Sustainable Transport Magazine

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Better streets.
Better cities.
Better lives.

From transport digitalization to human-centered design, this issue highlights trends and achievements in sustainable, equitable transport worldwide.

ITDP
Institute for Transportation & Development Policy

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— (Top) Paris, France was awarded the 2023 Sustainable Transport Award. Image: ITDP
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— (Bottom and Cover) In the Boston, USA region, newly designed bus shelters are integrating art and community. Image: Ad Hoc Industries

Letter from Heather Thompson, CEO: The Future of Our Cities Depends on the Investments We Make Today

It is no secret that this year we witnessed some of the warmest months ever, with 2023 recording some of the highest historical temperatures according to the World Meteorological Organization. The climate crisis is no longer a gradual shift but a rapid succession of destructive changes that will intensify if we do not prioritize a more sustainable and adaptable way of life. For more than half of the world's population that live in urban areas, this shift requires investments in transformative, forward-thinking urban and transport solutions that make it safer, healthier, more affordable, and more intuitive to live and work.

As much as it may seem like we are rapidly approaching a climate tipping point, the actions that cities take today can still make a big difference for the world of tomorrow. Notable progress is being made, especially in urban mobility—from a steady surge in bus electrification and bus rapid transit (BRT) projects, to the expansion of well-designed and protected cycle lanes, to the promise of new technologies and data-backed tools that can accelerate sustainable transport. For example, in several African cities where ITDP works, transit-oriented developments are growing around BRT stations, setting the stage for more compact, accessible neighborhoods.

In central China, ITDP is working with a global partnership to reshape a cluster of cities through low-carbon and decarbonization strategies. And in Mexico, ITDP is leading a multi-year program that has piloted multiple innovative, data-driven projects to help city officials improve future transport policies.

As you will read in the pages of this magazine, these projects are just a few examples of what can be possible when the right mix of investments, political will, and stakeholders come together. At the same time, many such projects in cities are also united by a common challenge: insufficient investment and financing dedicated to sustainable urban mobility. According to the World Bank, when considering the total costs of the existing transport sector (fuel, operations, losses due to congestion, healthcare costs, etc.), a worldwide shift that prioritizes more sustainable modes (cycling, walking, micromobility, and public transport) can deliver savings of nearly $70 trillion USD globally by 2050.

This transition can be achieved by shifting away global investments from the 'business-as-usual' spending that centers on cars and fossil fuels—a pattern that continues accelerating the climate crisis. Data from the United Nations also indicates that, of the current annual infrastructure investments worldwide, less than 40% is being received by developing countries where the needs and the opportunities for change are possibly the greatest. In comparison to current investment into fuel-

— Visiting public transport projects and investments in Bogotá, Colombia with ITDP teams during the 2023 MOBILIZE Learning Lab. Image: ITDP

intensive transport modes like highways and airports, it is notable that sustainable urban transport systems do not receive nearly the same level of support. In many cities, public transport services and safe walking and cycling facilities are not viewed as priorities for financing and planning, and this urgently needs to change.

We cannot continue cycles of inadequate investment into sustainable, low-carbon, and publicly accessible mobility solutions. Instead, we need more dedicated financial and institutional support prioritizing public transit, compact neighborhoods, complete streets, and green infrastructure to allow people to move and live safer, healthier, and more affordably while reducing the impact of harmful emissions.

For our cities and transport systems to thrive now and into the future, they will also need political commitments for more comprehensive capital projects that go hand-in-hand with funding mechanisms that subsidize operational, workforce, and maintenance needs. Our teams at ITDP have seen first-hand the positive impact such commitments can have in cities all around the world. While great partners are helping us realize much of this work, it also requires more collaboration from the public, private, and civic sectors to make the necessary upfront investments and policy changes to truly move the needle.

Otherwise, the long-term effects of our 'business-as-usual' strategies will only come at much higher and irreversible costs. The evidence is already here—from Rio de Janeiro to Dar es Salaam to Guangzhou, the potential for real change is visible in the work ITDP and our partners engage in daily. It can be seen in our efforts to enhance bus reliability and operations, to reform outdated parking policies and reclaim public space, to create streets and roads that are safer and more inclusive, and to expand cycling and pedestrian networks that make cities accessible to all.

A significant milestone marks this year's COP28—the conclusion of the first 'Global Stocktake' assessment of the world's progress since the 2015 Paris Agreement. It is clear from the initial reports that there is a global need to focus on aligning financial support and accelerating the implementation of climate projects for us to have a chance at limiting warming within 1.5°C.

To achieve this, we require more governments, advocates, development banks, and institutions to join us in transitioning to fossil fuel-free mobility. As you read through these pages, I hope you will remember how you, too, can support a future of sustainable, equitable, and resilient cities where people and the planet come first.

Sincerely,
Heather

— During and after the pandemic, Paris has invested in its public spaces and streets to prioritize people over cars. Image: ITDP

Paris, France Presents a Bold Vision for the Future of its Historic Streets

By Iwona Alfred and Alphonse Tam, ITDP Global, and the Mobility Agency of the City of Paris

It is impossible to imagine Paris without its sweeping boulevards, grand circular crossings, majestic architecture, and scenic bridges. Those iconic Parisian streetscapes were primarily built toward the end of the 19th century under the radical and divisive urban renewal efforts of Georges-Eugène Haussmann. In two decades, the complete transformation of the city's street plans sought to address issues that plagued the previous medieval layouts, including overcrowding, poor sanitation and airflow, and maze-like streets. Paris's transformation, in many ways, ushered in a new era of modern urban planning that still impacts how people experience their built environment today.

In a pattern repeated across Europe's cities, a surge in the popularity of motor vehicles in the 20th century quickly turned Haussmann's wide Parisian boulevards into sites of congestion, safety hazards, and pollution. By the 1970s, Paris' automotive boom had already impacted mobility and accessibility across the city of two million. Suburban sprawl and development gained traction, and density declined in the urban core, making commuting more challenging for residents in the metropolitan area. The city's mobility officials have been working to rectify these issues recently, undertaking a 'soft revolution' of its streets and public spaces. In 2023, the city's government continued to embrace ambitious plans to give every Parisian a cleaner, more convenient, more livable city.

Reclaiming the Boulevards

Over the past two decades, officials and advocates have sought to reclaim Paris from the dominance of cars to give equal priority to pedestrians, cyclists, and public transport. In 2001, the city initiated various social and environmental reforms and investments, including the region's first major bikeshare program and the city's first climate plan. Then-Mayor Bertrand Delanoë committed to improving Paris's public spaces and street designs by instituting dedicated bus lanes and over 400 miles of cycling paths.

Stretches of roadways along the banks of the famed Seine River were closed to vehicle traffic, and in 2007, the Vélib bikeshare system was officially introduced. In 2008, Paris was first recognized with the Sustainable Transport Award by the STA Committee, a global group of transport and sustainability experts, for the city's work to develop comprehensive, connected cycling infrastructure alongside the Vélib system. Vélib was just one component of Paris's early-2000s mobility transformations, emphasizing civic spaces and streets oriented toward people instead of cars.

These efforts helped to improve Parisians' quality of life by addressing the issues caused by rising vehicle emissions, traffic accidents, and congestion. Paris committed to renovating several public plazas, widening many sidewalks, improving landscaping, and designing raised crosswalks that better serve pedestrians and cyclists. Such improvements demonstrated tangible results: according to the city's 2020 *Climate Action Plan*, between 2004 and 2014, these public transport and active mobility policies helped Paris achieve an estimated 39% reduction in greenhouse gas emissions from the transport sector.

