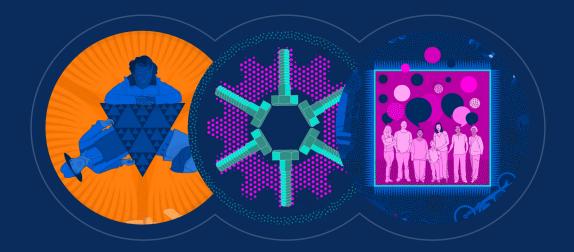
The Most Important Mile

Inclusive Futures for Local Delivery



By Anthony Townsend & Bryan Boyer



Inclusive Futures for Local Delivery

The future has arrived in a hurry.

Over the last decade, online shopping grew at a brisk pace. Most expected this trend to continue, steadily replacing our shopping centres and high streets with deliveries. Then the COVID-19 pandemic arrived, and that all went into fast-forward. Stores all over the world closed their doors for months. Changes we didn't expect until 2030 or 2040 were suddenly here.

What followed has been, in important ways, a story of stunning resilience. Local delivery brought food, groceries, and medicine to billions of people forced to shelter at home. Yes, global giants played a role in this, but so did small businesses and groups of local vendors working together to form quick co-ops in a form of 21st century mutual aid.

This is also a story of accumulating risk and disparity, exposing the tensions over economic security, equity, privacy, and sustainability in local delivery that have been growing for years. Working conditions for fulfillment and delivery workers, already poor, worsened as they were left exposed, without adequate protective gear or training. And many people are still being left out of local delivery altogether. Service costs are a formidable barrier, when delivery is available at all. That's because racially-biased algorithms redline more efficiently than humans ever could.¹ A persistent digital divide leaves behind some of the most vulnerable, including the elderly.

^{1.} Talbot, David. "Amazon Prime or Amazon Redline?" MIT Technology Review. MIT Technology Review, April 2, 2020. https://www.technologyreview.com/2016/04/25/71105/amazon-prime-or-amazon-redline/

The common cause for these problems is deep and profound—the consolidating market power of a handful of local delivery platforms: titans of the tech industry like Uber and Amazon. Capital and consumer information that used to stay in local communities is being extracted with unprecedented scale and efficiency by these and similar platforms. None of this is new, but with the pandemic having all but eliminated other forms of commerce, this reality is easier than ever to see, and harder than ever to accept. Amazon and Uber aggressively used their substantial cash reserves to consolidate and expand market share during the crisis, while local retailers were at a severe disadvantage. In the years to come, the expanded role big tech companies have usurped during the crisis, as intermediaries in local economies, will be extremely difficult to displace.

This future is, however, not yet fully baked. More sustainable, inclusive, homegrown approaches to the challenge of population-scale home delivery are taking root. Throughout Europe, agricultural co-operatives are running emergency home delivery services for locally-sourced productsand working together to keep supply chains short. In Toronto, restaurateurs are teaming up to build tools that take orders via Instagram and Facebook Messenger, avoiding app commissions that could otherwise tally as high as 35 percent for now, but still not freeing themselves from large tech platforms. And in India, a wave of new delivery startups has mobilised millions of small shops as big retailers struggle to meet surging demand.

These efforts show how the challenge of adapting to pandemic protocols provides an opportunity to

rethink how technology connects local economies together, and to the world. This is not lopsided innovation, but consumers and local vendors both testing out new relationships and technologies, hand-in-hand. They highlight how governing local delivery will mean rewiring the connections between local commerce, communities, supply chains, and the information or data that makes them move.

Creating the decision-making structures to produce better outcomes won't be easy. What do we expect in terms of work and economic security, a fair and level playing field for local enterprises, and the uses and abuses of sensitive information? What technologies need to be locally-provided and opened up, rather than controlled by global corporations, and which are better served by the reach of a global organisation? What is the role of local governments, and what tools do they have to shape what happens?

Advertisements for the Future

To highlight the urgency for action and the opportunity for a shortcut to sustainable futures, this forecast envisions three scenarios that explore the challenges and opportunities posed by the surging expansion of local delivery. These scenarios aren't predictions. Instead, they show the potential for transformative innovation when government, residents, and the business community come together to build their own technological platforms and governance models for the future. These stories begin in Eindhoven, Brooklyn, and Perth but they are relevant everywhere. These are not comfortable futures. The scenarios pose difficult questions. Farm to Table and Back Again asks whether it is possible for cooperatives to create a new model for consumer economies. The Makers of Etsytown asks the reader to speculate how local communities might disconnect from fragile and extractive global supply chains. The final story, Postify, explores how national postal systems could reinvent themselves to drive innovation and inclusion, asking whether it is possible to do so without becoming part of the surveillance state.

