WHAT YOU NEED TO KNOW ABOUT
THE EMERGING TRANSPORTATION MODES!

Save a Life™ Texas Department of Transportation

Texas A&M Transportation Institute

Safer Streets with Shared Micromobility

Bicycle | Electric Assisted Bicycle | Motor-Assisted Scooter | Electric Personal Assistive Mobility Device | Moped | Pocket Bike/ Mini Motorcycle

Shared Micromobility 101

Shared micromobility refers to fleets of transportation devices made available to the public for temporary use. While some micromobility devices are privately owned, the recent increase in their presence in cities is mainly due to private companies offering shared fleets.

These fleets are typically deployed in specific areas to facilitate short trips, often as part of "first-and-last-mile" connections to larger transit networks.

Shared fleets allow users to access devices on demand, with vehicles often parked in public spaces, either at designated docking stations or in a "dockless" setup. Users generally unlock the devices through a smartphone app. Since the launch of shared micromobility systems, the use and popularity of these devices, especially e-scooters and e-bikes, has continued to grow.[1]

The Federal Highway Administration (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".[2]

Fleet of electric bikes at a rental kiosk. Editorial credit: Joseph Hendrickson, stock.adobe.com

According to the Texas Transportation Code (TC Sec. 664.001), an electric bicycle is defined as:

CLASS 1: electric bikes equipped with a pedal-assist only motor which stops when the bike reaches 20 mph

CLASS 2: electric bikes equipped with a motor that may be used exclusively to propel the bicycle and stop when the bike reaches the speed of 20 mph

CLASS 3: electric bikes equipped with a motor that provides assistance only when the rider is pedaling and stops when the rider stops pedaling or when the bicycle reaches the speed of 28 mph

Dockless electric scooters parked on the street in a dedicated spot. Editorial credit: Simone, stock.adobe.com

According to the Texas Transportation Code (TC Sec 551.351), an electric scooter is defined as a self-propelled device with:

1. at least two wheels in contact with the ground during operation;
2. a braking system capable of stopping the device under typical operating conditions;
3. a gas or electric motor not exceeding 40 cubic centimeters;
4. a deck designed to allow a person to stand or sit while operating the device;
5. the ability to be propelled by human power alone; and
6. not falling within the definition of pocket bike or mini motorbike

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[1] Governor's Highway Safety Association [GHSA]. *Understanding and Tackling Micromobility: Transportations New Disruptor* (Washington DC; GHSA, 2020)

[2] Federal Highway Administration, *Making Micromobility Smarter and Safer* (Washington, DC, 2022)

Safer Streets with Shared Micromobility

2008
Docked bikeshare introduced in the United States

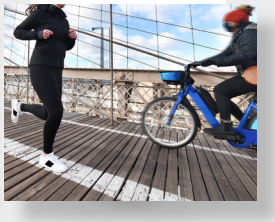
2013
Dockless bikeshare pilots begin in cities nationwide

2017
Shared e-scooter fleets deploy rapdily across the country

2018
84 million shared micromobility trips are taken annually

2022
128 million shared micromobility trips are taken annually

New micromobility device formats and types emerge



Source: Micromobility Fact Sheet (dot.gov)

Evolution of Shared Micromobility

Shared micromobility has grown to be an essential and deeply embedded element of urban transportation systems throughout the United States. People use these services for a wide range of destinations and purposes.

An analysis of some of the largest shared micromobility systems in the U.S. found that many riders use these services for a variety of purposes throughout the year: 34% of riders use shared micromobility to commute to work,

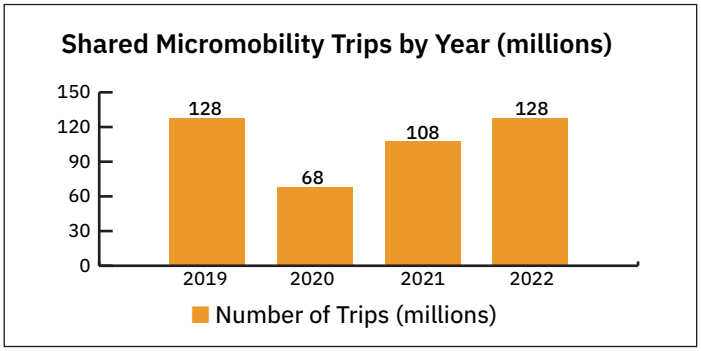
39% use shared micromobility to run errands, 16% use shared micromobility to get to school, and 50% of riders use shared micromobility for other social or recreation activities.[3]

