U.S. Department of Transportation
Federal Highway Administration

Micromobility

Emergence of New Transportation Modes

The Federal Highway Administration (FHWA) is advancing research on the rapidly evolving field of micromobility. FHWA defines micromobility as:

> *Any small, low-speed, human or electric-powered transportation device, including bicycles, scooters, electric-assist bicycles (e-bikes), electric scooters (e-scooters), and other small, lightweight, wheeled conveyances.*

The Society of Automotive Engineers classifies powered micromobility vehicles as those with a top speed of less than 30 mph and a curb weight of less than 500 pounds.

2008
Docked bikeshare introduced in the United States

2013
Dockless bikeshare pilots begin in cities nationwide

2017
Shared e-scooter fleets deploy rapidly across the country

2018
84 million shared micromobility trips are taken nationally

2020+
New micromobility device formats and types emerge

Evolution of shared micromobility devices. (Images sourced from www.123rf.com and www.unsplash.com)

Micromobility has rapidly proliferated in cities nationwide, proving to be a popular transportation option for many users. Micromobility devices may be individually owned; however, the recent surge of devices in cities is due primarily to the deployment of shared fleets by private companies. Shared micromobility systems are deployed in targeted service areas with the usage intended for short trips such as “first- and last-mile” connections to complete trips made via other modes including transit. Shared fleets provide users with on-demand access to devices. These fleets are most commonly parked in the public right-of-way, either grouped at a dock or as “dockless” devices. Users typically unlock the devices using a smartphone application.

The Bureau of Transportation Statistics maintains an interactive map showing the extent of the deployment of bike share and e-scooter systems across the country. The resource highlights docked bike share systems, which were the first shared micromobility systems to appear in the United States, along with the more recent systems of shared e-scooters and e-bikes that have emerged.

Micromobility Topic Areas

- **Safety and Infrastructure** – Because they lack the protection of an enclosed vehicle, micromobility users are considered "vulnerable road users," similar to pedestrians. Unprotected or discontinuous bicycle and pedestrian infrastructure can lead to conflicts with other road users, increasing the risk of injury. Micromobility users rely on safe and connected bicycle and pedestrian facilities for travel. Many cities and agencies have expanded bicycle and pedestrian programs to consider and account for the needs of micromobility users, while others have prohibited e-scooter use on sidewalks and other facilities fearing modal conflicts with pedestrians. FHWA, State and local jurisdictions, and private operators engage in efforts to educate the public on safe travel behaviors and to support the expansion of robust, continuous bicycle and pedestrian infrastructure. Policymakers have also enacted strategies such as geofencing and device parking corrals, which regulate the use and parking of devices to promote safety.

- **Access and Mobility** – Micromobility devices help to close the first- and last-mile gaps to transit and can offer individuals greater access to jobs, health care, and other services. Powered and adaptive micromobility devices may also increase mobility for older adults or individuals with disabilities, as they are less strenuous to operate than traditional bicycles or scooters. Despite these benefits, shared micromobility devices have presented challenges to cities as individuals operate and park them in the public right-of-way, sometimes blocking sidewalks. To combat this, cities employ strategies to maintain compliance with the Americans with Disabilities Act by removing parked or abandoned devices that block sidewalks and multi-use paths.

- **Equity** – Micromobility can help to expand access and mobility options to underserved communities. Cities and operators have enacted strategies to ensure equitable access for shared fleets including requiring a certain number of micromobility devices to be available in underserved communities, creating discounted fare structures, and providing credit-free access.

- **Data** – Local jurisdictions and private companies collect device and travel behavior data from shared micromobility devices. In many cities, operators provide real-time information on the number, location, and condition of devices. They may also provide the origin, destination, and routing of trips. These data inform policy decisions and enable cities to better manage shared micromobility. Emerging standards for data collection can improve the availability and utility of such data, as well as establish protocols for anonymizing data to protect individual privacy.

- **Regulation** – A growing number of cities permit private companies to operate shared micromobility fleets. Permits allow cities to enforce regulations at the local level, including vehicle caps, operating speed limits, data sharing requirements, and conditions to encourage equitable device access. The National Association of City Transportation Officials (NACTO) and People for Bikes both provide resources about micromobility regulations, including examples of regulations.

- **Funding** – Shared micromobility fleets are typically funded through private investment and sponsorships. The infrastructure that these devices use for travel and parking is typically public. Existing Federal transportation legislation includes funding for Federal-aid projects such as sidewalks and on-street bike lanes, which may be used by micromobility users, pending local regulations.

Success Stories

Improving Access and Safety for Shared Micromobility Users in Santa Monica, CA

Santa Monica, California, began a Shared Mobility Services Pilot in 2018 allowing four private companies to provide shared mobility services, including e-scooters and e-bicycles, to the community. The city carefully crafted the program to enable flexibility and collaboration with the participating companies in order to encourage data sharing, equity, and accessibility within the system. A report on Santa Monica's pilot found that 49 percent of shared mobility trips replaced trips that otherwise would have been driving or ride-hailing, showing the program's success in reducing congestion and emissions.

E-scooters parked in a designated drop zone. (Courtesy of the City of Santa Monica)

Chicago Advances Micromobility Efforts through an E-Scooter Pilot and Bikeshare Expansion

The Chicago Department of Transportation (CDOT) committed to expanding its shared micromobility program in 2019. CDOT launched an e-scooter pilot and expanded the city's Divvy docked bikeshare program, adding 10,500 new electric-assist bikes and 175 new stations. CDOT coordinated extensively with community partners during this expansion to provide traditionally underserved communities with improved access to shared micromobility devices. A report on Chicago's e-scooter pilot found they fill a mobility gap for lower-income residents and help shift travel from cars to active transportation.

Los Angeles DOT Develops Data Platform to Manage Mobility Providers

The Los Angeles Department of Transportation developed the Mobility Data Specification (MDS) in 2018 to provide a standard for two-way data exchange between mobility operators and cities. MDS is an open-source tool providing a shared data vocabulary and allowing cities to communicate to and manage operators. MDS has been adopted by cities, agencies, and mobility providers nationwide.

Coordination Efforts

The United States Department of Transportation (U.S. DOT) coordinates with internal and external stakeholders to advance the state of the practice related to micromobility. Please see the following resources for a summary of micromobility activities led by FHWA and by partners across U.S. DOT.

Resources

Pedestrian and Bicycle Information Center

- The Basics of Micromobility and Related Motorized Devices for Personal Transport
- E-Scooter Management in Midsized Cities in the United States

Centers for Disease Control

- Dockless Electric Scooter-Related Injuries Study

NACTO

- Shared Micromobility in the U.S.
- Guidelines for Regulating Shared Micromobility

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