Urban Bikeway Design Guide

WORKING PAPER

Shared Micromobility Permitting, Process, and Participation

December 2022

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NACTO Affiliate Member Representative

Working Group Contributors

Ashley Finch, *Atlanta DOT*
Meg Young, *Baltimore City Department of Transportation*
Russ Brooks, *Minneapolis Department of Public Works*
Sean Wiedel, *Chicago Department of Transportation*
Laura Hardwicke, *City of Orlando*
Bryan Nguyen, *Portland Bureau of Transportation*
Liza Farr, *City of Providence, RI*
Kristin Bennett, *City of Grand Rapids, MI*
Rachel Ruhlen, *City of Fort Collins, CO*

NACTO Project Team

Cary Bearn, *Senior Program Manager*
Zabe Bent, *Director of Design*
Kate Fillin-Yeh, *Director of Strategy*
Alex Engel, *Senior Manager, Communications*
Celine Schmidt, *Visual Communications Manager*
Ana Bercovich, *Graphic Design Consultant*
Corinne Kisner, *Executive Director*

Technical Contributor

Alta Planning + Design

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Updating the *Urban Bikeway Design Guide*

Shared Micromobility Permitting, Process, and Participation is one of seven Working Papers being released by NACTO as part of the ongoing update to the NACTO *Urban Bikeway Design Guide*. The working papers will cover topics related to equitable planning, engagement, and implementation. The papers will help inform project delivery concerns and policy considerations that should accompany the design updates in the guide. NACTO will develop a complete update to the *Urban Bikeway Design Guide* in 2023 by synthesizing these working papers with state-of-the-practice design guidance.

Making Bikes Count: Effective Data Collection, Metrics, & Storytelling

Breaking the Cycle: Reevaluating the Laws that Prevent Safe & Inclusive Biking

Shared Micromobility Permitting, Process, and Participation

Planning and Implementing Equitable Bike Networks

Scaling Success: Moving from Pop-up to Permanent

Toward Equitable Access: Community Engagement Tools & Practices

Designing For Small Things With Wheels

Source: Seattle Department of Transportation

Shared Micromobility Permitting, Process, and Participation

PART I: INTRODUCTION

Over the past decade, shared micromobility has become an integral part of transportation systems throughout North American cities. Cities have established strong shared micromobility programs by setting clear goals that guide key decisions like selecting a regulatory framework, determining system size, and establishing the bounds of an expansion. To be effective, city staff and leadership must connect broader city goals to specific shared micromobility outcomes. For example, a city's safety goals could support a program that invests in promoting the safe use of bikes and e-scooters. Alternatively, a city's affordability goals can support a program that regulates or subsidizes micromobility trip prices.

Thoughtful regulations are important tools for aligning public benefit and private profit.

Some of the metrics used to measure a city's goals for the program will likely differ from the metrics used to measure an operator's goals (for example, a city goal might be measured in ridership whereas an operator goal might be measured in revenue), but overall program goals need to align in support of a viable program that provides equitable transportation options for residents. Thoughtful regulations are important tools for aligning public benefit and private profit.

One of the keys to making shared micromobility a durable and effective part of a city's transportation system is ensuring that it is reliable–that a device (e.g. bike or e-scooter) can be counted on to be within short walking distance of where people make trips. Dependable systems with a large number of bikes/e-scooters within a short walking distance ensure access to many neighborhoods.

Trends in dockless shared micromobility have been emerging and shifting in recent years. This paper identifies recent trends in managing dockless shared micromobility and supplements NACTO's 2019 Guidelines for Regulating Shared Micromobility. For each recent trend, this paper discusses why the trend is prevailing and what to watch out for as these trends evolve. Although these trends are most prevalent among dockless systems, the considerations in this paper are relevant industry-wide.

What is shared micromobility?

Shared micromobility systems are shared-use fleets of micromobility devices–typically non-electric pedal bikes, pedal-assist electric bikes (e-bikes), and e-scooters–rented for short, point-to-point trips that start and end within the public right-of-way. Most systems utilize one of two primary strategies for where people can start and end trips: station-based or dockless.

