

## From Shared Mobility to Shared Responsibility: Crowdsourcing Local Knowledge of Dockless E-scooter Violations in Austin, Texas

### RESEARCH BACKGROUND

#### 1. Introduction

- Intuition 1: Supply gap between short-distance travel volume and available non-automotive travel options



50%+ total trips were less than 3 miles



60% of trips less than 1 mile were by automobiles

(Source: NHTS 2009, most recent published NHTS 2017 reported 50%+ total trips were less than 4 miles)

- Intuition 2: knowledge gap between rapid e-scooter influx and viable management strategies to alleviate its negative impacts.



1.74 million e-scooter trips, 1.3 million vehicle miles traveled in Austin, 2018

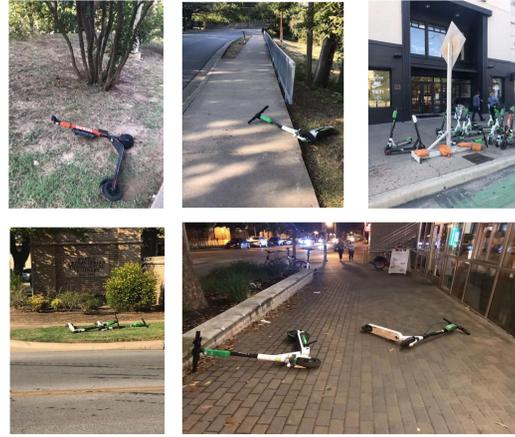


Very limited number of dockless management studies from the scholarship

#### 2. Research Questions

- What are the spatiotemporal characteristics of local dockless mobility violations?
- How efficient is the "311" channel as a public involvement method to facilitate planning knowledge co-production in dockless mobility management?
  - Is "311" channel efficient in facilitating information transformation between local knowledge and expert knowledge?
  - Is "311" channel efficient in assisting the city officials with timely responding to the violations?