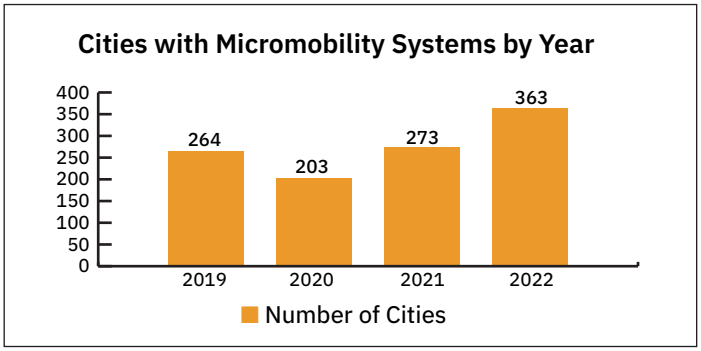
The 2022 State of the Industry Report (NABSA) indicates that shared micromobility ridership in the U.S. rebounded to pre-pandemic levels in 2022, marking the highest number of cities with active systems across the country to date.[3]

Looking for more micromobility and other related motorized device definitions?

SAE Taxonomy and Classification of Powered Micromobility Vehicles provides a commonality of terms, definitions, and classifications of powered micromobility vehicles consistent with current industry practice.

You can also visit the Texas Transportation Code!





In 2022, over 128 million shared micromobility trips were made in 363 cities across the U.S. The systems are also growing, with a record 250,000 shared micromobility vehicles now deployed. Since 2010, the number of shared micromobility trips in the U.S. has increased by a factor of 35.[3]

