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.

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

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?

3. Dockless E-scooter Violations

4. "311" Shared Micro-mobility Reports

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.

• For transportation planning scholarship: verified the validity of crowdsourced local knowledge in generating creative, context-specific expert knowledge in transportation planning.

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

Number of 311 reports

Detailedness (log10(Word))

Response time (log10(hours))

Hour of day

Day of week

Violation type

Involved company

Reporting method

Content analysis

Descriptive analysis

NLP

Textual analysis

GIS Visualization

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.