These futures are possible, but they demand bold and fresh approaches to governing the business and technology of local delivery. No matter how ethical the platforms described in these scenarios may be, unless consumers want to use them, they will fail. For this reason, the stories describe benefits and outcomes for individuals as well as the effects and potential for us all, collectively, at scale.

Each scenario opens with a glimpse of a possible tomorrow. We show real people living in a world where technology, the economy, society, and politics have shifted significantly—but human beings are still driven by the same basic motivations. Next we unpack how we got there. What choices were made? Who benefited, and why?

Finally, we highlight a selection of "building blocks" used to create the scenarios—realworld examples that inspired and informed these stories—and the larger questions they raise about our choices today.





April 8, 2031

Eindhoven, Netherlands

The mule waited silently as Daniel finished checking in the last of the crates, stacked neatly on the curb. The rest of the volunteers eyed the produce, bread, and honey with eager eyes.

"Let's load the compost bins and send it off," Daniel called to the team. His phone buzzed with orders, which he quickly swiped over to the throng of twenty-somethings before him. As the mule trundled away, the trainees sprang into action. The neighbourhood was already starting to wake up.

"Three of you do the deliveries," Daniel said. "The rest set up the stand. Where's little Sonja?" The nine-year-old, however, was already scooting away, basket in hand, to drop a delivery at the Husseins' flat on her way to school.

A minute or two later, the team's pockets buzzed in unison. All the deliveries were done, and their shares were already on deposit. That perhaps was the best part. SirPlus, the dumpster divers turned supermarket turned co-operative megaretailer, was theirs. Residents of Europe's posh urban enclaves are no strangers to outdoor markets. But now, a much larger cross-section of citydwellers are enjoying the fresh, nutritious, low-carbon food delivered by the likes of this youthful gang. The markets are smaller—just a cart or two. They aren't as folksy either, swapping the old farmer's wagons for hightech robovehicles. But there's always one open within a few blocks at any time of day or night, tapping a continent-wide web of connections to serve up a hand-picked palette of farm-to-table products. It's healthy, low-carbon food without the hype.

Getting here wasn't easy. The early 2020s were a wake-up call for western Europe. Although Germany skillfully threaded the medical crisis of COVID-19, there was little it could do to keep the EU from slipping into what historians now called "the Greatest Depression". As stimulus turned to austerity-teetering-on-collapse, once unthinkable anxieties about food security shot to the fore. But few were more prepared for the challenge than SirPlus, the Berlin-based "rescue supermarket" chain.

SirPlus always had big ambitions in its DNA. It's estimated that one-third of all food produced globally is thrown away. Founded in 2017, SirPlus set out to chip away at food waste by working with mainstream retailers, wholesalers, and logistics companies to source mislabeled, misshapen, misplaced, and expired food for its stores—where, after safety inspection, frugal consumers picked through products marked down as much as 80 percent of their original price. By 2020, four SirPlus supermarkets in Berlin were diverting some 2,000 tons of food from landfills annually. A year into the pandemic, the chain doubled in size again, to 10 stores. It cut a deal with Europe's sprawling federation of bicycle delivery co-operatives, significantly expanding its ability to reach seniors and those under quarantine.

Meanwhile, Europe's big retailers struggled to adapt. Scaling up delivery operations, maintaining far-flung supply chains, and securing credit which would have been hard under normal conditions—became intractable challenges during the prolonged political and economic uncertainty of the pandemic. SirPlus smelled opportunity and embarked on a breakneck expansion, moving into one region after another.

Today in 2031, SirPlus is Germany's largest retailer and the third-biggest in the EU. It is expanding beyond food, offering a fast-growing array of renewed and recirculated home goods and other personal needs that puts it in direct competition with AmazonAlphabet and BaiduAlibaba. And along the way, it reorganised in 2025 as a consumer co-operative, fully separating from an increasingly sclerotic European banking system. After Europe, the group's playbook has been copied all over the world—in the UK, US, Australia, Brazil, Nigeria, and Russia.

