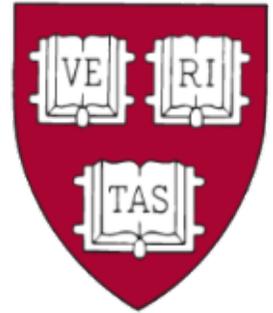


# Technology and Entrepreneurship



Center at Harvard



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## Micromobility: A Longer-Term Perspective

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# INTRODUCTION

Since the introduction of fixed bikeshare systems, and especially with the introduction of dockless shared scooters and e-bikes, cities all over the world have been pushing for the incorporation of micromobility as a key element of their transportation Net Zero strategies. Despite the excitement surrounding them, micromobility systems have been notoriously precarious. Micromobility services and the companies that operate them are frequently here today and gone tomorrow, preventing them from becoming a long-term, fixed element of a city's transport network.

This precarity is not entirely the fault of micromobility providers, who operate in a volatile, venture-backed market. Cities also lack a consistent approach that merges appropriate infrastructure, along with financial, operational, organizational, and regulatory regimes, that will ensure the long-term stability of micromobility systems as part of an integrated transport network alongside buses, trains, and other public services.

Many cities across Europe are exploring pathways to develop this new approach. This starts with funding. Cities have seen that without public support, micromobility services have struggled to stay afloat, so they have begun exploring new financial and commercial models, including revenue sharing and subsidies. Beyond funding, cities are also exploring new approaches to integrating micromobility services into their broader transport network while establishing policies and organizational changes to manage micromobility consistently across jurisdictions.

This paper examines how European cities are focusing on funding, integration, and consistency and evaluates the benefits and drawbacks of each approach. By examining these approaches, the paper offers recommendations for cities to take advantage of the potential of micromobility services to reduce emissions, create additional connections to transit, lower car dependency, and improve health outcomes for all residents.



Debates about micromobility are as old as roads themselves. This includes discussions about individually-owned bicycles throughout the 20th century, docked bikeshare systems in the late 20th and early 21st centuries, and ongoing debates about dockless systems today.

# Managing Micromobility: A New Twist on an Old Problem

Micromobility refers to the family of small vehicles that exist between the traditional transportation dichotomy of cars and pedestrians: too small and slow to be cars and too big and fast to be pedestrians. These include manual and battery-powered bicycles, e-scooters, e-bikes, and other self-balancing transportation devices, regardless of whether they are shared, user-owned, fixed, or dockless.

While this paper will primarily focus on the more recent forms of shared micromobility that have been enabled by new technologies (notably dockless e-bikes and e-scooters), it is important to recognize that conversations about micromobility cannot be held in a vacuum. Debates about micromobility are as old as roads themselves. This includes discussions about individually-owned bicycles throughout the 20th century, docked bikeshare systems in the late 20th and early 21st centuries, and ongoing debates about dockless systems today. All of these debates are ongoing and tied together, as policies around one will affect the other. As a result, while the discussions of dockless micromobility in this report focus on its particular business models and regulations, any regulatory regime should incorporate recommendations that support all types of micromobility together.

## HOW WE GOT HERE

The history of micromobility is a history of precarity. From the first bikeshare systems to the most recent dockless e-scooter programs, micromobility services have regularly launched in cities quickly and aggressively with promises of scale, growth, and profitability. Despite these promises, many of these systems have shuttered, sometimes abruptly and sometimes slowly, over the course of years.

Stories about these shutdowns typically assign blame to the provider or operator: that the unit economics were not right or that they could not get riders interested in the program. These stories mask the complex dynamics between cities and micromobility providers and absolve cities of their responsibility in this relationship. Cities and micromobility providers need to work together to align on the business models, operating structures, and regulatory

frameworks that will allow micromobility services to thrive in their communities. As much as micromobility providers have struggled to find firm footing in cities, cities have also struggled to create an environment that allows them to do this.