Source: BeyondDC

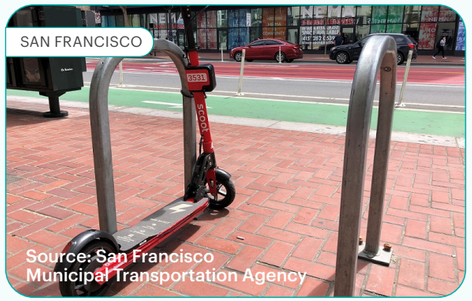
To use a **station-based system**, riders must start and end trips at stations or hubs. In some station-based systems, often referred to as **hybrid** or **smart-bike systems**, users are allowed to end trips away from stations or hubs for an additional out-of-hub charge.

Successful station-based systems require a high level of investment in station infrastructure.

To use a **dockless system**, riders can pick up and drop off devices from within the public right-of-way. Local regulations vary, but most will prohibit leaving devices in a way that blocks pedestrian access or other important infrastructure. Areas with wide furniture zones and frequent bike racks can accommodate more dockless devices with fewer compliance issues. Some dockless systems, often referred to as **lock-to systems**, require users to lock-to a bike rack or other physical object at the end of a trip.

Successful dockless systems require high investments in compliance monitoring and enforcement. Cities should ensure regulations support practical use throughout the service area; if regulations are too restrictive, ending trips could become illegal in portions of the service area.

Source: Jordan Samson, Seattle Department of Transportation



Source: San Francisco Municipal Transportation Agency

What is a hub or station?

Station-based bike share systems typically rely on docking stations or marked hubs. Dockless systems don't require hub infrastructure, but they often include some sort of hub in designated areas. Incentives like ride discounts or out-of-hub fees can encourage people to end trips at stations or hubs as part of both station-based and dockless systems.

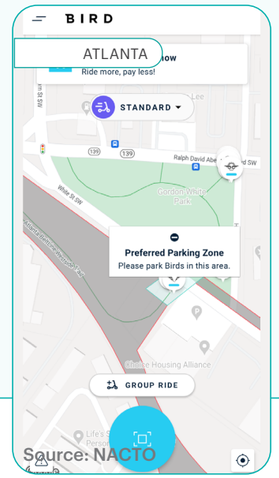
The following stations and hubs are common features of shared micromobility systems.

Source: Mark Bennett, Sam Schwartz

Docking stations: Docking stations include docks for the exclusive use of the shared micromobility system. Although docking stations are most commonly used for station-based bike share, some e-scooter share systems also include docking stations. In Chicago, Divvy Bikes modified docking stations to accommodate both bikes and e-scooters.

Source: Dorret Oosterhoff

Marked hubs: Marked hubs are areas for storing shared micromobility devices designated by sidewalk or on-street pavement markings. They may or may not include vertical signage and racks for devices to lock-to and are typically also represented within the app.



Source: NACTO

Virtual hubs: Virtual hubs do not have physical signage or markings, but are designated in the system map within the app as a hub for leaving devices.

NACTO's Bike Share Station Siting Guidance includes details that are relevant for siting marked and virtual hubs as well docking stations.

Short history of shared micromobility in the U.S.

In just over 10 years (2010-2021), city residents and visitors took more than 500 million trips on shared bikes and e-scooters across the U.S. This growth in a new mode of transportation has come in three distinct stages:

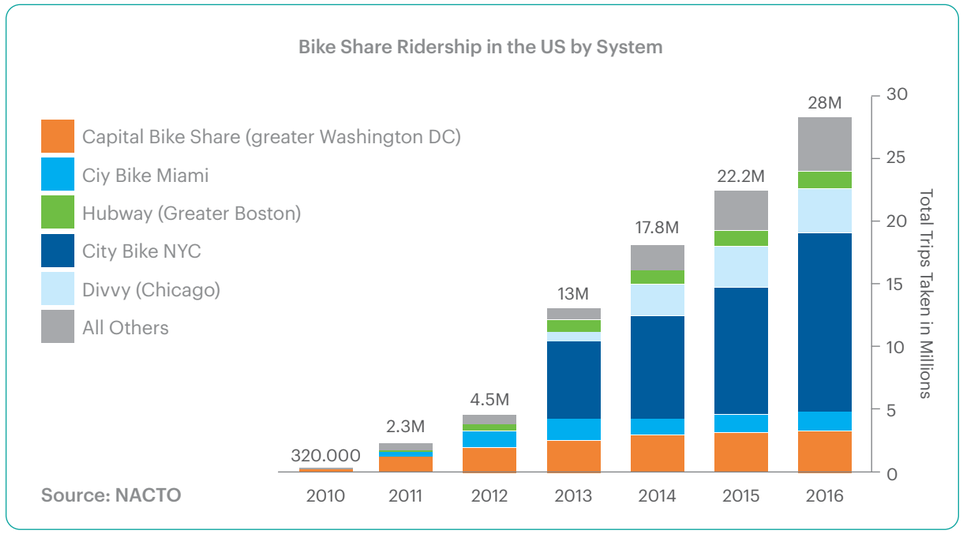
Stage 1: Cities launch station-based bike share