Paris's sustainability commitments have continued under the current tenure of Mayor Anne Hidalgo, who was elected in 2014 and re-elected in 2020. The administration continues to advance efforts to reduce driving and congestion, focusing on related measures like social housing, enhanced public spaces, and vehicle electrification. The city has adopted two consecutive mobility plans to cut local emissions by 50% by 2030. Promising progress is happening in the transport sector: according to the city's 2022 transport trends data, car traffic inside Paris decreased by 50% between 2002 and 2022. Cycling traffic on bike lanes increased by more than 71% in 2022 compared with 2019. Public transport's mode share grew by 4% between 2010 and 2020 for trips between the city's center and its suburbs.

Turning Crisis into Opportunity

When the COVID-19 pandemic restrictions hit Paris in 2020, Mayor Hidalgo's office seized the moment to advance a vision for a '15-minute city' that would expand temporary bike lanes, open up pedestrian streets, and reduce traffic to allow people to go outside while adhering to social distancing recommendations. As restrictions in Paris—and worldwide—brought people outdoors for leisure and exercise, enhancing the quality of urban streetscapes, parks, plazas, and playgrounds became a priority. Paris committed to extending its cycling infrastructure, including developing over 1,000 kilometers of cycling routes. The Mayor also presented a 2021–2026 citywide cycling plan calling for nearly €250 million to be invested in more bicycle infrastructure and related facilities.

Beyond cycling, Paris transformed local educational facilities into community hubs throughout the pandemic to encourage more active civic engagement. The city expanded the operations of schoolyards and nurseries to provide residents with much-needed recreational spaces. This was complemented by a pedestrianized 'school streets' program to support safe travel in and around school zones. Today, the city has

— Paris' 2023 STA honor highlights, among other efforts, the city's focus on improving cycling infrastructure. Image: Clement Dorval / City of Paris

Visit *STAward.org* for a technical case study on Paris' efforts.

enhanced numerous cycle paths, sidewalks, and bus routes to accommodate children, students, and families. Resident-focused urban development has further driven changes in how the city is governed, with new measures to allocate aspects of policymaking to the city's boroughs and local mayors.

The city has now created opportunities in every district for residents to participate in neighborhood planning to improve civic engagement. In 2021, Paris made available a participatory planning budget of €75 million that residents can allocate to crowdsourced community projects. These innovative and inclusion-oriented efforts earned the city its second Sustainable Transport Award in 2023. Over the past few years, Paris's mobility investments and policies have inspired cities worldwide and garnered significant recognition from the transport community. Soon, the whole world will turn its sights to the city as it prepares to host the 2024 Olympic Summer Games for the first time in nearly a century.

A Global Spotlight

Ahead of the Olympics, Paris is stepping up its vision to improve more streets and mobility systems with low-cost, efficient, and high-impact interventions. This includes ensuring its infrastructure is adaptive to residents and visitors through tactical urbanism projects that make public spaces more inviting, colorful, and human-scaled. Pop-up cycling paths and facilities will complement the increased demand for cycling and bikeshare that will undoubtedly come with the 2024 Games. The city has also modified street designs with more movable, convertible, and flexible facilities that protect pedestrians and cyclists and make public areas more vibrant.

"We are living in a historic inflection point. Like most major cities, Paris is shifting towards becoming more walkable and cyclable. We want to accelerate this revolution; it is both a public health issue and a response to climate change," emphasized Paris Deputy Mayor David Belliard following the announcement of the 2023 STA honor. "This paradigm shift concerns all of us—whether you are a driver, a cyclist, a pedestrian, or a public transport user."

Looking beyond the Olympics, Paris will continue advancing projects and policies to reduce its carbon footprint and enhance resident well-being by investing in more resilient infrastructure, flexible street facilities, and transit-oriented development. At this moment, Paris has the unique opportunity to demonstrate to other historic and global cities that sustainable and equitable transformations are possible, even for its iconic and storied streets and neighborhoods.

Cities Need Good Public Transport More Than Ever—BRT Shows Us How

By Jacob Mason, ITDP Global

— BRT ridership is growing again on systems like the Van Ness Corridor in San Francisco, CA, USA. Image: Wikimedia Commons

The COVID-19 pandemic had significant impacts on public transport systems worldwide. Public health restrictions in cities limited the mobility of many—the International Energy Agency reported a nearly 50% fall in global road transport activity in the first few months of the crisis. Now, more than three years since the height of the pandemic, many public transport systems are still recovering from a decline in ridership and funding, and many more continue to struggle with a lack of resources.

High-quality, reliable public transport is essential to all cities, especially in lower- and middle-income countries where public transport is often the only accessible option for millions of people. High-quality public transport is also critical to addressing the growing emissions, congestion, inequality, and traffic violence associated with increases in private vehicle use. As we face future crises, cities must have robust transport infrastructure and services that serve the needs of their diverse populations.

What Makes Good Public Transport?

A 'good' public transport system for today's world is one where a person can safely and reliably reach as many (or more) places as quickly by public transport as they could by car or motorcycle. Good public transport also prioritizes the needs of people who have been historically marginalized or who have the fewest mobility options, particularly women, children, people with low incomes, and people with disabilities.

Good public transport must have several essential qualities, which ITDP refers to as the 'C's:

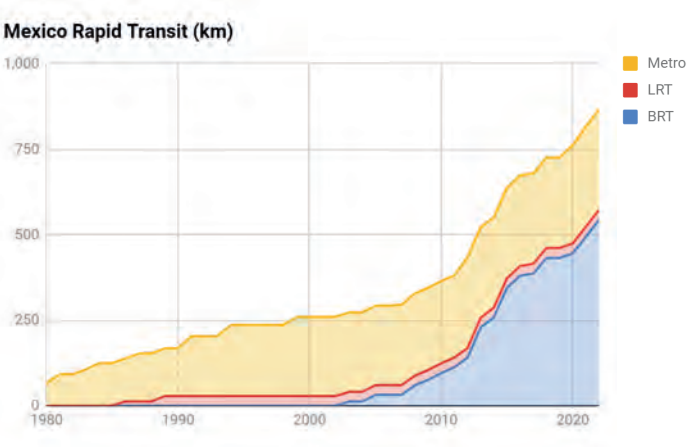
Connective: A comprehensive network of frequent service, including during off-peak and weekend hours, means short wait times between public transport services, leading to shorter trips and service to nearly all parts of the city.
Convenient: When public transport is accessible to all, people with disabilities, older people, women, and people traveling with children or goods can use the system.
Consistent: Better reliability means the times between public transport services are more consistent, reducing waits and improving the ability of people to reach destinations.
Comfortable: Safe services are operated in a way that avoids crashes, especially with vulnerable road users, like people walking and cycling.
Cost-effective: Affordable fares are set so almost everyone can afford to use the service regularly, with little to no additional cost for using multiple modes in a trip.
Customer-friendly: The easier a system is to understand and navigate, the more people can use it to move quickly around their city.
Clean: Services that emit little to no pollution may lower barriers to expanding public transport and improve passenger experience by reducing air and noise pollution.

The more a system can improve these qualities, the better support it can provide its passengers.

The Promise of BRT

Bus rapid transit (BRT) is a proven example of a public transport system that can employ these characteristics quickly and at a relatively low cost. In a BRT system, buses operate on a dedicated busway, typically at grade and in the center of a street. By removing much of the traffic that impedes typical bus service and adding other time-saving elements such as level-boarding and off-board fare collection, BRT has much higher travel speeds, safer operations, and better reliability than standard bus services.