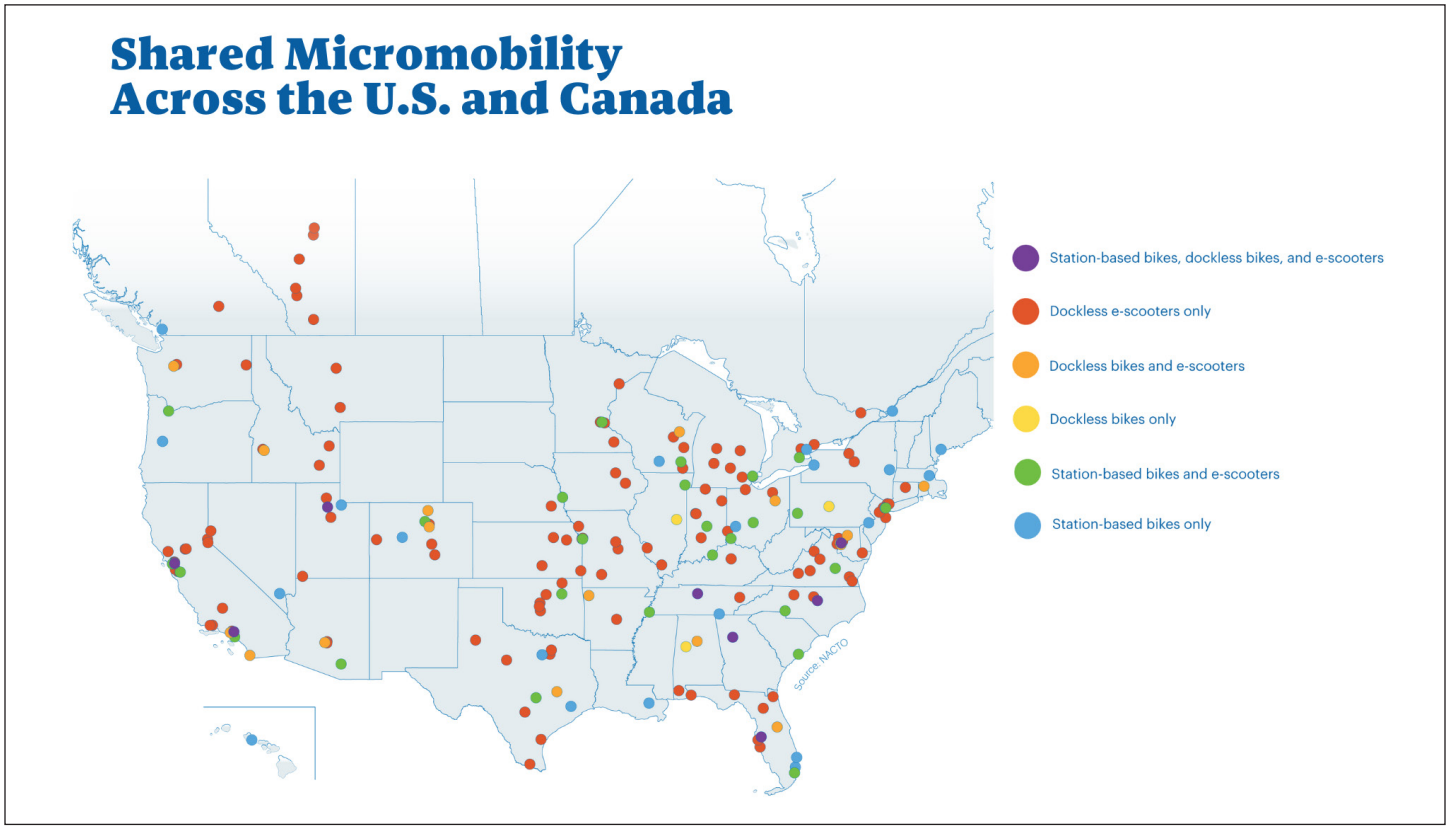
[3] North American Bikeshare and Scootershare Association [NABSA]. *2022 Shared Micromobility: State of the Industry Report* (Portland, Maine: NABSA, 2023)

Safer Streets with Shared Micromobility

The Bureau of Transportation Statistics* (BTS) tracks bikeshare and scootershare systems in the U.S. In Texas, there were twelve cities with shared micromobility systems in 2023. The primary service operators in Texas include Jump, Bird, Lime, LINK, and B-Cycle.

- Austin
- Corpus Christi
- Dallas
- Edinburg
- El Paso
- Fort Worth
- Houston
- Lubbock
- McAllen
- Plano
- San Antonio
- Texarkana

** For systems serving multiple cities, BTS shows just the name of the largest city served by the system. BTS does not count systems limited to college or employer campuses. There are likely more cities served by micromobility systems than listed above.*



Source: Shared Micromobility in 2022 *| National Association of City Transportation Officials (nacto.org)*

Safer Streets with Shared Micromobility

Safety Concerns: Injury and Fatality Data

Although shared micromobility offers numerous benefits, including reduced carbon emissions and improved access to affordable transportation, there are significant concerns regarding injuries and fatalities linked to their use. Studies analyzing medical records and emergency room data reveal that e-scooters and e-bikes are often involved in accidents, with riders suffering injuries and, in some cases, fatalities while using these devices.[4]

Between 2017 and 2022, an estimated **360,800 emergency room visits** were linked to micromobility-related injuries. The most common injuries occurred to the head, neck, and limbs (both upper and lower). More alarmingly, the number of fatalities has been steadily rising. The Consumer Product Safety Commission has reported **233 deaths** associated with micromobility products during this period.[4]

Injuries and fatalities involving e-scooters and e-bikes are usually caused by collisions with motor vehicles or other obstacles such as light posts, manhole covers, curbs, potholes, and uneven sidewalks or streets, as well as falls due to control issues. Surveillance of injury and fatality data identifies several key factors contributing to micromobility-related crashes, including:

- Speed
- Distractions
- Impairment
- Carrying/holding something
- Inexperience[4,5]

