A Multivariate Model of Ride-Hailing Trip Characteristics in Dallas, TX

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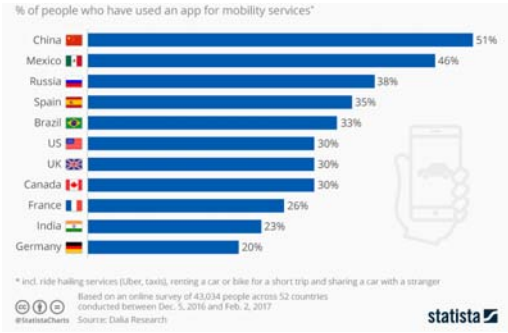
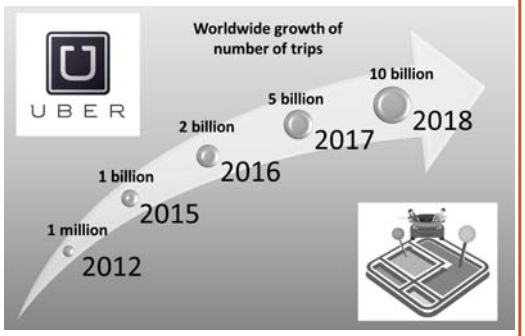
BACKGROUND

- Popularization of app-based mobility services



- Especially ride-hailing



MANY QUESTIONS ABOUT RIDE-HAILING USAGE REMAIN UNANSWERED

- Where do people go? (trip purposes)
- When are these trips made? (time-of-day)
- Are riders alone? (companionship)
- What mode would people use if ride-hailing were not available? Are new trips being generated? (mode substitution and trip induction)

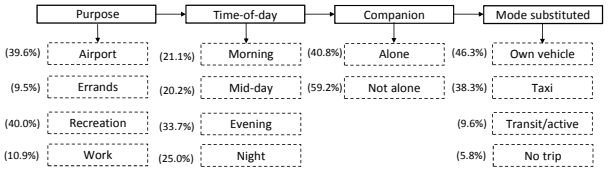
OBJECTIVES

(1) Explore ride-hailing trip characteristics in Dallas-Fort Worth
(2) Understand how ride-hailing is used by different population segments

DATA

- **Dallas-Fort Worth Metroplex, TX**
  - Fastest growing metropolitan area in the U.S., with a population of 7.4 million
  - Car-dominated and low density land use
- Online survey – Fall 2017
- Convenience sample of commuters
  - 906 ride-hailing users
  - Characteristics of users' last ride-hailing trip are modeled

MODEL FRAMEWORK



- **Modeling approach**
  - Joint model of 4 trip-related dimensions
  - Multivariate Multinomial Probit Model (MNNP)

RESULTS HIGHLIGHTS

Trip purpose

- Students and those with ***lower vehicle availability*** are more likely to use ride-hailing to ***pursue errands***
- ***Frequent*** ride-hailing ***users*** are more likely to pursue ***work*** relative to other activity purposes

Time of day

- Evening period (which includes the afternoon commute period) is when the overall intensity of ride-hailing activity is highest
- ***Millennials*** (18-34 years of age) make most of their ride-hailing trips during the ***night period***
- Frequent ride-hailing users appear to do so during the daytime
- Individuals who ride-hail during the ***nights*** appear to be from households with ***high vehicle availability*** and do so primarily for ***recreation***

Companionship

- More likely to travel ***alone***: non-Hispanic Whites and highly educated individuals; individuals running errands or going to work
- More likely to have a ***companion***: middle-aged individuals, part-time employees, and individuals from low-income households
- Ride-hailing trips made during the ***morning peak*** serve mostly individuals traveling ***alone***

Mode substituted and induced trips

- Women, individuals younger than 65 years of age, those with a bachelor's degree or higher, and individuals with experience with ***pooled ride-hailing*** tend to ***replace active/public transportation*** modes by ride-hailing
- Young adults (18-44 years of age), part-time employees, self-employed individuals, those that live in multi-worker households, and those that live in non-rural areas are more likely to ***generate trips*** due to ride-hailing availability

POLICY RECOMMENDATIONS

Need for…

- Subsidized and reliable pooled ride-hailing services to
  - Increase the attractiveness of this mode for commuting purposes
  - Increase the use of ride-hailing as an "accessibility-tool" by individuals with low income and no vehicle availability
- Policies that discourage the substitution of short-distance "walkable" trips
- Low cost and well-integrated multimodal systems to avoid substitution of transit trips by ride-hailing

Acknowledgements

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collaborate. innovate. educate.