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It's the flip-side to the "retail apocalypse:" A siege of delivery trucks is threatening to choke cities with traffic. But not everyone agrees on what to do about it.

This post is part of a CityLab series on <u>open secrets</u>—stories about what's hiding in plain sight.

Just before 3 in the afternoon on a rainy spring day, Keith Greenleaf busts out his "bricklaying" skills. That's delivery-driver parlance for balancing an inordinate amount of cardboard boxes on a metal handcart. As high as his collarbone he stacks them, packages labeled HP, J. Crew, Amazon Prime. "This is probably one of the first days I don't have Pampers or dog food," he says.

Greenleaf also doesn't have any 60-pound boxes of copier paper, which is a welcome way to finish his daily rounds.The veteran UPS driver is parked near 22nd and I St. in Washington, D.C., having arrived there about six hours earlier in a truck loaded down with 320 boxes. In a few hours he'll drive back to the distribution center in Landover, Maryland; several hours after that, he'll be at Outback Steakhouse downing beers with a few fellow drivers.

OPEN SECRETS

Revealing the invisible city

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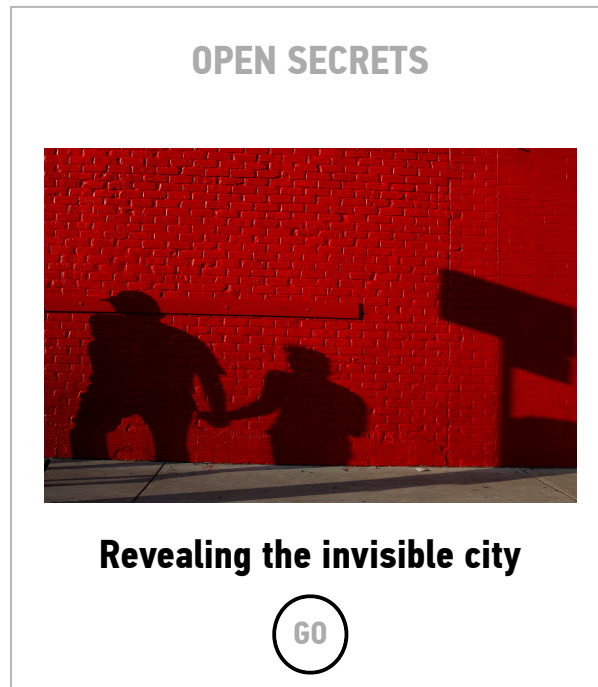
Right now, however, Greenleaf's in the thick of it. For 15 of his 25 years driving for UPS, he has delivered along roughly a 10-block route close to 22nd and I. Several years ago, to meet the demand, UPS shortened Greenleaf's route by two blocks and gave them to a new driver on a new route. When I meet up with him mid-afternoon one Friday (per UPS media ride-along convention, I've been given my own iconic brown uniform, including pants so baggy MC Hammer would cringe), he's unloading boxes from his parked truck onto a loading dock underneath the Residences on the Avenue, an apartment building with a Whole Foods right next door. As I get ready to climb aboard, he tells me we won't be making any deliveries in the truck.

Several years ago, the 56-year-old was delivering mainly to commercial locations. Now half his drop-offs are residential. The traffic congestion and lack of available parking has become so unworkable that Greenleaf would rather walk the remainder of his route, delivering packages by handcart, which is what he's done every afternoon for the last three years.

Pick any other major city or metropolitan area in the U.S., and the situation's probably the same: a massive surge in deliveries to residential dwellings, one that's outstripping deliveries to commercial establishments and creating a traffic nightmare.

Consumers today are spending less time in local stores and more time online, buying not only retail items but also such goods as groceries from Peapod, office supplies from Postmates, and whatever the hell they want from Amazon. It's estimated that, on average, every person in the U.S. generates demand for roughly 60 tons of freight each year, according to the National Capital Region Transportation Planning Board. In 2010, the United States Post Office—which has overtaken both FedEx and UPS as the largest parcel-delivery service in the country—delivered 3.1 billion packages nationwide; last year, the USPS delivered more than 5.1 billion packages. The growth in e-commerce is fueling a commensurate rise in the number of delivery vehicles—box trucks, smaller vans, and cars alike—on city streets.

While truck traffic currently represents about 7 percent of urban traffic in American cities, it bears a disproportionate congestion cost of $28 billion, or about 17 percent of the total U.S. congestion costs, in wasted hours and gas. Cities, struggling to keep up with the deluge of delivery drivers, are seeing their curb space and streets overtaken by double-parked vehicles, to say nothing of the bonus pollution and roadwear produced thanks to a surfeit of Amazon Prime orders.

