



The Struggle is Wheel: Evaluation of UCSD Electric Scooter Guidelines

UCSD E-Scooter Evaluation Team (Maya Bunyan, Catherine Cortez, Daria Malangone, Kaitlin Trease), and Nancy Binkin MD, MPH
BSPH Honors Program, University of California, San Diego Department of Family Medicine and Public Health

Background

Context

- Electric scooters (e-scooters) appeared at UCSD in 2018 and pose a potential public health risk
- E-scooter guidelines developed and disseminated by the UCSD Vice Chancellor's Committee in November 2018
- Evaluation requested by the UCSD Police Department

Objectives

- Measure the number of personal mobility devices (e-scooters, bicycles, and skateboards) per 1000 pedestrians in high-traffic campus locations
- Assess the frequency and types of observed guideline violations and police citations by device
- Map the location of e-scooters and measure the frequency and location of e-scooter incidents
- Evaluate student use, awareness, and attitudes regarding UCSD's e-scooter guidelines

Methods

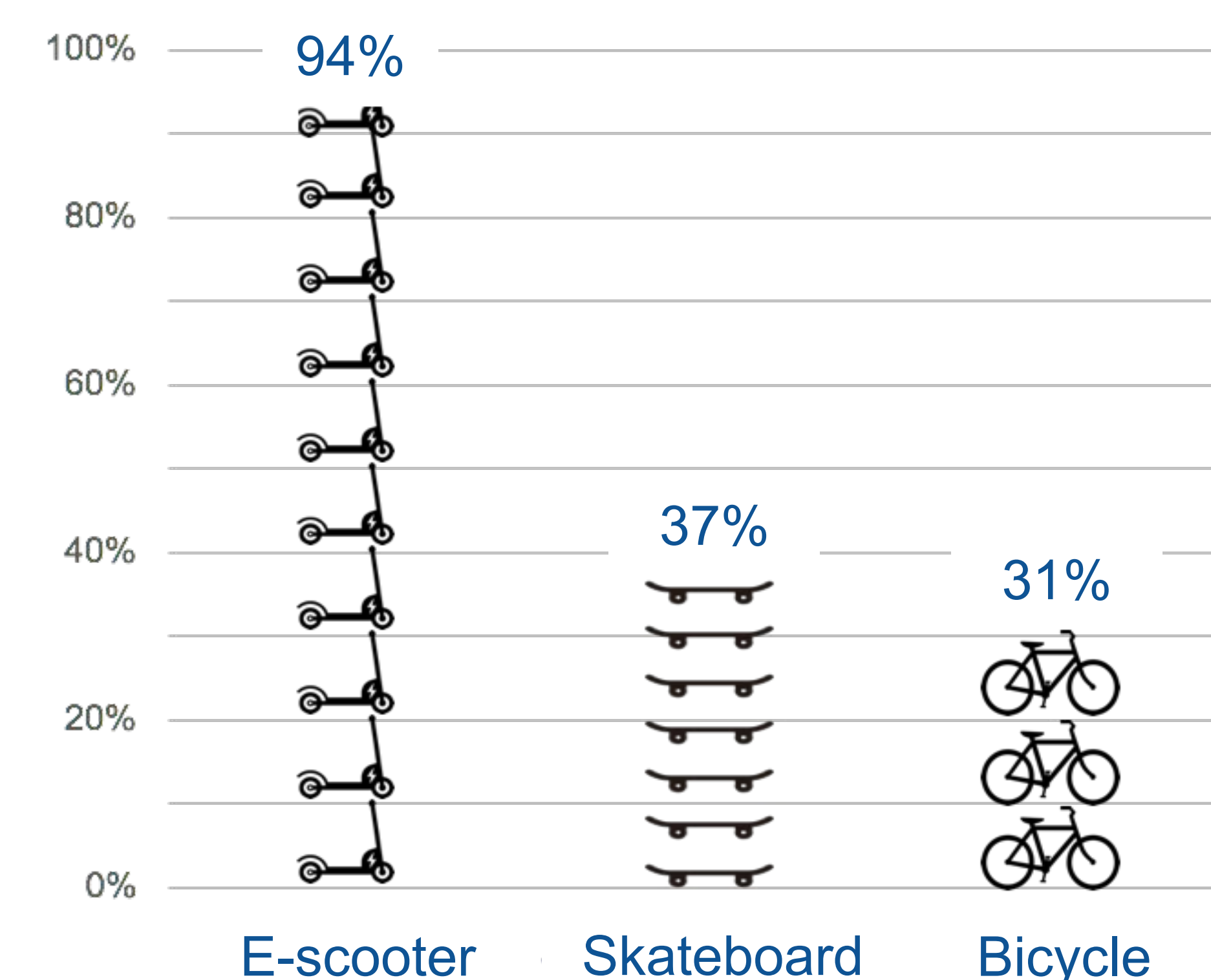
- Twenty-four 15-minute video recordings in 9 high-traffic UCSD campus locations from February - March 2019
 - Counted pedestrians, personal mobility device users, and campus guideline violations
- 19 pixel coordinate sets from Scootermapping.com used to map low, medium, and high densities of parked Bird and Lime e-scooters on campus
- Personal mobility device-related citations and 911 and helpline call data provided by UCSD Police for September 2018 - February 2019
- Call location plotted on e-scooter density maps
- Questionnaire administered to a sample of on-campus (n = 89) and off-campus (n = 73) students to assess e-scooter use, awareness, concerns, and recommendations
- Data entry and analysis using Epi Info 7, RStudio, and Survey123 for ArcGIS

How common are e-scooters at UCSD?