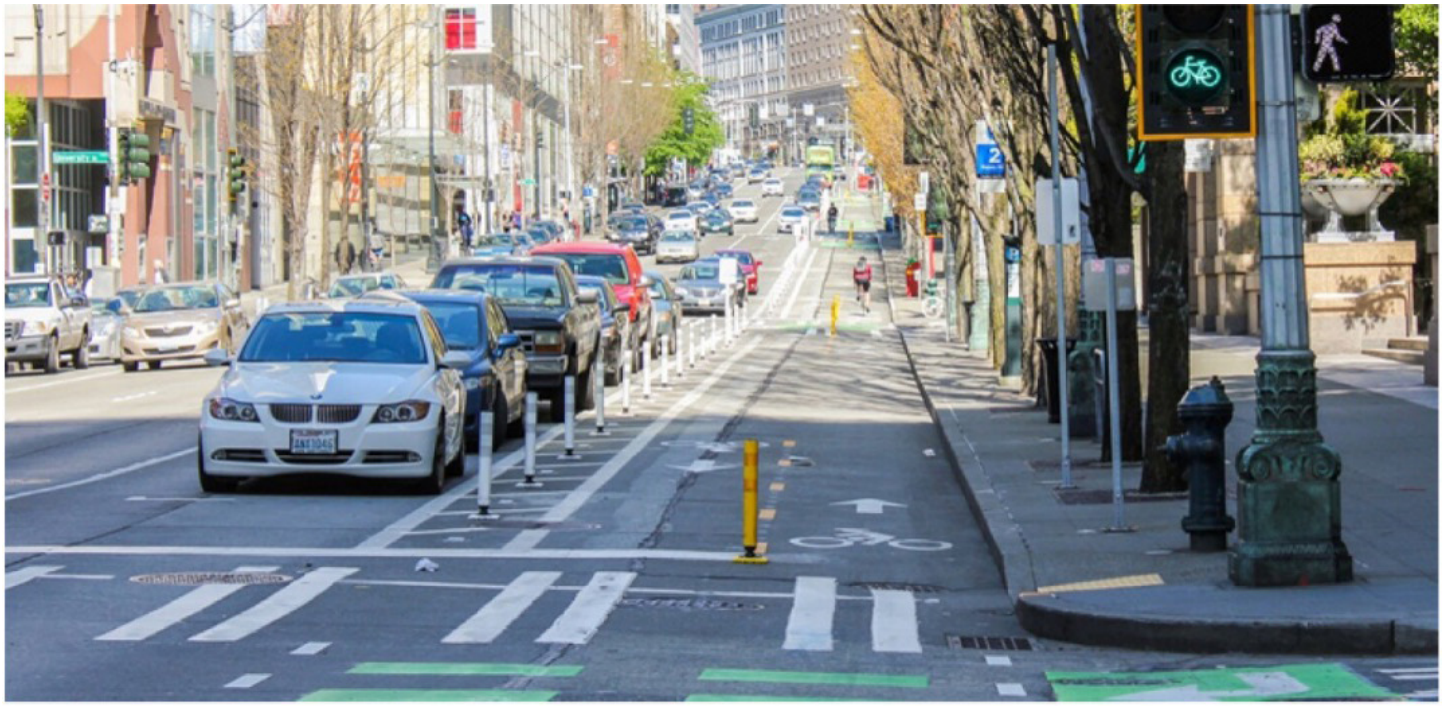
Want more injury and fatality data? Check out these recent abstracts and studies!

