Micromobility and Youth Education, Engagement & Awareness

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RUTGERS
Edward J. Bloustein School of Planning and Public Policy

NEW JERSEY Safe Routes

DEPARTMENT OF TRANSPORTATION THE STATE OF NEW JERSEY

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Acknowledgements

The New Jersey Safe Routes Program, supported by the New Jersey Department of Transportation, is a statewide initiative with a mission to partner with schools and communities to prioritize and implement opportunities for people to walk, bike, or travel by other wheeled devices. By focusing on improvements to support active travel by youth, we can create safe, healthy, equitable, and appealing conditions for all.

The New Jersey Safe Routes Resource Center assists public officials, transportation and health professionals, and the general public in creating safer and more accessible walking and bicycling environments for children in New Jersey through education, training, and research.

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Executive Summary

Definition

- Micromobility vehicles are small, lightweight, human- or electric motor-powered devices with limited speeds of 20 mph or lower.
- They are practical for short trips, especially for first- and last-mile connections, commuting to work or school, running errands, and recreation. They can reduce traffic congestion and increase mobility for carless households and people with disabilities.

Safety Concerns

- E-scooter fatalities overwhelmingly involve motor vehicles. Speed is the principal factor in these incidents. Although shared micromobility devices usually have a speed cap, personal devices do not.
- Risk of injury could be highest during a person's first few e-scooter rides. 60 percent of collisions between riders riding on the sidewalk and motor vehicles occurred at driveways and crosswalks.

Education Needs

- Efforts targeted toward education remain uncoordinated and not well documented. Many safety concerns associated with micromobility could be better addressed through infrastructure improvements coupled with targeted educational programming.
- Micromobility education needs to be multifaceted and target all roadway users, including drivers of vehicles, bicyclists, and pedestrians.
- While shared micromobility is usually restricted for users under 18 years of age, local regulations are often limited only to shared devices. Shared micromobility providers often require an online safety orientation for every new user. However, devices are often privately owned.
- Personal devices are purchased by parents for use by their children. Education efforts must include children and teenagers.
- In towns with high tourism rates, it is important that education efforts reach visitors as well as residents.

Education Strategies

- To reach private users, both adults and children, partnerships with community groups are needed to teach concepts regarding proper device use, traffic laws, and best practices.
- Coordination among police departments, non-profit organizations, community groups, and schools are needed to host learn-to-ride and safety events. Hosting events in conjunction with health and street festivals or other public events can help to effectively reach private micromobility device owners.
- Other community educational opportunities include printed information in multiple languages, social media, videos, municipal newsletters, etc.
- Increased signage can help micromobility riders comply with local regulations and encourage safe usage.
- Wayfinding signage can help micromobility users, especially visitors, find the streets, bike lanes, shared streets, or less busy roads where they can ride more comfortably, helping to minimize conflicts.

Next Steps

- Incorporate use of micromobility devices such as e-scooters and e-bikes into existing youth bicycle and pedestrian education, including on-device education about rules of the road and safety gear.
- Coordinate with stakeholders to develop targeted micromobility education events and programs.
- Continue research into best practices in education and educational materials including on-bike or on-scooter education, videos, lesson plans, etc.
- Research micromobility device use and travel by children and teenagers.

Netcong, NJ

I. Definition

Previously, micromobility devices, such as scooters or skateboards, were seen only as children's toys. Today, they are sophisticated, small, lightweight, human- or electric motor-powered devices with a limited speed of 20 mph or lower. Pedal-powered and electric bicycles, standing and seated electric scooters, and electric skateboards, one-wheels, and skates are some examples of the devices available.

Micromobility devices can benefit a community in several ways. E-bikes and e-scooters are practical for short trips including commuting to work or school, running errands, and recreation. They are helpful for first- and last-mile connections, increasing the accessibility of other transit options and thereby enlarging the catchment area of public transit service. Finally, as a substitute for short car trips, they can reduce traffic congestion and increase mobility for carless households and people with disabilities.

