FOUNDATION FOR TRAFFIC SAFETY

Safety of Micromobility: Regulations, Data and Stakeholders

INTRODUCTION

This research evaluates fragmented regulatory and data systems that hamper safety interventions for micromobility users, including people who ride e-scooters, e-bikes, and other small vehicles. The project focuses on the following:

- Summarizing literature on how data is collected and classified, what safety issues are most common, and which strategies can reduce crashes and injuries of micromobility users.
- Mapping policy environments to provide an updated national overview of regulatory policies across states and selected cities.
- Linking statewide crash and hospital data to quantify the true magnitude of underrepresented and miscoded micromobility crashes and to understand the severity of crash outcomes for rider falls, as well as micromobility crashes involving other motorized vehicles.
- Capturing perspectives from stakeholders to surface common challenges among public and private agencies.
- Producing actionable recommendations for safety practitioners for a coordinated strategy focused on data quality, infrastructure, education, and policy alignment.

METHODOLOGY

The study integrated complementary research tasks. First, a systematic review of U.S. and international literatures was performed to identify recurring themes related to demographics, private vs. shared systems, infrastructure, behavior, policy, and device specifications. Second, a state-level regulatory map was created to document regulations, vehicle class definitions, and emerging legislative activity. Third, quantitative analysis using available data was conducted in an effort to address the “classification chaos” across available state crash datasets and hospital records. In the first case study, the team performed rigorous quality checks using 10 years of Tennessee crash data and applied large language models used in artificial intelligence to process narratives and identify e-bike and e-scooter cases from crash reports. For the second case study, the team utilized probabilistic linkage methods to reconcile miscoded and fragmented crash records that were linked to hospital records describing

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ABOUT THE AAA FOUNDATION FOR TRAFFIC SAFETY

Founded in 1947, the AAA Foundation for Traffic Safety in Washington, D.C., is a nonprofit, publicly supported charitable research and educational organization dedicated to saving lives by preventing traffic crashes and reducing injuries when crashes occur. Funding for this research was provided by voluntary contributions from AAA/CAA and their affiliated motor clubs, individual members, AAA-affiliated insurance companies, and other organizations or sources.

607 14TH STREET, NW, STE 701
WASHINGTON, DC 20005
202-638-5944
AAAFOUNDATION.ORG

the type and severity of injuries among e-bike and e-scooter riders. These two case studies offer scalable methodologies that other practitioners with access to statewide crash reports and hospital datasets can replicate. Finally, the team conducted focus groups with more than 25 experts across federal and state agencies, operators, and advocate groups to capture policy and operational implications, education gaps, and infrastructure needs.

KEY FINDINGS

Project findings can be used to inform safety efforts such as enforcement clarity, advocacy for national data standards, and state-level regulatory actions:

1. State and local regulations vary widely and have various definitions for class devices, permitted sidewalk use, and parking rules. "Out of Class" devices marketed to consumers as toys can bypass vehicle regulations.
2. Police crash data and hospital records each capture different slices of the problem. Data linkage is crucial but technically and operationally challenging. Operator telematics exists among shared micromobility systems but are often inaccessible.
3. A core challenge is inconsistent device definitions and miscoding across crash datasets. E-scooter riders are often miscoded as pedestrians in police crash data and hospital records do not reliably capture device context.
4. Tennessee's linked crash–hospital analysis shows many micromobility injuries result from falls and striking objects rather than motor-vehicle collisions. Severe injuries tend to involve multiple injuries and more serious trauma fractures.
5. Focus groups reinforced the need for unified reporting standards, clearer device classifications, and policies that consider infrastructure design.

IMPLICATIONS

Effective micromobility policy requires harmonized device definitions, improved data standards, and sustained data-linkage efforts. Ongoing stakeholder engagement is needed because legislation and technology continue to evolve. Each section of this report provides practical recommendations to improve safety. The following reflects some regulation, device, and infrastructure realities that need to be addressed:

1. Promote alignment between federal, state, and local ordinances on how devices are sold, regulated, and used on roads.
2. Adopt uniform definitions for micromobility devices based on operating speed, weight, and aftermarket modifications.
3. Provide safety materials and consistent community guidance on age, speed, right of way expectations, and equipment for users, especially young riders.
4. Expand protected lanes, improve intersection designs and speed management, and implement micromobility parking to integrate micromobility into the transportation system.