- Dockless electric scooter-related injuries study, Austin, Texas, September–November 2018–2019
- Injuries Associated with Electric-Powered Bikes and Scooters: Analysis of Us Consumer Product Data – 2020
- Injuries Associated with Standing Electric Scooter Use – 2019
- The E-Merging E-Pidemic of E-Scooters – 2019
- Association of Scooter-Related Injury and Hospitalization with Electronic Scooter Sharing Systems in the United States – 2021
- E-Scooter Related Injuries: Using Language Processing to Rapidly Search 36 Million Medical Notes – 2022
- A Retrospective Study of Spine Injuries in Electric Bicycles Related Collisions – 2022
- Risk of Hospital Admission Related to Scooter Trauma Injuries: A National Emergency Room Database Study – 2022
- Dangers of E-Mobility: A Systematic Review and Meta-Analysis of Sustained Injury Patterns and Injury Severity – 2023
- E-Scooter and E-Bike Injury Pattern Profile in an Inner-City Trauma Center in Upper Manhattan – 2023

[4] Consumer Product Safety Commission [CPSC]. *Micromobility Products-Related Deaths, Injuries, and Hazard Patterns: 2017–2022* (Washington DC: CPSC, 2023)

[5] Governor's Highway Safety Association [GHSA]. *Understanding and Tackling Micromobility: Transportations New Disruptor* (Washington DC; GHSA, 2020)

Safer Streets with Shared Micromobility



Source: Flickr/NickFalbo

Best Practice Recommendations

Separate Infrastructure[7]

Micromobility users are considered "vulnerable road users" because they lack the protection of an enclosed vehicle. As a result, unprotected or fragmented bicycle and pedestrian infrastructure can lead to conflicts with other road users, raising the risk of injury. To ensure safety, micromobility users depend on well-designed and connected bicycle and pedestrian facilities. In response, many cities and agencies have expanded bicycle and pedestrian programs to better accommodate the needs of micromobility users. However, some cities have prohibited e-scooter use on sidewalks and other facilities due to concerns about potential conflicts with pedestrians.

***Recommended Infrastructure*[7,8]**

- Cycle tracks or on-street bicycle lanes that are physically separated from motor vehicles by barriers such as curbs or bollards
- Marked bike lanes
- Bicycle boulevards or greenways
- Bike boxes (pavement marking that features a stop line closer to the intersection to give bicyclist and micromobility riders a head-start when the light turns green
- Specially marked traffic lights that provide an advance green signal for riders

[7] National Academies of Sciences, Engineering, and Medicine. *E-Scooter Safety: Issues and Solutions* (Washington, DC: The National Academies Press, 2023)

[8] Governor's Highway Safety Association [GHSA]. *Understanding and Tackling Micromobility: Transportations New Disruptor* (Washington DC; GHSA, 2020)

Safer Streets with Shared Micromobility

Public Education[9]

Education plays a crucial role in ensuring that micromobility users operate devices safely and respectfully, while also helping other road and sidewalk users accept this mode of transportation. However, public outreach is resource-intensive and cannot be solely handled by cities or providers. It is essential to involve other partners to support and promote widespread public engagement.

Success Stories[9]

- Cities like Austin, Portland, and Chicago have created colorful posters in multiple languages to highlight the do's and don'ts of safe e-scooter use.
- Arlington, VA has launched a multi-modal campaign encouraging everyone to be a PAL—predictable, alert, and lawful.
- Some cities such as Chicago and Washington, DC use ambassadors to engage with riders and the public. The DC Bike Ambassadors, supported by a partnership with the city's Department of Transportation, engage with residents and visitors at street corners, transit stations, street fairs, and community events. Their goal is to encourage more people to try bicycling and micromobility, educate them on safe use of roads, sidewalks, and trails, provide resources for safe and easy non-motorized travel, and promote safe and respectful behavior on the road.
- The role of micromobility providers in delivering safety training and information is crucial. In addition to forming safety advisory boards in 2019, both Bird and Lime have been actively involved in extensive rider education initiatives, such as S.H.A.R.E. (see right) and the First Ride Academy.
- Cities can also share safety tips and information about where not to ride with both visitors and locals through on-device and on-street messaging. For example, Boise's shared bikes feature panels on their baskets that inform riders about pricing, safe riding practices, and appropriate places to ride.

What Does it Mean to S.H.A.R.E.?

