No one knew just how many Ubers and Lyfts were out there—until now

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Northeastern researchers Alan Mislove and Christo Wilson created a program that works to determine the volume of drivers for these ride-hailing services in San Francisco, collecting data that are typically held closely by both companies. Credit: Northeastern University

In urban areas—and in not so urban areas—around the globe, Uber and Lyft are ubiquitous. But knowing just how many are out there at a given time is a problem that's eluded municipal transportation officials since the ride-hailing services burst onto the scene. That is, until now.

New research by Northeastern associate professor Alan Mislove and assistant professor Christo Wilson pulls back the curtain on this information, which is criticial for municipal planners to make decisions on how to budget for mass transit updates, to understand the traffic impact on their cities and towns, and to get a picture of just what they're grappling with.

Mislove and Wilson, both in the College of Computer and Information Science, conducted a study of the density of Uber and Lyft vehicles in San Francisco. Mislove's research includes network measurement, networking, and security and privacy issues associated with online social networks, and Wilson's research focuses broadly on security, privacy, and transparency on the web. Together, they created a program that can determine the volume of drivers in the city, collecting data that are typically held closely by both companies.

The program uses the data available on the Uber and Lyft smartphone apps to create a broader map of the city. Wilson explained that each time a user calls up one of the apps, it shows the eight closest cars to that person. So, they created hundreds of accounts for both companies and placed those accounts strategically throughout the city.

"We run our fake accounts, and they all start asking Uber and Lyft what the eight closest cars to me are," Wilson said. "Since we have so many, we get a complete picture of all the cars in that location."

Their research revealed that on a typical weekday in San Francisco, Uber and Lyft are operating more than 5,700 vehicles, which make more than 170,000 trips within the city. From Mondays to Fridays, these vehicles travel roughly 570,000 miles within the city, accounting for 20 percent of local daily traffic.

Commissioned by the San Francisco County Transportation Authority, or SFCTA, the research focused specifically on the City by the Bay. But Wilson said transportation officials across the country have expressed interest in their work since it published.

Joe Castiglione, SFCTA's deputy director for technology, data, and analysis, agrees. "I've fielded dozens of questions and inquiries from officials who are dying to get their hands on the same information for their cities,"he said. "Our perception that this is a really critical issue in San Francisco is one that's shared by people across the country."

Wilson and Mislove also found that Uber and Lyft cars were more concentrated in the "densest and most congested parts of San Francisco." This, too, is something that may impact how transportation officials and city planners budget for public transportation.

"If you're an urban planner or a civil engineer, this is huge," Wilson said. "It will definitely impact your investment strategy going forward. Maybe you don't invest in more buses or trains, but instead in the roads—doing that with ride-sharing in mind."

Indeed, traffic congestion generally impacts dozens of other areas of life—air quality, accessibility, and mass transportation ridership are a few examples Castiglione offered. But until now, he and others in the field simply had no way of knowing what sort of impact Uber and Lyft rides were having on the broader traffic picture in San Francisco.

"We were in the dark, and this turned the light on," he said.

Provided by Northeastern University