Stage 2: Private companies flood streets with dockless systems

Stage 3: Cities build regulatory models to sustain public-private partnerships

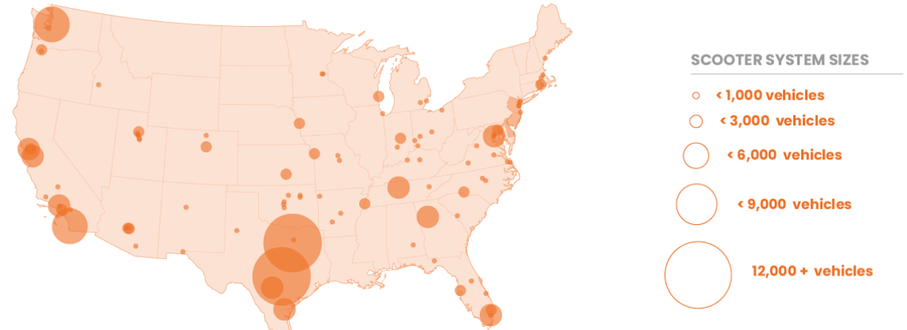
Stage 1: Cities launch station-based bike share (2009-2017)

After successes in Europe, bike share started expanding into North America. During this era, BIXI Montréal (launched in 2009) was the North American industry leader, helping cities in the U.S., Canada, and Mexico make the case for investing in bike share. Cities that launched during this period conducted extensive community engagement to build familiarity and support for these systems. In 2017, users took 35 million trips on bike share systems across the U.S., a 100-fold increase from 321,000 trips in 2010. These programs were largely city-initiated programs with private or non-profit operators contracted to run a station-based bike share program.



Stage 2: Private companies flood streets with dockless systems (2018-2020)

By the end of 2018, private, venture-capital backed companies launched dockless bike and e-scooter share programs in at least 100 U.S. cities with little-to-no regulation or coordination with local governments. Dockless systems require no station infrastructure and were often deployed overnight without any notification to cities. In response, cities developed regulatory mechanisms to pilot and permit these companies and services.



As the COVID-19 pandemic forced stay-at-home orders, service was suspended in two-thirds of the dockless systems and half of the station-based systems across the U.S. Ridership on station-based bike share systems (generally operated in a public-private partnership model) dropped 24% in 2020, compared to a 64% drop in trips on dockless e-scooters and bikes (which had not, until recently, been as closely managed by cities). Cities that kept their systems running demonstrated that resilient, well managed shared micromobility programs are a critical component of the transportation system. In August 2020 in Chicago, Divvy Bike set a new record high of 612,928 trips in a month and in September 2020 in the greater Boston area, Bluebikes set a record high of 14,403 trips in a single day.

Stage 3: Cities build regulatory models to sustain public-private partnerships (2021 - present)

During the second year of the pandemic, trips began to rebound and in 2021, people took 112 million trips on shared micromobility bikes and e-scooters only 18% less than the all time high in 2019. With bike and e-scooter share systems established as valuable transportation modes, cities continue to update regulations to develop stronger partnerships with operators. This paper discusses recent trends and how they are starting to define this era–largely one with new regulatory models to sustain longer-term (and less volatile) public-private partnerships.

PART II: TRENDS IN REGULATING SHARED MICROMOBILITY

In recent years, three trends have reshaped how shared micromobility programs operate in North America.

Electrification: many operators have electrified their fleets, offering users the option to ride e-bikes or e-scooters.

Goal-based selection: especially in jurisdictions with multiple shared micromobility operators, cities have undertaken processes to proactively select operators whose goals can better align with the city's own goals.