Personal mobility devices/1000 pedestrians		
Device	n	# per 1000 pedestrians
E-scooters	94	18.4
Skateboards	255	50.0
Bicycles	417	81.8
Pedestrians	5099	--

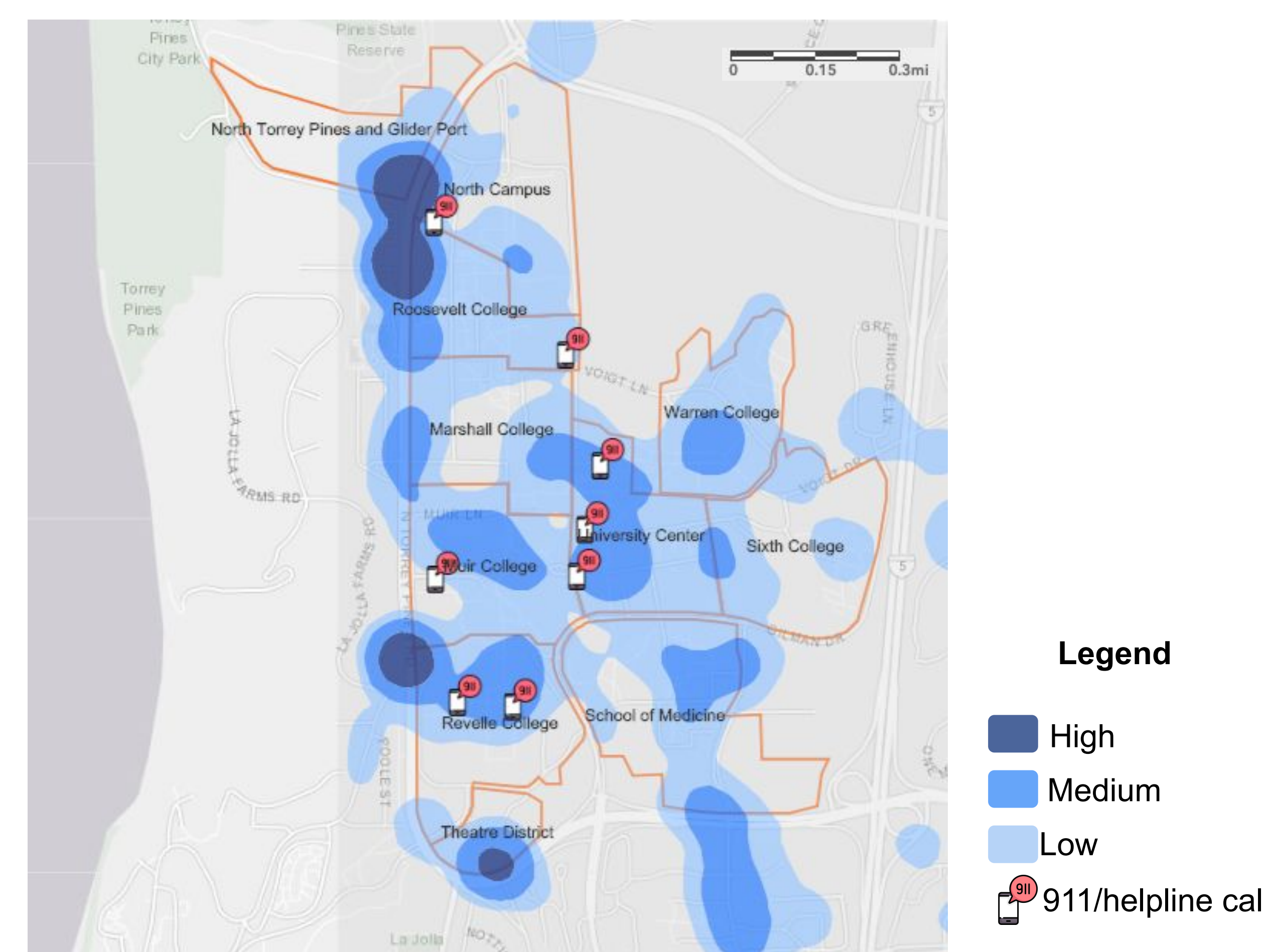
E-scooters were less common than bicycles and skateboards and represented only 12% of the observed devices.

How frequent are guideline violations?



Guideline violation rates are much higher for e-scooters. Virtually all of the 88 e-scooter violations (98%) were for failure to wear a helmet.

