POLIS – November 2023

Data Integration for Smart Curb Management

Case Study of Belltown Seattle

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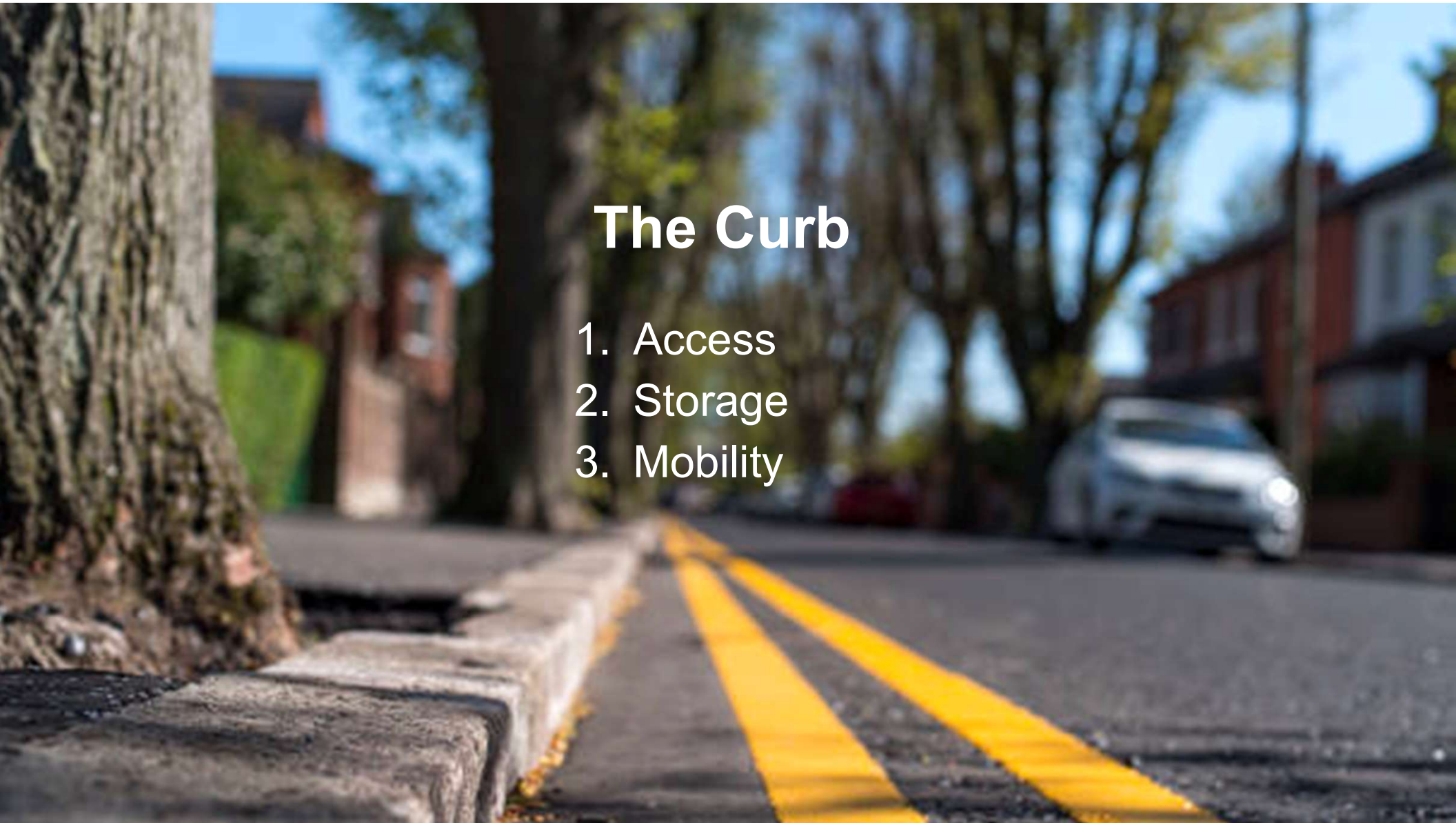
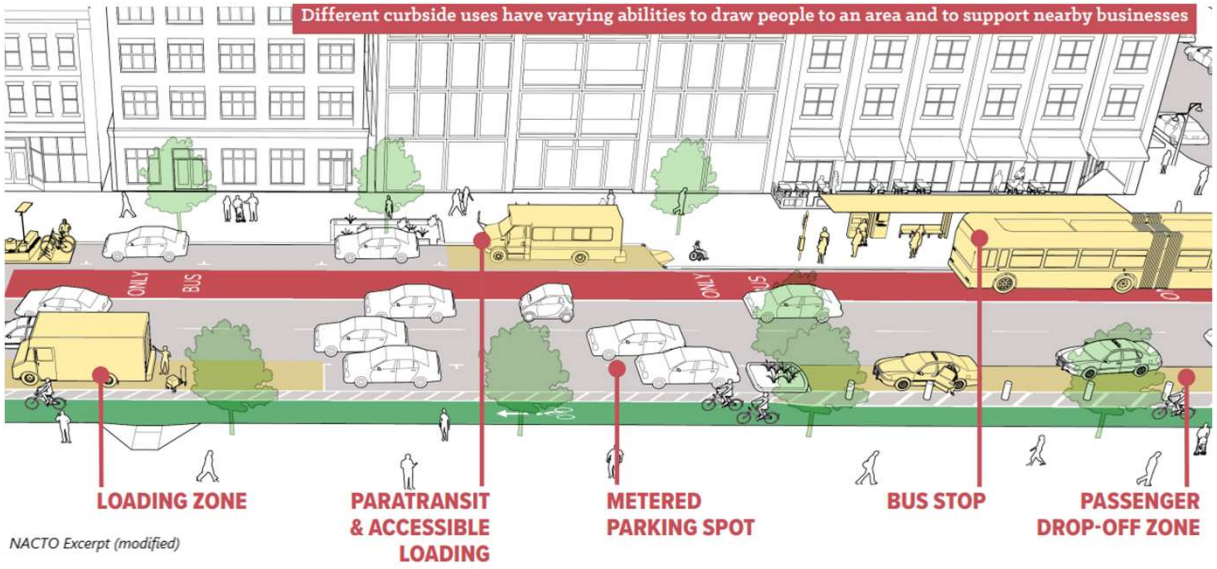