Expanded regulations to organize devices: cities are implementing context-sensitive zonal regulations to ensure that sidewalks, trails, and bike lanes are clear of discarded micromobility devices.


Source: Elvert Barnes - elvertxbarnes.com/2022

Shared micromobility is electrifying

With the rapid growth of e-scooter share systems in 2018 and 2019, the shared micromobility industry made a significant move toward electrification. During that same time, e-bikes also became more prevalent. By the end of 2021, over 70% of bike share systems in the U.S. included e-bikes, and e-bikes made up 25% of all bike share bikes available across the U.S. To electrify shared micromobility fleets, some systems, like Biketown in Portland, OR, launched or relaunched fully electric programs while others, like Nice Ride in Minneapolis, MN, added e-bikes and e-scooters to a system with non-electric pedal bikes.

E-bikes and e-scooters are undeniably popular and they will only become more prevalent as states and regions build incentive programs for e-bikes. When affordable, e-bikes are very popular as part of shared micromobility systems, supporting a higher share of trips than a pedal bike. In New York City, where e-bikes constitute just 20% of the Citi Bike fleet, nearly a third of all trips from 2020-2021 took place on an e-bike. In Washington, DC, 23% of trips from 2020-2021 were made on e-bikes despite e-bikes only making up 13% of the Capital Bikeshare fleet. For some bike share users, electrification can make bike share more accessible by lowering physical barriers to bicycling. Incorporating e-bikes and e-scooters into a shared micromobility fleet adds choice and is an important component of expanding access.

Considerations

Affordability across all income-ranges: Discounted pricing options available to qualifying low-income residents are a common and important part of shared micromobility affordability. However, these programs do not address affordability for users who do not qualify for discounted pricing, most of whom may be price sensitive as well. Without a membership or discount, shared e-bike and e-scooter trips can be more than double the cost of a transit trip. Prices for a 30-minute e-bike or e-scooter trip range from less than $3 to almost $20[1]. As a result, cities may find themselves with a mode that is only available to higher income riders. To address this issue, cities can:

- Prohibit companies from raising the price during a specified time period (i.e., no surge pricing or monthly price increases) and require city approvals for all price increases.
- Cap trip prices at a maximum dollar amount per hour or for all trips beginning or ending in priority areas.
- Create a monthly pass option to reduce costs for frequent riders.
- Monitor costs and price over time and collaborate with operators on strategies to reduce trip costs without sacrificing the viability of the system.

Ensuring e-bike availability: E-bikes are more expensive to operate due to additional charging requirements. Cities will have different market potential for e-bikes based in large part on the number of trips and risk of vandalism. Cities with low ridership or high vandalism rates may need to consider incentivizing or subsidizing e-bikes to ensure the program remains viable. To provide a more cohesive service, larger regions with multiple jurisdictions can work together to negotiate as a region instead of as individual jurisdictions.

Source: Austin Transportation Department

Austin-based artist, Jesse Melanson, transformed 20 MetroBike stations and over 200 e-bikes with geometric art designs

[1]Prices vary by city, but typical walk-up pricing for e-bikes and e-scooters is $1-$4 to unlock plus $0.05-$0.49 per minute.

Cities are shifting to goal-based selection

In the early years of bike share in North America, cities contracted a single operator to manage the city-initiated bike share program for as many as 5-10 years. As dockless programs proliferated, many cities created one-year, open permit programs, leading to situations where an unlimited number of operators could be permitted in the same city at the same time. In recent years, cities used pilots and open permits as a temporary regulatory framework before shifting to longer term agreements with fewer operators. The selective permit model, and to a greater extent, single-operator contracts increase city involvement, control, and accountability for outcomes.

Open License	Limited License	Limited License Strong Oversight	Multi-Operator Partnership	Single-Operator Partnership	Municipal Program
Any eligible operator can receive a license if they meet the license terms	Any eligible operator can apply for a license, but limited number available (granted either first-come-first-serve or competitive process)	Any eligible operator can apply for a license, but limited number available; City works closely with operators to regulate service	Competitive process used to select operators for multi-year contracts to partner with City in developing and operating a program	Competitive process used to select one operator for multi-year contract to partner with City in developing and operating a program	City develops and operates program with internal resources and owns infrastructure; City may contract out for support services

Increasing City Involvement, Investment, Ownership, Control and Accountability for Outcomes

Source: Mark Bennett, Sam Schwartz

For example, after allowing up to seven operators during a shared micromobility pilot, Denver's Department of Transportation & Infrastructure issued 5-year licensing agreements to only two operators in 2021. In 2019, the City of Atlanta issued permits to nine companies before pausing the permit program. A selective permit process in the City of Baltimore permitted three-to-four companies per year since 2019. The City of Baltimore issues one-year permits, but reduces administrative burden and improves program continuity by creating a permit renewal process for companies that perform well.

