To: Kim Wever, C/CAG

From: Libby Nachman, Alta Planning + Design

Date: June 09, 2022

Re: **San Mateo County Shared Micromobility Feasibility Study | Best Practices Memo**

Introduction

The following memorandum summarizes best practices for a shared micromobility system in San Mateo County based on a review of relevant case studies. The memorandum focuses on key considerations requested by C/CAG and the members of the Ad Hoc Advisory Group, and based upon Alta's expertise.

The project team identified three peer systems for review, with a focus on regional or countywide systems that operate in or across multiple jurisdictions, which are the most applicable to a future system in San Mateo County. The three systems are: Bay Wheels in the San Francisco Bay Area, ValleyBike Share in the Pioneer Valley region in Massachusetts, and Sacramento Regional Bike Share.

Peer System Comparison

Case Study #1: Bay Wheels

Location	SF Bay Area, CA
	• San Francisco
	• San José
	• Oakland
	• Berkeley
	• Emeryville
Population[1]	• San Francisco: 874,784
	• San José: 1,029,409
	• Oakland: 422,575
	• Berkeley: 123,065
	• Emeryville: 11,679
Owner/Operator	Lyft (exclusive contract for bike share)
Start of Service	2015
System Type	Hybrid
Number of Stations/Hubs	550 stations
Number of Bikes	7,000+ bikes

[1] American Community Survey (ACS) 2020 5-year estimates

About the System

Bay Wheels is a regional bike share system, launched in 2015, serving the San Francisco Bay Area, including the Cities of San Francisco, San José, Oakland, Berkeley and Emeryville. The initial pilot, launched in 2013, included three jurisdictions along the Peninsula (Redwood City, Palo Alto and Mountain View) but these jurisdictions were not brought into the final coordinated system.

The system is a partnership between the Metropolitan Transportation Commission (MTC), the five municipalities, and Lyft. The program offers discounted memberships for eligible low-income individuals through its "Bike Share For All" program. In this program, eligible individuals can sign up for a one-year pass for $5, and can pay $5/month after the initial one year. Lyft also allows cash payment and payment with a prepaid debit card.

The system is integrated with the regional transit card, Clipper, allowing registered members to unlock bikes using their card.

System Governance

The system is owned and operated by Motivate (a subsidiary of Lyft, acquired in 2018). MTC, the Bay Area's MPO, has a Program Agreement with Lyft that outlines the broad requirements of the bike share program. The Program Agreement outlines requirements for the scope of services, key performance indicators (KPIs), liquidated damages, program area, program size, program expansion, maintenance, operations, advertising, sponsorship, revenue sharing, price schedules for memberships, marketing, website, security fund, indemnity, insurance, termination, default, employment, disputes, etc.

MTC, Lyft and the five participating member jurisdictions have a Coordination Agreement that outlines the detailed requirements of member jurisdictions' coordination with Lyft. The Coordination Agreement outlines the details of a steering committee and member communities' responsibilities regarding permitting, CEQA compliance, summary of local activities, and notifications to MTC.

San Francisco and San José also have their own agreements with Lyft regarding hybrid e-bikes. The agreements are between each city and Lyft, and make clear requirements for Lyft in order to deploy e-bikes. The agreements outline details such as bicycle component requirements, fees, number of bikes, e-bike-specific KPIs, etc.

All entities are responsible for their own costs; this means that MTC and the local jurisdictions do not pay Lyft, and Lyft does not share revenues with the public agencies with the exceptions for fees related to e-bikes.

Case Study #2: ValleyBike Share

Location	Pioneer Valley, MA
	• Amherst
	• Easthampton
	• Holyoke
	• Northampton
	• South Hadley
	• Springfield
	• Chicopee
	• West Springfield
Population	• Amherst: 39,995
	• Easthampton: 15,930
	• Holyoke: 40,161
	• Northampton: 28,552
	• South Hadley: 17,715
	• Springfield: 153,677
	• Chicopee: 55,186
	• West Springfield: 28,527
Owner	Shared ownership between participating communities (public ownership)
Operator	Bewegen Technologies (exclusive contract)
Start of Service	2018
System Type	Docked
Number of Stations/Hubs	74 Stations (20 more planned within 18 months)
Number of Bikes	720 e-bikes (will add about 190 more within 18 months)

About the System

ValleyBike Share is a bike share system that currently serves University of Massachusetts and the communities of Amherst, Easthampton, Holyoke, Northampton, South Hadley, Springfield, West Springfield, and Chicopee, MA. The system plans to expand to Westfield later in 2022. Interest in the system began in 2008, though planning in earnest did not begin until 2014 when PVPC hired Alta to lead the Pioneer Valley Bike Share Feasibility Study. The system received $1.3 million from the federal Congestion Mitigation and Air Quality (CMAQ) Program in 2017, before launching in 2018 in five communities. In late 2018, a sixth community joined after receiving a Massachusetts Housing Choice grant. ValleyBike received a second CMAQ grant in 2019 to fund the system's 2021 expansion, which added about 21 stations, 300 bicycles, and two new communities.