II. Ridership Trends

Micromobility has evolved from a niche transportation mode to a growing trend, especially among younger people (Governors Highway Safety Assoc., 2020). Before Covid-19 restrictions, micromobility increased as a share of transportation mode use, especially for first- and last-mile connections. In the U.S., in 2019, users took 136 million trips on shared micromobility devices, a 60 percent increase from 2018 (FHWA). Post-pandemic usage is recovering; in 2021, there were 112 million trips on shared micromobility. Station-based bike share systems seem to be the preferable choice for users. In 2021, there were 65 million trips made by dockless bikes and e-scooters, a 27% decrease from 2019 (86 million). On the other hand, station-based bike share systems went from 40 million trips in 2019 to 47 million in 2021 (NACTO, 2021).

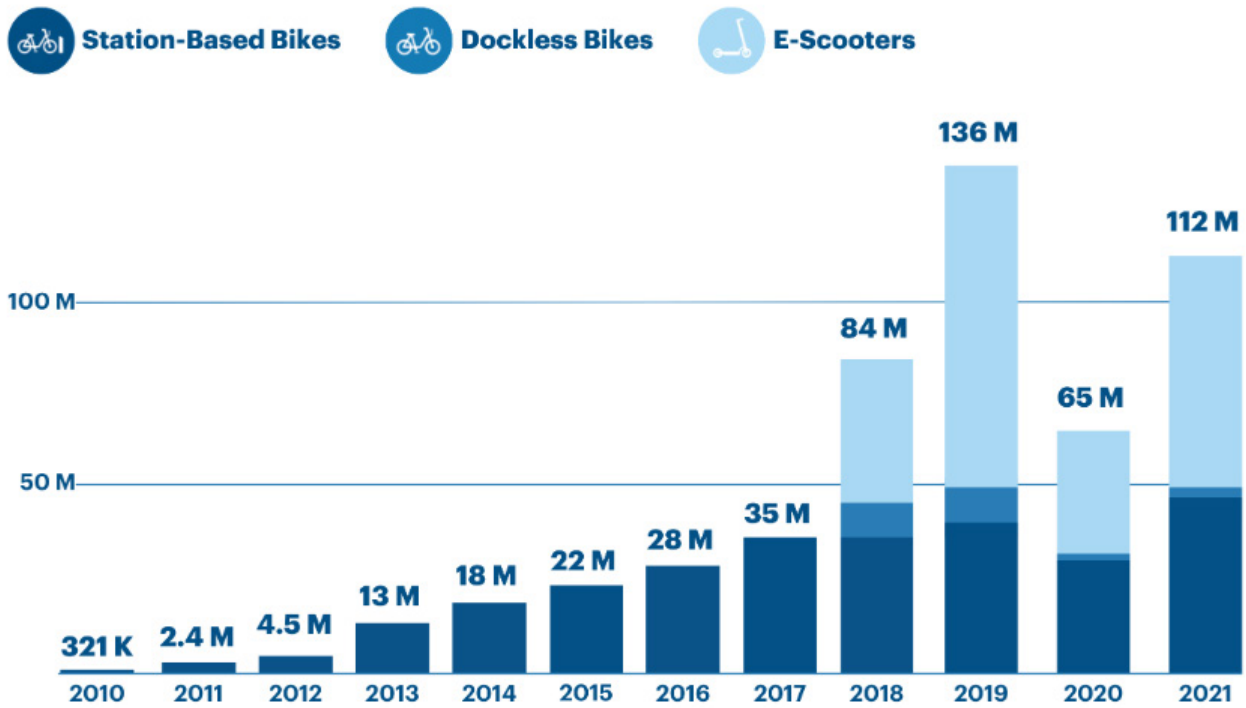

Figure 1. Shared Micromobility Ridership in the U.S. from 2010-2021. Source: NACTO report on Micromobility.