The first challenge was food security. The repeated shutdowns of 2020-21 revealed the brittleness of global supply chains and verticallyintegrated e-commerce platforms designed for the sole purpose of maximising output and putting producers in race-to-the-bottom competition with each other. Instead, SirPlus and its partners saw their cloud—built with the same off-the-shelf AI as the big guys—as a tool for moderating market shocks on small suppliers. With vastly better predictions of future demand, and automated tools for allocating production, the network combined many of the best aspects of both planned and free market systems. And it was programmed to minimise waste, shortages, and oversupply.

The second challenge was fast, fair, reliable, and cheap delivery. Existing supermarket chains, saddled with big box stores ill-suited for fast delivery, mobilised an army of underpaid, unprotected gig workers-cannon fodder that fed into the pandemic's breach. SirPlus went small and smart instead. It invested in open source robotics, operating out of smaller depots tucked into the storefronts, many left behind by failing retailers. This put crews closer to customers in case something went wrong with the automatons, but also buffered front-line workers from the greatest health risks. As an opportunity to bolster communities while also earning equity and a living wage, these jobs were highly sought after among a wide slice of Europe's idled youth.

The final piece of the puzzle was finance. With retirement plans decimated, and consumer anxieties about food supplies still front of mind, SirPlus put two and two together, and turned itself into a bank, too. Consumers could deposit savings, which would be used to finance the co-operative's expansion and operations. Depositors earned a less-than-stellar financial return, but they bought peace of mind. The scheme proved especially resilient when, during the Spanish drought of 2026, SirPlus stepped in to provide bridge financing for regional farming co-operatives, keeping workers on the job so they could continue to provide nutritious food on market shelves and in school lunchrooms.

As it has plowed its way across Europe, SirPlus's pioneering version of a kinder 21st century consumer economy has attracted its share of critics. In smaller countries, the group's lowprofile network links up a stunningly large share of the economy-in Belgium for instance, the broader SirPlus co-operative has a hand in 10 to 15 percent of consumer transactions by value, and is still gaining market share. Conservative groups have raised accusations of algorithmic price-fixing against the group, claiming that it is no longer just facilitating small-scale commerce, but is actively managing markets and making de facto economic policy. Yet even amidst the prospect of a new "red scare", Sir Plus continues to do the thankless work day-in. day-out. of making sure that safe, healthy, and affordable food makes its journey from Europe's farms to its tables, and the co-operative continues to build a more circular food system across Europe.



The Makers of Etsytown

Can local communities disengage

from fragile and extractive global supply chains? March 17, 2028

Former site of Queens Village Mall, United States

Gian snapped a photo of the autoshop and paced back and forth, surveying the algorithmicallydesigned facade. Everything about it was so... fake. Yesterday, this storefront had been empty. Today, it was a fully-functional 1,000-square-meter self-service emporium, stocked with 2 million of the most common household items—groceries, hardware, and antiviral gene therapies.

She resented everything about the store. Its augmented reality billboards blazing for blocks in every direction, shoving precision persuasion down passersby's feeds. And the scanners, sweeping the neighbourhood's spectrum like a Russian drone fleet, soaking up consumer profiles.

She chewed her fingernails and flicked the address into the motion for tomorrow's hearing. That made sixteen in the last week—and nearly fifty citywide since the beginning of the year. This was no market test, like '06. Amazon was coming for the city's fabrication collectives. This was the kill shot.

Just then, an alarm sounded while a garage door slid upwards, releasing a small fleet of 6-wheeled bots that zipped across the sidewalk and into the street, irritating and nearly cutting off a passing cyclist. Does computer vision know what the middle finger means? Probably not, but council members sure know public outrage when they see it.

Gian could use that. Tomorrow she would ask, plead, no... beg the City Council to adopt a resolution requiring open access on last mile delivery. Amazon would either do business the way the fabber collectives—Queens Village Gurdwara, Rockaway Renegadz, Bushwhax... and dozens like them did carry and carry alike, a co-operative bucket brigade in support of the black- and brown-powered economy, or.... Well, find your own streets. These are ours. Before all the other fire drills that followed, the one that sent the tourists and the onepercenters packing; the one that brought mighty New York City to a grinding halt—not once but twice—there was the one they called SARS-CoV2, or COVID-19. Or here, on the streets of Bushwick, the 'Rona.

