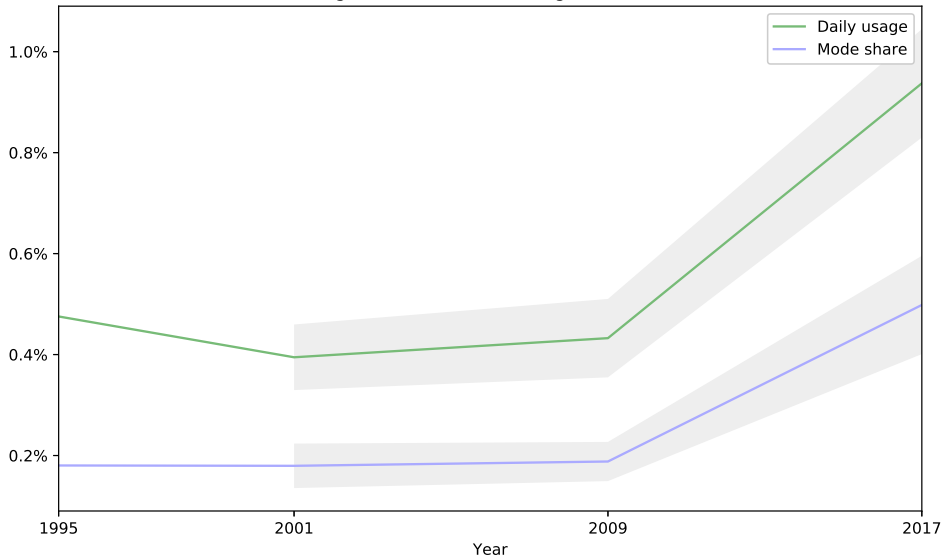
# Data

- ▶ 2017 NHTS asked two questions about ridehailing
  1. Ridehailing (specifically Uber/Lyft) was added to the taxi trip mode
  2. Users were asked how many ridehailing trips they made in the last 30 days
- ▶ This is the first large national survey to ask about ridehailing



# Results: Growth in for-hire vehicle use

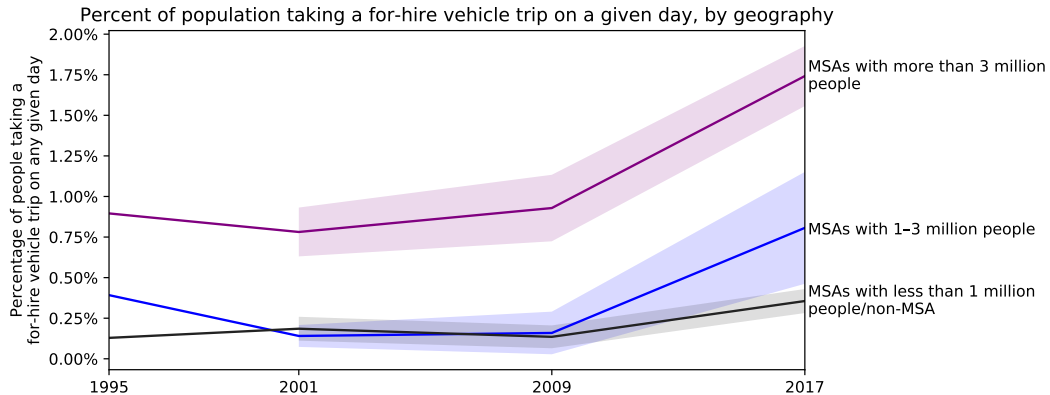
Change in taxi/rideshare usage, 1995-2017



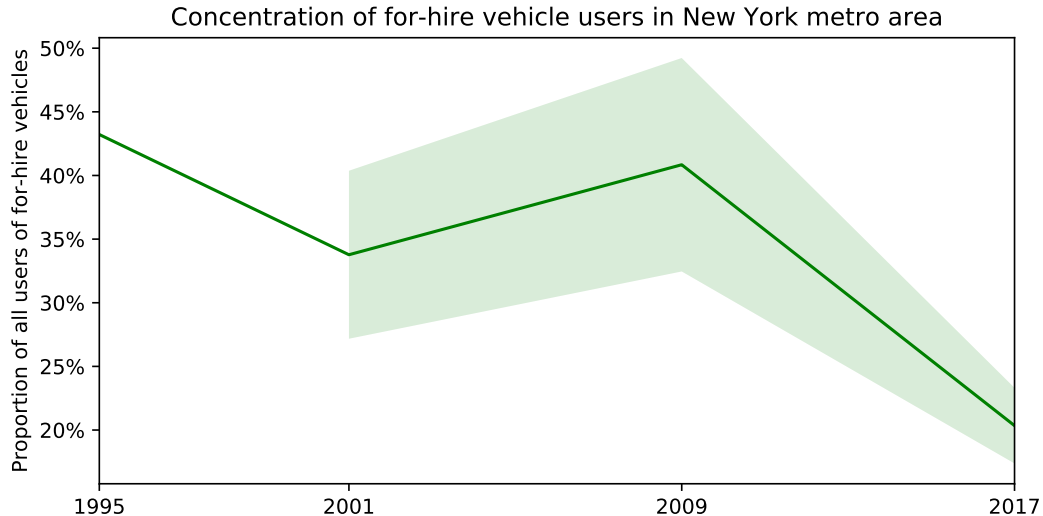
## Results: Growth in ridehailing use

9.81%  $\pm$  0.44 of Americans used ridehailing at least once  
in the last 30 days