ValleyBike has successfully created a bike share system that spans vastly different communities. Different populations served by the system include high-income and low-income communities, communities with large student populations, communities with large refugee populations, multilingual communities, and more. The system has worked to market the system to as many people as possible, including providing free low-income and student memberships through a grant from the Community Foundation of Western Massachusetts. ValleyBike representatives attend local events such as farmers markets to promote the free memberships and assist with enrollment for unbanked people.

The system is made entirely of electric-assist bicycles. Each of the bikes are equipped with horns, automatic front and back lights, a kickstand, a secondary lock for stops during the rental duration, seat height adjustments, and a front basket that holds up to 45 pounds.

System Governance

The bike share system consists of a contracted partnership between the University of Massachusetts, the Pioneer Valley Planning Commission (PVPC), the City of Northampton and Bewegen Technologies. The City of Northampton is the lead community and Bewegen Technologies is the vendor.

The City of Northampton acts as the lead community for the ValleyBike Share initiative, which makes them responsible for grants, contracts, and multi-community administration. Northampton estimates 0.4 Full-Time Equivalent (FTE) staff time spent working on the ValleyBike Share system.

The participating cities are responsible for their own station locations, the ownership of equipment within their communities, and assisting in identifying and soliciting local sponsors. After the system expanded in 2021, the participating cities (besides Northampton) started to pitch in fees to help fund system administration. Each participating municipality/entity pays $4,056 plus $463 per station. The participating cities are responsible for supplying power to each station within their community, which is estimated to be $110 per station that uses an existing power service and $150 per station that requires a dedicated connection to the power grid.

An estimated $2 million has been spent to date on capital costs for the system, most of which has been covered by the federal Congestion Mitigation and Air Quality (CMAQ) Improvement Program. Concrete pads and electric supply for stations have been paid for by each participating municipality, with the help of some small grants. Electric bicycles, docking stations, and wayfinding stations have mostly been funded by two CMAQ funding cycles, with a third to start in Fiscal Year 2023.

The vendor, Bewegen Technologies, develops and implements the system such as the hardware, software, operation, maintenance, marketing, sponsorship, and advertising. Bewegen keeps all user fees and sponsorship fees in return for no operating costs for the participating agencies/communities.

One financial challenge for the ValleyBike Share system is a lack of sponsors. User fee revenue is estimated to cover about 1/3 of the system costs, but more money from sponsorship fees is needed for long-term sustainability of the system.

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Case Study #3: Sacramento Regional Bike Share

Location	Sacramento, CA
	West Sacramento, CA
Population	Sacramento: 503,482
	West Sacramento: 53,574
Owner/Operator	Lime and other operators (non-exclusive permit)
Start of Service	2018
System Type	Dockless
Number of Stations/Hubs	133
Number of Bikes	350

About the System

The Sacramento Regional Bike Share system currently serves the Cities of Sacramento and West Sacramento and is planning to expand to the City of Davis.

Here is a brief timeline of how the system has evolved over time:

- 2013: Sacramento Metropolitan Air Quality Management District (SMAQMD) won a grant to launch a bike share system.
- 2015: SMAQMD handed over the management of the bike share grant and system to SACOG.
- 2016: SACOG, in partnership with the Cities of Sacramento, West Sacramento, and Davis, procured Social Bicycles (Sobi) to operate in the three municipalities.
- 2018: Uber (JUMP) purchased Sobi and SACOG launched an all-electric assist bike share system.
- 2019: SACOG was JUMP's second top market globally in terms of daily trips
- 2019: The City of West Sacramento and the City of Sacramento developed local ordinances to allow scooter operators. SACOG ran the regional bike share system with JUMP bikes across the three cities, and private e-scooter companies began operating in Sacramento and West Sacramento.
- 2020: The COVID-19 pandemic halted all shared micromobility operations. Lime took over the operations from Uber.
- 2021: SACOG, West Sacramento, and Sacramento entered into a revenue sharing agreement with Lime. The City of Davis does not currently allow e-scooters and is working with SACOG and Lime to develop a system. E-scooter operators returned to West Sacramento and Sacramento.
- 2022: SACOG issued an RFP to help determine the future arrangement of the regional shared micromobility program.

System Governance

The Sacramento Regional Bike Share system consists of a program agreement between the Sacramento Area Council of Governments (SACOG), the City of West Sacramento, the City of Sacramento, and Lime to operate shared bikes and scooters. In addition to Lime, three other privately owned and operated scooter vendors are currently permitted and operating in Sacramento and West Sacramento. Because the City of Davis doesn't currently allow shared scooters, SACOG and Lime are currently working with the City of Davis to launch bike share in Davis.

