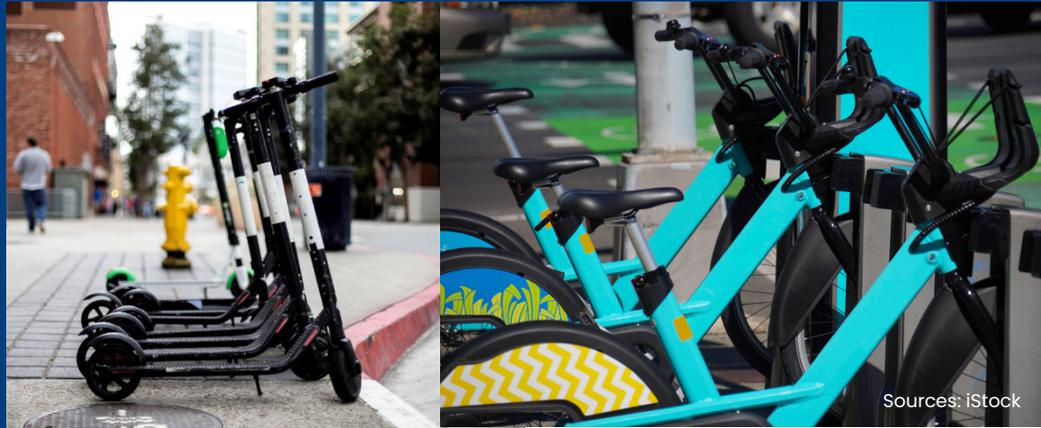




**ITS DEPLOYMENT  
EVALUATION**  
EXECUTIVE BRIEFING

## Highlights

- Micromobility may increase active travel, increase public transit ridership, and reduce automobile usage.
- Permit requirements are key to regulating micromobility services and minimizing adverse impacts.
- A District of Columbia pilot program shows promising early results.



# Micromobility

## Introduction

Micromobility, as defined by the National Association of City Transportation Officials (NACTO) (2019), refers to:

*“small, fully or partially human-powered vehicles such as bikes, e-bikes and e-scooters. These vehicles are generally rented through a mobile app or kiosk, are picked up and dropped off in the public right-of-way and are meant for short point-to-point trips.”<sup>2</sup>*

In the past decade, micromobility systems have rapidly become an integral part of the urban landscape in most cities. As such, cities are beginning to understand the benefits, costs, and lessons learned from micromobility.<sup>3</sup>

## Benefits ✓

Benefits of micromobility systems include:

- Improved first/last mile connections to/from transit
- Reduced vehicle miles traveled (VMTs)
- Increased active transportation and thus increased health benefits

A literature review of dockless bike sharing research found that dockless bike share systems may “extend the transfer radius of public transit” and hence encourage public transit use ([2020-01449](#)). Likewise, researchers found that Washington D.C. Metro Rail stations near bike sharing stations had higher ridership, suggesting that bike sharing systems support transit ridership ([2020-01453](#)). Other studies have found that bike sharing may increase transit use, but this increase may vary depending on local conditions. For example, in Washington DC, bike sharing decreased transit use in the urban core, but bike sharing increased use in the outer suburbs.

This briefing is based on past evaluation data contained in the ITS Benefits, Costs and Lessons Learned databases at:

[www.itskrs.its.dot.gov](http://www.itskrs.its.dot.gov). The databases are maintained by the U.S. DOT’s ITS JPO Evaluation Program to support informed decision making regarding ITS investments.



## **Benefits** (continued)

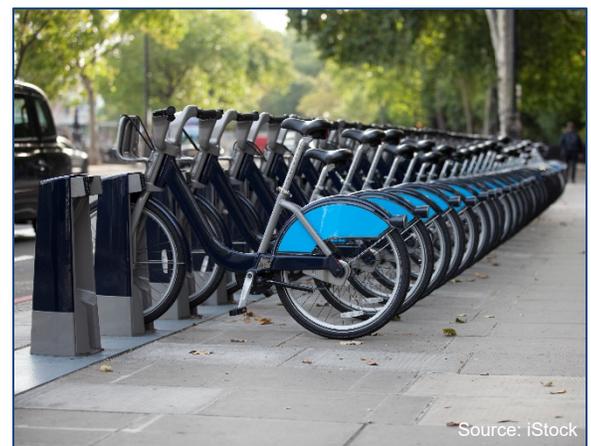
In Minneapolis bike sharing generally increased rail ridership ([2020-01468](#)). In certain situations, micromobility services may directly substitute for private automobile travel. A study of bike sharing systems in five different cities across the world found that bikeshare systems could potentially reduce aggregate car use by as much as 632,841 km (393,229 miles) per year, per city depending on the size of the city and rate of substitution ([2020-01450](#)). Another Washington, DC area study found that the presence of bike sharing services can reduce traffic congestion by up to 4 percent at the neighborhood level ([2020-01452](#)).

**Micromobility systems may reduce vehicle use which in turn reduces congestion, improves air quality, and improves urban quality of life.**

In addition to bike sharing systems, e-scooters may potentially reduce private car usage as well. In Portland, Oregon, an e-scooter pilot study found that 34 percent of e-scooter trips would have been car trips and that during the pilot program, e-scooters reduced vehicle miles traveled by 300,000 total miles ([2019-01353](#)). Other researchers have found that e-scooters may strongly substitute for automobile trips over 0.5 to 2-mile distances ([2020-01460](#)).