The Curb
1. Access
2. Storage
3. Mobility

The curb is a scarce good

- The curb is a limited public resource
- New curb demands >> Limited curb supply

Curb management



By deploying appropriate **curb management policies**, cities can:

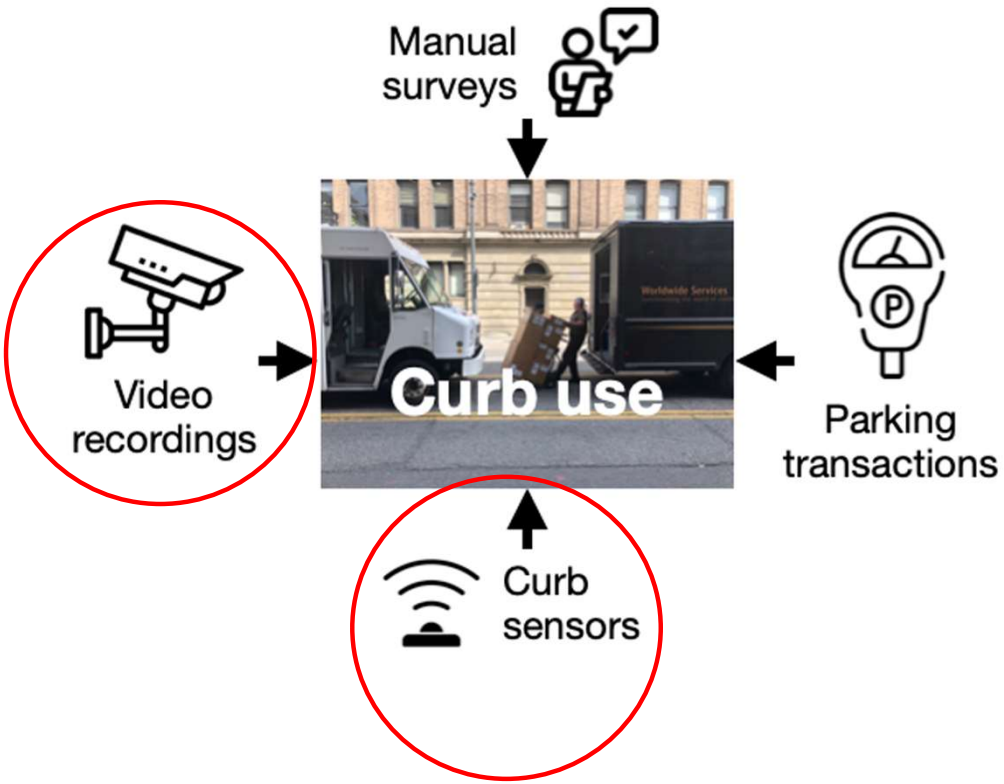
- Influence travel demand
- Reduce Vehicle Miles Traveled (VMT),
- Reduce emissions
- Reduce interactions between different road users


UFL Pilot Test Areas
Interactive map
53 miles of allocated curb
Seattle Curb Allocation
Study Area Curb Allocation
63%
11%
8%
5%
13%
70%
15%
13%
2%
Paid Parking
Bus
Other
CVLZ & PLZ
Residential
Curbspace type
bus_zone
CVLZ
no_parking
other
paid_parking
PLZ
unrestricted
Select study area
Seattle
The study area is highlighted in blue
Select data layers
Curbspace
Select curb designation
All allocations
CVLZ
Bus
No parking
Others
Paid Parking
PLZ
Unrestricted
Curb space distribution in pilot test area
count
600
400
200
0
Bus
CVLZ
No parking
Others
Paid Parking
PLZ
Curbside category
Leaflet | Map tiles by Stamen Design, CC BY 3.0 — Map data © OpenStreetMap contributors

Curb use behaviors

	Passenger vehicle	Commercial vehicle
% time spent parked	95%	80%
Mean dwell time	2-3 hours	15 minutes
Mean cruising for parking time	7 min. per trip	2.2 min. per trip

Research objectives



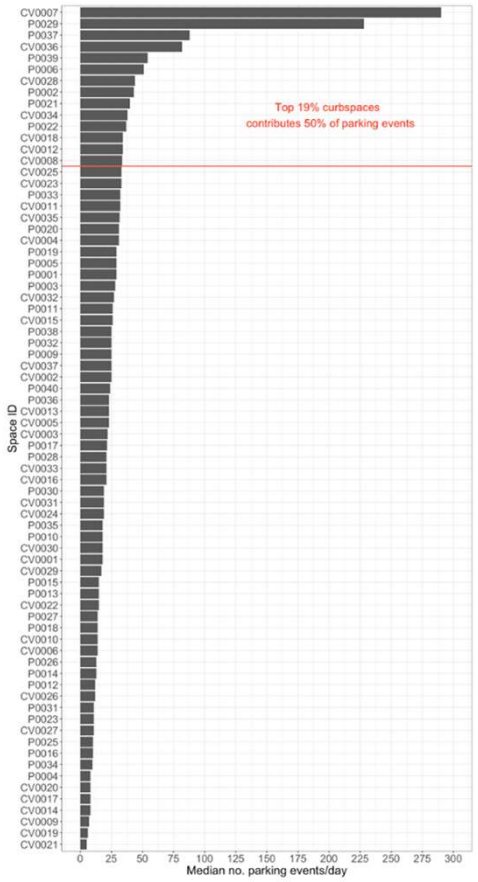
- Cities and in need of **data and methods to monitor curb use**, understand curb use behaviors, and formulate data-driven curb management strategies

