

BUSINESS

Inside Amazon's largest warehouse — where you'll find more robots than people

A visit to the future of shipping: Amazon's largest-ever warehouse replaces GM plant



Jairaj Vora, a manager at Amazon's giant facility in Stanton, near Wilmington, Del. stands inside the \$250 million warehouse.

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STANTON, Del. — Amazon's [biggest](#), newest warehouse, with more robots than ever, brings America closer to an automated future when machines do all the work of moving everything from groceries to laptops, from makers to users. And do it faster.

While Amazon has been building increasingly automated warehouses since opening its first satellite center in 1997, five miles down the road in New Castle, Del., this \$250 million showcase is something entirely different.

Insides the five-story plant — as big as 17 football fields, or four of Philadelphia's tallest high rises — an electromechanical ballet performed by robots takes place in an eerie quiet. Robot vehicles, guided by optical and motion sensors, make turns tightly adjacent to one another, selecting and carrying Amazon's vast array of merchandise from storage to delivery.

There are still workers unloading trucks from suppliers and stowing the contents — not in vast shelves for hands to grab but in eight-foot-tall stacks of square yellow bins. Once within these, goods begin their robotic travels.

Hour after hour, tireless robots seize the stacks and move them across the vast floors, dutifully pausing before isolated checkers, flesh, and blood, who wave electronics devices to verify the orders. Finally, workers pack the sorted goods onto conveyors to carry them to loaders for delivery.

And Amazon is developing drones and self-driving vehicles to speed those last steps.

Rival shippers such as FedEx or the U.S. Postal Service, big grocery chains, and upstart deliverers such as Philadelphia's Gopuff have also been speeding up their warehouses. But Amazon's massive investment will force its competitors to invest a lot more, a lot faster, analysts predict.

About 10,000 Amazon-built robots here far outnumber the 1,000 newly hired human workers who spend 10- to 12- hour shifts at the 3.7 million-square foot complex, which Amazon contractors erected on the site of a former General Motors factory.

Does that 10-1 ratio spell an end to the [massive hiring](#) that has made warehouse work at double the minimum wage so widely available in recent years?

Amazon and its admirers are a little sensitive on this point, so it's worth noting upfront: Amazon is still hiring, not just because so many workers don't last a year, but also because its service is so popular that it keeps building more centers, adding people to run them, doing things robots still can't. For now.

Amazon employed 1.3 million employees worldwide last year, up from 800,000 a year earlier. Among U.S. companies, only rival Walmart, with all its stores, employs more.

To be sure, some critical economists say Amazon destroys more jobs than it creates. Other analysts say that labor-saving has always been the goal of new technology.

In any event, Will Carney, the plant's manager here, said, "Our hiring is not quite done."

The facility is in a "ramp-up" stage, and may eventually employ as many as 4,000 to 5,000 workers, as the work expands over the next several years, according to spokesman Steve Kelly.

Amazon hopes it will be easier to keep human workers this winter, when the company has pledged to start providing workers up to \$5,250 a year toward colleges costs. It may also add robots and employees in Delaware, though Amazon won't detail its longer-term plans for the facility.



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About 10,000 robots carry packages at Amazon's new, 3.7 million-square-foot facility at a former General Motors plant near Wilmington.

The staff, as much as it has grown since opening this summer, is still fewer than Amazon employs at fulfillment centers one-quarter this size.

The facility is the flagship of [a sweeping expansion](#) by Amazon across the Philadelphia region. Amazon has plans to open as many as nine new facilities in the coming months. That's on top of the 14 sites added last year across Philadelphia and its suburbs, the Lehigh Valley, South Jersey, and northern Delaware.

In all, Amazon now has more than 57 centers up and running or underway across this greater Philadelphia region. Real estate and industry analysts call the growth unprecedented.

Still, here in Stanton, Amazon is no replacement for the former GM plant, where then-Sen. Joe Biden used to launch his political campaigns, glad-handling the union workers.

Built amid farm fields in 1946, the old plant employed at its peak as many as 5,000 United Auto Workers members who built Oldsmobiles, Chevettes and, toward the end, Saturns, before the last workers were let go in 2009 as a recession-wracked GM reined in production.

A Biden-backed proposal to build electric cars fizzled after burning through more than \$200 million in state and federal subsidies.

Manufacturers add value, and GM paid well; distribution of goods made somewhere else was historically a lot less lucrative. The GM plant, along with a nearby Chrysler factory, a DuPont paint complex, and a Claymont Steel works underpinned a prosperous post-World War II American manufacturing economy. All four are closed.

Despite Amazon's recent bump in pay up to \$18 an hour — \$3 more than Amazon projected two years ago when it announced its plan — the nonunion Amazon workers make less than GM workers did when the plant closed. (Less than half as much, adjusted for inflation.)

As wages creep up, Amazon has relentlessly focused on consolidating operations and speeding deliveries.

"This is just the beginning. You will see large centers like this throughout the country," with other supersized facilities already rising in California, New York, Virginia, and Arkansas, said Subodha Kumar, a professor at Temple University's business school and an expert on supply chains and information systems.

Robots make it easier to manage inventory, speeding the deliveries from Amazon's smaller distribution centers in such cities as Philadelphia, said Kumar. Amazon now guarantees two-hour deliveries in many locations.

"They want 30 minutes," he said. "They have plans to go shorter than that, if they can."

Amazon said automation frees workers from dull, repetitive tasks. But workers have complained that automated production has been accompanied by speed-ups and a [higher-than-average rate of injuries](#).

Why Delaware? It helps that the state gave the company, whose profits top \$2 billion a month, [about \\$4.5 million in up-front aid](#), while the local government cut realty taxes to a fraction of what GM paid. Wilmington's proximity to workforces in Maryland, New Jersey, and Philadelphia's southern suburbs helped, too.

"They try to find locations they can run at lower cost," Kumar said.

(Amazon officials say the plant's proximity to the Port of Wilmington, airports, and on-site railroad sidings don't matter, since cargo goes in and out by truck.)

"I call these very large plants the 'motherships,'" said Brittain Ladd, a former Amazon logistics executive turned automation consultant.

Ladd said Amazon's latest expansion draws upon location and system-management lessons from its highly profitable Amazon Web Services network of services to corporations.

He sees accelerating automation as inevitable.

"During the pandemic a lot of people decided they don't want to spend 20 or 30 years working in a fulfillment center," Ladd said. "Amazon may employ a million people. But turnover in some places is nearly 100% a year. They can't hire enough people. They have no choice but to invest in automation and robotics."

Amazon bought Kiva, which developed the robots deployed in Delaware and elsewhere, eight years go — and, thinking ahead, stopped supplying Gap and other retailers with Kiva machines as if to forestall competition and keep the savings for itself, Kumar said.

Ladd expects the robotics arms race to accelerate, with Amazon forcing competitors to upgrade.

"In the long run, if they are not going to innovate and automate, they will not survive," said Temple's Kuma. "Amazon is moving very fast."

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