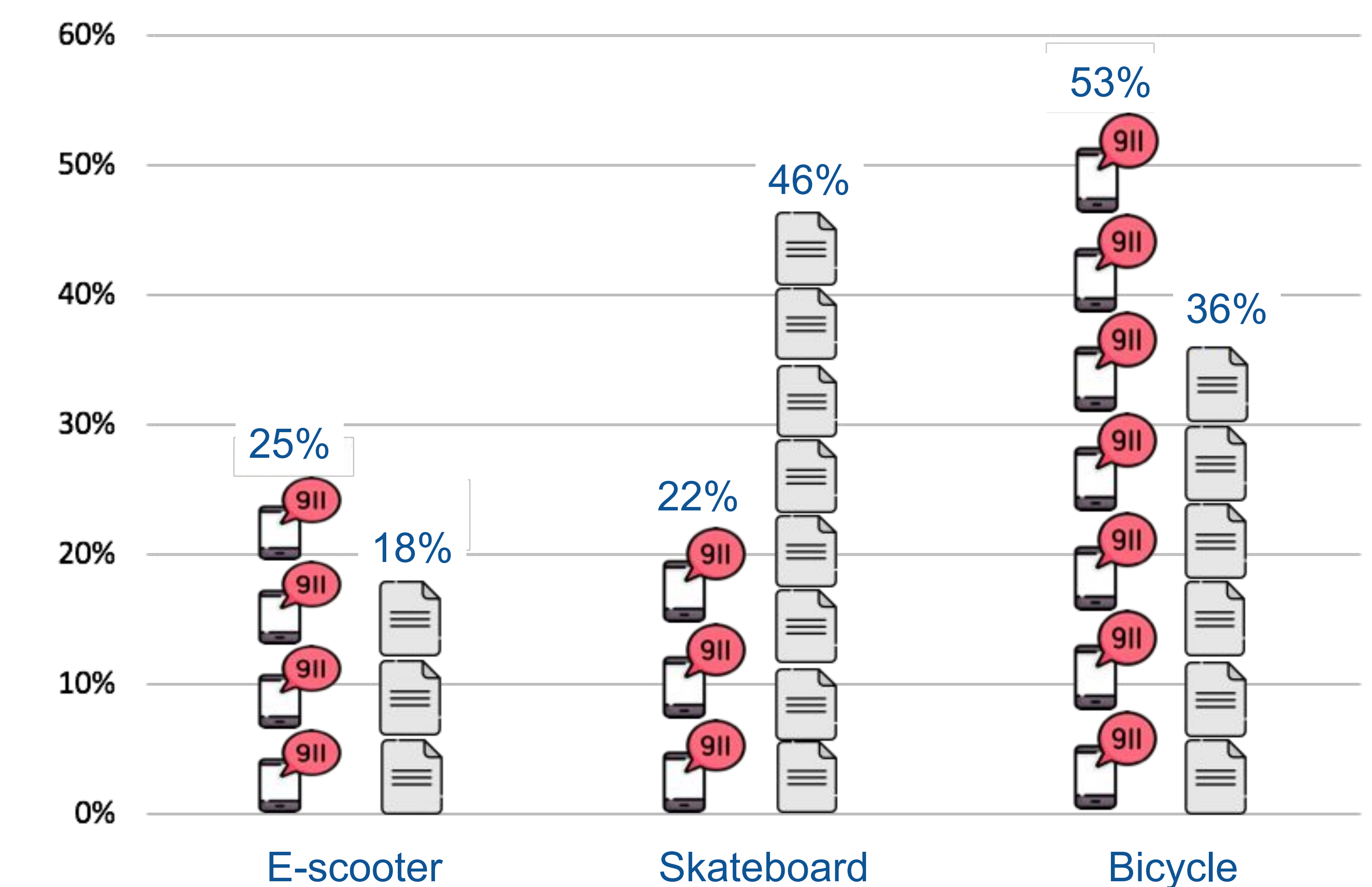
Where do e-scooter incidents occur?



E-scooter 911 and helpline calls were concentrated in parts of campus that had a moderate density of parked e-scooters.

Results

What proportion of personal mobility device 911 incidents and police citations on campus do e-scooters represent?



Although e-scooters represented only 12% of observed devices, they accounted for 25% of the 36 calls to 911 and 18% of the 50 campus citations. None of the e-scooter citations were for riding without a helmet.

What are levels of e-scooter use and guideline awareness among students?

- More than 1/3 (35%) had used e-scooters at least once
- On-campus students were 1.4 times more likely than off-campus students (39% vs 28%) to have ridden an e-scooter (p = 0.2)
- Guideline awareness was low in both users and non-users (15%)
- On-campus students were more likely than off-campus students (18% vs 12%) to be aware of the guidelines (p = 0.4)

What are students' greatest concerns and recommended speed limit in regards to e-scooters on campus?

- Students concerned about injuries (56%), haphazard e-scooter parking (45%), and areas where e-scooters are being ridden (37%)
- The majority recommended speed limits of 10-14 mph: light to moderate biking speed (35%) or 6-8 mph: jogging to running speed (32%)

Conclusions

- Awareness and compliance with campus e-scooter guidelines are poor.
- Further efforts and surveillance are needed to effectively disseminate and enforce guidelines that balance the benefits and perceived risks of e-scooters on campus.