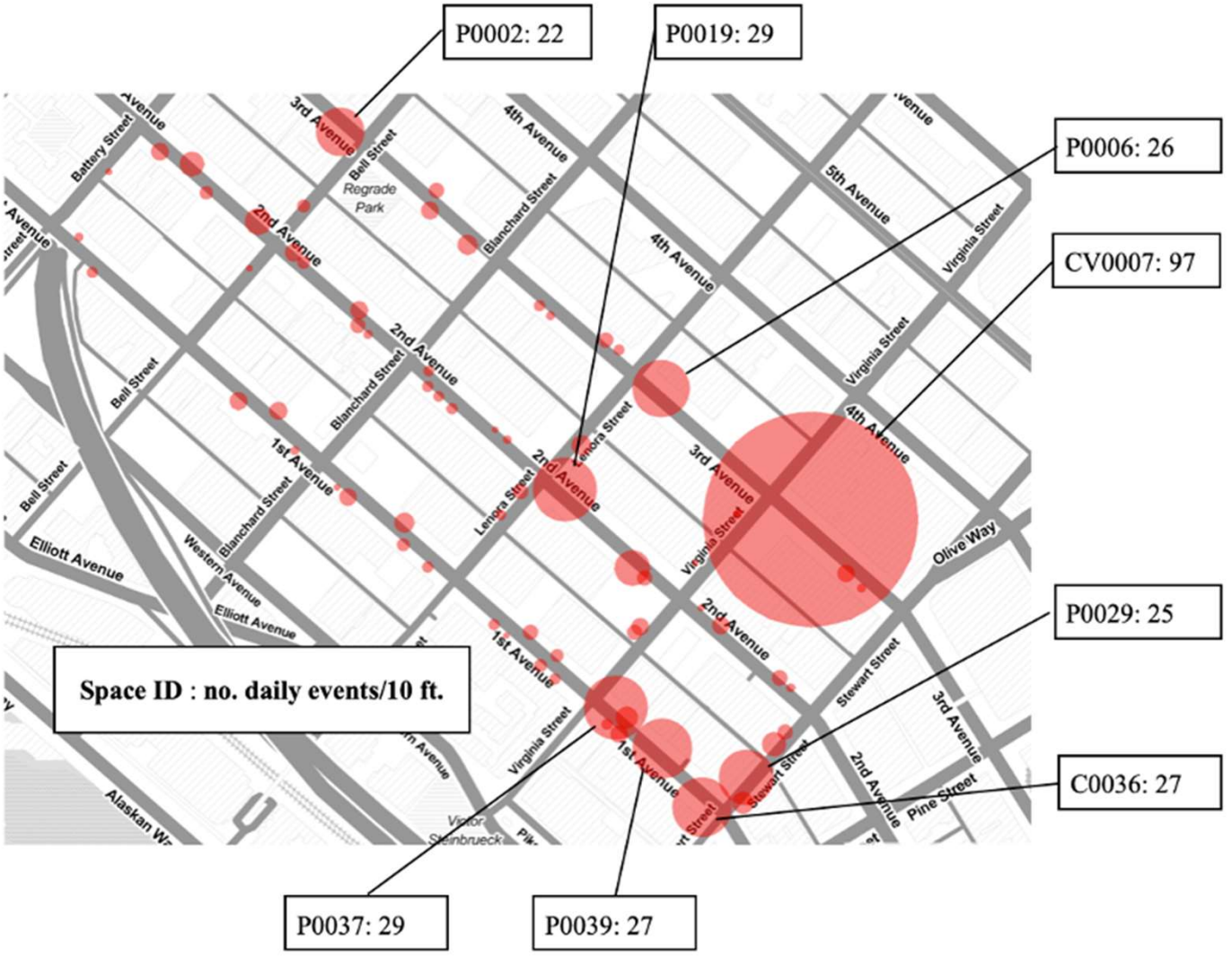
- The current study i**ntegrates and validates multiple sources of curb use data** to provide insights for curb management strategies