When selecting operators, cities should consider what value each operator contributes to the program individually and in combination. For example, in some cases, cities may want multiple operators to increase the variety of devices available; in other cases, a city may want to prioritize having just one operator with a track record of strong operations. Regulatory and managerial complexity increases with the number of operators and some of the benefits of more operators begin to erode when the total number of operators goes above three or four.

Benefits of...	
Longer agreements and fewer companies	**Shorter agreements and more companies**
Improves market attractiveness With fewer operators, each operator has the potential to capture a higher portion of the market resulting in more trips and higher revenue. With more revenue, operators may have more resources to partner on city goals. Longer agreements give operators a higher level of confidence in the local market supporting more investment in local operations and infrastructure.	**Allows cities to learn about the local market** During the first year of a program, multiple operators over a short period of time can help program administrators learn about the industry, observe how different companies operate, and refine strategic program goals.
Reduces pressure on high demand areas Within high demand areas, each company deploys redundant devices in an attempt to capture as much of the demand as possible. Reducing the number of operators will reduce the number of redundant deployments. Fewer devices can reduce impacts on sidewalk clearance and accessibility.	**Diversifies risk** With shorter agreements and multiple operators, the city is less committed to any single operator and will be able to maintain the shared micromobility program even if a single vendor goes out of business or decides to leave the market.
Simplifies the user experience Users have fewer operators to learn about over time and fewer apps to monitor on a daily basis.	**May provide users with more device types to choose from** Some users will prefer certain device options (e.g., sit-down e-scooters, e-bikes). Cities could select additional operators to satisfy a local market need.
Streamlines program administration With fewer operators and longer agreements, staff can spend more time monitoring, enforcing, and improving the program.	

Considerations

Evaluating technology: During a selective permit application or procurement process, prospective operators may exaggerate their technology or operational capacity to increase the chance of being selected. Cities should do their own research on how operators have performed and what is feasible or realistic by reaching out to other cities and holding a demonstration day before selecting preferred operators. Cities must hold operators accountable to the terms in the permit through program evaluation and enforcement.

Limiting operators: Limiting the number of operators often means excluding one or more interested operators from the local market. Procurement processes are typically resilient to appeals, but permit programs may need additional attention to ensure they are appropriately designed. In most cases, operators need a way to be able to appeal the selection process if they have legitimate complaints and cities need a process for reviewing and evaluating the legitimacy of the appeal. To minimize the risk of legal delays, cities should:

- **Work with legal teams as early as possible to strengthen the program at every step**. Include legal review throughout the program development and especially when drafting the appeals process and any selection criteria or scoring elements. Ensure lawyers have expertise related to managing a variety of elements in the public right-of-way (e.g., transportation, vending, advertising, rideshare/taxis) as well as lawyers with expertise related to procurement and permitting. Sometimes the lawyer with the right expertise may work for a different city department.
- **Establish the authority to limit the number of operators through a transparent and defensible process**. For example, use legislation to empower the department head to issue a limited number of permits at their discretion or include the desired number of operators in the permit application, legislation, or other regulatory agreements.
- **Define formal appeal procedures**. Have permit applicants agree to the details when submitting applications.

New York City Department of Transportation announces selected e-scooter share operators

Expanded regulations are organizing streets

While the initial allure of dockless systems was the flexibility to pick up or drop off devices anywhere and everywhere, cities and companies alike have found that there is value in establishing designated pickup and dropoff areas. Increasingly, cities with dockless shared micromobility programs use a combination of regulatory, administrative, and infrastructure tools to better organize devices. Some cities limit where operators can deploy and where users can end trips by only allowing devices in designated locations. Other cities incentivize (or disincentivize) leaving devices in certain areas through the use of fees.