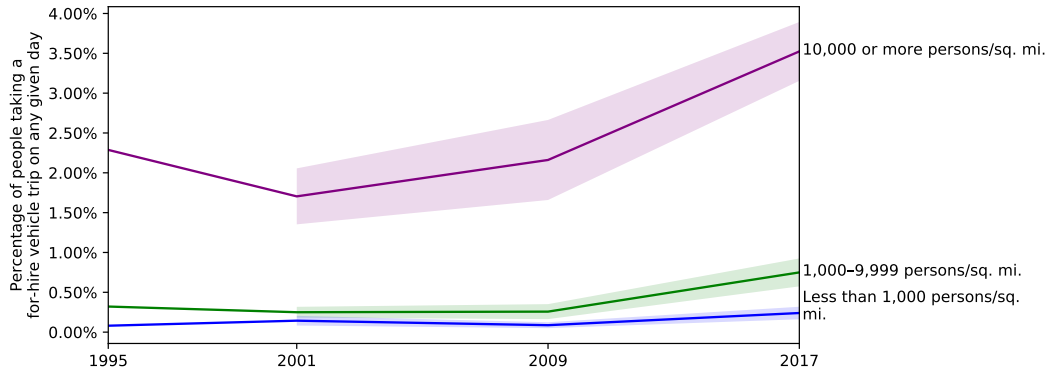
# Results: Geographic distribution of for-hire vehicle use



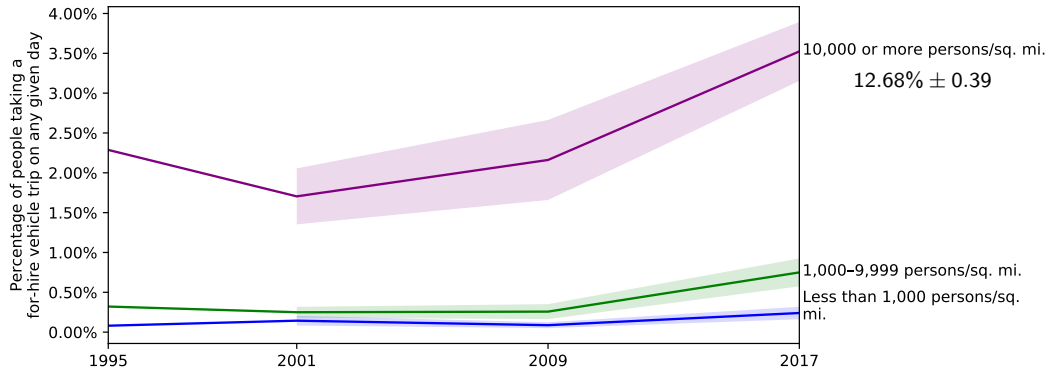
## Results: Geographic distribution of for-hire vehicle users



# Results: For-hire vehicle use and the built environment



# Results: For-hire vehicle use and the built environment





**Columbus, OH:  $11,650 \pm 1,264$   
persons/sq. mi.**



**Mesa, AZ:  $12,888 \pm 1,472$   
persons/sq. mi.**

Images © Google; density data from 2016 5-year ACS/Census Reporter.

## Results: Complementarity and substitutability with other modes

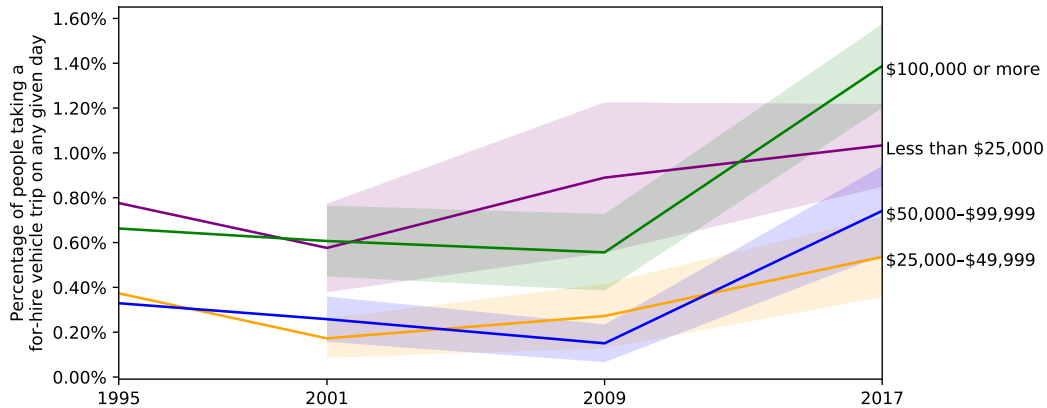
- ▶ Households with more vehicles per household member are less likely to use ridehailing
- ▶ This effect is much smaller for higher-income households
  - ▶ Consistent with two theorized groups of taxi users Gilbert and Samuels 1982
- ▶ Users of alternative modes use ridehailing at higher rates, suggesting complementarity
- ▶ This does not necessarily mean that ridehailing will increase transit usage