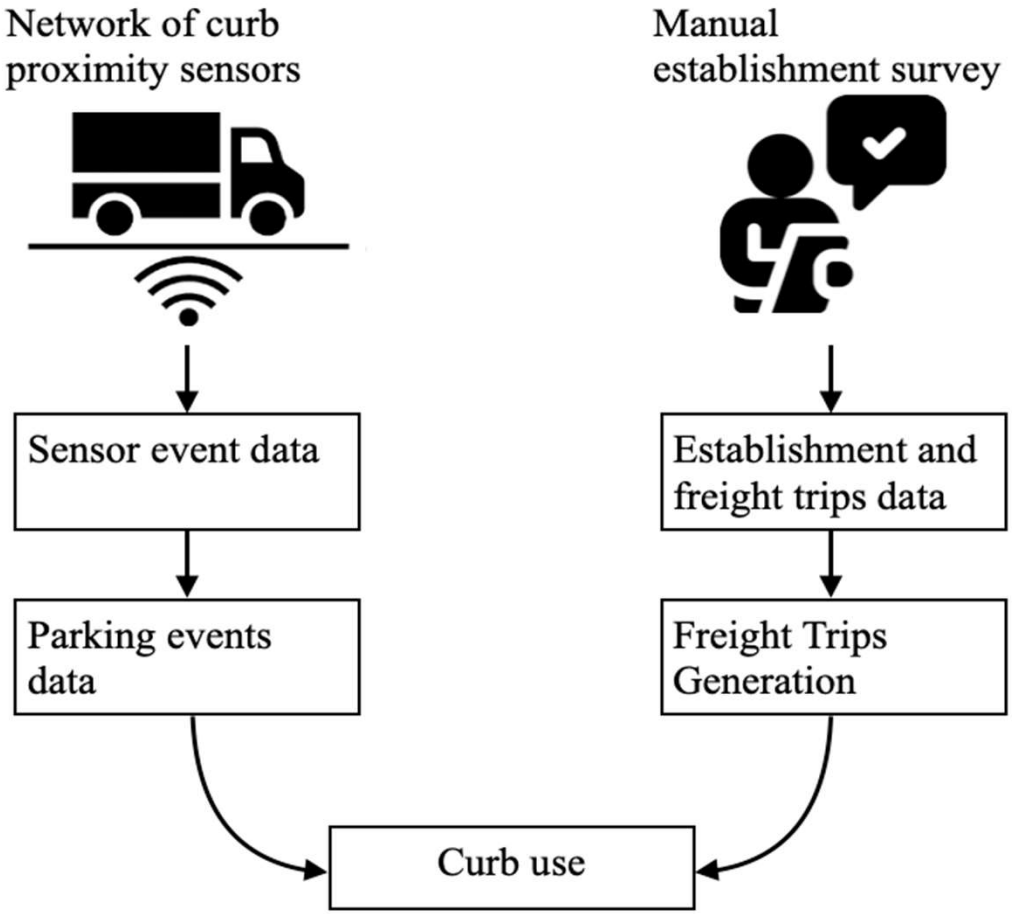
Study area

- Belltown neighbourhood, Seattle
- Vendor: Fybr
- 273 magnetic field sensors
- CVLZs + PLZs