Physically organizing devices within dockless systems supports operators and users. Operators can more efficiently collect and deploy devices at designated locations and users can be more confident that a device and a place to end the ride will be available on both ends of a trip. If using zones to manage pickup and dropoff options, cities should take care to ensure that the zones, and their differing regulations, are clear to users and operators. Too many zones may make a system overly-complicated, unfriendly, and difficult for people to use.

Cities use regulatory tools to help organize dockless systems on their streets. These include:

- Lock-to requirements
- Required deployment locations
- Hub zones
- Dockless zones
- Required service areas
- No deployment zones
- Prohibited zones

Crews install marked hubs at street level

Considerations

Prioritizing on-street options: The street, where people are already riding, is the best place for shared micromobility pick-up and drop-off. Many neighborhoods that have incomplete or narrow sidewalks and no furniture zones may also have abundant street-parking for motor vehicles. To support dockless shared micromobility in these areas, cities should consider all options, including: allowing lock-to at light poles and street signs; allowing dockless devices in striped bulb outs; and investing in designated on-street corrals. Consider marking on-street corrals in metered motor vehicle parking space or allowing operators and users to leave devices in unmetered street-parking spaces.

Managing compliance: The zonal organization of devices requires a higher level of effort from operators to maintain organization. It is the city's responsibility to monitor compliance with these regulations. Cities can collaborate with operators to balance operational intensity with deployment goals.

Strategies for organizing pick-up & drop-off

- **Lock-to requirement:** Requiring users and operators to lock devices to bike racks and other sign posts can reduce sidewalk clutter. Successful lock-to operations requires a dense network of bike rack infrastructure throughout the entire system area.
  - The City of Sacramento implemented a lock-to requirement after installing 7,000 bike-parking spaces and 35 marked hubs across the service area.
- **Required deployment locations:** Cities can help operators reduce clutter by requiring deployments only at specified locations. This is different from a hub-based zone because the system will remain dockless for users. Requiring deployments in specific locations can be helpful system-wide, in high demand areas, or in equity focus areas. Identify these locations in collaboration with local communities and businesses. Part III: Supporting shared micromobility, below, includes additional details on collaborating with communities.
  - The City of Long Beach uses required deployment locations for operators system-wide, but users can leave devices anywhere in the service area that meets standard requirements.
  - The Baltimore City Department of Transportation uses required deployment locations to support equity goals by requiring a minimum deployment of 3 devices in each of twenty equity zones and a percentage of the fleet in every district of the city.
- **Hub zones:** Dockless or lock-to systems may create hub zones to organize devices in high demand areas. These hub zones are areas in which users can only end trips in designated hubs. Temporary hub zones can be set up for special events to better organize devices during games or concerts. Successful permanent hub zones need a dense network of walkable hubs.
  - The City of Atlanta Department of Transportation created a hub zone along the Atlanta BeltLine, a popular path for biking and walking, to only allow devices at designated access points.
- **Dockless zones:** Station-based or lock-to systems may create dockless zones to expand coverage around the edge of the service area or provide flexibility by waiving any out-of-hub fees in equity focus areas.
  - To make the system more accessible in east Portland, Oregon, Biketown waives a $1 out-of-hub fee creating a dockless zone known as the East Portland Super Hub Zone.
- **Required service areas:** Cities can require a certain level of deployment outside of high demand areas or in equity focus areas. The larger the required deployment area is, the more success depends on the operator's specific deployment decisions.
  - The District Department of Transportation in Washington, D.C., requires dockless operators to serve all eight wards without exceeding 35% of the permitted fleet in any single ward.

- **No deployment zones:** In popular destinations where overcrowding is likely to occur or where private property owners request, cities can prohibit deployments while still allowing users to end trips in that area. This keeps the overall number of devices in the area down, but still allows access to these areas.
  - The City of Santa Monica prohibits deployments in busy pedestrian areas and only allows users to leave devices at bike racks or other designated areas within these zones.
- **Prohibited zones:** These areas do not allow riding, ending trips, or both. Over relying on prohibited zones may limit the functionality of the program, but can be helpful in areas of very high pedestrian use or immediately adjacent to sensitive land uses (e.g. waterways or conservation areas).
  - The New York City Department of Transportation set up prohibited zones in the e-scooter share pilot to limit use within hospital campuses, sports complexes, and outside the pilot area.