III. Micromobility Concerns

Safety for the rider, pedestrians, and other road users, is the principal concern surrounding the expanded usage of micromobility devices. E-scooter fatalities overwhelmingly involve motor vehicles (Shah et al., 2021). A crash between a motor vehicle and a personal transportation device is more likely to result in a severe or fatal injury for the rider than a collision with a pedestrian or other fixed objects (Austin Public Health Department, 2019).

While the data on crashes involving e-scooters is limited due to misclassification of the incidents and the recent adoption of the devices in regulatory frameworks, some studies have shown that users are not more likely to crash on an e-scooter than on a regular bicycle (ITF, 2020). Speed is the principal factor in these incidents. Although shared micromobility devices usually have a speed cap, personal devices do not.

Riding on the sidewalk can be hazardous for e-bike and e-scooter riders, especially at points of conflict with pedestrians and vehicles, such as driveways and crosswalks. One study found over 60 percent of collisions between e-scooter and bicycle riders riding on the sidewalk and motor vehicles occurred at driveways and crosswalks (Shah et.al., 2021). In addition, speeding and riding recklessly on the sidewalks and leaving dockless devices blocking the sidewalk can cause unsafe conditions for pedestrians, especially people with physical, visual, and cognitive impairments.

While local authorities seek to address the regulatory framework for micromobility providers and device owners to establish speed limits and other requirements to improve safety, safety cannot be accomplished through regulation alone. The need for more education among motor vehicle drivers on the rights of micromobility users and among micromobility users on principles of safe riding offers potential for increasing the acceptance of micromobility as a transportation mode that is sustainable and convenient.

Hoboken, NJ

IV. The Role of Education

Education and training are discussed in many of the studies regarding micromobility safety. While studies note that safe vehicles and infrastructure are indispensable, education and raising awareness can complement these other measures (ITF, 2020). Many of the discussions around education center on lack of experience. Concerns related to lack of experience have two dimensions: 1) people may not be familiar with the operation of new vehicle types, including e-scooters and e-bikes, and 2) people may not be familiar with the traffic rules and techniques for anticipating danger and staying safe (ITF, 2020). Research has shown that these concerns are justified and has suggested that the risk of injury could be highest during a person's first few e-scooter rides. A study in Austin, Texas, found that 33% of e-scooter rider injuries occurred during the user's first ride, and 63% occurred during the user's first nine rides (Austin Public Health Department, 2019).

It has also been suggested that youth and lack of experience have a compound effect on crash risk. While studies involving micromobility are limited, studies of novice motor vehicle drivers have found that the crash rate of older novice drivers is lower than that of younger ones (Curry et al., 2017). Drivers between 16-24 years old are highly over-represented in crash statistics, with risks that are two to three times higher than those of more experienced drivers. They are more often involved in single-vehicle crashes, in night-time crashes, and in crashes involving "loss of control" or "high speeds" (ITF,2020)

Research examining if some of the experience acquired with one vehicle type, such as a bicycle, may be transferable to another, such as an e-scooter, is very limited. For example, studies have found that experience driving a car contributes positively to the safety of riders of two-wheeled motor vehicles (Lardelli-Claret et al., 2005). Similarly, other studies have found that e-bike riders with experience driving cars were statistically less likely to be involved in at-fault crashes (Yao & Wu, 2012). However, the results are not always good. For example, one study found that cycling experience was not associated with differences in drivers' attention toward bicyclists (Robbins & Chapman, 2018). While this limited research suggests there may be some transferability of experience, the evidence is hardly conclusive. Therefore, even among experienced drivers, pedestrians, and cyclists, there remains a need for targeted micromobility education efforts to bridge not only the experience gap in the operation of micromobility devices but also to familiarize all roadway users with the rules of the road and safe operational techniques for safely accommodating micromobility users.

Newark, NJ

V. Existing Education Resources

Internet searches for information on micromobility education return limited results. Instead of offering information on comprehensive safety programs, the information returned is focused more on developing regulations and outright bans. While the aim of these regulations and bans are suggested to be safety, they are often treating the symptom rather than the cause of micromobility safety issues. Instead of encouraging bans and excessive regulation, many of the safety concerns associated with micromobility could be better addressed through infrastructure improvements coupled with targeted educational programming.

