Can Micromobility Make our Cities, Skies and Lives Healthier?

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The bicycle is an unlikely winner of the pandemic. In the past year, Paris has permanently cleared out cars on tony Rue de Rivoli near the Louvre to ease its flow of bikes, buses and feet and Lima has said it would grow its cycle network by 300 kilometers. In the virus epicenter of New York City, cars were banned on 67 miles of streets (some temporarily, some permanently) so cyclists and pedestrians could circulate safely past sidewalk cafes.

Though commuter flight from crowded trains to escape contagion sparked this big shift to wheeled devices, the move was already underway driven by efforts to curb carbon emissions. As we exit this crisis, new measures, if seized and expanded, can bolster the health of our ecosystems, communities, economies, skies and lives. With some 2.5 billion more people pegged to live in cities by 2050, such moves are badly needed.

But for true 'network effects' to take root and grow, more intertwined policy changes are needed. Meshing interventions, innovations, regulations and incentives across the many facets of urban infrastructure with so-called micromobility-to-mass transit at its heart can help solve hard problems like congestion, climate change, obesity and poverty.

Micromobility is different

Micromobility's universe of wheeled, internal combustion engine-free options includes scooters (stand-up and seated), skateboards, skates, rickshaws, hoverboards, cargo bikes and of course bikes – both electric and human-powered. These devices generally weigh under 100 pounds, are shared or owned and generally cover distances of fewer than 10 kilometers at speeds that are 25 to 45 kmph.

Of these, e-bikes and e-scooters are perhaps the most promising. Many millennials are keen to ditch cars for convenience, cost and environmental reasons. For short commutes, stand up e-scooters fit the bill. Meanwhile older inner-city dwellers are more health and eco-conscious. E-bikes and seated e-scooters are luring them, along with the less svelte, for fast and fun ways to zip around town, sweat-free. E-bikes' higher speeds (28 miles per hour, tops) and longer range (up to 120 miles per charge) make them a very real alternative to cars for short runs like errands or school drop-offs.

For a sense of shared e-scooters' likely trajectory, consider that Parisians took to them twice as fast as they did Velib bikes and over the pandemic consistent scooter riders

(versus occasional) were up 93% globally, says operator Bird. Same goes for e-bikes. Dutch supplier VanMoof cited an 140% spike in sales from February to April 2020 year-on-year.

As a result, Deloitte forecasts a 50% rise in e-bikes in circulation by 2023 on 2019, to 300 million. In Europe alone a nearly ten-fold rise is expected by 2030, to 62 million e-bikes from 6.5 million in 2015.

Reclaiming streets, a brief history

Why all this wheeling around? At its crux, bike sharing is about giving space back to people, to inject more humanity and healthy habits into dense city centers. Sparked by the famous White Bike counterculture experiment in 1960s Amsterdam to cut congestion and reclaim streets, 'Flying Pigeon' bikes backed by China's state also helped fuel China's 1980s agrarian to industrialism rise, though there was a dip in bike use in the early 2000s as China encouraged people to support its auto industry. However, by 2012 bikes were all the rage again. In 2016, Wuhan, a city unknown until a year ago, boasted the world's largest shared bike fleet, with some 90,000 two wheelers available that year. Paris' wildly successfully Velib bikes arrived in between, in 2007, in the first mega-scale 'docked' (parked) system – one that New York, Montreal and Hangzhou, China, later copied. Today well over 1,100 cities, municipalities and jurisdictions globally have bike sharing schemes; many are rapidly adding e- scooters, e-bikes and other wheeled devices. More mid-sized cities and university campuses are also following megapolises into micromobility.

The equity lens

What is missing today is the connective tissue to safely bring the benefits of micromobility to a broader swathe in cities, starting with those in underserved areas. An equity lens over ambitious 'build back better' infrastructure expansions will ensure that when micromobility arrives it will help all of us.

To reap the full benefits of connected micromobility, policy makers need to act fast. This year brings several opportunities to do so. Three UN Summits — climate, land use and ocean — and Europe's post-pandemic stimulus packages with green strings offer a path to shape mobility policies. And, in the US, around $20 billion in US President Biden's just-announced American Jobs Plan is earmarked to "improve road safety for all users, including increases to existing safety programs and a new Safe Streets for All program to fund state and local 'vision zero' plans and other improvements to reduce crashes and fatalities, especially for cyclists and pedestrians."

At this aspirational but resource-constrained hour, when all options are on the table, learnings and cautionary tales from successful bikesharing schemes, which paved the way for broader micromobility ones, can show the way to long-term adoption and success.