#### 3. Dockless E-scooter Violations



#### 4. "311" Shared Micro-mobility Reports

- non-emergency municipal service request system
- 3 channels, 24/7/365 service



- Information of interest



Timestamp



location



Violation type



Description

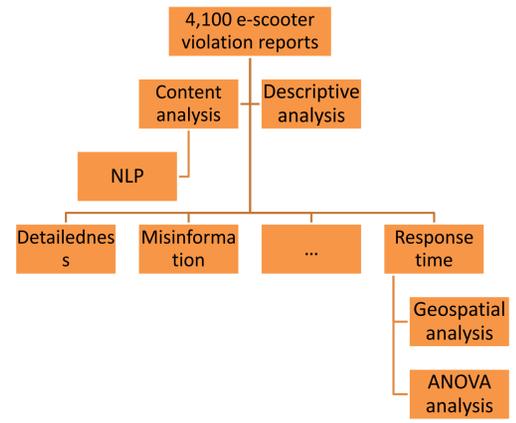


Company



Reporting method

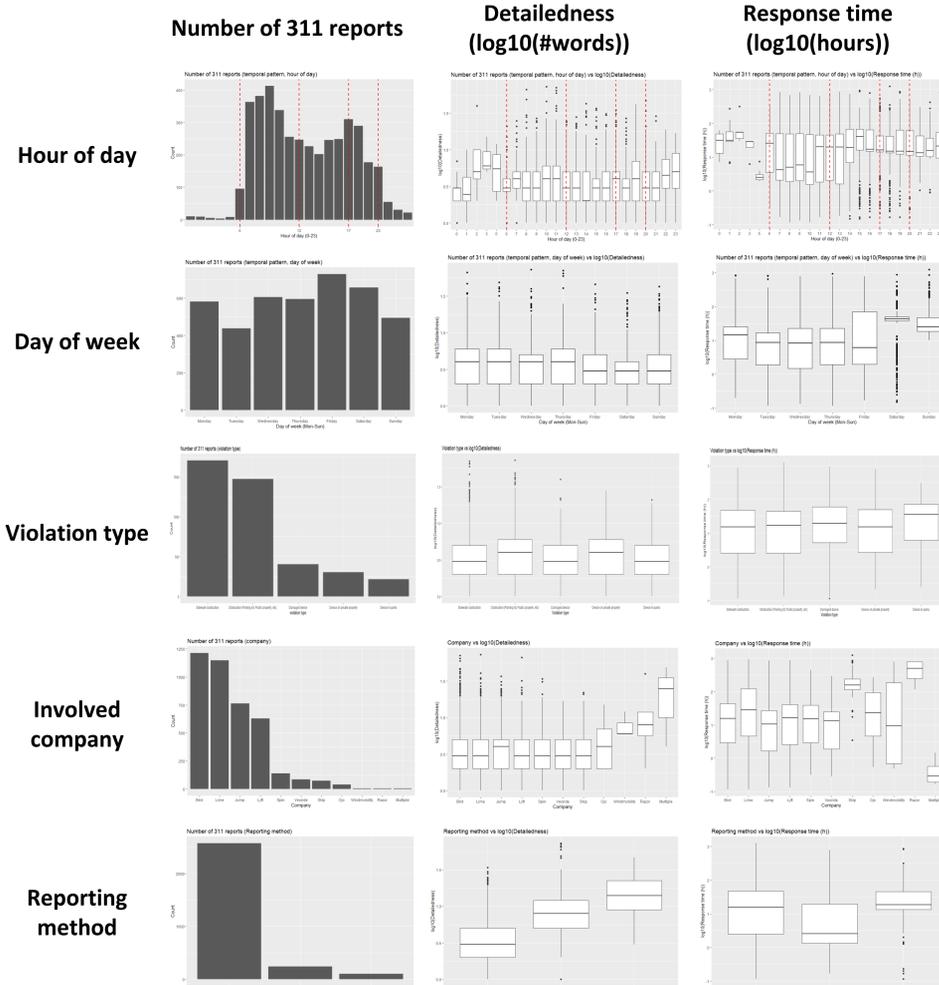
#### 5. Research Design



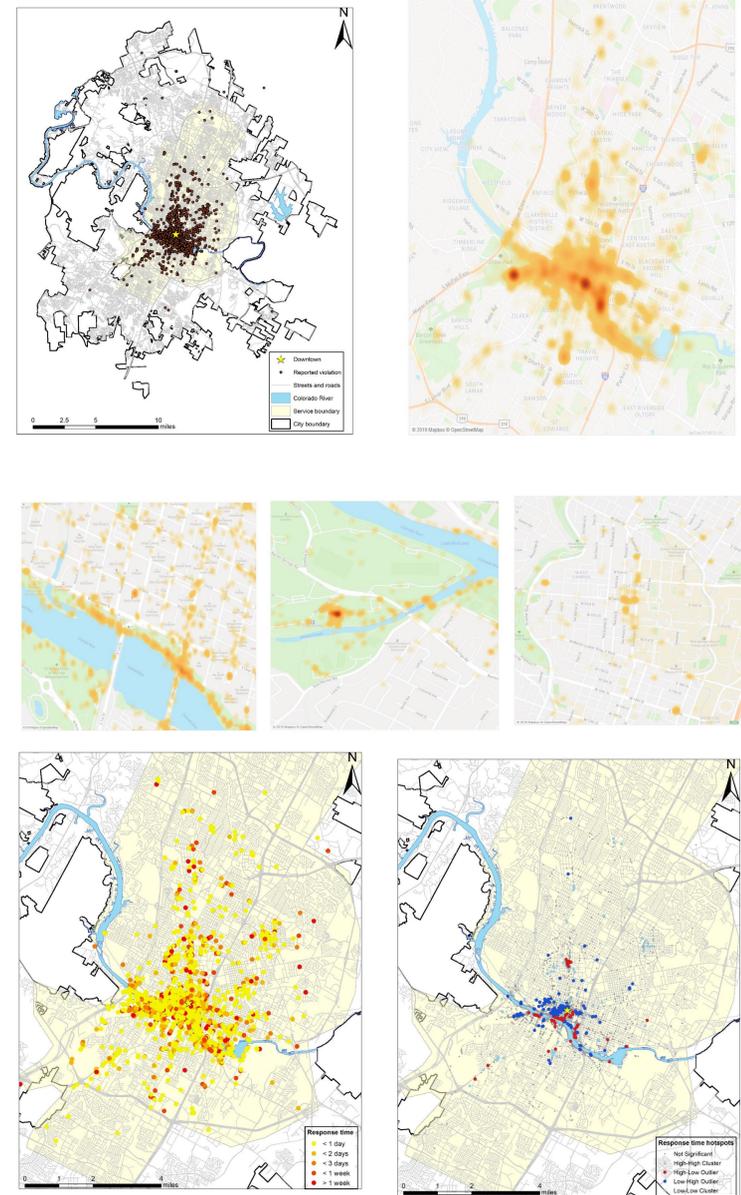
#### 6. Contributions

- For transportation planning **practice**:
  - evaluated the efficiency of "311" communication channel when dealing with dockless e-scooter influx in Austin
  - proposed practical recommendations on what the city can do to better facilitate communications with the public
- For transportation planning **scholarship**:
  - Verified the validity of crowdsourced local knowledge in generating creative, context-specific expert knowledge in transportation planning
  - Identified challenges and opportunities in the public involvement process of information exchange and knowledge co-production using crowdsourcing as the data collection method

### Descriptive Analysis



### GIS Visualization



### Findings

- Spatial clusters of e-scooter violations:
  - Zilker Metropolitan Park-Trail of Lights
  - Ann W Richards Congress Avenue Bridge
  - Downtown
  - UT Austin Main Campus
- Number of violations:
  - Sidewalk > Public property > Damaged device > private property > parks(new)
  - Bird > Lime > Jump > Lyft
- Violation report time:
  - Weekdays > weekends
  - Mornings > afternoons > evenings > nights
- Response time:
  - 7am – 10am < other time
  - Weekdays < weekends
  - Different violations are close
  - Phone call < smart phone app < web
- Public participation:
  - Smart phone app > phone call > web

### Future work

- Use Natural Language Processing(NLP) techniques to clean the textual data, calculate word frequency, and detect reports with misinformation by finding contradictions between self-reported violation types and place keywords in descriptions.
- Perform ANOVA analysis to compare the statistical significance of response time differences among groups of interest.
- Provide recommendations for urban planning practice in managing shared micro-mobility in cities.