Source: Marketa Jancar

PART III: SUPPORTING SHARED MICROMOBILITY

Committing to equitable shared micromobility means investing in supportive programs. Strong shared micromobility programs are grounded in core operational elements that ensure a dense network of bikes are affordable and physically accessible. Equitable access to shared micromobility also requires that people across the service area know how to use the system and have safe places to ride.

To best support equitable shared micromobility programs, cities should:

- Collaborate with communities
- Invest in safer streets

Collaborate with communities

Strong community collaboration strategies are foundational components of equitable shared micromobility. During the emergence of North American station-based bike share systems in the 2010's, cities developed extensive engagement efforts that blended planning for bike share with the city's multimodal goals, safety priorities, and bike network needs. Similar efforts can be adapted to support permitted programs, dockless programs, and station-based system expansions.

Bike share planning workshop in New York City

Create a collaborative planning process

Prioritize public input as early as possible to inform the vision of the program and incorporate feedback from stakeholders throughout the program development and station siting (if relevant for the program). Mix strategies and create opportunities for in-depth discussions at workshops and conversations at popular events and festivals.

During the launch of Citi Bike, the New York City Department of Transportation developed a multi-year participatory planning effort designed to hear from a diverse set of community members and stakeholders. In addition to 159 public meetings and workshops, the city held 21 multilingual in-street demonstrations of how bike share would work and hosted online engagement tools that, at its peak, received 1,200 visits per hour.

Indego ambassador hosts a community resource fair

Support on-the-ground engagement teams

Hiring local ambassadors or liaisons who know, and are known, within the local community is one of the most effective ways to share information about a shared micromobility program. The most successful on-the-ground teams are paid and supported by a city staff member who oversees the program.

The City of Philadelphia has worked with local ambassadors since launching in 2015. To support an ongoing system expansion, the City of Philadelphia's Office of Transportation, Infrastructure, and Sustainability (oTIS) and Indego Bike Share hired Expansion Liaisons to support collaboration with communities during the multi-year expansion effort.

Operators sponsor wheelie competition in Baltimore

Establish strong partnerships

Cities with short duration operating agreements (e.g., only 1-2 years) may find that requiring a company to conduct a certain amount of engagement has minimal impact and can become a check-the-box or marketing exercise. To successfully collaborate on engagement, both the city and the operator(s) need to invest in the effort. Cities should require and reward operators for attending events and working with communities directly. Cities should understand that private operators are best at marketing activities like helmet giveaways and promoting discounted rides. To conduct equitable community engagement, city staff may need to develop and fund a supplemental engagement strategy working with internal experts or local community based organizations. Regulatory frameworks that give the operator a higher market share and longer term agreement may support more collaboration on engagement.

Invest in safer streets

To support shared micromobility as a convenient and comfortable option, cities need to equitably expand their All Ages & Abilities bike networks and reevaluate laws that prevent safe and inclusive biking.

Build more (and better) bikeways

Expanding the bikeway network enhances safety benefits and supports higher ridership, but many streets still do not include dedicated space for micromobility. People will choose to ride where they feel safest and most comfortable - which may be in the street with motor vehicles, in a bikeway, on the sidewalk, or on a shared path. Cities should prioritize street improvements at high conflict locations and not rely on enforcement.

Investing in bikeways can reduce sidewalk riding immediately. On 10th Street in Atlanta, city staff found that under normal conditions, 1 in 3 people on bicycles and e-scooters choose to ride on the sidewalk. When the city implemented a week-long pop-up bikeway, however, staff found that only 1 in 15 people chose to ride on the sidewalk. Similarly, before a protected bikeway was installed on Prospect Park West in Brooklyn, half of riders chose to bike on the sidewalk. After the protected bikeway was installed, fewer than 3% of riders chose to ride on the sidewalk.

Source: Seattle Department of Transportation

Pilot reduced speed zones

In cities with popular e-scooter share options, potential conflicts with pedestrians may be intensified due to higher speed differentials. As cities are prioritizing street improvements to address these concerns, shared micromobility programs can reduce conflict severity by creating reduced speed zones.

