As Delivery Methods Evolve, Will City Streets Keep Up?

UPS is among the companies testing e-bikes and other alternative delivery vehicles. Credit: UPS.

FOR YEARS, innovations in alternative mobility—scooters, e-bikes, autonomous vehicles—have focused on how individuals get around. But the pandemic era has put fresh emphasis on a different mobility goal: moving *stuff* around.

The demand for rapid delivery has increased sharply in the past two years, and it doesn't seem to be abating. By some estimates, companies like Door Dash see the quick delivery of groceries alone adding up to a $1 trillion market. With major companies from UPS to Domino's trying out new ways to deliver their products, the pace and range of vehicle experiments has accelerated—and that is likely to impact the design, planning, and regulation of urban and suburban spaces.

While it's unclear *which* of these experiments will pan out, it's undeniable that new kinds of delivery vehicles are or soon will be on our streets. With new questions arising, urban design thinkers, retail and technology companies, and municipalities are working to address the convergence of increasing delivery demand and new vehicle forms.

Leading the micro-mobility pack is the e-bike, a form that's been around for decades but has lately become strikingly popular: with sales up 145 percent since the pandemic started, e-bikes now reportedly outsell electric cars. John MacArthur, a program manager at Portland State University's Transportation Research and Education Center (TREC), has been researching their potential—including the "tantalizing hope" that micro-mobility tech gets more people out of cars—for the better part of a decade. Last year, he taught a new class focused on cities dealing with all manner of new micro-mobility experiments, or "technologies being thrust in the public right of way."

Students in that class found that the pandemic was inspiring a range of responses from cities. On the one hand, work-from-home trends reduced and reconfigured car-centric commuter patterns. In Portland and elsewhere, MacArthur notes, that led to the creation of more bike and bus lanes. On the other hand, delivery demand spiked, leading to concern about a corresponding spike in single-occupancy delivery vehicles.

MacArthur's research connected him to Portland's B-Line Urban Delivery, a 12-year-old firm that operates a fleet of electric cargo trikes that can handle 500-pound loads. With input from TREC and B-Line, Portland is now considering ways to create "micro-delivery hubs." In this model, a truck brings a load of deliveries to a strategic location, with e-bikes or other micro-vehicles handling the last mile for each delivery, reducing traffic congestion. Such experiments are already underway in Europe, where delivery giant UPS has been experimenting with e-bikes, delivery hubs, and other "sustainable logistics solutions."

MacArthur acknowledges that complicated zoning and other issues are involved. But the bigger point is that Portland is among the cities proactively grappling with the future of mobility and how cities can respond to it and, more important, shape it.

Shaping the response to new vehicle forms was a theme of a recent "Rebooting NYC" research project spearheaded by Rohit Aggarwala, a senior fellow at the Urban Tech Hub of the Jacobs Technion-Cornell Institute at Cornell Tech. Aggarwala—who previously led mobility work for Sidewalk Labs and recently joined New York City government as commissioner of the Department of Environmental Protection and the city's chief climate officer—sketches the broader context. "If a vehicle is designed to fit well in traditional traffic, then it is almost by definition not designed to be a good urban vehicle," he says. Cars, pickups, and SUVs are built for highways; their makers put far less emphasis on, say, turning radius or other factors that would make them more suited to the narrower confines of urban streets.

Thus the rise of new, smaller autonomous vehicles such as the Nuro, shaped like a diminutive van and about half the width of a conventional sedan; with no driver, it's designed to haul up to 500 pounds of cargo. The startup might be best known for a limited pilot program

Nuro, an autonomous vehicle company founded by two former Google engineers, has partnered with companies including Domino's, CVS, Walmart, and FedEx on delivery pilot projects in several U.S. states. Credit: Domino's.

in Houston with Domino's, offering "the world's first fully automated pizza delivery service."

While such wee vehicles are pitched as virtuously reducing not just pollution but also traffic congestion, the reality is that they're often fundamentally unsuited to real-world traffic. So where can they go?

Another recent pilot program involving startup Refraction AI's REV-1 had the three-wheeled, washing machine–sized autonomous vehicle hauling pizzas via bike lanes in Austin, Texas—a development that some cyclists were not pleased about. "What if in two years we have several hundred of these on the road?" one bike advocate asked a local journalist. Yet another startup, Starship, has been testing its small mobile robot—a 55-pound object with the footprint of a wagon—in several cities, using sidewalks. This, too, has met with a mixed response.

Such responses signal a major potential flashpoint, but also, perhaps, an opportunity. Aggarwala points out that in New York and other cities, bicyclists and e-bike users (who are often delivery workers) have long battled over bike lane use. In many cases, bike advocates have fought for years or decades to establish dedicated lanes, and have little interest in seeing them clogged with newfangled motorized vehicles of any kind.

But the problem isn't the e-bikes or AVs or robots, each of which offers positive alternatives to traditional cars, Aggarwala says: "The problem is all these alternative vehicles being shoehorned into an incomplete network of generally unpro-tected lanes that are way too narrow." Thus the "Rebooting NYC" proposals include creating New Mobility Lanes. This would involve widening and expanding the city's existing bike lanes into a "network that can accommodate both bicycles and these new vehicles."

Other researchers have made similar proposals for "light individual transport lanes," with varying specifics but a common goal. "You're basically providing more space for different kinds of vehicles," says MacArthur of PSU. "That's the big question that planners will have to face in the next five years." It's a knotty challenge for municipalities caught between the ambitions of tech companies, the limits on local regulation resulting from superseding state or federal rules, and the reality that even designating bike lanes in the first place depends more on mustering political will and popular support than it does on the planning that underpins it.

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On that last point, Aggarwala suggests a potential opportunity. As a political matter, bike lanes are often seen as benefiting just a portion of the population at the expense of everyone else. But pretty much everyone has been stuck behind a delivery vehicle. And, maybe more to the point, more of us than ever have come to depend on those delivery vehicles. So rejiggering the way road space is divided doesn't just benefit the few—it's for nearly everyone. In other words, Aggarwala asks: "What if you broaden the relevance of a bike lane by expanding its use?"

Clearly a wave of new-vehicle experimenta-tion is poised to disrupt the delivery business, in a time of unprecedented demand. It's worth thinking about how planners and policy makers can not just respond to that wave, but harness it to help make city streets more functional and accessible for all.

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