Finally, micromobility, specifically bike sharing, may induce more active travel behavior (i.e. travel that involves exercise). Active travel, at both a population and individual level, leads to numerous health benefits including reductions in risk of all-cause mortality, hypertension, and Type 2 diabetes.<sup>4</sup> One study found that bike share systems may increase active travel by as much as 1.4 million minutes per year ([2020-01451](#)). Another study involving bike sharing systems in London found that the London bike sharing system reduced disability adjusted life years, a measure of disease burden, by 55 years at the population-level, even when accounting for cycling crashes ([2020-01467](#)).

However, increased bike and e-scooter travel may endanger pedestrians and riders if public authorities do not implement basic safety measures. Several studies recommend that municipalities strongly encourage helmet wearing and lower speed riding when operating shared bikes and e-scooters ([2019-00901](#), [2020-00930](#)).



Source: iStock  
Dock-based bike share station.

## Costs

Specific cost information for micromobility systems is almost entirely limited to publicly operated bike sharing systems. Private micromobility operators, who exclusively operate e-scooters services and some bike sharing services, have not released data on what these systems cost to operate. Table 1 summarizes costs to install new bike share systems.

**Table 1:** Costs to Install New Bike Share Systems

Bike Share System	Installation Cost
City of Baton Rouge, Louisiana	The City of Baton Rouge, Louisiana spent \$320,000 to install a public bike share system in the city. This estimated cost includes the cost of new bikes, bike racks, and check-in/out kiosks <a href="#">(2020-00460)</a> .
LA Metro Bike Share (Los Angeles, California)	LA Metro, the public transit authority in Los Angeles, California estimated the cost of a new bike share bike at \$3,000-\$5,000 per bike, inclusive of infrastructure such as kiosks <a href="#">(2020-00459)</a> .

## Best Practices

Despite their benefits, micromobility systems have not been without controversy.<sup>5</sup> Cities have gradually learned how to regulate these systems to enhance public safety and maximize mobility benefits.

In 2019 NACTO released the second version of its *Guidelines for Regulating Shared Micromobility* which details recommend best practices for regulating, operating, and implementing bike sharing and e-scooter services in cities. Some selected best practices from this guide include [\(2020-00964\)](#):

## **Best Practices** (continued)

- **Only Allow Permitted Operators.** Cities should implement a permitting system for micromobility operators and only allow fully vetted and permitted operators in their communities. Cities should ensure that permitted operators have adequate insurance, conduct themselves in an ethical manner, and comply with all applicable laws.
- **Ensure Adequate Maintenance of Vehicles and Removal of Broken Vehicles.** Abandoned and broken vehicles have been a key problem with shared micromobility services since their inception.<sup>14</sup> Therefore, NACTO recommends that cities require operators to conduct full maintenance checks of vehicles at least once a month and send proof of maintenance to the city. Cities may also consider randomly checking the maintenance status of vehicles. Additionally, cities should require operators to remove inoperable vehicles from public right-of-way in a timely manner and cities should reserve the right to remove vehicles if operators do not do so. Finally, cities should require operators to hold in escrow adequate cash reserves to remove and dismantle fleets should operators cease operations in the city.
- **Conduct Public Outreach.** Cities should work with operators to conduct extensive public outreach about shared micromobility services. This outreach should educate the public about what services are available, how users should operate these vehicles.
- **Promote Equity.** Shared micromobility, if not adequately regulated, may suffer from equity issues. Therefore, cities should work with operators to promote equal access to these services. Cities should require operators to rebalance their fleets in a timely manner and consider geographic distribution requirements to help ensure geographic equity. Cities should require that all information about services is available in multiple languages, as appropriate. Cities should also consider implementing cash payment plans and low-income subsidy plans.



Scooters for hire on sidewalk.

**Early experiences show that cities should consider playing an active role in managing micromobility systems in their community.**



## Case Study

In September 2017, the District of Columbia (D.C.) began its dockless micromobility pilot program (2020-00965). D.C. issued permits to eight different micromobility operators and allowed each operator to operate 400 vehicles of their choice in the public right-of-way in D.C.

The D.C. Department of Transportation (DDOT) collected data from all these operators and carefully studied these data to understand how these dockless services operated in D.C. DDOT also surveyed citizens about the pilot to understand the public's reaction to the program. The pilot ended in August 2018 and DDOT released the phase 1 evaluation in December 2018.



Micromobility in Washington D.C.

## Findings

Overall, the DDOT pilot program findings include:

- Dockless transportation usage was low in both absolute numbers and compared to docked Capital Bikeshare. In June 2018, the last month of the pilot program, travelers took just over 5,000 trips by dockless bikeshare and just under 5,000 trips by e-scooter.
- Travelers started and ended most of their trips in the denser downtown areas of D.C. and took most of their trips during daylight hours. This suggests that while the dockless program “[showed] promise” there is not yet “strong empirical evidence” that dockless micromobility modes are significantly altering travel habits. However, usage may have also been low due to the low number of vehicles overall.
- The program encountered issues related to improper use of dockless vehicles. During the program, DDOT employees randomly inspected where users had parked micromobility. Of the 181 completed inspections, inspectors found a significant minority (34 percent) of vehicles improperly parked. This suggests that cities need to educate users about how to properly park dockless vehicles and further implement regulatory measures to encourage proper parking.
- Public perception of the pilot was generally positive. The “primary negative concern was clutter, [blocked] pedestrian travel ways, and parking.” Additionally, 12 percent of the surveyed public strongly disagreed with the idea of continuing the pilot program.



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