Representation in Travel Behavior Data: A Comparison of Travel Surveys and Passively Collected Data

SUMMARY

- Used LBS data to measure travel for residents of the Minneapolis-St. Paul region throughout 2020
- Assessed inequity in travel to recreational areas by income group using processed LBS data
- **Compared results to contemporaneous travel survey**

LBS DATA METHODS

Each device's location records were processed as follows:

- A spatial clustering algorithm (DBSCAN) was applied to all stationary location records to identify clusters
- Sequential records in same cluster were grouped to form visits
- **Trips** were formed between visits and routed on the OpenStreetMap roadway network
- Home locations & demographic information were inferred using overnighting patterns and land use data
- Recreational visits were identified using land use data

A device panel was constructed consisting of devices that appeared in all seasons



SURVEY METHODS

2020 panel survey

- Included spring, summer, and fall waves
- Participants recruited from 2018-2019 survey, which used targeted recruitment methods to obtain more representative sample
- Behavioral and attitudinal questions related to pandemic
- Included questions about frequency and location of recreational activity

Household income associated with the frequency of recreational trips in both LBS and survey data

> Household income associated with the **location** of recreational trips in LBS data

ACA: areas of concentrated affluence; ACP: areas of concentrated poverty

4 FUTURE DIRECTIONS: A FRAMEWORK FOR COMBINING SURVEY AND PASSIVE DATA COLLECTION

- 2. Pair with continuous passive data collection
- - Assess bias in passive data sample

3 RESULTS



Weekly recreational visits (LBS data)

Recreation visits, household income <\$50k



Establish a recurrent survey program with a focus on representation

- Partner with community-based organizations, implement new sampling approaches, and offer differential incentives

Leverage large sample to shed light on inequities

3. Use survey 'ground truth' to reality-check passive data insights

– Multiple data sources providing evidence of inequities strengthens robustness of findings

Stephen Lawe



Weekly park visits (survey)



Recreation visits, household income >\$50k

