

CAMBRIDGE
SYSTEMATICS

Think  Forward

MEASURING DISRUPTION BY RIDESOURCING SERVICES ON TAXI OPERATIONS IN CHICAGO

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A New Look to an Overlooked Market

- Taxi travel market still likely to be excluded in demand models
- In 2015, Chicago residents and visitors:
 - » Took more than 27 million taxi rides,
 - » Traveled about 83 million miles, and
 - » Spent more than \$400 million.



New Players in Town

- TNCs were allowed in June 2014
- Permission to serve O'Hare and Midway was granted in November 2015
- From 2014 to 2017 taxi service has declined:
 - » Taxi usage has declined nearly 50 percent, a rate of 13 percent per year
 - » Number of active taxis has declined by more than 30 percent (to nearly 4,000 taxis)
 - » Average number of daily trips is down to 13 trips per active cab from 20 trips
 - » Average monthly income per medallion has declined by \$2,000



Objectives

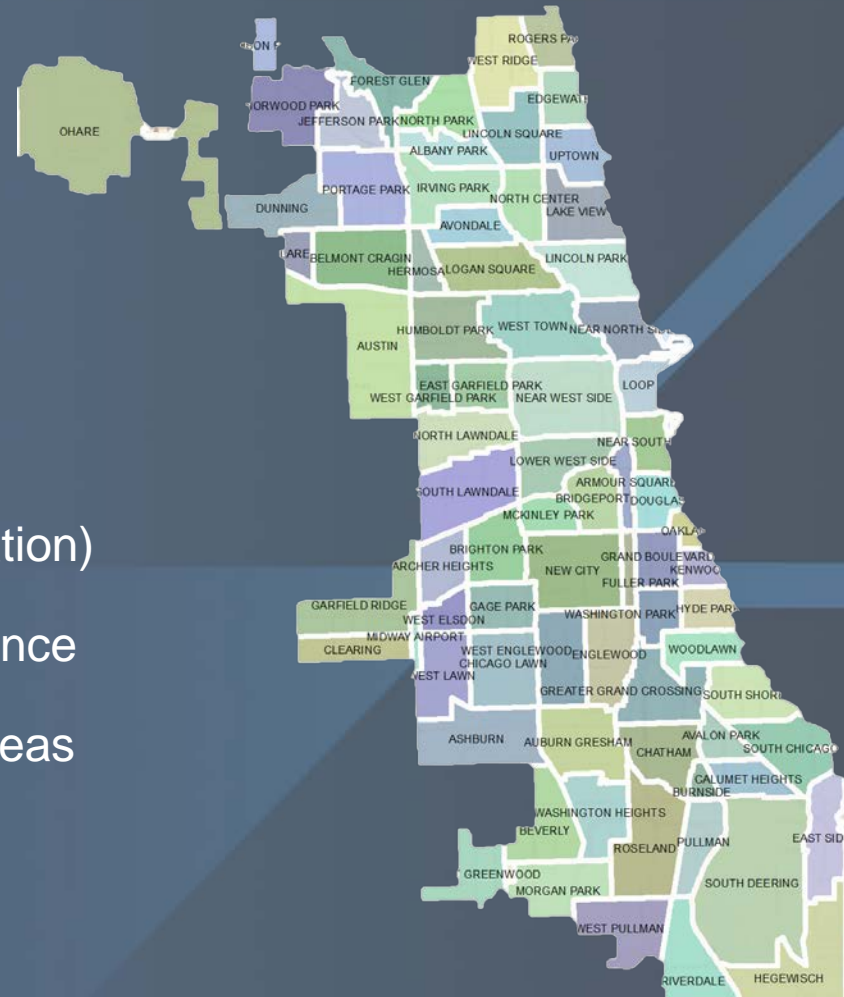
- Establish trends and analyze changes in key characteristics:
 - » Number of trips,
 - » Active taxis,
 - » Trip lengths, and
 - » Total revenue and revenue hours.
- Quantify changes by:
 - » Day of the week,
 - » Time of day, and
 - » Geography.
- Develop estimates of revenue and deadhead VMT:
 - » Spatial and temporal distributions
 - » Establish shares of VMT by mode for CBD and airport trips.



Chicago Taxi Data

Data covers Jan 2013 - Aug 2017

- 113 Million Trips
- Compiled with a delay
- Taxi ID that provided the trip
- Trip start and end times (15-min. gradation)
- Length of the trip in both time and distance
- O-D Geography – by 78 Community Areas
- Fare and tips
- Type of payment – cash or credit



Data Analysis

- Traditional tools are barely sufficient
- Data are messy:
 - » Duplicate entries, time stamp issues, trips over midnight...
 - » Careful cleaning and filtering
 - » Complimentary datasets
- Trips are grouped in shifts analogous to a trip diary
 - » Assumptions on shift definition
- Spatial aggregation somewhat restrictive
 - » Connections with CMAP model and transit data



Significance

- Analysis to quantify the net impact of ridesourcing
- Spatial distribution of reductions in taxi travel
 - » Proxies for trips served by TNCs
 - » Comparisons with changes in transit markets
 - » TNCs complementary or in competition with transit?
- Key markets
 - » In and near the Central Area and the two airports
 - » Test whether the level of disruption is equivalent across key markets
- Deadhead times and distances
 - » Assumptions about zero-occupant travel for personal autonomous vehicles
- Analysis of travel on special events, dates and historic events

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Thank you.