With BRT, cities can quickly build a high-capacity network and high-quality public transport services. And because BRT is built around the elements of good public transport, it can readily demonstrate how public transport can operate effectively within the city's overall transport system. Building on this foundation, cities can



— In Mexico, BRT infrastructure is expanding alongside the development of metro and rail systems. Image: ITDP

High-quality, reliable public transport is essential to all cities.

then integrate other transport modes, such as walking, cycling, and paratransit, with BRT, improving connections across cities.

Bogotá, Colombia, has embodied this type of transformation. A few decades ago, much of the public transport in Bogotá was informally operated. The city then built Transmilenio, a network of BRT routes that spanned the metropolitan area. The system attracted so many riders that its primary problem became overcrowding. Building on this success, the city incorporated private operators into its overall public transport system and added subsidies to ensure good quality services. Bogotá now has one of the highest rates of public transport population coverage, according to initial data in ITDP's upcoming *Atlas of Urban Transport*. The city is also constructing its first-ever metro line, integrated with the BRT and other public transport services.

At the country level, Colombia has shown how BRT can allow a region to grow its rapid transport networks quickly. As late as 1994, Colombia did not have a single kilometer of BRT, light rail transit, or metro. Thirty years later, urban residents in Colombia are now twice as likely to live close to rapid transit as their peers in Germany and China, which are well-known for their investments in public transport. The interest in affordable, expansive BRT infrastructure has spread around the world. In the United States, BRT ridership this year is seeing a surge back to pre-pandemic levels, and in rapidly urbanizing countries like Mexico and across Africa, rapid transit networks are being built mainly around BRT. Since 2012, over 153 BRT corridors have opened in 91 cities in 24 countries, and these systems are now a far more familiar concept.

— Jakarta's Transjakarta BRT system recorded over one million daily riders in 2023. Image: ITDP

ITDP has supported that growth, working in cities worldwide to develop high-quality public transport—often based on the backbone of BRT. ITDP and partners first developed the *BRT Standard* in 2012 to ensure that BRT corridors consistently provide high-quality service and promote ridership. With the third edition of the *BRT Standard*, ITDP is increasing its focus on equity, inclusion, and sustainability, reflecting the realities of a transport sector transformed by weather events and a global pandemic.

The upcoming edition of the *BRT Standard* aims to help cities create more resilient rapid transit while addressing today's many urban challenges, from climate change to growing wealth inequality. The new *Standard* highlights accessibility for all, particularly for people with disabilities, people with low incomes, children, caregivers, and older populations. BRT is particularly well suited to addressing these challenges, providing mass transit in a shorter time frame for lower costs than other options like rail infrastructure. Most importantly, BRT demonstrates that high-quality, efficient, and reliable public transport can function well and serve the needs of diverse global cities.

Moving Forward

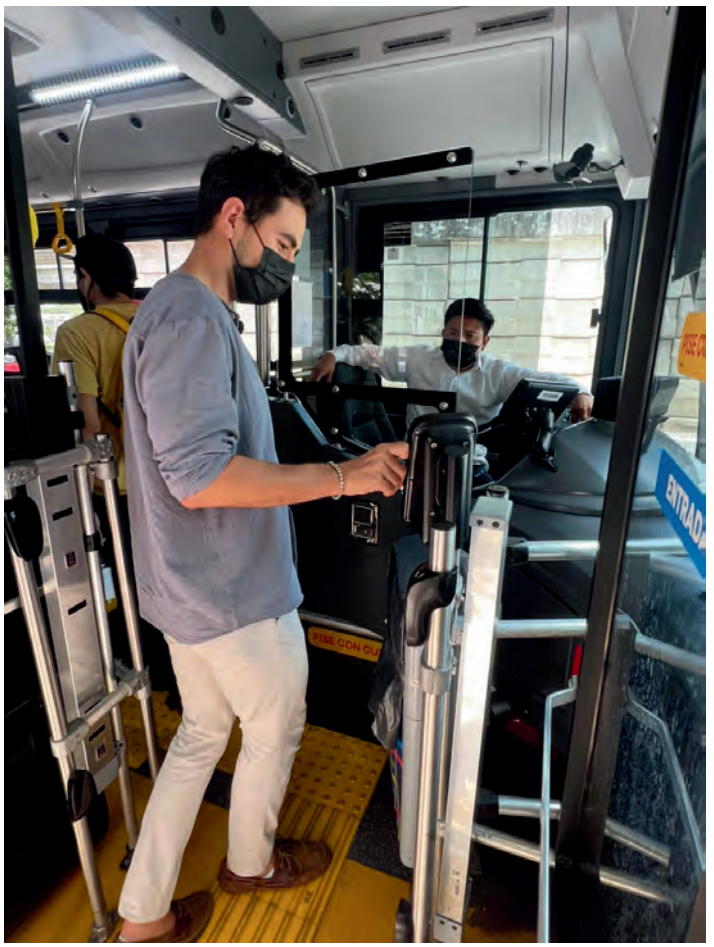
Planning decisions about public transport are never simple. Each city's transport system has unique strengths, weaknesses, and concerns, and each project and policy comes with benefits and costs that must be considered in the local context. There is no universal path forward. However, good public transport is always crucial to a well-functioning city, and the characteristics of good public transport are, in fact, universal. If done well and based on the elements outlined in the *BRT Standard*, BRT can be a model for nearly all these characteristics in a single project, built at a relatively low cost and in a short time frame.

However, there are also many other paths to developing high-quality public transport, such as prioritizing system integration or focusing on institution building. In all cases, the elements of good BRT provide a framework for improving urban mobility more broadly. Any efforts to improve city infrastructure must start with decision-makers identifying the tools available and assessing how well they align with the city's goals, how they fit within budgets, and how they address equity issues.

As a city grapples with these decisions, it is crucial to remember that the most significant benefit of public transport is its geometry: it moves many people in a small amount of space. By asking the right questions and evaluating logical outcomes, urban planners, decision-makers, and funders can find solutions that best serve each city and its people.

What Digitalization Means for Transport

By D. Taylor Reich, ITDP Global



— New technologies make collecting data on fares and riding public transport simpler and more efficient. Image: ITDP

"Elektronik vor Beton" is an idiom among Swiss transport planners, meaning "electronics before concrete." In other words, before pouring money into bridges and tunnels, see how silicon can improve service. This phrase is not only valid in the Global North. It might even be more meaningful in the rest of the world, where digital technology can improve long-neglected modes of transport with great potential for reducing carbon emissions and connecting people to jobs.

Take the city of Jakarta. Just a year ago, if you wanted to get somewhere by bus in Indonesia's capital, you often had to ask someone for directions and hope they knew. Today, thanks to the work of city agencies and partners convened by ITDP, Jakartans can get optimized bus directions instantly on their smartphones. Moreover, when they ride a bus—whether it is a cooperative-owned angkot microbus or a TransJakarta BRT—they can pay with a single smartcard with free transfers. Without needing to buy a single new bus, Jakarta has made it much easier to access public transport systems.

Digital technology is especially valuable for informal public transport, the unregulated or semi-regulated services that carry so much travel in many of the world's regions. Digitalization will not solve problems by itself—it must be part of a coherent strategy supported by local expertise and political will. However, it is a catalyst for moving informal transport toward regulation, subsidy, safer operations, reliable service, and electrification. Digital transport is impactful at every level, from the local to the global, and the world's journey toward digital transport is only just beginning.

A Shared Foundation: Open Standards

All approaches to digital transport must rest on a shared foundation of open data standards, enabling the combination of datasets from different sources. These include fundamentals like the General Transit Feed Specification (GTFS), the General Bikeshare Feed Specification (GBFS), and OpenStreetMap. For example, if five transit operators in the same city use different data specifications, a passenger will need five apps to get directions; if the transit operators all use GTFS, the passenger will need just one.