"A humongous amount of externalities are being produced," says José Holguín-Veras, director of the Center of Excellence for Sustainable Urban Freight Systems at Rensselaer Polytechnic Institute. "Every 25 people produce one Internet delivery. … So imagine any congested city you know of. Imagine that you were to increase freight traffic by a factor of three. This is what's happening now."

UPS driver Keith Greenleaf is doing less driving in the city these days: Most of his urban drop-offs need to be done via hand-cart, because of traffic congestion. (Andrew Zaleski/CityLab)

It didn't used to be like this.

The urban home-delivery ecosystem of yore evokes images of icemen making their rounds or kindly white-capped milk men stopping by with a new glass bottle. City dwellers, with their density of retail options within close walking distance, often had newspapers and perishables delivered daily, but in the earlier decades of the 20th century, home delivery of purchased goods was typically something arranged after a trip to the store, where shoppers tried on or tested out the clothes and furniture they wanted, and then scheduled what they couldn't carry back by hand or in taxis or streetcars to be dropped off later. It was for this very purpose that UPS was founded in 1907 in Seattle. Overall, though, bulk deliveries predominated. These were deliveries of large retail goods to stores in shopping districts, where some thought had been given to how streets would accommodate trucks.

In recent years, urban dwellers have managed to flip the script. Since the beginning of this decade, online retail sales in the U.S. have grown by about 15 percent every year. So consider a UPS driver like Greenleaf 110 years later: On any given weekday, he's one of an average of 241 drivers making deliveries on D.C.'s streets, delivering products like clothes, books, food, and household goods—stuff that shoppers could easily pick up on their own at area stores. (Often, he's dropping off boxes of toiletries to residents in an apartment building with a pharmacy or a grocery store on the same block.)

In 2010, UPS delivered 1.1 million packages around D.C. in the month of March. It's now dropping off 6,500 more packages each day than it did then. The demand is so great that this year, for the first time in its history, UPS will begin delivering packages by truck on Saturdays. "A lot of people see our brown trucks parked on streets with tickets on the window and say we're causing all this backup," says Jim Bruce, senior VP of corporate public affairs with UPS. "People may think of us as the cause of congestion, but you've got to have some way to get those packages delivered."

Sending fleets of box trucks through the streets of Manhattan is transplanting a suburban model of e-commerce delivery to a walkable, urban environment.

The problem, really, is that we now live in a world where the brick-and-mortar stores are only one part of the retail equation—and, as many a "retail apocalypse" story is warning, they are a shrinking part. Demand is being driven by people in their individual homes and apartments ordering smaller amounts of goods with higher frequency: groceries one day, several items from Amazon the next. "Instant" deliveries are now in vogue. Jean-Paul Rodrigue, a global studies and geography professor at Hofstra University, recently completed his own delivery survey of a 300-unit apartment building in northern New Jersey. Over the course of 2016, more than 23,000 packages were delivered, which breaks down to about 65 packages per day.

But as more goods are ordered, more delivery trucks are dispatched on narrow city streets. Often, the box trucks will double-park in a two-lane street if there's no loading zone to pull into, snarling traffic behind them. "We're taking that demand that used to be concentrated and we're spreading it throughout the city throughout all times of day. The streets were not designed for that kind of activity," says Alison Conway, an assistant professor of civil engineering at the City College of New York. She's conducted several pilot studies over the last year estimating the number of packages arriving at residential buildings and the related vehicle trips and parking patterns.

Studies of the locations of residential buildings revealed the problems that leave delivery trucks idling in the street: no storage space for parcels, no freight elevators for deliveries, and no loading docks to park trucks. In a place like New York City, where more than 120,000 packages are delivered daily in Manhattan below 60th Street, according to the city's department of transportation, these missing accommodations compound the congestion problem.

Christopher Leinberger, chair of the Center for Real Estate and Urban Analysis at George Washington University, argues there's no way this current model of urban freight can continue to work, given the increasing demand for online goods. Sending fleets of box trucks daily through the crowded streets of Manhattan or down M Street in Georgetown is merely transplanting a suburban model of e-commerce delivery to a walkable, urban environment.

"Urban freight trips are basically fitting a square peg into a round hole," he says. "It's more trucks and more routes jammed onto city streets, which is trying to address a challenge with obsolete thinking."