SACOG leads the system administration for the agreement with Lime. The City of Sacramento and City of West Sacramento oversee the other permitted scooter vendors. Lime and the scooter vendors own and operate the system. SACOG spends staff time—an estimated 0.2 FTE—administering the system, planning for system expansion, and planning for bike parking to supplement the system. All operational tasks and costs are covered by the vendors. Under the program agreement, the vendors must meet certain service level, equity, and data sharing requirements. A Bike Share Policy Steering Committee, consisting of staff from SACOG and representatives from the city partners, makes administrative decisions regarding the shared micromobility system.

While Lime owns their equipment, SACOG has spent roughly $1 million buying and installing the public bike racks meant for shared bike parking. The Cities of Sacramento and West Sacramento reinvest per trip fees from permitted scooter vendors on bike parking.

SACOG and Lime recently entered into a multi-year revenue-sharing agreement in which Lime receives a subsidy when ridership is low and the Lime provides funding to SACOG when ridership is high. For more information about the terms of this agreement, see the *Funding Mechanisms* section below. The revenue-sharing agreement between SACOG and Lime is a short-term agreement. SACOG spent roughly $75,000 on the revenue-sharing agreement in 2021. SACOG is currently evaluating the system and considering options for a long-term approach to shared micromobility in the region.

Key Considerations

Funding Mechanisms

Discussed in more detail in the Feasibility Memo (Task 2.6), funding for shared micromobility programs can come from user fees, sponsorship and advertising, and grants. It is not likely that the full cost of shared micromobility will be covered by a single source. All types of funding, in addition to securing local funds, should be leveraged to implement and sustain the system.

From the full list of potential public funding sources from grants (listed in the Feasibility Memo), the table below identifies the highest priority public funding sources for shared.

Table 1. Highest Priority Shared Micromobility Funding Sources

Funding Opportunity	Eligible Project Types	Funding Source Detail
Congestion Mitigation and Air Quality Improvement Program (CMAQ)	Funds may be used for a transportation project or program that is likely to contribute to the attainment or maintenance of a national ambient air quality standard	CMAQ funding is apportioned by the federal government to state governments, which can then fund projects either in an MPO's current transportation plan and transportation improvement program (TIP) or the current state transportation improvement program (STIP). Allocating CMAQ funds to bike/scooter share would ensure bike/scooter share is included in the TIP/STIP.

Funding Opportunity	Eligible Project Types	Funding Source Detail
State and Regional Funding		
[Transportation Fund for Clean Air (TFCA)](#)	First- and Last-Mile Connections (existing and pilot), trip reduction projects, bicycle parking, bikeways, bike share	In 1991, the California State Legislature authorized the Bay Area Air Quality Management District to impose a $4 surcharge on motor vehicles registered within the Bay Area to fund projects that reduce vehicle emissions. The Air District allocates this revenue through its Transportation Fund for Clean Air (TFCA) program to fund eligible projects and programs. The County Program Manager funds ongoing projects such as Commute.org and BART shuttles as well as local quick build projects. Projects must demonstrate cost effectiveness.
[Bike Share Capital Program](#)	Grants support local government to conduct community planning, site selection, and contract with private vendors for a bike share system.	Administered by MTC and provides grants to help launch bike share in Bay Area Counties. The grants are part of the larger One Bay Area Grant (OBAG) program.

Revenue Sharing

In addition to the funding sources mentioned above, the managing entity and the operator/vendor can create an agreement to share revenue. This type of agreement can be structured in many ways.

The Sacramento Area Council of Governments (SACOG) and Lime recently entered into a multi-year revenue-sharing agreement in which the operator/vendor receives a subsidy when ridership is low and the operator/vendor provides funding to the managing entity when ridership is high. According to the minutes from the Regional Bike Share Policy Steering Committee meeting when the agreement took place, the goal of the agreement was to "provide an option to continue bike share in the near term and collect more information about ridership, revenues, and costs in current and post-pandemic market conditions while the region updates the bike share business plan and considers the longer-term delivery of micromobility for the region's residents."

Under the general terms of the revenue-sharing agreement, SACOG would provide a monthly subsidy to Lime when ridership is low (below 2.75 trips per bike per day) and would receive revenue from Lime when ridership is high (above 3.5 trips per bike per day).

Operational Considerations

Owner/Operator Models

Table 2 below discusses pros and cons of the most common operational models for shared micromobility programs in the U.S. The four models are:

1. Privately owned and operated (permitted or contracted)
2. Publicly owned and privately operated
3. Publicly owned and nonprofit operated

4.   Nonprofit owned and operated

For more information on common shared micromobility ownership and operational models, refer to the Feasibility Memo (Task 2.6).