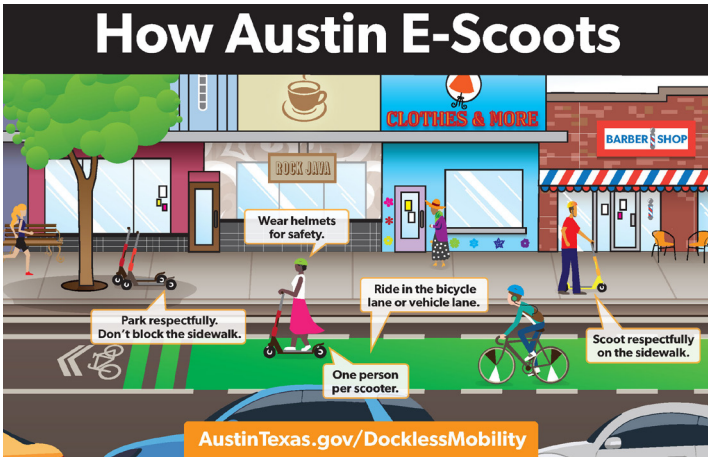
Safe Riding. Navigate traffic and bike lanes with care.

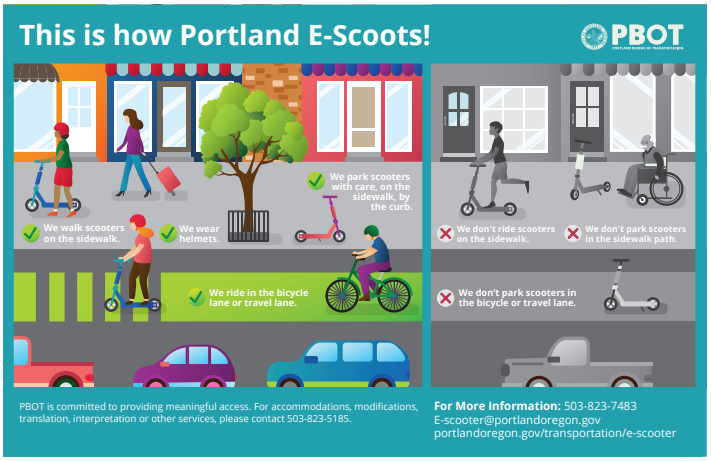
Heightened awareness. Anticipate what others might do.

Always alert. Save the selfies and music for after the ride.

Respect pedestrians. Yield and always keep walkways accessible.

Every voice matters. Get involved to help your city reshape its streets (Bird, 2019).





[9] Governor's Highway Safety Association [GHSA]. *Understanding and Tackling Micromobility: Transportations New Disruptor* (Washington DC; GHSA, 2020)

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Micromobility Training for Law Enforcement[10]

While most cities require providers to inform riders about safe operating rules, the responsibility for enforcing these rules falls to local law enforcement. Officer training is essential to ensure that rules are enforced fairly and equitably. This training should include an introduction to micromobility device types and their operation, how to identify them in crash reports, safe riding practices, and strategies for educating riders, drivers, and pedestrians on how to safely share the road.

Need officer training on micromobility devices? Check out these FREE resources

- **Unlock On-Demand Training**
- **A Law Enforcement Officer's Guide to Micromobility Devices**

Resources

- 2022 Shared Micromobility: State of the Industry Report – North American Bikeshare and Scootershare Association
- E-Scooter Safety: Issues and Solutions – Transportation Research Board
- E-Scooter Safety Toolbox – Transportation Research Board
- Guidelines for Regulating Shared Micromobility – North American Transportation Officials
- Micromobility: Data Challenges Associated with Assessing the Prevalence and Risk of Electric Scooter and Electric Bicycle Fatalities and Injuries - National Transportation Safety Board
- Micromobility Products-Related Deaths, Injuries, and Hazard Patterns: 2017–2022 – Consumer Product Safety Commission
- The Basics of Micromobility and Related Motorized Devices for Personal Transport – North American Transportation Officials
- Understanding and Tackling Micromobility: Transportations New Disruptor – Governor Highway Safety Association

Visit the Safer Streets with Shared Micromobility webpage for more educational materials!

[10] Governor's Highway Safety Association [GHSA]. *Understanding and Tackling Micromobility: Transportations New Disruptor* (Washington DC; GHSA, 2020)