Local Digitalization: Mapping

A staggering 86% of cities worldwide do not have published public transport systems data. Digitalization begins with mapping and mapping is not just a step toward improvements; it is also an end in itself. In Cairo, for example, ITDP partner TransportForCairo has mapped the informal transport network of the Egyptian metropolis using GTFS. This map helps Cairenes find directions *and* it illustrates the significance of the informal network to decision-makers who have historically ignored it. The map demonstrates that at least one-third of residents of the Greater Cairo area live within a short walk of frequent transport services or systems.

Mapping is also essential for bicycle lanes. Bogotá, Colombia, has the fifth-most extensive bicycle lane system outside Europe. Bogotá is building new bicycle lanes so rapidly that it can be challenging to keep track. Technology can help—many cyclists like to use apps to find the safest, most direct route to their destination. Google Maps does not provide data for bicycle routes in Colombia. Fortunately, OpenStreetMap provides an international open standard for data about bicycle lanes, which anyone can use to get directions in Bogotá or worldwide.

Local Digitalization: Operations

After mapping, the next step is to use digital technology to regulate the operations of informal transport. In Mérida, Mexico, ITDP provided technical assistance in using technology to improve bus fleet operations, digitally monitoring the concessioned bus operators to reduce maintenance issues and improve scheduling. With this new system, the buses now have a fixed schedule, with the government compensating operators per kilometer rather than per passenger. This increase in fleet efficiency led to a 9% reduction in CO2 emissions per passenger and an 11% increase in speed while increasing ridership and improving organizational efficiency—all without paying for any new buses.

Similarly, Rio de Janeiro rolled out a digital system to improve user experience on nearly 3,900 buses between 2021 and 2022. ITDP's team in Brazil is mapping the usage of GPS data, e-ticketing, and GTFS in multiple municipalities to better understand the landscape of municipal public transport data. Digital operations enable city governments to better oversee and regulate public transport and provide targeted subsidies to transit-dependent and low-income groups. Meanwhile, in Jakarta, regulators are using digital monitoring to enforce a 200-kilometer daily cap on each transit driver, preventing excessive working hours and reducing the risk of operators falling asleep at the wheel.

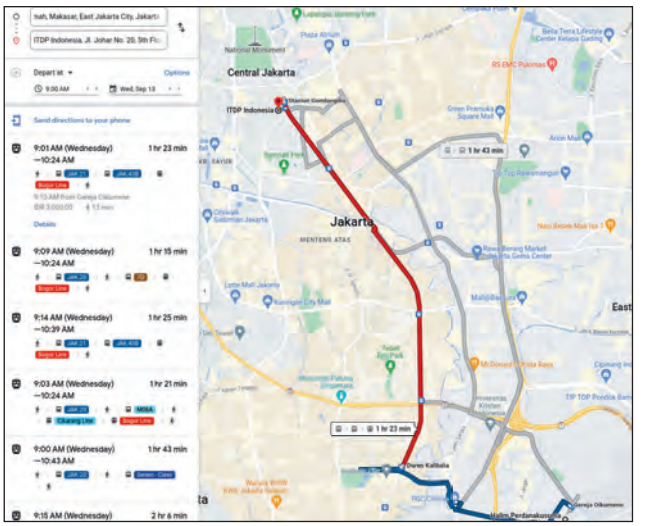
Scaling Nationally

While individual cities can prove the benefits of transport digitalization, national governments can scale those benefits across the country. The Federal Transit Administration has begun requiring all public transport agencies to publish their data openly in GTFS in the United States. Governments in Latin America are considering similar policies. National-level policies to promote informal transport digitalization would rapidly expand the city-level benefits. Mérida's 9% reduction in emissions per passenger is significant; a similar reduction across all of Mexico would be groundbreaking.

Approaches to digital transport must rest on a shared foundation.

In India, the country's national *Transport4All* initiative, spearheaded by the government and supported by ITDP, has engaged over 100 cities in gathering better data on their public transport systems, with support from private technology companies. In 2022, the initiative selected ten startups to receive seed funding to help these cities implement digital operations, such as gathering online feedback from riders and streamlining staff schedules.

In Brazil, ITDP and partners have developed a comprehensive dashboard called *MobiliDados* to show meaningful indicators of urban transport across the country and help cities use data to better inform planning for public transport routes, stations, and cycle lanes. In Rio de Janeiro, *MobiliDados* is now helping identify bike lane locations for a citywide cycling plan based on route origin and destination data from the existing bikeshare system.



— Open data standards now enable commuters in Jakarta to map public transport trips. Image: Google Maps

In Latin America, the *Urban Accessibility Visualizer* from ITDP combines data for various modes of travel in one interface, telling users where Mexico's transport infrastructure is located and how people travel so that planners can focus on neighborhoods with the greatest need. ITDP's forthcoming *Atlas of City Transport* will analyze these same indicators on an international scale, helping make the case for increased transport funding from development banks and national governments. The Atlas is currently in beta mode—contact *data@itdp.org* to request access.

Potential for the Future

Cities like Jakarta and Mérida have used digital technology to improve efficiency, ridership, and road safety by formalizing transport operations. These improvements have already delivered substantial reductions in emissions, which is only the beginning. Digitalization of existing transport is a significant step toward electrification. Without a map or a well-organized regulatory system, it would be impossible for a government to incentivize informal operators to electrify constructively. Jakarta, for example, with its current digital operations system, aims to fully electrify its fleet by 2030. Even in Jakarta, there is still potential for growth—ridership data could be analyzed to optimize the network, for instance, or payments could be integrated with smartphones.

Across the Global South, around a quarter of all travel is done by informal or semiformal public transport. The CO2 emissions from informal transport worldwide totals hundreds of millions of tons per year, as much as all sources of emissions in New York State combined. And that is only the start of the decarbonization potential: improving such services will support a widespread modal shift from private vehicles to public transport. With the help of digital technology, cities worldwide can regulate and electrify their informal public transport, slashing emissions and bringing considerable benefits to road safety, urban accessibility, economic inclusion, and beyond.

Interview with Supriya Sahu, Indian Administrative Service

Ms. Supriya Sahu *is the Additional Chief Secretary to the Government of Tamil Nadu—one of India's most populated states—in the Department of Environment, Climate Change, and Forests. She spoke with ITDP India about the state's ambitious climate initiatives, the role of urban mobility, and her vision for the future of India.*

Tamil Nadu became India's first state to launch a Climate Change Mission and district-level programs. The state has also launched the Tamil Nadu Green Mission, the Wetlands Mission, and the Green Climate Company (TNGCC). Could you tell us more about the state's initiatives and how you see the role of urban mobility in state-level climate action?

At India's national and subnational levels, much work is already happening. Tamil Nadu is one such state, where you have a firm political commitment from our Honorable Chief Minister, a proactive bureaucracy, and an excellent civil society movement—three reasons why a lot of climate action is happening here. Mobility is one of the core areas of these actions. If you look at greenhouse gas (GHG) inventories, mobility is a main source of emissions. Metro cities like Chennai and Coimbatore, Madurai, Trichy, and Tirunelveli must do much more work. We have already embarked on a journey to look at the transport sector's emissions and to develop a plan to decarbonize the entire sector.

While it might take some time to work on the entire GHG inventory and complete decarbonization plans, the state Transport Department has already developed several action plans, which include the launch of about 2,000 e-buses to be procured by the department with assistance from KfW, a German development bank. The department has also floated tenders for procuring these vehicles and is also setting up charging infrastructure. Another significant component is green mobility—creating better public spaces for cycling and walking. Discussions are ongoing with the Chennai Metropolitan Development Authority and the Greater Chennai Corporation to free up urban space and create dedicated corridors for cycling, walking, and micromobility.