The shortages of personal protective gear during the pandemic's first wave caught everyone by surprise. But the response of makers, who mobilised sewing machines and 3-D printers by the thousands, was equally inspiring. Soon, the folks from The Gates Foundation showed up, with the WHO in tow, and talk quickly turned to finding ways to teach others around the world how to replicate the success here. As brighteyed, out-of-work twentysomethings with nothing better to do started showing up looking for ways to help, the place took on a noticeable click-hereto-save-everything kind of vibe, and a crafty name to match... "Etsytown".

Then the second wave bounced off Oklahoma City in August, combined with a fast-gathering flu outbreak, and came tearing back across the country that fall—and all that optimism turned to terror. With businesses gutted, schools semipermanently closed, and hospitals still reeling from the first wave of pandemic response and starving for cash as people deferred or cancelled treatments, panic set in. Half a million people left the city during the first wave. As the winter approached, the city started to empty out. Some said a million, others said two. City officials simply stopped counting.

For those left behind, the material struggle for daily survival took on a new desperation. Amazon,

perhaps as payback for the city's snub over its HQ2 plans, was the first to pull out, announcing on September 10, 2020, that it would no longer deliver within the five boroughs, citing unspecified "health and safety concerns" after 'sick-out' protests resumed at its fulfillment center in Staten Island and several reported van hijackings. Walmart quietly followed suit a few days later. With almost all small businesses bankrupt or again shuttered, the city's storefronts were blacked out. In neighbourhoods where activists had once mapped "food deserts", highlighting the lack of grocery stores—even the liquor stores were gone.

Over at Etsytown, all was quiet. But there were some in the community who saw this as a chance to break free from chains that had been holding urban communities back for generations, while business behemoths built empires with wealth extracted from marginalised communities. For them, this was a chance to remake the economy by making makers. And they sprang into action.

As the call went out that something was happening, the complex started to sprawl. By Thanksgiving, Etsytown had taken over a dozen loft buildings and the surrounding streets, as a bigger, stronger, more purposeful version of the self-organised machine that'd been prototyped during the Occupy movement swung into action to produce food, basic medical supplies, and clothing. An entire building was devoted to upcycling, recovering every reusable element, nearly down to the atom, that could be gleaned from the waste stream. Another housed a stunning array of hacked-together machine tools for high-precision production—the obligatory 3-D printer or three spewing plastic, but also serious stuff like CNC and laser sintering machines. By winter, the first big greenhouses, built on empty parking lots, were coming online. The Black Vegans, who saw it as the cornerstone of the new commonwealth, had worked around the clock on it.

Soon, though, Etsytown started to struggle with its own success. Supply chains, spread out across the sprawling network of shops and storehouses, became increasingly disjointed. Cargo bikes worked as a DIY logistics solution, for a while, but as the volume of material grew and COVID/flu exposure concerns nagged, a more reliable solution was needed. As a growing population of small retailers and distributors started demanding an ever-increasing volume and frequency of shipments, order fulfillment took on Amazon-like dimensions.

Much like Amazon, the collective soon turned to tiny, electric automated vehicles as a solution to the last-mile problem. But there was a catch. Amazon had already cornered the global market for deliverybot technology, buying up every startup that dared wander into lastmile automation. That's when an offshoot of the local mesh wifi co-operative, NYCMesh, started to develop their own deliverybot design together with a global network of open source collaborators.

But the real hack was regulation—a citywide moratorium on curb cuts. Gian hoped it would work because each of the new Amazon outlets created a chokepoint of conveyor traffic. With dozens of departing and returning droids crossing sidewalks to enter the building, they cut up blocks into no-go zones for pedestrians, and permanently removed on-street parking that was in short supply in a city that now shunned mass transit.

The collective's botnet footprint was, in contrast, far more spread out. Their co-operatively-owned swarm parked in garden sheds, alleyways, and condo basements when not in use, and slipped onto streets via pre-existing curb cuts. No Great Wall of bots scuttered back and forth, no faraway corporate behemoths controlled the streets.





Postify

Can national postal systems reinvent themselves to drive innovation and inclusion, without becoming part of the surveillance state? March 8, 2023

Mends Street Jetty, South Perth, Western Australia As the CarryFair autobarge glided up towards the Mends Street Jetty, its lidar tickled the quay with laser light.