Boost safety, by creating new rules of the road and tapping innovation

Safety is *the* top concern of current and would-be users of all wheeled devices in global studies. For good reason. Some 20,000 cyclists die on the road annually in China; California reports two pedestrian and cyclist fatalities on roads every day versus zero in Helsinki. As the volume of cyclists and variety of wheeled devices grow—led by e-anything—so, too, will such worries.

More fret over e-scooters owing to their higher speeds and odds of crashes, injury, even fatalities, as neophytes take to clogged roads and sidewalks. 2019 brought at least 18 e-scooter deaths (threefold 2018's) and sent almost 30,000 US riders to emergency rooms (nearly double 2018's 15,500), sparking a US class action suit against operators Bird and Lime. E-scooters' injury per trip odds are roughly 120 times those of cars', according to a 2019 Calgary study.

Moreover, strewn electric scooters block walkways and roads. Roughly three-in-four scooter-related citations in Alexandria, Virginia, in 2019, for example, concerned sidewalk blockages; the same year, a disability rights group sued the City of San Diego alleging that the clutter forced them to navigate sidewalks unsafely or not at all.

Following several laissez-faire years, micromobility tenders, licenses, permits, fees, safety codes and self-regulation are prevailing. Lime in 2020 said it hoped to turn its users into road safety activists by streaming guidance through its apps, and via tie-ups with nonprofits that advocate for greater mass transit or bike use.

Meanwhile, countries, states and cities are taking charge. Many already limit operator and e-scooter device numbers, set speed and age limits, and ban cell phone use. Some cities also mandate 'no riding zones'; others require brakes, lights and reflectors, and that riders yield to pedestrians.

In the US, there is even talk of putting micromobility designs under the purview of the Consumer Safety Protection Commission in a new 'Mobility Division' – adding oversight to similar devices already subject to scrutiny such as off-road vehicles.

Integrated cameras and telematics can help prevent accidents while accelerometers and gyroscopes can spot them. Dublin-based Luna, for example, taps computer vision for its alert system that detects distances from autos and pedestrians; its technology is also used

by Swedish e-scooter provider Voi. Artificial intelligence algorithms trained on thousands of photos of pedestrians helps slow e-scooters if they veer too close to a nearby pedestrian. Santa Monica's e-scooters slow near a deactivated zone beach area, much as some shopping carts' wheels lock near exits. UC California Berkeley's 'Street Story' crowdsources accident data. Future 'Smart Scooters' might lock out frequent speeders – or slow them down if there are too many pedestrians are on a shared path.

Ground your micromobility-to-mass transit expansion plans in equity goals

Historically, bikeshare users have leaned wealthy, white and male. But that image overlooks the untapped potential that low-cost, reliable mobility could offer all communities. Research confirms this: Commuting time is the most important factor in escaping poverty, according to a 2015 Harvard University global study on upward mobility. In fact, just 1 in 4 US low-to-middle skill jobs are within a 90-minute mass transit commute, many of which are at off-hours when transit services are less frequent, a Brookings Institution study found.

Micromobility could help noticeably reduce commuting times if integrated into mass transit hubs. It won't be easy. Some worry that investment in sharing programs or protected lanes will eat into funds for much-needed mass transit infrastructure.

"Black people in black neighborhoods, when asked about bike lanes, they say 'No, I really want a crosswalk, so my kid doesn't die. And a bus shelter. Bike lanes are number four on my list,'" explains Robin Chase, former CEO and co-founder of Zipcar.

To expand access, many sharing systems have equity programs — 60% at last count – and are starting to amass key learnings:

Tracking fluctuating micromobility demand can help to spot overlooked areas for expansion. For example, over the pandemic rides to and from areas with homeless, youth outreach and mental health centers on San Francisco's Bay Wheels' and Portland's Biketown's bikes rose. More broadly, a Vancouver, Canada study showed that bikeshare 'super users' (more than 20 rides a month) were 2.5 times more likely to earn under $35,000 than their peers who earned over $150,000. They were also young and lived within the bike share area. This suggests micro-targeted expansion could effectively reach those most in need.

Many credit Paris' bikeshare leadership for its easy and low-priced membership. Velib's $3.70 fee is almost one-third of London's comparable membership and one-fourth that of New York's City's.