Green mobility is also a key focus for the TNGCC. Could you tell us how the company was created and how it is positioned to support statewide sustainable mobility initiatives?

We wanted to unite all stakeholders working on climate action and create a platform for them to give their views in a unified manner. In India and worldwide, many players are working on climate issues, but each organization has different objectives, and they drive the action in that particular direction. The government must ensure all this action is synergized and focused on everyday citizens. The TNGCC was created to have an accountable, transparent, and professional agency to ensure government actions are based on climate science and data.

The company has a Board of Directors from different government departments—including the finance, housing, municipal administration, and transport secretaries. Each one brings a unique perspective, yet we can sit together and collaborate. TNGCC has experts working on green mobility, and in the coming year, we will be putting together a roadmap with a clear pathway for the decarbonization of the transport sector. On green mobility, Tamil Nadu was one of the first states to develop an electric vehicle policy, giving us a clear policy directive.

The state has seen great success with the *Meendum Manjappai* (Once Again, Yellow Bags) campaign, which nudges people to shift to more eco-friendly behaviors. Tamil Nadu has had a long-standing program of giving out bicycles, especially to students, encouraging an estimated 500,000 people to cycle annually. Could you tell us more about the campaign and how it began? Are there any learnings that can help people shift behaviors toward cycling?

People in Tamil Nadu have long known about *Manjappai*, a ubiquitous yellow bag that we can recognize immediately as a symbol of local culture and tradition. In the days when plastic bags had not yet invaded our lives, you had only the yellow bag, which was given as a return gift at weddings, used to carry cash, and used by children to carry books. The *Meendum Manjappai* campaign aims to bring back reusable bags in the fight against single-use plastic. The campaign has become a people's movement.

Similarly, Indian society and bicycles are inseparable. In many parts of the country, people still use bicycles to connect between villages and visit the market. But in many cities and towns, we need more safe infrastructure for cycling. If you want to promote cycling, then it has to be safe

— In Chennai, Tamil Nadu's largest city, efforts are underway to improve walking and cycling infrastructure. Image: ITDP

and convenient. Many are still scared to cycle in peak traffic when cars could hit them. You should also be able to pick up a cycle from a stand with the help of an app, deposit it elsewhere, and pick it up again. We have yet to bring that seamless integration in Indian cities that you see in cities abroad. People have tried creating bicycle-sharing systems here—the stations are there, some even with e-bikes. But they need to be maintained better and designed more conveniently to become part of the culture.

The Chennai Corporation has started an initiative to close down certain streets to vehicles on weekends and open them for cycling and walking, which has become very popular. I also cycle sometimes during these weekends, and many enthusiastic women, children, and even older people use those open streets. We must remember that roads must be safe—people must find cycling accessible. In many cities abroad, people use cycling for convenience. In Indian cities, we need to revolutionize this, and it has to be done by the local administrations. They have to ensure roads are wide enough and create dedicated lanes for cycling; this can help build confidence in people that they can cycle safely.

We have the Climate Change Mission and Climate Action Plan at the state level, district-level missions, and city-level action plans. In addition, we have national initiatives like the 'FAME' scheme for cleaner vehicles. However, multiple agencies are involved with different priorities. You mentioned the role of the TNGCC is to bring them together—how can we ensure swift and coordinated action at all levels?

That is one of the most critical objectives of the TNGCC. The important thing is to break barriers of communication to avoid duplication and help people collaborate rather than compete with each other. We organized the Tamil Nadu Climate Change Summit in 2022—India's first climate summit—to unite all stakeholders who presented their work. We have collected insights from more than 25 workshops, seminars, and conferences, where we also offered the reports of the baseline studies to ensure people know what work is happening. Through the TNGCC, we have also signed memorandums of understanding with several essential stakeholders. We are trying to synergize everybody's actions for the maximum benefit of the sector.

Are there any insights you would like to share with your counterparts in other countries working toward climate action that may be facing similar challenges?

We have just begun, and we have a long way to go. But whatever we have achieved in a short period is because of three things. One, you need a robust policy framework. You must have a clear vision and mandate for a clear roadmap. So, we have created a framework with an apex body—the TNGCC's three missions: Green Tamil Nadu, Climate Change, and Wetlands. We will soon be adding a fourth: the Coastal Mission.

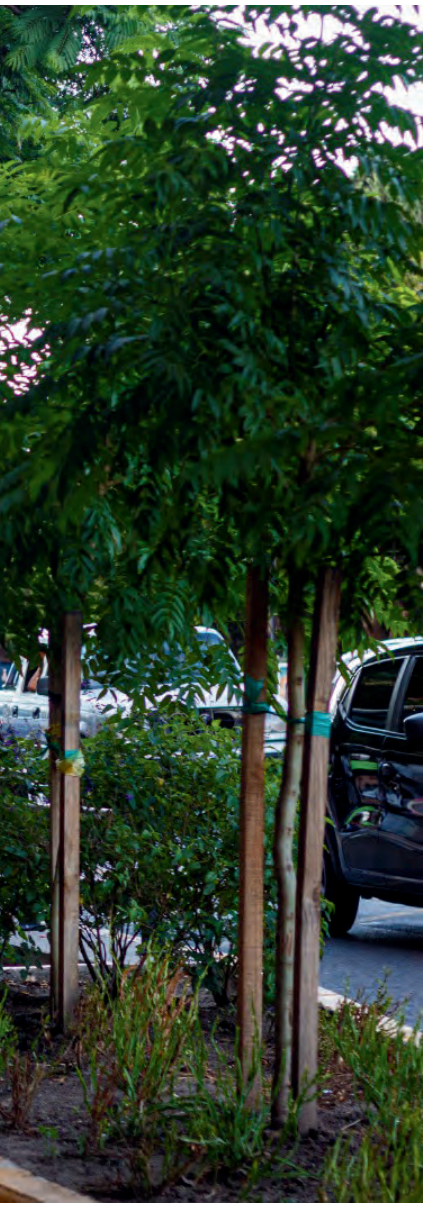
Second, once you have a policy framework, you need a mechanism to operationalize it. Once we had the TNGCC and the missions, we set up climate change missions in all 38 districts in Tamil Nadu and appointed the first climate officers in India in each district. We now have 40 Green Fellows: qualified youth champions who will work with us for the next two years and bring new energy and ideas to the table.

Third, we have also set up a Climate Studio, the brain behind all this action, which gives us the science, data, and evidence. While policy is important, you must create a mechanism to operationalize the policy. Meanwhile, you must also work on building capacities and a knowledge base from the ground level up. Science and data should inform all of this work to be truly effective.

Celebrating Two Years of the Cycling Cities Campaign Worldwide

Main Avenue Redesign in Buenos Aires, Argentina
The street redesign of Calle Compartida Libertador helped transform an essential avenue into a bike- and pedestrian-friendly corridor with upgraded lanes, intersections, and sidewalks.

ITDP launched the Cycling Cities campaign in 2021 to bring together a coalition of cities, partners, and pledge signers to work towards providing safe cycling access to 25 million more people by 2025. Each cycling city has unique opportunities and challenges, ranging from those seeking to expand infrastructure investment to those focused on building a cycling culture in marginalized communities. ITDP provides campaign members access to resources, tools, connections, and guidance to help them create a future where *all* cities can be cycling cities. The images in this spread were provided by the campaign.



Cycling Training for Women and Girls in Surat, India
A cycling initiative to empower people from low-income households in Surat has helped train over 500 women and girls, helping them feel more comfortable on commutes.