Table 2. Pros and Cons of Different Operational Models

MODEL	PROS	CONS
Privately Owned and Operated	• Removes financial responsibility and risk from the City and other local partners • The private operator is strongly incentivized to ensure program success (e.g. high ridership and profitability) • Higher likelihood of success due to established skills and experience from private sector operator	• Correlated to market demand and highly dependent on private sector interest • Due to private operation, agency control and program transparency is limited to what is defined in regulation and permitting • Funding options may be limited to what private operator can support • Equity goals are harder to implement
Publicly Owned and Privately or Non-Profit Operated	• The agency has full program control, including the brand, look, and operating standards • Agency can apply for federal, state, and local funding • Public can hold the agency accountable to a transparent system • Agency can include goals such as geographic and social equity in the program	• Agency must have both interest and capacity to manage the program • Agency takes on risk and ongoing financial responsibility • There are multiple competing priorities beyond financial and operating performance
Non-Profit Owned and Operated	• This option provides the most flexibility in funding, including local, state, and federal funds, sponsorships, advertising, and philanthropic contributions • Community-oriented missions of NPOs are well-received by the public • A Board of Directors made up of a broad range of community stakeholders effectively engages public, private, and community organizations in the system	• If NPO is newly-created, building capacity and establishing organization can take time • NPO often lacks skills and experience at system launch • The NPO's performance standards may not meet public and agency expectations for transit service

Major Operational Considerations

The following contains a list of the major factors to consider when planning to operate a shared micromobility system.

- **Maintenance:** Ongoing maintenance of shared micromobility vehicles and stations is required for a shared micromobility system to operate smoothly. If the managing entity pursues a private vendor and operator, maintenance protocols should be included within service level agreements between the governing agency and the shared micromobility vendor. Penalties for noncompliance should be included within the agreement to empower the governing agency to enforce maintenance procedures.
- **Re-Balancing and E-Vehicle Charging:** This is a critical aspect of any successful shared micromobility system, as it ensures that people have vehicles where and when they want them. The system operator should be able to demonstrate how they will maintain vehicle availability throughout the service area on a daily basis. Additionally, e-bikes and e-scooters necessitate battery charging, so it will be important that the operator is experienced with charging a fleet of electric vehicles, whether through on-street charging (such as through a charging dock), off-street charging (such as in a maintenance warehouse) or swapping out batteries on the street. A service level agreement can include metrics for re-balancing and e-vehicle charging.
- **Customer Service:** Operators are responsible for customer service and should have a call center, online portal, and service center to help resolve technical and mechanical issues. A service level agreement can include metrics for customer service levels.
- **Data Collection and Evaluation:** Shared micromobility data collection has the potential to improve user experience by providing information about where vehicles are available throughout the system. Data collected from users also has the potential to improve overall system delivery by allowing the governing agency or private vendors to analyze usage trends and respond to customer desires and needs. Despite these benefits, data collection should be anonymized to protect users' privacy and user data should not be shared with third parties. The data to be provided should be described within a service level agreement or other written agreement. At a minimum, raw ridership data collected and provided to the governing agency should include trip date and time, point of origin/destination, length of trip (in miles), and duration of trip (in minutes). Data aggregated on a monthly basis should, at a minimum, include average number of trips per day, origin and destination locations (presented in a mapped format), average trip distance, average trip duration (in minutes), average number of unique riders per day, average number of trips per unique rider per day, location and details of all reported crashes involving shared micromobility vehicles, location of each complaint, nature of each complaint, description of vendor response, and vendor response time for each complaint. See the section below for shared micromobility data sharing best practices.

Additional Operational Considerations

As part of developing any agreement with a shared micromobility operator, whether private or nonprofit, staff should review the *NACTO Guidelines for Regulating Shared Micromobility* document to ensure that the agreement addresses the considerations. In addition to the above considerations, some key considerations from the report include:

- Limit number of companies operating
- Require operator to remain in good standing (fees, fines, reporting and other requirements)
- Require operator to remove inoperable or unsafe vehicles
- Require operator to have at least one local staff person
- Develop management plans to address fleet removals before severe weather events, and fleet relocations for special events
- Develop reporting to inform managing entity on regular maintenance, rebalancing and other operations duties and immediately report any incidents
- Include ability to remotely lock vehicles
- Provide 24/7 customer service and report on customer service inquiries
- Include discount payment plans and a variety of payment options
- Develop and undertake outreach and promotion strategies and marketing

- Implement data privacy and security measures
- Require real-time vehicle location data to be publicly available and available in a standard format

Implementation Process

A shared micromobility system can be implemented in multiple phases, with an initial service area for system launch and subsequent system expansion. Shared micromobility service expansion can be accomplished either as a single large-scale system expansion or incremental installation of hubs as funds become available.

The first phase of a shared micromobility system provides the opportunity for residents and visitors to get comfortable with small-scale shared micromobility on city streets and build support for bike and/or scooter share and bike infrastructure before the system expands to other neighborhoods.

