

# A Method for Placing Shared E-Scooters Corrals Near Transit Stops

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## Motivation

- Shared electric scooters have become a popular mode of travel in recent years across the United States
- The rapid adoption of shared electric scooters has created different challenges for cities
- One important challenge is related to shared e-scooter parking:
  - Block sidewalks
  - Impede access to bus stops
  - Obstruct access to fire hydrants
  - Create safety hazards
- Shared e-scooters have also created opportunities for cities; they could service as First-mile/last-mile to public transit
- Can we help to solve shared e-scooters parking challenges and promote them as first-mile/last-mile solution?



## Background

### Research Objective

- Propose e-scooter corrals near bus stops to encourage the use of these two modes

### Study Location

- Nashville, Tennessee



### Why Nashville?

- Popularity of shared e-scooters
- Nashville was ranked third among cities that have the greatest potential for micromobility options to succeed in the United States
- Nashville has a very accurate disaggregated shared e-scooters trip dataset
- Prior understanding of shared e-scooters usage patterns and impacts on transit in Nashville (1,2)

## Method

### Step 1: Identification of shared e-scooter trips complementing transit

Supervised machine learning models were used to classify shared e-scooters trips based on a prior study (1)

**Social** trips were chosen as they have positive impact on bus ridership, as suggested by a prior study (2)

### Step 2: Assignment of shared e-scooters to bus stops

Bus stops in Nashville CBD were explored

A catchment area of 0.1 mile around each stop was used

### Step 3: Ranking bus stops based on multi criteria scoring system

The average weekday **social trips started**

The average weekday **social trips ended**

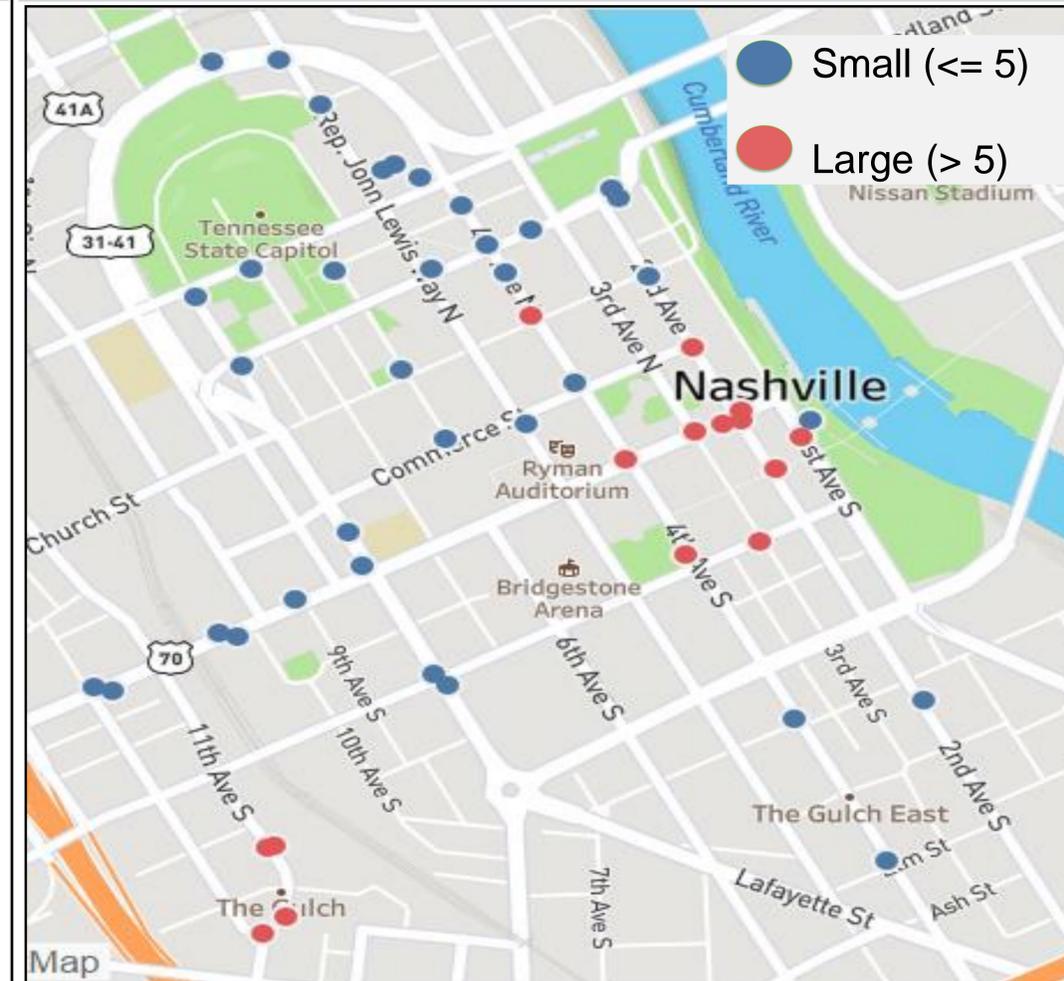
The number of **bus routes**

The number of **bus trips**

### Step 4: Propose capacity for corrals

The 85<sup>th</sup> percentile of number of hourly trip origins was used to classify bus stops into two groups

## Results: Proposed Locations



## Considerations for Implementation

- Space availability and curb use
- Converting on-street parking
- Bike lanes and other bike infrastructures

## Conclusions

- This study proposed 50 potential locations for shared e-scooter corrals near bus stops in the central business district of Nashville
- The proposed locations could capture about 44% of shared e-scooter demand

## References

- Shah, N., Guo, J., Han, L. & Cherry, C. Why do people take e-scooter trips? Insights on temporal and spatial usage patterns of detailed trip dat. Under Review. <http://dx.doi.org/10.2139/ssrn.3988137>
- Ziedan, A., Shah, N. R., Wen, Y., Brakewood, C., Cherry, C. R., & Cole, J. (2021). Complement or compete? The effects of shared electric scooters on bus ridership. Transportation Research Part D: Transport and Environment, 101, 103098.

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