## MICROMOBILITY INDUSTRY

Starting in 2016, on an almost daily basis, residents of cities all over the world woke up to find a fully scaled fleet of dockless bikes or e-scooters on their sidewalks. These vehicles were easy to use, cheap, and fun. They also promised a car-free, zero-emission ride.

The providers of these new systems, such as Bird, Lime, and many others, entered cities riding a wave of venture capital funding with an ambition to scale as much and as quickly as possible. This urgency pushed them to enter cities as soon as they had the vehicles ready, often with limited warning or notice beforehand. This meant that cities could have no dockless bikes or e-scooters one day and hundreds the next.

From a short-term business perspective, the strategy made sense. Even as many cities forced companies to remove vehicles from their streets, riders got enough micromobility to push for their cities to keep them around. As a result, after their initial removal, dockless bikes and e-scooters were back within weeks. This did not last long, however. Just months after their return, many of these companies began to run out of operating funds from expanding too much and too quickly, leaving cities with a micromobility network that was a shadow of what it once was, if they had one left at all.

While the chaos of these early years has settled, dockless providers remain in a precarious position. As the wave of venture capital-funded technology firms in the transportation space has waned, concern remains about the long-term stability of micromobility systems and their providers. This is best seen through the example of major industry players like Bird going into comprehensive restructuring and companies such as Dott abruptly pulling out of major markets such as London due to financial concerns.

**Today, there are fewer providers with stronger relationships with cities, better operational awareness, and much less cash on hand.**

## **LOCAL REGULATIONS**

The in-and-out nature of micromobility systems is not entirely the fault of providers in a sink-or-swim industry. Cities, understandably, were reluctant to welcome dockless micromobility providers onto their streets. By 2016, many communities recognized the challenges that came from limited regulations on ridesharing services such as Uber. As micromobility providers aggressively push into new cities, they saw the implementation of new regulations as an opportunity to prevent making the same mistake they had made a few years before.

As a result, early regulations were highly limited and highly strict. After removing bikes and e-scooters from their streets through a formal order, cities then went to work developing appropriate policies or permitting standards. This included caps on vehicles, caps on providers, redistribution policies, and often service fees. Instead of signing off on limitless growth, cities firmly clarified the full scale of a micromobility service. Since these companies had enough money to launch in dozens of cities every few months, they made them pay for their use of the road. Further, many of these legal arrangements, whether pilot projects, contracts, or permits, were short-lived. This gave cities the authority to move onto new companies when they wished.

At the time, this approach made sense. Cities had no experience regulating services like these, and many early companies lasted only a few months or years, so a short-term operating agreement that incorporated multiple providers was a reasonable strategy. Further, providers with a fleet of new micromobility vehicles seemed to enter their cities with no end in sight, regardless of the fees they charged, so charging a fee per use was a smart way to raise funds.

The micromobility industry has shifted dramatically since these early years. Today, there are fewer providers with stronger relationships with cities, better operational awareness, and much less cash on hand. However, cities continue to operate with regulations designed to bring new providers in for short-term contracts with strict operational requirements. Further, while cities are no longer regularly charging per vehicle, they are reluctant to provide any funding of their own to subsidize a service many of them consider key to their climate and sustainability goals. For many cities, this boils down to running a trial program like a business-as-usual micromobility service. They have established basic regulations to test out this new technology but have yet to update their regulations with knowledge gained from different approaches.

These challenges ultimately feed into the business and operating models of micromobility providers.

Further, while regulatory approaches across European cities have many similar characteristics, they all remain distinct. This means that micromobility companies are pushed to design a bespoke commercial model for each contract that typically focuses on short-term commercial goals rather than a systematic long-term goal, limiting their ability to develop offerings that incorporate micromobility as a consistent, grounded component of transportation networks.

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# Policy Approaches

Determining the right policy approach for micromobility is not easy. While we are far from the chaos of 2016, micromobility remains a volatile industry. It is also still new. Micromobility providers are still working to establish a business model that ensures their continued operations. At the same time, cities simply have not had enough time to settle on a regulatory approach that meets their needs while also ensuring micromobility services can operate for the long term.