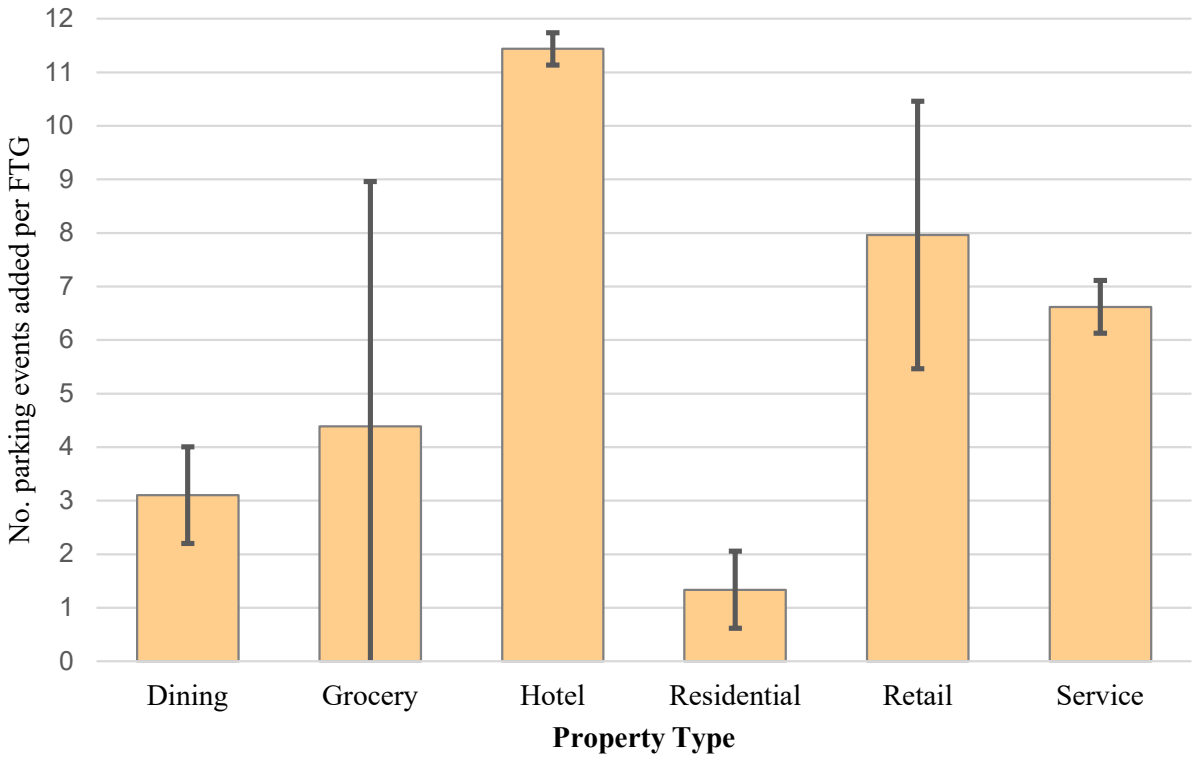
Results (3)


Top 19% curbspaces
contributes 50% of parking events
Space ID
Median no. parking events/day
0
25
50
75
100
125
150
175
200
225
250
275
300


P0002: 22
P0019: 29
P0006: 26
CV0007: 97
P0029: 25
C0036: 27
P0037: 29
P0039: 27
Space ID : no. daily events/10 ft.
3rd Avenue
Bell Street
Regrade Park
4th Avenue
Battery Street
5th Avenue
Virginia Street
2nd Avenue
Blanchard Street
1st Avenue
Lenora Street
Olive Way
Stewart Street
Pine Street
Elliott Avenue
Western Avenue
Alaskan Way


Network of curb proximity sensors
Manual establishment survey
Sensor event data
Establishment and freight trips data
Parking events data
Freight Trips Generation
Curb use

Number of additional curb events per FTG



Sensor event ≠ parking event ≠ FTG

- Curb segment sensor data requires algorithms to estimate parking events and validation with ground-truth data

- Freight trip generation rates from establishments do not equal curb events

Thank you!

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