

Want to wait less at the bus stop? Beware real-time updates

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Smartphone apps that tell commuters when a bus will arrive at a stop don't result in less time waiting than reliance on an official bus route schedule, a new study suggests.

In fact, people who followed the suggestions of transit apps to [time](#) their arrival for when the bus pulls up to the stop were likely to miss the bus about three-fourths of the time, results showed.

"Following what transit apps tell you about when to leave your home or office for the bus stop is a risky strategy," said Luyu Liu, lead author of the study and a doctoral student in geography at The Ohio State University.

"The app may tell you the bus will be five minutes late, but drivers can make up time after you start walking, and you end up missing the bus."

The best choice on average for bus commuters is to refer to the official [schedule](#), or at least build in extra time when using the app's suggestions, according to the researchers.

Liu conducted the study with Harvey Miller, professor of geography and director of Ohio State's Center for Urban and Regional Analysis. The study was published recently online in the journal *Transportation Research Part A*.

"We're not saying that real-time bus information is bad. It is reassuring to know that a bus is coming," Miller said.

"But if you're going to use these apps, you have to know how to use them and realize it still won't be better on average than following the schedule."

For the study, the researchers analyzed bus traffic for one year (May 2018 to May 2019) on one route of the Central Ohio Transit Authority (COTA), the public bus system in Columbus.

Liu and Miller used the same real-time data that publicly available apps use to tell riders where busses are and when they are likely to reach individual stops. They compared the real-time data predictions of when busses would arrive at stops to when busses actually arrived for a popular bus route that traverses a large part of the city. The researchers then calculated the average time commuters would wait at a stop if they used different tactics to time their arrival, including just following the bus schedule.

The absolute worst way to catch the bus was using what the researchers called the "greedy [tactic](#)"—the one used by many transit apps—in which commuters timed their arrival at the stop to when the app said the bus would pull up.

The average wait using the greedy tactic was about 12½ minutes—about three times longer than simply following the schedule. That's because riders using this tactic are at high risk of missing the bus, researchers found.

The app tells riders when the bus will arrive based

on where it is and how fast it is traveling when a commuter checks it, Miller said.

But there are two problems with that method, he said. For one, drivers can make up lost time.

"COTA wants to deliver on-time service, so bus operators understandably will try to get back on schedule," Miller said.

Plus, the apps don't check the bus location often enough to get accurate real-time information.

Slightly better was the "arbitrary tactic" when a person just randomly walked up to a stop and caught the next bus that arrived. Commuters using this tactic would wait on average about 8½ minutes for the next bus.

The second-best tactic was what the researchers called the "prudent tactic," which was using the app to plan for arrival at the stop but adding some time as an "insurance buffer." Here the average wait time was four minutes and 42 seconds, with a 10 percent risk of missing the bus.

The prudent tactic waiting time was similar to the "schedule tactic," which is just using the public schedule to determine when to arrive at the stop. These commuters waited an average of four minutes and 12 seconds, with only a 6 percent risk of missing the bus.

There is some variation on waiting time within these averages, especially with the two tactics that use real-time information from apps. One of the most [important factors](#) is the length of a commuter's walk to the bus stop.

Those who have longer walks take more risks when they rely on real-time information. If the app tells commuters their bus is running late, a long walk gives the bus more time to speed up to get back on schedule.

Another important factor is the length of time between busses arriving at a stop. A longer time between busses means more risk if you miss a bus, and results in more time waiting.

While on average the schedule tactic worked best, there were minor exceptions.

Results showed that it was generally better for work commuters to follow the schedule tactic in the morning when going to work and follow the prudent tactic using an app in the afternoon.

But one thing was certain, the researchers said: It was never a good idea to be greedy and try to achieve no waiting at the bus stop.

Waiting time for busses is an important issue, Miller said. For one, long waiting times is one of the top issues cited by people for not using public transportation.

It is also a safety concern for people to not have to wait for long periods at stops, especially at night, or for those rushing around busy streets because they are late for a bus. And for many people, missing busses can jeopardize their jobs or important health care appointments, Miller said.

Miller said the apps themselves could be more helpful by taking advantage of the data used in this study to make better recommendations.

"These apps shouldn't be pushing risky strategies on users for eliminating waiting time. They should be more sophisticated," he said.

More information: Luyu Liu et al. Does real-time transit information reduce waiting time? An empirical analysis, *Transportation Research Part A: Policy and Practice* (2020). [DOI: 10.1016/j.tra.2020.09.014](#)

Provided by The Ohio State University

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