It is not necessary to expand all at once. The timing and size of the expansion should consider the following factors:

- **Ridership**: High system ridership may indicate the system is ready to expand.
- **Funding**: Identifying additional funding from sponsorships, grants, or operational funding will be necessary to determine the timing and size of system expansions.
- **Infrastructure**: As new bike infrastructure is implemented, system expansions could be coordinated with the arrival of new facilities that provide safe connections for people bicycling and rolling. Space for shared micromobility can be included in the design of new infrastructure; for example, a bike share station could serve as a separation device in a protected bike lane, or a shared-use path could include additional bike racks for parking micromobility vehicles.
- **New Indicators of Demand**: Shared micromobility system expansion could be implemented to respond to new development, changes in land use, or expansion of transit service.

Equity

As a shared micromobility system is developed in San Mateo County, it is critical to build a system that equitably serves all users of the transportation system. Traditionally, the community members most susceptible to experiencing the negative impacts of limited mobility options have been children, senior citizens, people of color, people with limited access to a car, people with limited formal education, lower-income households, or people with limited proficiency with speaking English. Access to transportation can help or hinder a person's ability to get to work, attend school, buy healthy food, visit a doctor, and socialize or otherwise contribute to their community.

It is important for new shared micromobility services to address these barriers in order to create a successful, sustainable system. Developing specific shared micromobility equity programs can help these historically marginalized communities gain greater access to the transportation network in San Mateo County and can help foster new opportunities for economic and social inclusion.

Removing Barriers to Users

Subsidized Memberships and Income-Based Discounts: The vast majority of shared micromobility systems that pursue equity goals, regardless of size, have plans that address the financial barriers to users. An income-based discount option is a key strategy to include low-income shared micromobility riders who may not be able to afford the transportation service at the standard fee. Subsidized memberships support equity goals by reducing barriers to access to those who might not usually consider shared micromobility to be a low-cost form of transportation. For example, Bike Share for All, the Bay Wheels equity program, features $5 first-year Annual Memberships ($5/month after the first year) for Bay Area residents who qualify for CalFresh, SFMTA Lifeline Pass, or PG&E CARE utility discount.

Cash Payment: Cash or prepaid card options are critical to allow unbanked populations to participate in shared micromobility. In recent years, many shared micromobility providers, both public and private, have implemented cash payment options where users can go to designated locations to add cash to their accounts. Reload locations are often social service providers, shared micromobility offices, and local grocery or convenience stores. Other systems are allowing prepaid debit cards to be included as a payment option. For example, Bike Share For All allows users to pay with cash and prepaid cards in addition to debit cards.

Alternate Payment Structures: Beyond income-based discounts and cash payment options, shared micromobility systems should consider other alternative payment structures in order to reduce the financial barriers to entry. For example, rather than offering either a year-long pass or weekly passes, shared micromobility providers could consider offering monthly passes which cater to regular users who can't afford the high total cost of a year-long pass or the high per-trip cost of a weekly pass. Additionally, providing longer rental times can alleviate fears of overage charges.

Reduce Liability and Eliminate Hidden Fees: Some shared micromobility systems require a deposit or have steep fees for lost or stolen bikes or scooters. Eliminating these fees across the board or just for low-income users can make people feel more comfortable using the system. This will require discussion with the operator/vendor ultimately chosen to support implementation of shared micromobility in San Mateo County.

Targeted Marketing: Targeted marketing is any content that increases awareness of shared micromobility among demographics and populations that may benefit from additional outreach. This strategy is a key way for providers to pursue equity goals. Targeted marketing should reflect the experiences of San Mateo County residents. Successful content is created for (and often with the help of) specific groups and communities the shared micromobility system hopes to engage. These strategies could include: ambassador photo shoots, press releases, social media, billboards, bus-stop displays, station panels, flyers, emails, and custom painted or sponsored bikes and/or scooters by community partners. Additionally, shared micromobility information offered in both Spanish and English will help further reduce barriers.

Electric Assist Vehicles: Electric assist bicycles and scooters provide better access to a system's service area for riders with mobility and fitness challenges. With the introduction of these devices into the shared micromobility system, users will be able to more easily move throughout the service area, as electric vehicles make longer trips more possible and help users to overcome steep terrain.

Station Location and Service Area: Shared micromobility station location and service area are critical components of an equitable system. While shared micromobility systems typically launch in high demand (and presumed higher revenue) areas, such as downtowns and near tourist destinations, geographic and social equity should be considered when deciding where to locate a system. The extent of the service area should be determined with community stakeholders to make sure that the balance between station coverage and station density aligns with community goals. Station sites should consider areas that are currently underserved by public transit, near destinations such as libraries, grocery stores and community or cultural centers. The National Association of City Transportation Officials (NACTO) guidelines recommend that stations be no more than 0.4 miles apart to have truly comprehensive, equitable networks well-integrated with common destinations and existing transit.[2]

There are strategies to ensure that system coverage and density are met. For example, in Detroit, MoGo bike share is expanding to suburban communities through the creation of satellite bike share hubs for outlying pockets of residents.[3] The purpose of this style of expansion is to cover Detroit border communities who live near other jurisdictions and face a fragmented transportation system. Ultimately, it is important for every shared micromobility provider to determine the extent of the service area with community stakeholders and effectively communicate that extent to its members.