Most of the micromobility educational material located through internet searches fell under the categories of listed safety tips, "Do's & Don'ts" lists and micromobility etiquette. While this information may be helpful, there is a lack of a coordinated and multifaceted micromobility educational program. Most of the identified materials are single items designed to operate alone. In addition to these standalone materials, searches for micromobility educational materials also returned results for videos offered through YouTube. While some of these videos appear to be more comprehensive than many of the standalone materials, the quality of their content and videography vary drastically.

Whether a video or a standalone list, nearly all of the micromobility educational materials were targeted solely to the operators of micromobility devices. While micromobility users have a duty to understand the rules of the road and the safe operation of their device, to be effective, micromobility education needs to be multifaceted and target all roadway users, including drivers of vehicles, bicyclists, and pedestrians.

VI. Education Opportunities for Micromobility

In the absence of targeted, comprehensive micromobility education, there are opportunities for local stakeholders to work within existing structures to advance education efforts and to build partnerships that could enhance and expand micromobility education efforts moving forward.

Working with shared micromobility providers

Micromobility providers and ride-sharing networks can support safety education practices by collaborating with local authorities, advocacy groups, and educators on safety campaigns and innovative programs to encourage safe riding. Shared micromobility providers often require an online safety orientation for every new user. Some even add a training mode to their devices which automatically reduces the top speed of the device to 8 mph while the rider gains skill and confidence with the device. Working with local partners, these orientations and training mode periods can be enhanced and tailored to local rules and specific needs, helping to improve the user experience and allowing users to better understand and more easily comply with safe riding practices and local regulations.

Bird's Safe Street S.H.A.R.E program

- Safe Riding. Ride carefully.
- Heightened awareness. Anticipate what others might do.
- Always alert. Do not listen to music or use any device while riding.
- Respect pedestrians. Yield and always keep walkways accessible.
- Every voice matters. Get involved to re-shape your city's streets.

In 2019, e-scooter company Bird hosted more than one hundred educational events called "s.h.a.r.e. Safe Streets. Through this campaign, the company provided tips for safe and responsible riding through their website and smartphone app, which also include videos (ITF, 2020). Bird built upon this concept with the "Ride Better" campaign, a series of educational initiatives that include videos, out-of-home advertising, community partnerships, responsible riding incentives, and more resources dedicated to keeping riders and communities safe. The campaign started with the launch of their "virtual Safety School," a 3-video driver education program focused on common causes of crashes involving automobiles colliding with micromobility riders, including Dooring, blind spots while turning, and speeding. Each video highlights knowledge and skills to help avoid potentially serious crashes and ends with a brief quiz to help ensure participants have retained the information(Bird).

Regardless of the provider, most customers of shared micromobility companies rely on smartphones to locate, unlock, and use vehicles. Therefore, smartphones offer an opportunity to replicate and enhance programs like those discussed above from Bird to provide rider training and education directly to users of micromobility.

Community Education

Working with shared micromobility providers provides an opportunity to enhance education efforts, but it is not enough to ensure widespread education. While shared micromobility tends to get the most focus, micromobility devices are often privately owned, and education efforts must also be targeted toward these private owners. This is especially important for educating children and teenagers. While shared micromobility is usually restricted for users under 18 years of age, local regulations are often limited only to shared devices, allowing parents to purchase personal devices for use by their children. To reach these private users, both adults and children, partnerships with community groups provide an excellent opportunity for engaging with both new and experienced riders regarding proper device use, traffic laws, and best practices.

Coordination among police departments, non-profit organizations, community groups, and schools to host learn-to-ride and safety events in conjunction with health and street festivals or other public events can help to effectively reach private micromobility device owners. In addition, these events can also help to introduce micromobility to the greater community to not only help current riders to feel more comfortable but also to educate other roadway users about safe micromobility usage.