With a growing number of urban residents picking up daily necessities from regular Amazon deliveries, the fate of brick-and-mortar retailers in increasingly cloudy. (Paul Sakuma/AP)

Not all urban traffic sages, however, are convinced that the delivery-fueled congestion woes cities are currently facing are here for the long haul.

"If over the next 20 years we slowly increase freight share, it's fine. It's offset by fewer private vehicle trips," says David Levinson, a professor at the School of Civil Engineering at the University of Sydney and co-author of <u>The End of Traffic and the Future of Transport</u>. "We might consume more [goods] in total, but the vast majority of this is substitution. And there's a lot of evidence that people are shopping less."

The thinking here goes that if online shopping is increasing, and there are more delivery vehicles on the roads, home deliveries will offset personal shopping trips, reducing the total number of cars on the road and ultimately reducing congestion. Cities will struggle in the short-term while this cultural transformation is happening. But eventually, you won't even be on the road to notice that FedEx van double-parked by your favorite parallel parking spot. You won't be parking at all.

"E-commerce delivery in the U.S. is currently a bloodbath.… But the number of passenger vehicles on the street is likely going to drop. Congestion, I suspect, will be less of an issue," says Rodrigue, who also thinks the advent of self-driving vehicles will be a boon for the freight industry.

Others, like RPI's Holguín-Veras, aren't so optimistic. He says the data he's been studying shows there's a net increase in the number of vehicle trips. To take one example from UPS' hometown of Seattle: Data from the Puget Sound Regional Council shows that non-work trips increased from 10.3 million trips per day in 2006 to 12.6 million trips per day in 2014. Internet deliveries are not substitutes for trips to stores: We're just adding them on. "When you're sitting in your house, you don't give a damn if all you're ordering is a book or a watch. You're not internalizing those costs. And if you get free deliveries, you have the illusion that this is easy," he says. "And we are ordering a lot."

Addressing consumer behavior directly is perhaps the most difficult part of this. How do you ask urbanites to stop buying stuff online and getting it delivered to their homes when it could easily be purchased at a local store conveniently situated in their dense urban environment? Indeed, what's the point of *having* a city if your retail habits are shaped entirely by your online existence?

During a recent visit to Amazon.com, I was told via pop-up that my online shopping at the Bezos Emporium—books, board games, toiletries, two Tweety Bird dish towels for my Looney Tunes-obsessed grandmother—had saved me 15 shopping trips over the last year. I don't remember exactly, but by counting when packages were delivered, I figured about 17 truck drop-offs were needed to get those items to my door.

"People like you and me are the ones creating the problem," says Holguín-Veras.

A FedEx truck on the streets of the San Francisco (Jeff Chiu/AP)

By and large, many American cities are also playing catch-up as they try to understand these new urban delivery challenges and systems. That's due in part to the failures of urban planning and the nature of the trucking business. While matters of public policy like public transit, bike lanes, and walkability fall within the purview of planning boards and municipal departments of transportation, freight has always been a purely private-sector enterprise. That means cities don't even have reliable data on the number of delivery trucks coursing through their streets. "Metro planning organizations do regular data collection on personal travel. We don't have that equivalent for freight, and we don't have good, metropolitan-scale data about goods movement. Surprise surprise, we don't understand it very well," says Anne Goodchild, director of the Supply Chain Transportation and Logistics Center at the University of Washington in Seattle.

Recently, the center launched UW's Urban Freight Lab, a new partnership between the university, the Seattle Department of Transportation, and private-sector delivery companies (including UPS). Founded in the fall, the lab's job is to begin collecting some of that data. So far, Goodchild and a team of students are measuring dwell time (how long a delivery vehicle has to remain on the street) and failed deliveries (when a driver shows up somewhere to deliver a package but can't because the recipient isn't home and a signature is required). It's the sort of data Seattle hopes to incorporate into an urban goods delivery strategy, one of the cornerstones of a "freight master plan" the city adopted last year.

"It's going to lead to a whole bunch of policy questions," says Scott Kubly, director of the Seattle DOT. "For instance, how do you get away from an enforcement regime? With the volume of deliveries, ticketing isn't effective for us in terms of managing the street. UPS and FedEx will just negotiate a lump sum payment for all the tickets they get instead of fighting every ticket."