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[2] National Association of City Transportation Officials, (2016). "Bike Share Station Siting Guide." Nacto.org.

[3] Cos, S. "Detroit Provides Adaptive Bikes, Will Expand System," Better Bike Share Partnership. Betterbikeshare.org.

Rebalancing: Shared micromobility is a transportation system that is dynamic and fluid. It is important for every shared micromobility provider to ensure the appropriate redistribution of bicycles and scooters to its full service area such that no location is over or undersupplied. Without rebalancing efforts, the system may drift away from its original service area and be rendered ineffective or exclusionary to certain communities. Shared micromobility providers can incentivize rebalancing through fee and payment structures, or prioritize certain locations over others to ensure that the system is equitable for all people. For example, Citi Bike in NYC implemented its Bike Angels program to incentivize users to take bikes from crowded stations and drop them off at empty or nearly-empty stations. Users earn points, and can win prizes such as ebike credit, free 1-week membership extensions, Lyft credit, and even cash rewards.

Partnerships with Non-Profits and Social Services: Before a shared micromobility system is implemented, it is important to build community buy-in to attract users to a system and build trust in the program. Thoughtful community engagement is essential. Portland State University research found that lack of knowledge of about the bike share system is a significant barrier for lower income people of color.[4] The same study found that more personal sources of information, such as talking to a shared micromobility outreach staff person, volunteer, or community center staff were more effective than more passive sources of information at inspiring community members to try shared micromobility.

Community engagement should be designed with a feedback loop, so that there are clear ways to incorporate recommendations from the community into the shared micromobility system design and programming. For example, community input can:

- Influence the specific location of a station,
- Help identify nonprofit partners to support program outreach,
- Change crime prevention strategies, and/or
- Guide new investments in bike infrastructure.

Shared micromobility providers should collaborate and form partnerships with local non-profits and social service providers who already work directly with historically-marginalized communities. Over 75% of bike share systems report having at least one community partner, and over half report having two.[5] Local non-profits and social service providers have deep knowledge about community needs and communication channels for additional outreach. Community partners share the trust and history of the people shared micromobility providers need to engage. Shared micromobility providers should look for ways to add capacity and support local groups, such as paying advocates for their time, creating local jobs, and being responsive to community feedback. By tapping local resources, shared micromobility providers can more effectively mitigate the lack of knowledge among community members for how to use the system or how to sign up. Key strategies that shared micromobility systems around the country employ in partnership with non-profits and social services are: facilitated enrollment, education and skills classes, prescribe-a-bike public health programs, organized rides, and ambassador programs.[6]

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[4] McNeil, Nathan, Jennifer Dill, John MacArthur, Joseph Broach, Steven Howland. Breaking Barriers to Bike Share: Insights from Residents of Traditionally Underserved Neighborhoods. NITC-RR-884b. Portland, OR: Transportation Research and Education Center (TREC), 2017.

[5] Ibid.

[6] Ibid.

Adaptive Bike Options: In the past several years, many shared micromobility systems have begun to offer adaptive bikes for people with limited mobility to expand the benefits of shared micromobility beyond the typical able-bodied user and respond to critiques from disability rights advocates. The mobility, recreation, and inclusion benefits are abundant, but challenges remain. Adaptive shared micromobility bikes require specialized maintenance, are not always intuitive to use, and create logistical challenges for commuting. For example, in 2019, the Bay Wheels in Oakland, CA piloted five different types of adaptive bicycles: upright handcycles, recumbent handcycles, recumbent leg trikes, recumbent trike tandems, and side-by-side tandems.[7] However, the bikes were only available for checkout at one location at specific times on the weekends, and only for round-trip ride.

Hiring Policies: Equity in internal operations means hiring policies that provide job opportunities for underserved residents. By training employees from disadvantaged communities, the shared micromobility system will ultimately be more responsive to servicing the needs of all its residents.[8] By integrating communities directly into the planning, implementation, and continuation of a bike share system, providers can ensure a greater degree of success of the shared micromobility system in those same communities.

Transit Integration

Among shared micromobility systems that have equity programs, half of all medium sized systems (350-750 bikes) report efforts to integrate transit with their system.[9] Generally, these efforts manifest themselves in three areas: access, pricing and payment methods. Integrated transit systems and shared micromobility systems can be mutually reinforcing in their goals to increase connectivity, awareness, and user support.

**Access*:* To ensure that a shared micromobility system is accessible from public transit, station planners should consider siting stations near or at existing bus stops or transit centers. Larger scale integration efforts may include changing transit routes to better align with the local bicycle infrastructure network, in order to facilitate cross-use. For example, in Pittsburgh, PA, the Port Authority of Allegheny County allows riders a free bike trip (up to 15 minutes) if they are taking a trip to a public transportation stop.[10] Shared micromobility systems can become first and last mile solutions if those trips are made easily accessible to and from the existing transit network.

