

# Minding the gap between mass transit and ride-hailing apps

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As Uber and Lyft become more widely available, researchers zero in on how these ride-hailing services are affecting urban development and the environment. Credit: University of Pennsylvania

If it's a Friday evening and you're leaving the office to meet a friend across town, modern transportation technology offers you a few options. You could walk to the nearest subway station, wait for the next train, sit through a series of stops, and then walk the additional distance to your location. Or, you could pull out your phone, request an Uber or Lyft, and have a personal driver ferry you from where you stand to the door of where you're going.

This is the exact situation that Penn doctoral student Caitlin Gorbach found herself in one day. She pulled up the Uber app on her phone.

"That got me thinking: My consumer behavior has now changed in an era where my transportation options have suddenly expanded," says Gorbach, a sixth-year applied economics graduate student at Wharton. She began to wonder what other areas of urban economics this affects. "If restaurant and bar owners, for example, know that I can get to

them more easily, can they locate in previously underserved areas that offer potentially lower rent?"

That epiphany spurred the idea for Gorbach's Ph.D. thesis, which focuses on determining how the introduction of Uber has changed the way people travel in urban areas. It's one of a pair of research projects on ride-hailing funded by Penn's Kleinman Center for Energy Policy. Gorbach is looking at whether previously inaccessible regions—for example, those a far walk from the nearest subway or bus station—have seen an uptick in businesses and restaurants moving in to coincide with the ride-sharing boom. A second project led by doctoral student Xiaoxia Summer Dong focuses on how transportation habits have changed in this new era. Both researchers are dedicated to understanding the larger impacts of greater access to such services.

The way Gorbach sees it, an urban area is like a doughnut. The hole in the middle represents the bustling city center and the doughy, edible part represents the regions outside of that center, accessible by different modes of transportation. Previously, the doughy part wasn't all that thick, because public transportation had a limited reach. But how has the doughnut thickened now that Ubers and Lyfts can take curious urbanites virtually anywhere?

So far she's found what she expected to find: Previously underserved, hard-to-access regions are seeing a burst of redevelopment with businesses like restaurants and bars. Although that's a great benefit to those areas, there are other repercussions to consider. "A bigger goal of the project is trying to weigh those benefits in amenities and access with the costs of increased emissions, increased travel," she says.

EPA data measuring carbon monoxide, a common output from cars, don't paint a positive picture,

highlighting a clear correlation between the introduction of Uber and greater emissions in more than a dozen cities in the United States. And according to Dong's project, after Uber arrived in Philadelphia, ridership on the city's public transit options decreased significantly, in some cases to the lowest levels since the 2008 recession. Dong, a third-year Ph.D. student studying city planning in Penn's Stuart Weitzman School of Design, came to this conclusion by analyzing several years of subway, bus, trolley, and regional rail ridership data for Philadelphia County and the surrounding Pennsylvania counties of Bucks, Chester, Delaware, and Montgomery.

For these five areas, he also sent a survey to 600 residents, asking whether they would opt for public transportation or a ride-hailing service like Uber or Lyft in different travel-time and trip-cost scenarios. City dwellers, he found, choose public transportation or Uber almost equally, but those in the suburbs prefer ride-hailing services. Dong posits that the reason behind the data could relate to the fact that public transportation is more extensive in the city center and also that average incomes are generally higher in the suburban areas, potentially making Ubers more feasible, even if they're a little pricier.

Additionally, the survey asked participants whether they were aware of the difference in environmental impacts between a ride-hailing service and public transportation. "Most people either aren't aware or simply just don't care about the environmental impact of ride-hail when they choose their travel mode," he says. The analysis of the survey is almost complete, and a paper about it is under revision for a city planning journal. Dong plans to finish his dissertation research in March 2020.

For environmental impact research on ride-hailing services to continue, companies like Uber and Lyft will need to make their data much more available—they will remain a part of the climate equation for the foreseeable future.

"The transportation sector is the biggest CO<sub>2</sub> emitter in the United States, and globally is the fastest growing contributor to climate emissions," says Mark Alan Hughes, founding faculty director of

the Kleinman Center and a professor of practice in the Weitzman School. "With the rise of Uber and Lyft, research like this is crucial for understanding consumer behavior, urban development, and the impacts of such services on our climate mitigation efforts."

Provided by University of Pennsylvania

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