Research Title:

Studying E-Scooters' Safety Based on Spatially Explicit Knowledge of the Urban Road Infrastructure and Shared Dockless E-Scooters

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Electric scooters (ES) are an efficient mode of urban travel: they are environmentally friendly, help riders avoid traffic jams, and, when widely adopted, can ease congestion. At the same time, ES riders are highly vulnerable road users. As a case study, our research focuses on Tel Aviv–Yafo, the Israeli city with the highest number of ES crashes. We analyze the years 2013–2024.

In year one of the research, we prioritized data assembly and now hold several unique datasets enabling a comprehensive ES safety analysis: (1) spatially explicit trip-level records of Shared Dockless E-Scooter (SDES) rides from the Municipality's POPULUS system (eight years); (2) Central Bureau of Statistics (CBS) accidents microdata on road crashes, persons, and vehicles (twelve years); (3) ride counts and observations of rider behavior collected by the Municipality and our team; (4) enforcement activity records from the Israel Police and the Municipality; and (5) geospatial infrastructure layers (road network, sidewalks, cycling paths, transport hubs, neighborhoods, etc.).

In parallel, we have developed a micro-model of rider-pedestrian interaction at the crossroad that will be used for analysis of the environmental and behavioral factors on the rates of accidents of different kinds.

Our objective is to model the relationships among (1) ES-related crash occurrence; (2) SDES users' travel patterns; (3) characteristics of Tel Aviv's infrastructure; and (4) demographic characteristics of the city's population.

Preliminary analyses suggest that: (1) a substantial share of ES crash locations are inaccurately geocoded, even for severe crashes and relative to other crash types; (2) ES crash hotspots concentrate at intersections; (3) ES trips account for ~35% of micromobility rides; and (4) descriptively, the share of fatal crashes appears higher near the Arlozorov–Savidor transport hub. These early findings are descriptive and will be validated in subsequent phases.

The research is conducted with multidisciplinary partners and collaborators: academic, the NGO “Natun L'Shinui,” and the Tel Aviv–Yafo Municipality, which are beneficial for the study’s rigor, comprehensive data access, and the translation of findings into policy and practice.