One thing is clear: Cities can't just ticket their way out of the delivery-truck problem. For big commercial delivery companies, parking fines are just part of the cost of doing business. UPS paid New York City $18.7 million in parking fines in 2006; in 2011 in Washington, D.C., UPS alone received just shy of 32,000 tickets. Instead of adjudicating each ticket, many large cities will strike agreements or introduce programs through which delivery companies can pay off all tickets in one swoop. New York City's stipulated fine program is one example; by waiving their right to challenge parking tickets, delivery companies pay a pre-set, reduced fine for each parking violation.

If enhanced enforcement isn't the answer, diverting delivery traffic might be. Kubly says that Seattle is taking an inventory of all the remaining alley space in the city. Instead of letting developers extend housing lots into the alleys, they might be used to accommodate some of the incoming delivery traffic. In New York City, where deliveries to residential areas have gone up 30 percent over the last five years, the department of transportation's Office of Freight Mobility is currently assembling its own freight master plan. It's also working with RPI's Holguín-Veras to obtain delivery data from several private companies. By signing a non-disclosure agreement with the university, the office is able to gain access to summary delivery data—on metrics like dwell time—which she says makes private companies, leery of competitors, more willing to share their own numbers.

"If you get free deliveries, you have the illusion that this is easy."

"We need them to share data with us in order to understand what's really happening and advance policy," says Stacey Hodge, director of the Office of Freight Mobility. "Since we started the office in 2007, we've built a very good trust with the private sector. They understand the purpose of sharing data."

Even Uber, <u>notoriously tight-lipped about its data</u>, has extended an olive branch. As part of its new Movement initiative, it's making aggregated driver data available to city planners so they can get a better understanding of traffic and commuter behaviors. Washington, D.C., was one of the three pilot cities that launched the initiative earlier this year.

To ease the squeeze they're feeling with more delivery trucks on the road, cities have begun considering different concepts to make urban spaces more e-commerce friendly. That might mean modifying zoning codes so that new residential buildings are approved for construction only if they accommodate a loading dock, or extending the amount of time a truck can be parked in an on-street delivery zone, or making sure that the corners of sidewalks slope down to meet the street to make it easier for a delivery person with a handcart. Existing apartment buildings could dedicate some of their ground floor space as an incoming deliveries room, which would enable drivers to make one stop instead of needing to go door to door. Some apartment buildings have installed package lockers, a series of closed-door cubbies that delivery drivers can access to drop off packages.

A UPS bike/truck plies the streets of Portland. (UPS)

Delivery companies are also experimenting with ways to reduce their impact. Late last year, UPS introduced its first "eBike" deliveries in (of course) Portland, Oregon. The aim is twofold: Reduce carbon emissions while putting a delivery vehicle on the road small enough to take advantage of curb space. UPS is also integrating across its U.S. routes its new big-data tool, Orion, or On-Road Integrated Optimization and Navigation. As a UPS driver travels their route, Orion works in the background considering up to 200,000 possible routes before picking the most optimal route for a driver to take to reduce the overall time spent driving around from delivery to delivery. "The next generation of that is going to be a real-time tool taking traffic into account," says UPS's Bruce.

Some cities have also begun taking concrete steps to address the issue—sometimes on their own, and sometimes in partnership with private companies. In New York City, a slow shift to off-hour deliveries is taking place. Of the Big Apple's roughly 18,000 restaurants, about 400 restaurants now take deliveries between the off-peak hours of 7 p.m. and 6 a.m. Holguín-Veras led a study of the change in delivery time, and demonstrated that a truck traveling at night produced 60 percent less pollution, or a greenhouse-gas reduction of more than 6,000 tons a year, than a truck traveling in the morning. "Cities are congested now, and without changing behavior, there is no way out," he says. "We need to somehow find solutions."

They're the sorts of challenges that guys like Keith Greenleaf know well, and his solution, at least for the time being, is to complete his daily route on foot, pushing and pulling a handcart weighed down with brown boxes. For nearly two hours I trudge along with him, playing the part of UPS delivery man in training.

Some parts of his job are getting easier. When we make our way inside the Residences on the Avenue apartment building, he tells me it used to take him almost an hour to deliver about 60 packages door to door. Now he handles it in 20 minutes by using a new package locker, where he's able to drop boxes off at individual storage units accessible to residents who receive text messages when their packages have arrived.

Five minutes before 5 p.m., a happy Greenleaf has completed his day. As he takes his seat, he motions to the back of his box truck. For motivation, Greenleaf keeps a Christmas tree stand hanging to remind him that, no matter how much of a slog it is, people are counting on him to get their packages on time. "Every day's Christmas, and every day's game day," he says.

With that, he hits the ignition and heads out into the rush-hour streets.