

Study found consumers are more prepared for automated vehicle delivery than drones or robots

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With Amazon aiming to make 10,000 deliveries with drones in Europe this year and Walmart planning to expand its drone delivery services to

an additional 60,000 homes this year in the states, companies are investing more research and development funding into drone delivery, But are consumers ready to accept this change as the new normal?

Northwestern University's Mobility and Behavior Lab, led by Amanda Stathopoulos, an associate professor of civil and environmental engineering, wanted to know if consumers were ready for robots to replace delivery drivers, in the form of automated vehicles, drones and robots. The team found that societally, there's work to do to shift public perceptions of the near-future technology.

"We need to think really carefully about the effect of these new technologies on people and communities, and to tune in to what they think about these changes," Stathopoulos, the study's senior author, said.

The study, titled "Robots at your doorstep: Acceptance of near-future technologies for automated parcel delivery," [published](#) last week in the journal *Scientific Reports*. Researchers noted a "complex and multifaceted" relationship between behavior and acceptance of near-future technologies for automated parcel delivery.

While people were generally more willing to accept an [automated vehicle](#) as a substitute for a delivery person—perhaps because there already is familiarity with self-driving cars—people disliked drones and robots as options. However, as delivery speed increased and price decreased, likelihood to accept the technology increased.

They also found that tech-savvy consumers were more accepting of the near-future technologies than populations less familiar with the technology.

Stathopoulos is the William Patterson Junior professor of civil and [environmental engineering](#) at Northwestern's McCormick School of

Engineering, where she studies the human aspects of new systems of mobility. She also is a faculty affiliate of Northwestern's Transportation Center. She said especially after the pandemic, people have come to expect efficient delivery from e-commerce purchases as they increasingly work from home.

Maher Said, a graduate of Stathopoulos's lab, is the study's lead author.

"There's a paradox: We're having a hard time reconciling the convenience and the benefit of getting speedy, efficient delivery with its consequences, like poor labor conditions in warehouses, air pollution and congested streets," Stathopoulos said. "We don't really see that other role that we play as citizens or as users of the city. And one role is directly affecting the other role, and we are both. With automated delivery, we could reduce some of these issues."

The team designed a survey to assess preferences of 692 U.S. respondents, asking questions about different delivery options and variables like delivery speed, package handling and general perceptions.

Stathopoulos said that while new modes of delivery present an exciting opportunity, societally, "we're not there just yet." As companies ramp up drone deliveries due in part to labor shortages and in part because existing systems cannot satisfy the sheer volume of e-commerce deliveries, the researchers caution that these innovations may fail because of a lack of public acceptance.

Stathopoulos said she thinks shipping and logistics centers should be placed at the "front and center" of city planning and design, as in some European cities, to recognize its importance and role in quality of life. Policy makers will also need to become part of the conversation as more drones enter the airspace and labor shifts. None of this will work, Stathopoulos argued, until companies begin to consolidate their unique

systems.

"On the planning side, we need to make sure that we embrace the fact that the massive amount of deliveries is going to shape our cities," Stathopoulos said. "Collaboration, coordination, and information sharing between companies has been a running challenge—but it's not going to work if everyone has their own technology. It just destroys the purpose and builds redundant and overlapping systems."

However, by listening to and conducting more frequent assessments of user acceptance of technologies, Stathopoulos argues that policy makers and companies can prepare for the future and work to overcome anxiety and reluctance to accept new technologies.

More information: Maher Said et al, Robots at your doorstep: acceptance of near-future technologies for automated parcel delivery, *Scientific Reports* (2023). [DOI: 10.1038/s41598-023-45371-1](https://doi.org/10.1038/s41598-023-45371-1)

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