(Top) Streets for People in New Town Kolkata, India
New Town Kolkata's *StreetsforPeople* project transformed underused space beneath an overpass into a zone for cyclists and pedestrians, which thousands of people use weekly.

(Bottom) Annual Car-Free Days in Kisumu, Kenya
The city of Kisumu restricts motorized traffic for Car-Free Days on several streets throughout the year, encouraging more people to choose alternative modes of transport.

Infrastructure Upgrades in Recife, Brazil
Recife built the Agamemnon Magalhães cycle lane, a one-kilometer bi-directional path along a main avenue that is now used by more than 2,000 cyclists every day.

Since 2021, Cycling Cities cohort cities have:

Built 300 kilometers of protected cycle lanes
Built 150 kilometers of unprotected cycle lanes
Hosted 1,100 car-free or open streets events
Organized 350 Learn-to-Ride and cycle training events
Planned over 700 kilometers of future cycling infrastructure and facilities

Cycling Cities Collaborate: Encontro Cidades Pedaláveis
Representatives from the cities of Rio de Janeiro and Niterói in Brazil participated in a technical visit in Rio to explore and assess various design solutions for improving cycling environments.

Region's First Bikeshare Launched in Cairo, Egypt
The Cairo Governate launched the region's first bikeshare program, known as Cairo Bike, in 2022 with the first phase offering more than 250 bicycles across 26 stations.

"It is incredibly motivating to see that in other parts of the world, we are all fighting for the same objective of better, safer cycling access for everyone."
— Mercedes Cruz Vázquez, Director of Mobility and Transportation, Zapopan, Mexico (Cohort City)

Fostering Sustainable, Accessible African Cities Through Transit-Oriented Development

By Carolyne Mimano and Christopher Kost, ITDP Africa

— In Dar es Salaam, development plans near BRT corridors aim to promote more compact, mixed-use growth. Image: Noble Studios TZ

Rapid urbanization is creating complex, multifaceted challenges and opportunities around the world. African cities are undeniably at the forefront of this phenomenon. As Africa's cities grow, they must implement more sustainable, inclusive urban development strategies. One critical strategy is transit-oriented development (TOD), which focuses on creating walkable, vibrant, mixed-use, dense communities with well-connected public transport options. TOD has proven successful in major metropolitan regions from Bogotá to Seoul, efficiently prioritizing land use while providing complementary sustainable mobility options that combat rising transport-related emissions. With more interest in and implementation of bus rapid transit (BRT) systems in Africa's cities, a future of TOD-focused development can transform urban life across the continent.

Existing Urban Challenges

African cities face many unique mobility issues, with high-traffic paratransit systems often characterized by stiff competition among individual operators, leading to long wait times, inefficient journeys, and a high cost of travel. In addition, most cities have developed with a single commercial core surrounded by dispersed residential districts, leading to complex commute patterns and heavy congestion on major roads leading to central areas. Land use is also often dispersed, with stark contrasts between business and residential neighborhoods and high- and low-income areas. The shortage of affordable housing near employment hubs has had a significant role in the growth of informal settlements, characterized by uncertain land tenure, limited sanitation, and insufficient space for quality streets.

In contrast, affluent neighborhoods have developed with large compound walls, enclosed city blocks, gated communities, and a notable lack of pedestrian- and cyclist-friendly streets.

— More African cities are planning mixed-use, affordable developments with streets that support walking, cycling and public transit. Image: ITDP

Furthermore, many cities still have stringent building regulations that mandate minimum parking development, leading to abundant, low-cost parking spaces that encourage unnecessary driving. This combination of inefficiencies in public transport and car-oriented land use development has prompted most Africans with the means and resources to opt for private vehicles rather than more sustainable commutes.

Revitalizing Growth: BRT and Affordable Housing Can Drive TOD

To significantly enhance urban transport networks, some regional governments have begun to strategically develop and deploy BRT systems. Dar es Salaam, Tanzania, is one noteworthy example, with an impressive 154.5 kilometers of BRT corridors in progress and 20.9 kilometers already operational. Meanwhile, Nairobi, Kenya, is actively pursuing plans for five BRT corridors, having commenced construction on one and secured the financing for two more. In Addis Ababa, Ethiopia, an ambitious network comprised of 15 BRT corridors is now also in the planning stages. Kigali, Rwanda, has presented plans to enhance access and mobility by introducing more BRT and non-motorized infrastructure, as outlined in the *Kigali Master Plan 2050*. These cities' efforts collectively demonstrate a growing movement to provide urban residents with more efficient, inclusive transport options and services.

Other targeted initiatives are underway to address the affordable housing and informal settlement issues exacerbating mobility challenges in many cities. TOD presents a comprehensive opportunity for urban development and policy reform in Africa by incorporating considerations for high-quality public transport; promoting dense and mixed-use neighborhoods; increasing opportunities for developers and small businesses; and conserving public space. ITDP has been working in African cities to promote these types of vibrant, accessible, and pedestrian- and transit-oriented projects to ensure that BRT systems support sustainable growth.

For progress on TOD to be made, land development rights need to be aligned with investments in rapid transit to increase ridership and revenues for governments and the private sector, a strategy that has already proven successful in cities like Tokyo and Hong Kong. Planning the proximity of affordable housing projects to transport nodes, with adequate connectivity through non-motorized transport networks, can also help improve liveability and access to opportunities. At the same time, more mixed-use development also reduces the need for complex commutes.

Progress on TOD: Scaling Future Opportunities

The eight core TOD principles identified by ITDP's *TOD Standard*—*Walk, Cycle, Connect, Transit, Mix, Densify, Compact,* and *Shift*—

— Dense, mixed-use city planning curbs urban sprawl by integrating services and destinations, promoting walking and cycling, and reducing commute times. Image: ITDP

Awareness of TOD, and its potential to improve urban life, is growing across Africa.

can be contextualized and realized at different scales. The *Kigali Master Plan 2050*, for example, advocates for dense development along the city's planned BRT network and a 30% higher floor-area ratio (FAR) if at least 15% of the residential units in a project are made affordable. The G*reen City Kigali Kinyinya Hill Sub-Area Master Plan* is another new effort to ensure that the city's streets offer a fine-grained network of pedestrian paths connecting to public transport, alongside designs that promote walkability over private vehicle use.

In Dar es Salaam, ITDP has been working with the Dar Rapid Transit Agency (DART) on a local area plan for one of the terminals in the first phase of its BRT network. The *Gerezani Local Area Plan* is part of a strategy to revolutionize local city planning by using idle government land, promoting denser mixed-use development, developing active commercial space, and implementing land value capture to support infrastructure and utility improvements. The pilot project will be expanded across the BRT network, with accompanying policies to ensure a more compact city in the future. There are also notable opportunities in Nairobi, with planned BRT corridors and an upcoming *Railway City* development that integrates the city's central commuter rail station with more BRT connections. Other key aspects include ensuring mass rapid transit stations have an adjacent affordable housing development, retail uses, and access to non-motorized infrastructure.

With ongoing upgrade plans for informal settlements and more affordable housing initiatives underway in many cities, there is also an urgent need to ensure that residential areas are mixed-use, have access to essential services and amenities, and are close to public transport nodes. Compact urban development offers significant savings over current patterns of low-density urban sprawl by reducing travel costs and investments in peripheral public utilities. Revising land tenure policies in informal settlements and improving streets and service provision, including water, sewer, and sanitation systems upgrades, is also essential for a TOD future in Africa. Ensuring that all urban residents have access to quality living conditions and public services will encourage more investment in transport noes, leading to organic infrastructure improvements and greenfield development.