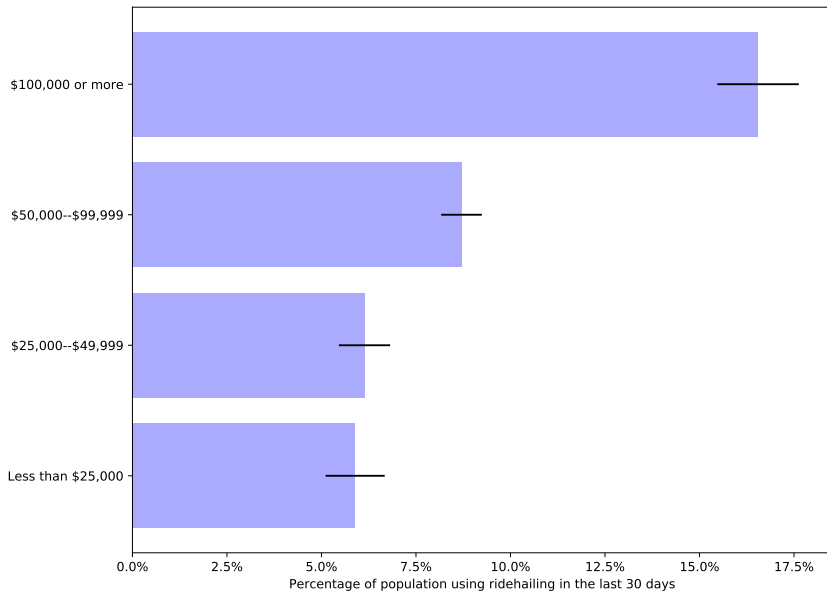
## Results: Multimodality

- ▶ For-hire vehicle users are very multimodal
- ▶ 2017 NHTS for-hire vehicle users took only  $45.00\% \pm 2.83$  of their trips via for-hire vehicles
  - ▶ for auto users:  $92.69\% \pm 0.25$
- ▶  $74.89\% \pm 4.28$  of home-based tours using a for-hire vehicles were multimodal
  - ▶ for auto users:  $7.74\% \pm 0.18$
- ▶ Ridehailing allows users to choose the mode that makes sense for a particular trip, and combine it with other modes, even within the same tour

# Results: For-hire vehicle use by income



## Results: Ridehailing use by income



# Incorporating ridehailing into planning

- ▶ For-hire vehicle use has grown dramatically since the introduction of ridehailing
- ▶ Cities need to incorporate ridehailing into their planning processes
- ▶ Examples
  - ▶ Ridehailing pickup zones
  - ▶ “Microtransit” /partnerships to provide transit in low-demand areas
    - ▶ So far have not been very successful (Urgo 2018; Westervelt et al. 2018)
  - ▶ Paratransit provided via ridehailing
  - ▶ Loss of parking revenue
- ▶ When incorporating for-hire vehicles into travel demand modeling, important to understand multimodality, deadhead miles, and vehicle ownership dynamics




# Research agenda

- ▶ Ridehailing and public transportation
- ▶ Equity
- ▶ Price elasticity of ridehailing
- ▶ Geographic and built environment influences on ridehailing
  - ▶ At what densities is (pooled) ridehailing efficient?

## Data needs

- ▶ Taxi and ridehailing should be separate modes
- ▶ Additional trip-level information should be collected
  - ▶ Waiting time
  - ▶ Was pooled ride requested
  - ▶ Was pooled ride matched
  - ▶ Hailing method
  - ▶ Cost
- ▶ Larger sample sizes in urban areas to help reduce uncertainty
- ▶ Surveys are still relevant even in places where ridehailing O-D data are available

## Bibliography/Questions

-  Gilbert, Gorman, and Robert E Samuels. 1982. *The Taxicab: An Urban Transportation Survivor*. Chapel Hill, NC USA: University of North Carolina Press.
-  Urgo, John. 2018. "Flex V. Fixed: An Experiment in On-Demand Transit." Available online: <http://transitcenter.org/2018/05/15/adding-flexible-routes-improve-fixed-route-network/> (accessed 10 July 2018), *TransitCenter* (May).
-  Westervelt, Marla, Emma Huang, Joshua Schank, Nolan Borgman, Tamar Fuhrer, Colin Peppard, and Rani Narula-Woods. 2018. *UpRouted: Exploring Microtransit in the United States*. Washington, DC: Eno Center for Transportation. <https://www.enotrans.org/wp-content/uploads/2018/01/UpRouted-18.pdf>.