Developing this long-term view requires cities to take responsibility for the presence of micromobility services in their communities. While micromobility may have entered cities as a venture-backed fad, it has since shown itself as a critical tool for connecting riders to healthy, affordable, and flexible transport options. Cities owe it to their residents to ensure this mode is easily accessible, the same way they provide access to roads and public transit.

The first and most important of these is financial. As micromobility providers back out of cities due to financial constraints, cities need to establish financial and commercial models that allow micromobility providers to operate sustainably over time.

Beyond financial concerns, cities need to continue to develop practices to establish the integration of micromobility services with a larger component of their transport network and ensure consistency in regulations. While cities have not engaged in these areas to the same extent as new financial models, they are critical elements of micromobility's long-term sustainability.

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# Financial Models

What is the right commercial model that will allow cities to find the sweet spot between riders, operators, and their long-term goals? How can cities financially support micromobility services without giving away all of their money to a private operator? So far, cities have experimented with a range of options, including flat fees charged to operators, revenue-sharing schemes, charging operators for infrastructure costs, and investment in operators through subsidies. Here is an overview of three examples.

## LONDON: COST RECOVERY

Since the summer of 2021, London has been running micromobility trials for dockless scooters. Regulated through Transport for London (TfL), the transport authority, the trial's most recent phase launched in September of 2023 with three providers across ten boroughs. Through this trial, TfL aims to gather additional data to ensure the safety of scooters on city streets, determine additional areas for vehicle parking, and develop further recommendations around product design. TfL has stated that trials may continue through 2026.

TfL's trial includes no subsidies or financial incentives to operators. Instead, it is based on the idea of cost recovery: that for every pound the authority spends on the project, it receives a

pound back from the operators. In other words, it does not want to “lose” any money on the trial. The operators effectively pay for it themselves, and none of the funds go back to support long-term use, either in terms of operating subsidies or physical infrastructure.

TfL recoups its project costs through two fees. First, an upfront fee from each operator. This fee goes primarily to each Borough where vehicles are eligible to travel to fund additional vehicle parking or signage. Second, TfL charges each operator a per-vehicle fee. This per-vehicle fee, for at least the first trial in 2021, increases depending on the number of vehicles deployed by an operator during the trial period. This means that while TfL charged £5.50 per vehicle for a fleet with 2,100 vehicles, it charged £7.50 per vehicle for a fleet with over 4,400.

Applying a cost recovery approach was understandable when scooters first appeared nearly a decade ago, but today, the benefit is less clear. Transportation has never been an industry that operates successfully according to this model. It is a public service that costs money, and that investment is recovered through its positive externalities: by providing access to jobs, entertainment, and other resources. If cities want successful micromobility services, why are they charging for their existence rather than supporting it? Further, if micromobility requires economies of scale, why would a city charge higher per-vehicle fees for larger fleets rather than scaling them down as the fleet grew?

The problems of this approach have grown clear for TfL. This March, Dott, one of the three micromobility providers in the current trial, pulled out of London, citing existing market challenges and solidifying the need for public support for micromobility.

While TfL continues its trial, other cities are searching for a more sustainable solution.



## WECA: REVENUE SHARING

The West of England Combined Authority (WECA), along with many operators in the UK and Europe, are exploring revenue sharing with micromobility providers, including TIER. Under revenue sharing, WECA will collect a certain percentage of TIER's fare revenue to fund long-term public transport investments.

WECA launched revenue sharing through a new contract with TIER this summer. The provider agreed to a contract with over 5,000 micromobility vehicles, including both scooters and e-bikes, covering Bath and North East Somerset, Bristol, and South Gloucestershire. The four-year contract is projected to bring an estimated £9.7m to the WECA region over the course of its term.

On its face, revenue sharing may look similar to cost recovery. WECA, like TfL, collects funds from a micromobility provider to fund a specific initiative. However, revenue sharing is far more ambitious for two reasons. First, by tying funding to revenue, it pegs funding to the success of the service. This means that the more riders using the service, the more money for investments that will come along. Second, the revenue funding is focused on broad investments in transit, especially micromobility. Unlike TfL's approach, where funding was simply about parking areas and signage, WECA's funding is designed to pay for proactive transit and infrastructure investments that will make micromobility an increasingly accessible mode over the years to come.