**Pricing*:* Pricing models may change depending on what equity targets the shared micromobility provider focuses on. However, when integrating with a transit system, some providers create a payment system that mirrors current transit fares such that the payment is an easily understood extension of the current pricing model, as in the case of Metro in Los Angeles.[11]

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[7] Baldassari, E. (2019). "The shared bike and scooter industry often leaves out people with disabilities – but Oakland is changing that," The Mercury News. Mercurynews.com.

[8] IBID

[9] IBID

[10] IBID

[11] Corbin, A. Editor. "Bike Share or Bus? In Los Angeles, the Price Will be the Same. Better Bike Share Partnership. Betterbikeshare.org.

Payment Methods*:* Integrating payment methods will depend on the technology being used by the existing transit system. Some systems utilize a single card. Others add a special RFID bikeshare sticker to existing transit cards that sends a different frequency signal to unlock bikes, as in the case of Milwaukee County Transit System and Bublr Bikes.[12] Alternatively, Fargo's Great Rides bike share allows North Dakota State University student access to both public transportation and bike share systems with their student ID, paid for by student fees.[13] Researchers note that an integrated fare pass requires a debit or credit card on file, especially for pricing models that have a pay-as-you-go option.

Additional strategies to integrate transit systems and shared micromobility systems can be learned from the Milwaukee County Transit System's partnership with Bublr Bikes. These include having buses announce when stops are connected to bike share stations, displaying stops with bike stations via a MCTS transit app, co-branding bikes, and exploring joint station maintenance.[14]

Accessibility

Whether a shared micromobility system has stations or dockless vehicles, the system must take measures to ensure the public right-of-way (ROW) meets Americans with Disabilities Act (ADA) standards and is kept clear and accessible for all sidewalk users. To maximize ROW accessibility, system owners and operators should consider the following:

- **Discourage sidewalk riding**: People tend to ride on the sidewalk when they don't feel safe on the roadway—typically when there are no designated bicycle facilities. While laws regarding riding shared micromobility vehicles on sidewalks varies from jurisdiction to jurisdiction, it is best practice for system users to ride on the street and use designated bicycle infrastructure where available.
- **Provide adequate parking solutions**: The managing entity, the operator, and the local jurisdiction should partner to ensure shared micromobility vehicles are properly parked outside of the ROW. A variety of infrastructure and non-infrastructure related parking solutions include:
  - **Geofencing**: Typically shown through the shared micromobility vendor's app, geofencing is a virtual area defining where shared micromobility vehicles are or are not allowed to park. Some vendors are also now requiring photographs from users to ensure proper parking and/or have sound to indicate improper parking.
  - **Bike racks**: Depending on the type of shared micromobility vehicle and vendor, users can be encouraged or required to park vehicles to physical infrastructure such as bike racks. A system utilizing bike racks for parking should ensure that there are enough bike racks available to accommodate both the shared micromobility vehicles and personal owned devices.
  - **Painted parking zones**: Users can be encouraged or required to park vehicles in designated parking areas that are indicated using thermoplastic, paint, or tape. For example, Arlington, VA uses painted parking areas to indicate appropriate scooter parking locations (see image below).
  - **Stations**: Docked and hybrid systems require or encourage shared micromobility vehicle parking at stations, which have to be placed outside of the ROW.

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[12] Davies, J. "MTCS + BUBLR = BUSLR." Bublr Bikes. Bublrbikes.org.

[13] Corbin, A. Editor. "Why the Country's Best Bike Share Might be in Fargo." Better Bike Share Partnership. Betterbikeshare.org.

[14] MacArthur, J., McNeil, N, Broach, J., Cumings, A., Stark, R., Sanders, R., and Witte, A. (2019). "National Scan of Bike Share Equity Programs: Approaches and Best Practices for Promoting Equity in Bike Share." Transportation Research and Education Center (TREC) pp 1-138.

- **Provide methods to report and address ROW violations**: Users should be able to easily report improper vehicle parking and operators should have a clear policy for how to address improper vehicle parking and answer user concerns.

Scooter parking in Arlington, VA. Image source: Shared Use Mobility Center

Liability Considerations

Owners and operators can limit liability related to shared micromobility systems in various ways[15], including:

- Purchasing insurance
- Requiring users of the program to sign waivers releasing the program from liability for injuries
- Keeping the shared micromobility vehicles well-maintained
- Educating users about use of the shared micromobility vehicle and providing safety training

Public agencies have some immunity in regards to discretionary decisions, such as shared micromobility station locations, maintenance schedules, and helmet use by system users.