This knowledge and awareness of TOD principles and their potential for improving quality of life is still growing in many parts of Africa. Still, more work needs to be done to understand how sustainable zoning policies, building codes, and non-motorized and public transport improvements can be applied to existing cityscapes. Understanding how TOD principles can and should be leveraged in the unique context of Africa is critical to real-world implementation. With rapidly growing urban populations, how cities plan and orient their policies today will considerably impact the region's social, economic, and environmental future. African cities have a chance to chart a course toward a brighter, greener, and more equitable future by promoting holistic approaches toward TOD, compact development, and sustainable public transport for all.

— In Brazil's cities, one's access to safe and reliable public transport depends on issues of race and gender. Image: Gabrielle Guido / ITDP

The Intersection of Gender, Race, and Mobility in Brazil

By Lorena Freitas, Juan Melo, and Beatriz Rodrigues, ITDP Brazil

Women represent more than half the world's population, yet they still experience systemic gender discrimination on a daily basis in urban life—and this is even more true for Black women from low-income communities. This disparity is particularly evident in cities across Brazil where gender roles are tightly woven into institutional and power structures, defining who should be responsible for what types of work. At the same time, women are expected to perform domestic, caregiving, job, and personal activities using urban systems that do not reflect their needs or commutes.

Barriers to Inclusive Mobility

Accessible and affordable transport is essential to Brazilian women's daily lives in these roles. In fact, studies by Brazil's government have found that Black women spend, on average, 18.6 hours a week performing caregiving and domestic activities, while white Brazilian men spend just over 10 hours a week on the same. This may well be due to the fact that many Black women are dependent on public transport and take multiple trips every day, often on services that were not designed for them. These stark contrasts demonstrate a need to rethink existing transport systems to better reflect perspectives of Black women and address the intersectional issues of gender, race, and mobility so cities can truly serve all people.

The concept of intersectionality between gender and race comes from reflections raised in the context of Black Feminism in the United States in the late 1970s. This term was coined in 1989 by the African-American academic Kimberlé Crenshaw, who noted that characteristics of gender and race are inseparable in analyzing the experiences of Black women.

— For many low-income Black women in Brazil, lengthy, complex, and unsafe commutes are a daily challenge. Image: Gabrielle Guido / ITDP

While transport planning and policies have indeed advanced in recent times to address gender and racial inequities, many cities still fail to prioritize the experiences of many vulnerable populations, particularly low-income Black women. Despite accounting for over 28% of Brazil's population according to 2019 census data, Black women often bear the brunt of "gender-neutral" urban planning that does not create spaces that reflect their needs. Their experiences and challenges differ significantly from those of men and, in general, from those of white women.

Indicators presented on ITDP's *MobiliDADOS* platform, which provides open data on Brazil's mobility policies, shows that in all of the cities studied, the percentage of Black women living within 300 meters of cycling infrastructure or within one kilometer of a rapid transit station is notably lower than that of the general population. At the same time, Black women from low-income areas are typically the most reliant on public transport and cycling in daily life.

Transport for All

To understand the roots of these barriers, ITDP, in collaboration with Brazil's Center for the Study of Labor Relations and Inequalities (CEERT), developed the *Transport for All: Gender and Race in Urban Mobility* project. The project employs research, studies, and other initiatives to explore race and gender with a focus on São Paulo's transport systems. The project found that Black women have been the most adversely impacted by the city's systems that were not planned to accommodate them. Black women account for 36% of the female population of São Paulo but are 43% of public transport users, suggesting that Black women rely on these services much more than their white and male counterparts.

This mirrors much of the history of Black populations in Brazil that have been forced to live in urban peripheries, further from economic and social opportunities. As a result, Black women today are also the most impacted by the poor quality of transport in peripheral communities and made all the more vulnerable to violence, harassment, and exclusion on transport. The most recurrent issue identified by *Transport for All* is the impact of gender-based violence on Black women's commutes. Many women feel afraid throughout their travels, whether they are walking, cycling, or riding the bus.

Black women also often feel invisible to white or male passengers, to the authorities that should protect them, and within transport policies more broadly. As one of the participants in the project said of their harassment: "It's not worth reporting because nothing is done in Brazil. Domestic and sexual violence requires proof that that a person is guilty. We have to prove that we are the victim and that can be traumatic. This has to change for it to be worth making a complaint."

To effectively incorporate a gender and race–responsive culture into urban and transport planning and policy, multiple areas need to be addressed. Notably, more diversity is needed in the companies that manage transport systems in Brazil, especially at the senior levels with the most decision-making power. Many limitations are also built into these entities' organizational structures, with few specific resources dedicated to addressing inequality and access for Black women in particular.

According to one official from São Paulo interviewed for the project: "If you were to ask who takes care of gender policies and plans, there is no one. So, people who know [about the problem] make an effort, but we are missing someone who is dedicated to thinking about who the user is and the services they need." To further substantiate this perspective, *Transport for All* assessed the operations of transport systems in São Paulo and found that the jobs and roles performed by women and men are often unequally distributed in gender and in race. In São Paulo, 85% of workers in the transport sector are white men, 8% are white women, and just 4% are Black women.

Black women's unique experiences can help inform how public transport is managed, designed, and operated.

A Way Forward

More gender and race representation in the sector will require strategies targeted at empowering Black women, giving them a more active and prominent role to influence decisions. Greater presence of women is needed in technical roles in public companies and utilities as well, in addition to senior levels. Black women's unique experiences can help transform how transport is managed, designed, and operated to the benefit of all groups. More targeted public policies with transparent, reliable information and guidance on inclusion, safety, and access is also fundamental. To achieve these changes, Brazil must start by addressing the lack of comprehensive data on gender and race in mobility while encouraging more data collection between public agencies and authorities.

Just as importantly, management within transport agencies and operators must institutionalize steps to support and validate a race and gender lens in their day-to-day work. *Transport for All* aims to advocate for more subsidies and resources to enhance services for all public transport users in Brazil, by starting with the populations most often excluded from policy and planning conversations. This research is certainly not exhaustive—instead, it provides a foundation for reflection, inspiration, and guidance to build a better future where the needs of diverse urban communities are valued.

— Yichang, one of the largest cities in China's Hubei province, is working to lower emissions through sustainable transport. Image: ITDP

Towards A Low-Carbon Future for Yichang, China

By Han Deng and Qiuyang Lu, ITDP China

During the 2020 United Nations General Assembly, China announced its goal of achieving carbon neutrality before 2060. Although this timeline is further out than the 2050 goals set by nations like the United States, it is nonetheless an ambitious target given China's extensive emissions footprint, diverse economy, and significant population. To tackle this major challenge, ITDP has spearheaded efforts with regional and global partners to guide Chinese cities towards transport emissions reductions. One promising example of these efforts is in Yichang, a city with a population of over four million nestled in a cluster of cities in central China's Hubei province.

Since 2022, ITDP has been supporting the World Bank in assessing Yichang's emissions profile and evaluating the feasibility and cost-effectiveness of various decarbonization policies applied in the context of the city, particularly as it relates to urban transport. This work addresses an important and timely question for the region: how can cities in China develop actionable transport strategies to benefit people *and* the climate?

Yichang's Emissions Profile

China continues to be one of the world's top three greenhouse gas (GHG) producers, and its transport sector is the fourth

— The improvement of integrated public bus and transport networks is key to Yichang's emissions reduction strategies. Image: ITDP

largest contributor to this. Reducing transport-related emissions is a pressing priority for China's government. With more than 65% of the population living in urban areas, focusing on low-carbon transitions in mid- and large-sized cities is crucial for future change. In the assessments conducted by ITDP and partners, it was revealed that Yichang's primary emissions source is, in fact, road transport and it accounted for upwards of 80% of the city's emissions between 2015 and 2021. Private passenger vehicles were the most significant contributor to total emissions, with freight transport coming in second. In addition, given Yichang's strategic location along the Yangtze River, water-based cargo transport contributes nearly 10% of the city's transport emissions, with railways and civil aviation contributing another 10% together.