At the same time, revenue sharing can present challenges. As micromobility providers continue to struggle toward profitability, many may be reluctant to accept a service where they are not allowed to keep all the revenue they

generate. This could be critical if this results in frustration from the market. Further, providers have claimed revenue sharing agreements makes financial forecasting more difficult as the share they keep may be unclear. For these reasons, providers such as Lime have pulled out of tenders with revenue sharing, creating a more limited set of providers WECA and similar entities can work with.

## BRUSSELS: SUBSIDIES

Last summer, Brussels launched a pilot subsidy program to increase access to micromobility services. Launched in partnership with Dott and Molière, a mobility data company, Brussels offered reduced prices for micromobility trips across targeted neighborhoods in the city. All neighborhoods were the areas micromobility providers typically do not serve well: those with lower income and limited access to public transport.

The trial lasted for 12 weeks and resulted in up to a 10% increase in total trips in each neighborhood, demonstrating the potential impact of subsidies in making trips affordable and providing an incentive for private providers to place their vehicles there.

The Brussels experiment also offers a model for determining when and where to use micromobility subsidies to drive the direction of a service. Left to their own devices, micromobility providers will concentrate on areas with the highest potential for ridership. Often, these are busy downtown areas with high incomes. These trips largely do not require subsidies. As a result, cities can use subsidies to direct service where it would not be on its own, making a more scaled, equitable, and impactful service.



**For micromobility to work in cities, there needs to be a strong alignment on the vision in terms of the different municipalities impacted and the different future governing authorities**

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# Integration

After selecting the appropriate financial model, the second obstacle cities face is integration. While all cities agree on the need for coordination across modes, many have struggled with this, to the point where mass transit, bicycle and pedestrian planning, docked micromobility planning, and dockless micromobility planning are all handled by different teams in different offices. Cities have responded to these challenges in a range of ways, some by vilifying micromobility, with others embracing it.

Challenges with integration are clear in cities across the world. Providers have cited challenges with separate e-bike and e-scooter trials or tenders, arguing that e-bikes and e-scooters were competing against each other for service, making neither system viable. Regardless of how accurate these claims are, it speaks to a

key issue. Cities are treating bikes and scooters separately instead of merging them into the general umbrella of micromobility to support coordination.

Similarly, we are still seeing examples through city tenders where there is limited integration between city-run Cycle Hire Schemes and public transport schemes. For example, customers have to use different payment methods when paying for a trip on Cycle Hire or public transport instead of a single account holding customer details. If cities can't provide an integrated offering internally, requiring multiple apps and payment methods for each service, how can they partner with a private operator?

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# Consistency

A final challenge cities face with micromobility is consistency. For micromobility to work in cities, there needs to be a strong alignment on the vision in terms of the different municipalities impacted and the different future governing authorities.

For example, only ten of the thirty-three London boroughs opted into the recent e-scooter trial. This has made it challenging to bring a consistent service across the city and to allow operators to scale. Further, it meant TfL had to create an awkward payment structure where "pass-through" boroughs would receive a fee from micromobility providers that wanted to pass through those boroughs, but riders could not start or end rides there. London had a similar challenge in its e-bike trial, where providers had to negotiate with thirty-three different London boroughs and TfL, which could not secure regulatory jurisdiction across all of London.

Instead of a single tender providing micromobility operators with consistent regulations and access to the entire city, London provided a confusing, Balkanized model with irregular parking and operating regulations based on policies that varied borough by borough.

In Paris, the referendum on e-scooters resulted in them being banned in the city after almost 90% of votes cast favored a ban, although under 8% of those eligible turned out to vote. Suddenly, the potential value of moving people to sustainable forms of transport has been pulled, owing to 90,000 casting a vote from the city's nearly 1.4m population.