Reduced speed zones are not speed limits and do not involve enforcing people's behavior. People on personally owned e-devices and any non-electric device will not be impacted by a reduced speed zone. Reduced speed zones are areas where the city requires operators to limit the maximum speed of specific, shared electric devices. These zones should only be used in areas where micromobility devices are the fastest users and never in spaces shared with cars. For example, the Baltimore City Department of Transportation set a reduced speed zone that requires operators to limit device speeds to 8 mph in the busy Inner Harbor Promenade, a space shared with people walking. Operators must allow full speed operations along the bikeway that passes by the Harbor Promenade, preserving the transportation benefits of shared micromobility in this area.

Reduced speed zones are not a substitution for investing in dedicated bikeways along busy sidewalks or shared use paths. City staff should use the data from their shared micromobility program to make the case for better bike infrastructure both internally and with the public.

Source: Dorret Oosterhoff

Alongside the Harbor Promenade reduced speed zone, Baltimore allows full speed operations in the bikeway

PART IV: RESOURCES FOR MANAGING EQUITABLE SHARED MICROMOBILITY

The following section provides additional resources for shared micromobility. While many of the resources are focused on bike share systems, the findings also apply to e-scooter share systems.

NACTO resources

NACTO's shared micromobility work is supported by the Better Bike Share Partnership, a collaboration between NACTO, People for Bikes, and the City of Philadelphia, funded by the JPB Foundation.

1. NACTO's Shared Micromobility Snapshots are annual reports on the number of shared micromobility trips in the U.S.:
    - *Bike Share in the U.S.: 2010-2016*
    - *Bike Share in the U.S.: 2017*
    - *Shared Micromobility in the U.S.: 2018*
    - *Shared Micromobility in the U.S.: 2019*
    - *Shared Micromobility in the U.S.: 2020 & 2021*
2. *Breaking the Cycle: Reevaluating the Laws that Prevent Safe and Inclusive Biking* (2022) includes research on how laws regulating how people can ride bikes often fail to improve safety while leading to harmful over-policing that disproportionately punishes Black, Latine/x, low-income, and unhoused bike riders.
3. *Making Bikes Count: Effective Data Collection, Metrics, & Storytelling* (2022) includes additional guidance on telling compelling stories with data.
4. *Guidelines for Regulating Shared Micromobility* (2019) outlines regulatory elements for setting up shared micromobility pilots and permits.
5. *Strategies for Engaging Community* (2018) provides guidance for practitioners seeking to build meaningful relationships with communities they serve as they plan for and operate bike share systems.
6. *Bringing Equitable Bike Share to Bed-Stuy* (2017) is a case study for how equitable collaboration with communities can support higher system utilization.
7. *Bike Share Station Siting Guide* (2016) provides a high-level guidance on station siting principles.

8. *Bike Share Intercept Survey Toolkit* (2016) supports cities in conducting surveys to learn more about how people use shared micromobility.
9. *Equitable bike share means building better places for people to ride* (2016) includes additional research on how building safer places to ride supports equitable shared micromobility.
10. *Can Monthly Passes Improve Bike Share Equity?* (2015) explores the impact of pricing structures on sign-up rates, particularly in low-income communities.
11. *Walkable Station Spacing is Key to Successful, Equitable Bike Share* (2015) presents analysis of establishing walkable station density as a key component of equitable bike share.

Other resources

Brown, Howell, Creger. 2022. *Mobility for the People: Evaluating Equity Requirements in Shared Micromobility Programs*. Transportation Research and Education Center (TREC) at Portland State University.

Desjardins, Higgins, and Páez. January 2022. *Examining equity in accessibility to bike share: A balanced floating catchment area approach*. Transportation Research Part D: Transport and Environment, volume 102.

Dill, Ma, McNeil, Broach, and MacArthur. 2022. *Factors influencing bike share among underserved populations: Evidence from three U.S. cities*. Transportation Research Part D: Transport and Environment, volume 112.

Institute for Local Government. 2015. *Partnering with Community-Based ORganizations for More Broad-Based Public Engagement*.

MacArthur, McNeil, and Broach. 2020. *National Scan of Bike Share Equity Programs*. Transportation Research and Education Center (TREC) at Portland State University.

McNeil, Broach, and Dill. 2018. *Breaking Barriers to Bike Share: Insights Equity*. Transportation Research and Education Center (TREC) at Portland State University.

Shared Use Mobility Center. 2019. *Equity and Shared Mobility Services: Working with the Private Sector to Meet Equity Objectives*.