

Exploring the Relationship Between the Emergence of Transportation Network Companies (TNCs) and Congestion in San Francisco

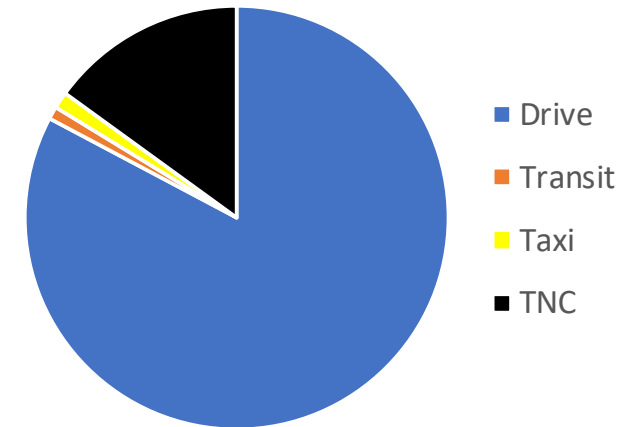
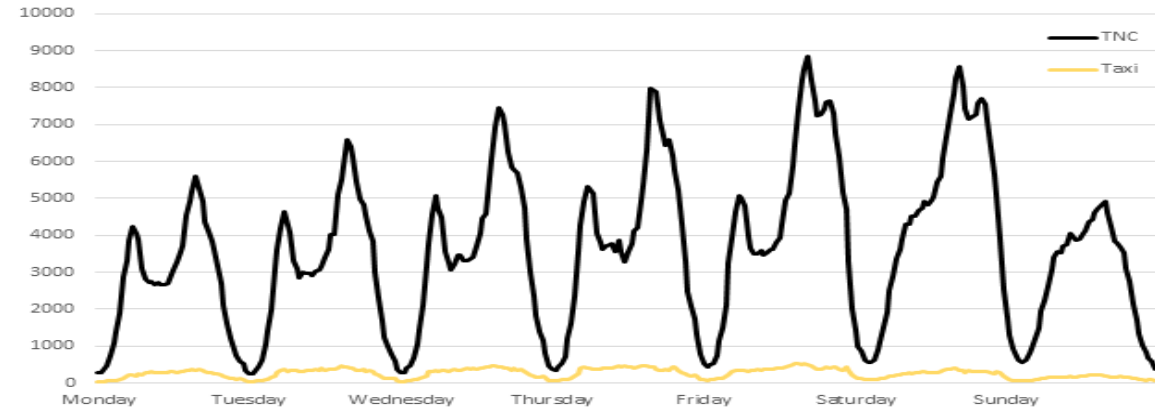


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TNCs in SF



- ▶ TNC = Uber, Lyft, etc.
- ▶ 170,000 intra-SF TNC trips on typical weekday
 - ▶ Fridays ~220,000 TNC trips
 - ▶ Sunday ~130,000 TNC trips
- ▶ ~9% of all intra-SF person trips are by TNC
- ▶ TNC usage greatest during peak periods and evenings.
- ▶ TNC usage greatest in densest and most congested parts of San Francisco
 - ▶ 25% of all vehicle trips South of Market during peak period

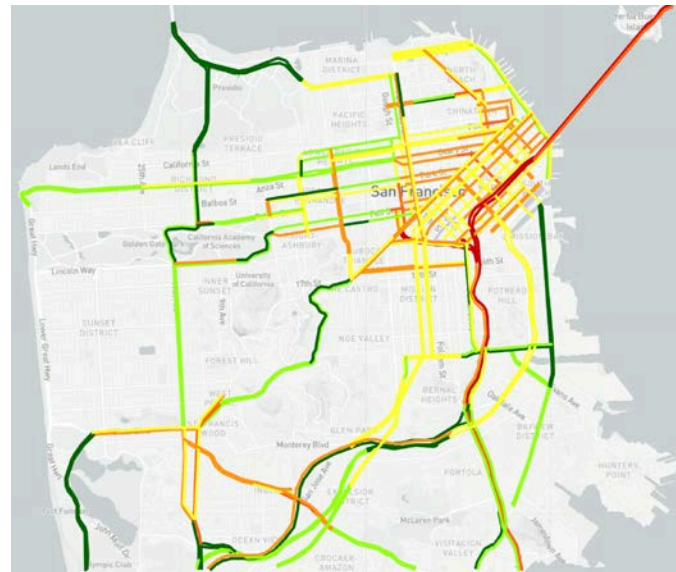


Congestion in SF

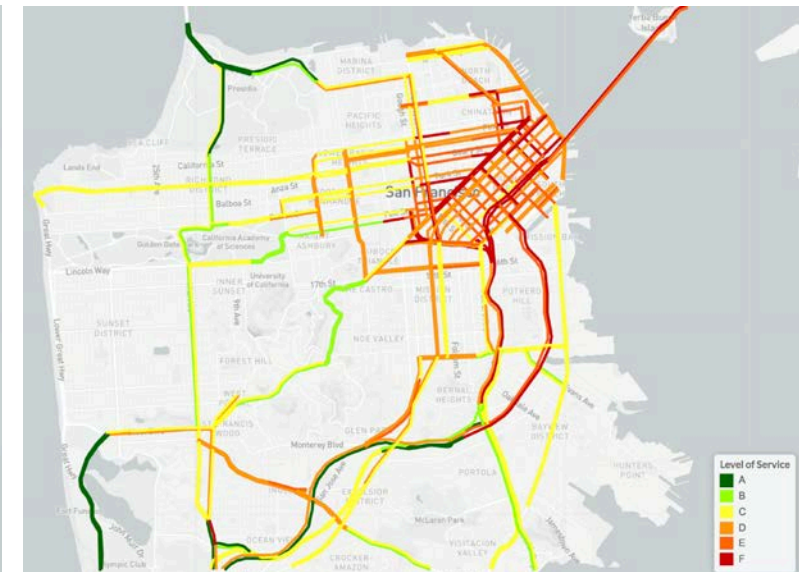


- ▶ Congestion has gotten worse in SF between 2010-2016
- ▶ Potential Sources
 - ▶ Employment: 545,000 to 703,000
 - ▶ Population: 805,000 to 876,000
 - ▶ Network Changes: Presidio Parkway, Market Street, Road diets, Busways
 - ▶ Emergence of TNCs