# Recommendations

*After reviewing these policies and trends, we have identified key lessons for cities to support the long-term integration of micromobility into their transportation networks.*

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## Commercial

### **SUBSIDIES FOR SERVICES**

In reviewing the brief history of micromobility services, one thing is clear: micromobility services cannot operate without public funds, and the idea that venture capital will continue to keep these services in operation for many years is a myth. In a world where venture-backed funding for new technology-driven transportation services is drying up, cities need to invest in the ongoing operations of micromobility services for them to survive.

Finding the right balance of this direct funding is tricky. To ensure investments are going a long way, cities need to determine where and how much they subsidize, such as subsidizing trips in outer-ring suburbs or low-income neighborhoods alone. Further, they need to determine the structure of these subsidies. Are they per trip, per vehicle, time-based, or do they scale with need? Cities need to be careful to ensure their subsidies go toward the maintenance of a viable service rather than profit.

Investments can be more than local. Regional governments, national governments, and the EU at large should consider grant programs or additional operating support for micromobility services in areas that otherwise could not afford them as part of overall transport investment. Further, as a new technology, grants could also support experimentation with new models, such as a micromobility service that is entirely publicly owned and operated.

### **LONG-TERM, SINGLE-ENTITY CONTRACTS**

Transit authorities regularly contract out services to a third-party operator. These long-term contracts allow the public agency and the operator to build a strong, collaborative

relationship that will evolve and improve transit service over time.

Cities should incorporate this same approach when contracting with a micromobility provider. Cities need a long-term service partner that can get to know their network over time, can support new ideas for operational improvements, and is locked in to invest as much in the service as possible. Further, contracting with a single provider allows for easier service experimentation and improvements.

### **PUBLIC MANAGEMENT AND/OR ADDITIONAL OVERSIGHT**

As stated above, cities should take responsibility for the presence and success of micromobility in their communities and should experiment with different management and organizational models to achieve short- and long-term goals. This could include models with city-run service management, city-run operations, or full city ownership. Critically, cities should continue to recognize that micromobility services are still new, and the models are still in flux. Therefore, they can test new models and share these results with similar communities.

### **FUNDS FOR RELEVANT INFRASTRUCTURE**

Investments in public infrastructure for shared micromobility will go beyond users of dockless bikes and scooters. Cities should use the necessary investments for micromobility to benefit other road users, such as private cyclists, through better bike infrastructure, signage, and additional parking for bikes, scooters, and other small vehicles. At the same time, cities should use increased ridership or bike lane usage to advocate for further investments in the future, using micromobility as a lever for broader community investment.

**50% of customers drop out of making their first journey on an e-scooter or e-bike because of the complicated onboarding process to access the trip.**

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# Integration

## **MANDATE MULTIMODAL FOCUS**

One barrier to successful micromobility services today is collaboration across modes. The internal teams managing a dockless scooter service, a docked bikeshare service, and bus service are often on different teams and sometimes different agencies.

Integrated planning for all three services is critical to get the most out of them. This includes initiatives such as unified parking for bikes and scooters, bus stops located adjacent to vehicle docking infrastructure, and integrated payment systems for riders. Bringing these together will ensure that micromobility is part of a truly multimodal and regional transportation network.

## **INCORPORATE INTO LONG-TERM TRANSPORTATION AND/OR CLIMATE VISION**

Cities regularly include goals for bicycle and pedestrian travel as part of their decarbonization strategies through infrastructure investments or mode share targets. As part of an integrated transportation approach, cities should bring micromobility into this mix, using operating data to gauge the impact of existing rides and future system growth as well.

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# Consistency

## **CUSTOMER ADOPTION**

There is an opportunity to make micromobility more attractive. During our interviews, it was said that 50% of customers drop out of making their first journey on an e-scooter or e-bike because of the complicated onboarding process to access the trip. More broadly, there is a need to integrate all forms of micromobility into the city transport mix so there is consistency on branding, payments, access points, and fare policy, so this form of transport isn't independent of the city offerings. By better understanding the customer, the city can provide a personalized offering so the appropriate transport is used at the right time to support individual and city goals.