The smooth approach was deceptively hot, as the computerised captain rode the flood tide to shave a few seconds, punching the bow thruster at just the last minute to spin around into position under the loading gantry. Without a stevedore in sight, meal packets lowered into the hold one by one. In under a minute, the locally-built, Dutchdriven vessel (all the best cargoboat Al had been trained in the busy canals of Amsterdam), was back on the river rising on its foils, steaming off for the Sunset Heritage Precinct.

Miss Chow's customers were waiting, after all.

But what had started out a few years ago as an ad hoc effort by a handful of restaurateurs to bootstrap their own delivery services during the COVID-19 dine-at-home surge, had morphed into an offshoot of Perth's ride-hail co-operative. In the hold, Miss Chow's meals jostled over the waves next to food from a variety of other South Perth eateries. Technically the competition, but not really. Each fills their own niche of locals and superfans, just now with more reach.

A few minutes later, the quay in sight, a stream of metadata shot ahead from the autobarge's masthead antenna, passing up into the cloud where a pool of algo agents quickly brokered matches for delivery along the last half kilometre. On dry land, a chorus of magpies was briefly joined by the pings of assignments reaching the phones of waiting bicycle couriers. The last thing the United States Postal Service ever delivered was an umbrella, dropped one morning in 2022 on the front porch of a home in Arizona, where the sun shines more than 200 days a year. It was supposed to go to Seattle instead. Like millions of other parcels, this one had been misdirected by the agency's ancient computer systems. Later that day, with Congress deadlocked over yet another bailout, the USPS finally ran out of cash and shut down yet again. This time, however, it would be for good.

The USPS's collapse shook Australia to its core. It was impossible to avoid, playing out online in real-time. Virtual reality flythroughs revealed the final resting places of millions of parcels stranded all across America, a distribution chain frozen forever in time—while social media streams reveal the pain of people who waited in vain for prescriptions, baby formula, and spare parts. In Australia, where a double-dose of climaterelated disasters and pandemic flare-ups had culled all but the biggest global carriers like Uber and ZTO Express from the delivery business, a growing number of voices called for action. Slowly, the government's repeated flirtation with privatisation of Australia Post gave way to a new debate—how to bolster the postal system for the challenges ahead.

The biggest crisis was express delivery. Australia Post simply couldn't compete when it came to local delivery, and Uber and ZTO Express had carved the country up, extracting high fees from small businesses. If small business was not to become a thing of the past, something had to be done. That something was called Postify. The pitch was simple. Australia Post would get out of the business of physically moving stuff, and get into the business of orchestrating the entire national distribution system instead. They called it a "delivery utility".

For the fast-growing base of conscious consumers, the benefits were obvious. Uber and Instacart had perfected the art of high-speed delivery, at the cost of everything else. Postify expanded the range of responsible choices. Don't need those spare shoelaces immediately? Insist on a zero-emissions shipment? Your package might arrive in the bucket of a cargobike courier, or under the arm of an affable retiree who delivers small packages by foot on neighborhood routes. The beauty was ease of use. Just state your preferences and Postify does the matchmaking between you and scores of providers, instantly and invisibly.

The plumbing behind the scenes was a bit more complex. Postify was a lot like "mobility as a service", online marketplaces for taxi rides, scooter time, and train trips. In Berlin, Montreal, Vancouver, and Sydney, city transit agencies established these exchanges—but any mobility provider and any app designer could use them to buy and sell tickets, creating a truly free and open market. Where mobility as a service took hold, prices fell and choice expanded. Postify promised to do the same for moving stuff instead of people. For Australia, this was transformational.

First, the scheme was flexible enough to drive innovation in delivery services in the "last mile" between local depot and final destination, across all of the continent's varied geographies. Postify unleashed investment in local delivery services in cities and suburbs while providing sophisticated software for shared deliveries to reduce costs and improve service in the outback.

Second, Postify provided a platform to boost small business through a combination of preferential rates and supporting services. In 2023, Australia Post slashed the shipping fees for small-, Indigenous-, and women-owned businesses to next to nothing, leveling the playing field between micro-enterprises and megaretailers. To lower the barrier to entry, Postify provides a whole 'stack' of flexible digital tools that work together to make it easier for folks to spin up a new logistics business.