Subsidies, free bike sharing memberships and low-priced services based on income also help boost ridership. Chicago offers a $5 annual bikeshare pass to low-income residents and those receiving SNAP, WIC or public housing assistance – and displays discounts at bikeshare stations. Philadelphia sells its month-to-month pass at 7-Eleven and Family Dollar. Tucson, Arizona discounts bike share fees for regular mass transit riders when these services are bought together. For $5, low-income residents, seniors, Medicare card Holders, and the disabled get annual membership passes.

Cities increasingly seek to serve the disabled and elderly through recumbent bikes and e-wheelchairs. This is true of Detroit's Adaptive MoGo program, which includes hand tricycles, cargo bikes and tandems among the 16 types of cycles it offers. The program also holds get-to-know our bikes events to build awareness and interest. Many other US cities also have adaptive fleets that for one user in Portland, OR with cerebral palsy was a 'game changer'. Two e-scooter operators there have seated e-scooters for the disabled, with larger wheels. And VeoRide supplies cities and colleges across the US with a variety of wheeled devices including ADA-compliant bikes.

Blend shared services into a flexible mass transit and traffic grid through integrated streetscape, micromobility and mass transit planning, maps, apps and ticketing options.

Linking transit options boosts 'network effects' in a hub-and-spokes transportation model serving mass-transit stations and dense areas. Expansion into underserved areas with transit links to downtown cores could boost jobs potential, particularly for those under 35, according to an e-scooter users' poll in Melbourne and Brisbane.

Los Angeles' Metro Bike program does this. City backing allows for one shared smart card for easy access to the bus, rail and shared bike system, which now includes e-bikes.

Milwaukee's system is also integrated. Four in five of their bikeshare stations overlap with bus stops, which announce the availability of bikes before arrival; users can use the same mass transit pass for buses and shared bikes.

Open Mobility Data Specifications (MDS), which signal to users which transportation options are available and/or in good condition – a platform created by LA County and subsequently adopted by 80 cities and public agencies globally – should also make mode-shifting easier, more efficient and more effective. Google Maps now lists Lime sharing stations in 100 global cities, as well. And Lyft offers options to book a Citibike through its app.

Shared micromobility devices can stream a trove of real-time data about potholes, congestion, accidents, commute time and mass transit connections, informing meaningful improvements in human and motorized transit behavior and infrastructure.

Consider Bogota's Mobility Ministry and UC Berkeley's partnership, tapping data from anonymized cell phone location data, a local fitness app and cell towers to identify gaps in the city's 500 kilometers of cycle paths, based on the mobility patterns of cyclists, motor vehicles, pedestrians and those in mass transit. Research caught a palpable lack of such paths in the city's lower-income South, helping inform future infrastructure buildout decisions where there is likely latent demand.

MDS also draws on real-time traffic and transport data and new telematics applications, helping transit officials build new lanes and operators shift supply to meet demand.

"It has been a huge year in people getting where they need to go—by bike, particularly when they won't or can't take public transit," Jemilah Magnusson, Global Communications director at the Institute for Transportation & Development Policy told Driving Change in December. "Not just for this pandemic, but also for climate change, air quality issues – there'll be more crises in the future. We need all our options on the table, including mass transit, cycling, walking, and other types of sustainable mobility."

As the world shifts to a new normal, one that seeks to integrate existential lessons about peace and equity into its future, micromobility is now a key node in a cleaner, more humane mass transit network. Great opportunity exists to expand such programs to rapidly growing mid-sized cities and to the less auto-saturated megapolises of Africa and Asia. Kampala and Addis Ababa are but two cities which are biking back better, helped by organizations like the World Resources Institute and the UN Environment Program, with heavy local community input.

"There's a lot of reason for optimism about African cities. They already have a high cycling mode share. You just need the infrastructure. I'm particularly excited about Addis. They are planning nonmotorized transport and transit very carefully. Their incredibly progressive, young and interesting government wants to do things differently, to plan for the future," continues Magnusson. "Let's hope that how we commute now will be remembered. We can make big changes in how we use our streets."

Seconds EcoPlan's Eric Britton, "The environment is reinventing itself amid a high speed of change and perplexing problems. Rotterdam's mass transit is provided by electric trains, buses and trolleys, with the rest covered by micro mobility, plus walking. City engineers and designers have to face this challenge. We'll see quite shortly that you can live very

nicely in many parts of the world without a car. The shared car or Uber will replace the car in a non-urban context. Within cities, we'll take care of the problem through micromobility.

The next 10 years will be fantastically interesting. We will handle the challenges as we transform our cities and make them safer and more efficient places where we still live. We've got a terrific 10 years in front of us. But the only thing that matters is what we do next year. If next year does not bring significant benefits to the environment, life quality, then we're not rising to the challenge."