## **EVIDENCE**

Operators and cities need to work closer together to continually make the case that micromobility can replace car journeys and support the broader city goal of more sustainable trips. If this case can't be made in every city, it makes it difficult for city authorities to provide a financial commitment to new schemes.

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# Conclusion

Micromobility provides an opportunity for cities to accelerate their sustainability objectives, but the current climate illustrates a tension on who pays for this service. We have moved on from the days when venture capital funding could easily cover costs, as things are now starting to stabilize with more consolidation and reduced funding from the market. This then directly raises a series of questions for city authorities around the role of cities when it comes to maximising value from micromobility. Simply expecting operators to cover the costs isn't a good long-term option, nor is doing nothing.

Secondly, one size does not fit all. Every city is different from the perspective of geography, culture, infrastructure, policy, and many other factors. However, the considerations above set out some things to consider as cities move forward with micromobility.

## Special thanks to:

- **City of Budapest, Hungary**
- **Dott**
- **City of Dusseldorf, Germany**
- **Transport for London**

## References

Bath Echo New Team, 2023 [New provider set to take over West of England e-scooter scheme | Bath Echo](#)

Bird Global Inc., 2023 [Bird Enters into Comprehensive Restructuring Support Agreement with First- and Second-Lien Lenders to Strengthen Financial Position \(prnewswire.com\)](#)

Bowden, Alex. "Dott blames "rapid and unregulated rise of e-bikes" for decision to abandon London e-scooter trial." 2024. [Dott blames "rapid and unregulated rise of e-bikes" for decision to abandon London e-scooter trial | electric bike reviews, buying advice and news - ebiketips \(road.cc\)](#)

"Catch Me If You Can!: How European Cities Are Regulating Shared Micromobility." [Polis: Cities and Regions for Transport Innovation, 2023. https://www.polisnetwork.eu/wp-content/uploads/2023/11/SHARED-MICROMOBILITY-REPORT.pdf.](#)

Carey, Nick and Cohn, Carolyn, 2021. "[Focus: After Wild West start, scooter providers chase scale to survive |](#)" Reuters

European Commission. "The Rise of Micromobility," 2020. [https://urban-mobility-observatory.transport.ec.europa.eu/resources/case-studies/rise-micromobility\\_en.](#)

Freehafer, Lydia. "Despite Volatility, Micromobility Thrives in European Cities |." TheCityFix (blog), March 13, 2024. [https://thecityfix.com/blog/despite-volatility-micromobility-thrives-in-european-cities/.](#)

Giovannini, Valerio. "The New European Regulatory Framework for Micromobility Could Be Adopted When It Is Already Too Late." Lexology, March 29, 2023. [https://www.lexology.com/library/detail.aspx?g=0812f760-18d4-4616-89f7-81f3fb1788d7.](#)

Harris, Alyssa. "EXCLUSIVE: Revenue Share Requirements Creating a 'Negative Cycle' for UK Operators." Zag Daily (blog), September 6, 2023. [https://zagdaily.com/people/exclusive-revenue-share-requirements-creating-a-negative-cycle-for-uk-operators/.](#)

London.gov.uk - [md2770 appendices a-d.pdf \(london.gov.uk\)](#)

Mallonee, Laura. "Shared Micromobility Needs Public Funding to Support It." North American Bikeshare & Scootershare Association (blog), March 28, 2024. [https://nabsa.net/2024/03/28/public-funds/.](#)

"Political Priorities for Micro-Mobility 2024 - 2029." Micro-Mobility for Europe, 2023.

Taylor, Guy. "Dott Ditches London after Withdrawing 'financially Unsustainable' e-Scooters." CityAM, March 26, 2024. [https://www.cityam.com/dott-ditches-london-after-withdrawing-financially-unsustainable-e-scooters/.](#)

Turner, Abigail. "New E-Scooter Provider Secured for West of England." Business Live, June 30, 2023. [https://www.business-live.co.uk/economic-development/new-e-scooter-provider-secured-27230332.](#)