2009 PM LOS



2017 PM LOS



Research Question & Methods



- ▶ How much have TNCs contributed to changes in congestion?
- ▶ Fixed Effects Panel Model
 - ▶ Two time periods, 2010 and 2016
 - ▶ Dependent Variable
 - INRIX-observed speed transformed to implied volume
 - ▶ Independent Variables
 - Background growth (based on SF-CHAMP volume)
 - TNC Volume (in-service and out-of-service)
 - TNC Pickups and Drop-offs
 - Dummy variable for Presidio Parkway
- ▶ Application Congestion Metrics
 - VHD, VMT, Speed, TTI, PTI80
- ▶ New Mode introduced
- ▶ Independence of Irrelevant Alternatives of Multinomial Logit Model

Data

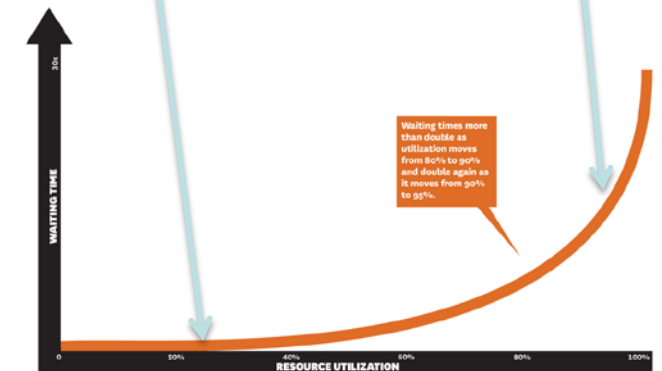
- ▶ INRIX observed speed of highest confidence value
- ▶ In-service and Out-of-Service TNC volumes
- ▶ Pickup and Drop-off locations
- ▶ Employment changes
- ▶ Population changes
- ▶ Network changes
- ▶ Spatial Unit: INRIX Traffic Messaging Channels (TMCs)
- ▶ Temporal Units
 - ▶ 5 time periods (EA, AM, MD, PM, EV)
 - ▶ 2 years (2010, 2016)



2010-2016 INRIX Speed % Diff



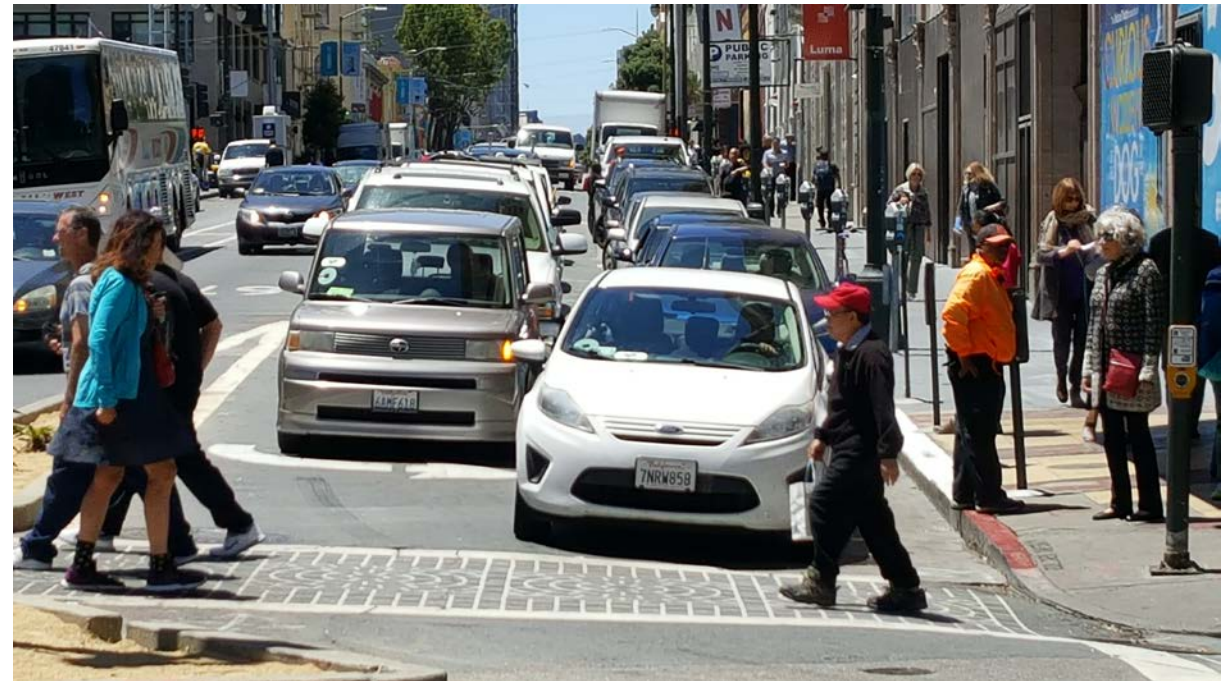
2016 TNC Pickup/Dropoff per mile



Conclusions



- ▶ Report release September 2018
- ▶ Additional TNC research
 - ▶ TNCs & Transit Ridership
 - ▶ TNCs & Transit Operations
 - ▶ TNCs & Equity



Questions?

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