When purchasing insurance, it is recommended that shared micromobility companies purchase the following[16]:

- General Liability

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[15] https://www.publichealthlawcenter.org/sites/default/files/resources/ship-fs2-bikeshareliability-2011.pdf
[16] https://foundershield.com/industry/micro-mobility/

- Excess General Liability
- Workers' Compensation
- Hired and non-owned auto coverage (HNOA)
- Property Insurance

Theft/Vandalism/Security

For all shared micromobility system types, theft and vandalism are part of the business. However, shared micromobility vendors have designed the current generation of market-available vehicles to be more resistant to vandalism and theft than earlier models. Today's shared micromobility vehicles have a number of anti-vandalism and anti-theft features, including:

- **GPS tracking:** GPS technology integrated into shared micromobility vehicles allows for the tracking and recovery of vehicles that have been stolen.
- **Integrated locks:** Integrated locks allow users to securely lock dockless and hybrid shared micromobility vehicles to a hub or public bike rack.
- **Encasement of vulnerable parts**: Shared micromobility vehicles today often feature wires, chains, and gears that are partially or entirely encased within the frame of the bike or scooter itself. This encasement shields these vulnerable parts from being cut or stolen off of the vehicle.
- **Anti-theft hardware:** Shared micromobility vehicles generally feature anti-theft nuts and bolts that cannot be quickly or easily removed using standard hand tools.
- **Accessory integration with frame**: Accessory features on shared micromobility vehicles (such as lights, bells, and baskets) are sometimes integrated into the design of a vehicle's stem, handlebars, or frame rather than being attached as a mountable feature.
- **Solid tires:** Some shared micromobility vehicles feature tires made out of solid rubber rather than inflatable tubes to mitigate risk of flats and slashed tires.
- **Custom design:** Shared micromobility vehicles are highly customized to the unique demands of shared mobility, and many parts are not compatible with private bicycles. This greatly reduced the street value of shared micromobility vehicle parts.

Additionally, the encouragement and enforcement of secure parking practices through in-app messaging, user fines, and diligent complaint response times can decrease the risk of shared micromobility vehicle theft.

Data Sharing Requirements

Data Collection & Sharing

The managing entity should collect data from the system in order to monitor and evaluate fleet performance and system operation as well as inform planning processes and infrastructure improvements.

Shared micromobility systems typically collect and utilize data through one of two primary data formats: the General Bike Share Feed Specification (GBFS) and the Mobility Data Specification (MDS). The overall purpose of the data formats is to provide a consistent and secure way to share data between the public, bike share providers, and regulatory. These two data formats are described below:

- **GBFS:** GBFS provides municipalities and system users with the status of the shared micromobility system at a point-in-time. The data is publicly available and offered in real time. Examples of data available through GBFS include the location and status of existing bikes and scooters, stations, and relevant street level data such as speed limits and parking zones. GBFS does not contain historical data or data about bikes and scooters that are being used. GBFS is most often used by shared micromobility system users to identify the number and location of available bikes and scooters and/or stations within the system. Over 600 bike share and scooter systems have adopted the GBFS standard.

- **MDS:** MDS provides both real-time and historic data about shared micromobility vehicles and trips. MDS also allows municipalities to digitally and dynamically set policies related to bike and scooter share—such as where and how shared micromobility vehicles can operate—and easily communicate with shared micromobility service providers. The data is only intended for use by shared micromobility regulators and not the public. As a requirement to use MDS, however, shared micromobility operators must also provide a publicly available GBFS feed. Over 130 public agencies currently use MDS.

A single agency facilitating data collection and sharing can support regionwide data standardization. For example, the Denver Regional Council of Governments (DRCOG) uses Ride Report to manage an open data shared micromobility portal. Five cities participate with DRCOG, the Colorado Department of Transportation and the Regional Transit District. New partners can join with a simple Letter of Interest pledging to provide data and a nominal annual fee of $1,000 for cities and $2,000 for counties.

Data Protection

Privacy Principles for Mobility Data

The collection and use of shared micromobility system data should be used in a way that both informs system functionality and protects individual privacy. It is best practice for the managing and operational entities of the shared micromobility system to adhere to the Privacy Principles for Mobility Data.[17] The Privacy Principles were developed by transportation and technology professionals and experts in the public sector, private sector, and academia, such as the City of Philadelphia, the Open Mobility Foundation, Future of Privacy Forum, and Columbia University. The goal of the Privacy Principles is to protect individual privacy in the use of mobility data.

The seven principles include:

1. We will uphold the rights of individuals to privacy in their movements.
2. We will ensure community engagement and input, especially from those that have been historically marginalized, as we define our purposes, practices, and policies related to mobility data.
3. We will communicate our purposes, practices, and policies around mobility data to the people and communities we serve.
4. We will collect and retain the minimum amount of mobility data that is necessary to fulfill our purposes.
5. We will establish policies and practices that protect mobility data privacy.
6. We will protect privacy when sharing mobility data.
7. We will clearly and specifically define our purposes for working with mobility data.

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[17] https://nabsa.net/2021/11/03/privacyprinciples/