Community partnerships offer educational value in communities primarily served by shared micromobility. Particularly in towns with high tourism rates, it is important that education efforts reach visitors as well as residents. As local laws vary among municipalities, local authorities can collaborate with community partners and shared mobility providers to provide information stations and even staff or volunteers in strategic locations to help visitors to learn the local rules related to micromobility devices, their rights as a micromobility user, and their responsibilities.

Community partnerships and events also offer the opportunity to engage with roadway users who do not currently use micromobility devices and may never. As mentioned above, crashes with motor vehicles represent the highest risk of severe injuries for micromobility users. Through these partnerships and events, motor vehicle drivers can be made to understand that micromobility users, as well as pedestrians and bicyclists, have a right to use the road. Education can emphasize the difference in size and weight between a motor vehicle and a micromobility device and highlight best practices and safety information that can be used to help keep all roadway users safe.

Local authorities can work with shared micromobility providers, community groups, and other stakeholders to develop and distribute printed information in multiple languages and share information digitally. Distribution through social media, municipal newsletters, etc. provides an opportunity to distribute information regarding micromobility education, motor vehicle driver education, laws, and local regulations described visually using simple language through infographics.

Increased signage can help micromobility riders comply with local regulations and encourage safe usage. Also, wayfinding signage can help micromobility users, especially visitors, find the streets, bike lanes, shared streets, or less busy roads where they can ride more comfortably, helping to minimize conflicts. Finally, signage targeted toward motor vehicle drivers could increase their awareness of the presence of micromobility devices in a community, clarify the driver's responsibility to be cautious, and help them to understand the laws that enable and help to ensure safe micromobility usage on the road.

Device showing local and basic rules in Newark, NJ

New Brunswick, NJ

VII. Next steps

Micromobility devices and shared systems offer new opportunities for people to meet their daily transportation needs. Micromobility not only has the potential to replace local motor vehicle trips, but it can also help people to overcome distance barriers that prevent them from taking mass transportation, greatly enhancing local networks. At the same time, while most micromobility trips end without incident, considerable remains to be done to improve safety for micromobility users. While there have been many studies regarding safety related to micromobility, most of the efforts targeted toward improving safety have focused on micromobility regulation. Efforts targeted toward education remain uncoordinated and not well documented. Pedestrian and bicycle education models offer a starting platform and base of knowledge for micromobility education to start development. Opportunities should be sought to incorporate information regarding the use of micromobility devices such as e-scooters and e-bikes into existing youth bicycle and pedestrian education, including on-device education about the rules of the road and safety gear. Research regarding micromobility device use and travel by children and teenagers and continued research into best practices in education and educational materials including on-bike or on-scooter education videos and lesson plans will remain essential as micromobility continues to grow and expand.

Asbury Park, NJ

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- **eScooter Infographic:** https://nabsa.net/wp-content/uploads/2019/06/PBOT-E-Scooter-Infographic-translated.pdf
- **eScooter Do's & Don'ts:** https://www.chicago.gov/content/dam/city/depts/cdot/Misc/EScooters/Chicago%20E-Scooter_Do's%20and%20Don'ts_FLYER_English20190705updated.pdf
- **Streetcar & Electric Scooter Safety (video):** https://vimeo.com/292980933
- **Dockless Video Parking (video):** https://www.youtube.com/watch?v=_KphZveCjNg
- **Bird's Safety Tips S.H.A.R.E.** http://safestreetstour.com/#share
- **E-Scooter safety (videos):**
  - https://www.youtube.com/watch?v=5CBxr3s9nqM
  - https://www.youtube.com/watch?v=Z3A6CNku5LM
- **Ultimate Safety Guide: Electric Scooter Safety** https://electric-scooter.guide/safety/ultimate-guide-electric-scooter-safety/#:~:text=You%20should%20always%20wear%20a,more%20protective%20for%20higher%20speeds.
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