

# Do bikeshare systems complement or replace public transit?

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A student rides a VeoRide bicycle on the University of Illinois campus. Credit: College of ACES, University of Illinois.

Bikeshare systems have come a long way since they were first introduced in the Netherlands in the 1960s. They are popular in cities

around the world, but how do bike systems affect existing public transportation? That's the topic of a new paper from the University of Illinois, published in *Transportation Research Part A: Policy and Practice*.

The researchers study the impact of bikeshare bikes in U of I's hometown, the midsize metropolitan area of Champaign-Urbana in Central Illinois. The town houses 500 VeoRide bikeshare bikes on campus and in the wider communities, 400 of which are electric. All are dockless, meaning they can be picked up and parked anywhere.

Since VeoRide launched in 2018, Champaign-Urbana has seen an increase in bikeshare riding, while [bus ridership](#) in the United States has declined since 2014.

"On one hand, bikeshare has the potential to compete with other transit types due to the convenience and speed (especially electric bikes). On the other hand, bikes might complement [bus transit](#) by replacing just a segment of the trip," says Yilan Xu, associate professor in the Department of Agricultural and Consumer Economics (ACE) at U of I, and co-author on the paper.

Dockless systems especially can help solve the age-old problem of the first and last mile of a trip, allowing users to ride directly to the bus stop or their final destination, Xu notes.

In order to determine how bikeshare interacts with the bus system, Xu and Rebecca Martin, who was a graduate student in ACE when the research was conducted, measured the number of boarding passengers at bus stops in each hour between 8 a.m. and 6 p.m. during the fall season.

The biggest challenge to pinpointing the effect of bikeshare on [bus ridership](#) is that ridership naturally varies from year to year due to factors the researchers cannot measure, Xu notes. Simply comparing

ridership before and after the VeoRide bikeshare system was introduced or the year bikes were upgraded to electric could not measure the true effect.

Instead, Martin and Xu compared the differences in the ridership between dry and rainy hours across years, leveraging the fact that rainy hours are less desirable for bike-riding and therefore serve as a good control for the ridership trajectory in the absence of the bikeshare.

Rather than replacing or diminishing bus riding, the researchers found the bikeshare system supported ridership. In fact, pedal bikes increased the number of bus rides by 1%, and the introduction of electric bikes took that to 2.1%. The bus system in Champaign-Urbana had over 12 million passenger trips in 2017; thus, ridership could increase with 120,000 to 252,000 trips per year.

The timing of the complementary use suggests that people are using bikes to solve the first/last mile problem, while the locations suggest socioeconomically disadvantaged and young people benefited more from the option of bikeshare.

"This is encouraging news to bikeshare and traditional public transit systems," Xu says.

Bikeshare is a public benefit because it helps people access mass transit, everyday amenities, and job opportunities. Martin and Xu have several suggestions for city planners and [city governments](#) based on their data and other factors.

"Governments may want to invest in infrastructure like bike lanes and facilitate a bike-friendly community and encourage bikeshare companies to distribute their bikes in spots that would solve the first/last mile problem, probably by using a dockless system," Xu concludes.

"Finally, transit systems and bikeshare systems may want to create partnerships to integrate charging systems that allow transfers between bikeshare and bus ride. This is going to create a win-win for both parties and benefit consumers."

The paper, "Is tech-enhanced bikeshare a substitute or complement for public transit?" is published in *Transportation Research Part A: Policy and Practice*.

**More information:** Rebecca Martin et al, Is tech-enhanced bikeshare a substitute or complement for public transit?, *Transportation Research Part A: Policy and Practice* (2021). [DOI: 10.1016/j.tra.2021.11.007](https://doi.org/10.1016/j.tra.2021.11.007)

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