One platform co-operative that made the most of these opportunities is Send-n-Help, a mashup of Instacart and TaskRabbit, but without the mansplaining. Send-n-Help combines delivery with extra services like unpacking, installation, and clean-up. Say you've ordered a new bunk bed (from a regional workshop using sustainably-sourced woods, of course). Send-n-Help's emissaries will deliver the item and make sure it's assembled safely, all before little Timmy's naptime.

Finally, Postify's deep insights into the nation's supply chain have bolstered resilience—but at the same time raised new questions about the depth and precision of its knowledge. When bushfires swept the country a second time in 2023, the platform helped the government to quickly locate and purchase emergency provisions. But as military procurement officers marched out of pharmacies all over Australia with boxes of medical supplies, many were unsettled about how precisely it could track the contents of Australia's shelves and storerooms. What else did Postify know?

Building Blocks

These scenarios were inspired and informed by ideas, initiatives, businesses, and organisations at work in the world today. While the stories combine and integrate those examples to bring to life possible futures, the signals we detected happening right now clarify larger challenges for strategic action. Under each scenario the signals are itemised in the following format:

The noun from the scenario - a place, organisation, or technology.

The real-world signal that inspired/informed it.

The big, actionable question it raises.

From Farm to Table and Back Again

Can consumer co-operatives bootstrap a new circular economic model?



Noun	Signal	Question
Rescue supermarkets	SirPlus, which operates four markets in Berlin	What national and local policies are needed to sup- port the expansion of food recovery systems?
Digital regional food exchanges	Denver Food Rescue's Food Rescue Robot, a "web-application for scheduling, routing, and tracking just-in-time food rescue" is used by several peer organisations around the world.	What data standards and protocols are needed to enable secure, sustainable regional food systems?
Federation of bike delivery co-ops	CoopCycle, a Europe-wide federation of bike delivery co-ops	What organising models and policies are needed to ensure better outcomes for labour in local delivery?
Crowdfund or credit union as infrastructure financier	Bank of North Dakota is a state-owned, state-run financial institution that has recently expanded its role in infrastructure finance. Windcentrale operates 13 crowdfunded wind turbines in the Netherlands	Which financial organisa- tion will be the first mover to work with virtuous local delivery operators to create access to values-aligned and patient capital?

The Makers of Etsytown

Can local communities disengage from fragile and extractive global supply chains?



Noun	Signal	Question
Rapid small business response to supply chain shocks	Self-organised efforts to manufacture masks, face shields and other PPE during the COVID-19 crisis such as Argentina's Ranatela Co-operative and India's SEWA Co- operative Federation	How do we do a better job assessing, monitoring, and supporting local manufac- turing and logistics capaci- ty—before, during, and after supply chain shocks?
Open source delivery robots	Meituan's open- source delivery "mules" underwent testing in Beijing in 2019	What's needed to kickstart development of open source alternatives to big tech's last- mile delivery platforms?
Resilient, circular, and self-sufficient urban manufacturing webs	In 2016 Paris declared itself the "City of Makers" with the goal of doubling local production and emphasising short supply chains	What last-mile capabilities are needed to support urban man- ufacturing that links scattered sites, reuses waste, is resilient to shocks, and meets local needs?

Postify

Can national postal systems reinvent themselves to drive innovation and inclusion, without becoming part of the surveillance state?



Noun	Signal	Question
Mobility-as-a- service platforms	Finland's 2016 Act on Transport Services, which required mobility operators to make ticketing functioning available to third-party apps	Should last-mile policy be driven at the national level?
Services targeting under- served or special needs groups	NeighborExpress, an initiative of US Digital Response, provides cities with a platform for coordinating peer-to-peer deliveries for people who can't shop for themselves	What customer-facing ser- vices should postal systems prioritise for strategic inno- vation investments?
Local delivery "stack" - which is a set of interoperable, convenient digital tools	Shopify is a Canadian e-commerce platform that provides additional tools to process payments, handle shipments, and even provide access to capital, all lowering the barrier to entry for new shopkeepers	How much and which parts of the stack are the "right" pieces for government to fund or build directly?
Ambient data streams leveraged for the public good	Studies in US, UK, and Netherlands have shown that municipal wastewater can be used to predict a rise in COVID 19 cases up to two weeks before conventional public health mechanisms	What level of supply chain surveillance is required/de- sirable/tolerable?

Credits

The Most Important Mile: Inclusive Futures for Local Delivery

An educational resource developed by Star City Group & Dash Marshall for Minderoo Foundation's Frontier Technology Initiative

August, 2020

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