Cars and Freight Driving High Emissions

Yichang's car ownership rates have risen an astounding 96% since 2015, with an estimated 640,000 car owners as of 2020. The COVID-19 pandemic also reduced public transport ridership dramatically in China, pushing more people to opt for private vehicles. This shift toward cars, rather than public transport or active mobility, has contributed significantly to the city's rising emissions in recent years. Yichang's efforts to evaluate and understand its emissions profile are essential to identifying potential areas for more sustainable mobility interventions and progress.

The popularity of e-commerce and goods delivery in recent years has also led to a rapid rise in Yichang's road cargo and freight challenges. In 2019, emissions from freight in the city accounted for 81% of total emissions from all road transport. For the city to successfully address emissions, freight and cargo delivery logistics systems must be better optimized to promote more rail- and water-based deliveries rather than fuel-based vehicles. Expanding the proportion of electric and clean energy vehicles is just as crucial to limiting the GHG impacts of the delivery sector.

Optimizing travel demand is another solution for tackling emissions. Rapid urbanization has dramatically changed the city's planning, exacerbating long commute times and congestion. New development models should help reduce the demand for unnecessary travel through compact urban planning that streamlines access to essential services and destinations while highlighting walking, cycling, and public transport. With the pandemic-driven rise in remote work, there is ample opportunity for China's cities to explore more '15-minute city' models that prioritize mixed-use density and active mobility.

— The expansion of cycling and pedestrian infrastructure in Yichang can encourage a shift away from private vehicles. Image: ITDP

Rethinking the city's infrastructure as a whole is also critical—to reduce the GHG impact of road transport, streets and public spaces must be designed to support all forms of travel. This will require complementary policies regulating high-emission vehicles, reforming parking laws, and improving road safety.

Opportunities to Decarbonize

There are many opportunities for mid-sized Chinese cities like Yichang to design more flexible, adaptable, and low-cost public transport networks, such as bus rapid transit (BRT) and dedicated bus corridors. ITDP has worked on developing BRT systems in several Chinese cities, including Yichang and Guangzhou in the south, which has helped increase public and private interest in mass transit.

At the same time, promoting cleaner electric buses and passenger vehicles is just as fundamental to a future of low-carbon transport. This transition could be accomplished in phases in Yichang, with public buses, taxis, rideshares, smaller delivery vehicles, and sanitation vehicles prioritized for electrification. In addition to reducing emissions and improving air quality, electric public transport vehicles enhances operational efficiency, improves user experience, and encourages more ridership.

Public transport electrification is already underway across Yichang, with the city achieving the transition of nearly 47% of its public bus fleet and over 90% of its dual-fuel taxi vehicles as of 2021. This shift to low-emission buses and taxis has the potential to set an important example for the ongoing transition of individual cars, two-wheelers, trucks, and beyond. Achieving carbon neutrality for Yichang will require fundamentally reshaping invidual- and system-level approaches to mobility, urban planning, infrastructure design, and technology adoption.

China's cities face an uphill battle when it comes to shifting transport behaviors and actions to meet the country's ambitious climate goals. Yichang's current emissions profile still shows a dominance of emissions-heavy road and freight transport, and this is likely a similar scenario in many of China's other cities. Decision-makers and global partners with a vested interest in a low-carbon future for China and the world must work to change this paradigm. There is hope on the horizon, however. As seen in the work that ITDP and others are undertaking in Yichang and nationally, there could soon be new models for transformation, innovation, and progress.

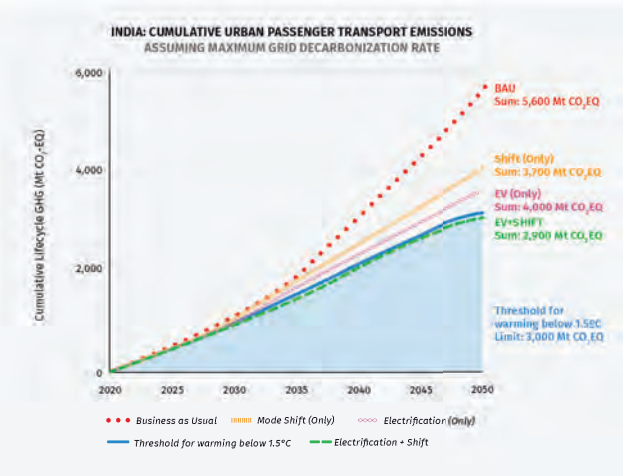
India Needs More Compact, Electrified Cities to Meet Climate Goals

By Keshav Suryanarayanan, ITDP India, and Jacob Mason, ITDP Global

— The most populated country in the world, a sustainable future for India requires compact city planning in tandem with electrification. Image: ITDP

Imagine a computer system that can only be activated with a key—but that key comes in two halves. Only bringing both keys together can make the system work. Each half-key is important, but each is insufficient—remember this image. In 2021, ITDP and the University of California, Davis (UC Davis) released *The Compact City Scenario—Electrified* report with critical research demonstrating a similar scenario for the future of our urban transport sectors.

Cities worldwide have two strategies available to decarbonize their transport sectors, but neither alone will be sufficient to address the impacts of climate change. One approach is extensive vehicle electrification across all modes, and the other is creating compact cities that minimize excess travel while encouraging a shift to walking, cycling, and public transport. Both strategies are important, but neither can have a sufficient impact on its own. These strategies are the two half-keys to unlock a future of sustainable, low-carbon cities.



— The *India Roadmap* finds that a scenario of compact cities combined with transport electrification is critical to limiting emissions. Image: ITDP

ITDP–UC Davis' research involved modeling four scenarios of growth in passenger transport and resulting emissions:

> ***Business-as-Usual (BaU)***: Cities continue with past trends and current policies.
> ***High Shift:*** Cities embrace compact land use and make walking, cycling, and public transport a priority.
> ***High Electrification***: Cities pursue vehicle electrification intensively.
> ***Electrification + Shift***: Cities combine the *High Electrification* and *High Shift* strategies.

The research ultimately finds that neither *High Shift* nor *High Electrification* can reduce emissions to limit global warming within 1.5°C—rather, the world needs both approaches combined. To assess the future of urban transport in high-emissions regions like India, ITDP and UC Davis recently developed the *Compact Electrified Cities: India Roadmap* to evaluate the potential of *Electrification + Shift* to help India achieve net zero emissions by 2070. *Electrification + Shift* would reduce national emissions and promote resilient, equitable, and healthier cities for all Indians.

A 2023 *Air Quality Life Index Report* estimates that, since 2013, 59% of the world's growth in air pollution has come from India. Transport is the primary driver of these emissions, accounting for roughly a tenth of national emissions. Road transport makes up an alarming 90% of this figure, with the number of vehicles on India's roads increasing four-fold since the early 2000s. However, cities continue to prioritize motor vehicles and are not adequately addressing unsafe conditions for walking and cycling and a lack of high-quality public transport.

The United Nations projects that, between 2020 and 2050, India's urban population will nearly double to 877 million. This means that half of these future urban areas in India will be newly built and developed over the next 30 years. The country must take more action now to reduce vehicle emissions and improve sustainable mobility in its cities. Planners and policymakers cannot continue the same unsustainable urban growth and development models. Designing and creating infrastructure that prioritizes compact, mixed-use planning and electric transport will help ensure that India meets its climate commitments, produces significant economic savings, increases road safety, lowers congestion, and enhances quality-of-life.

How India Can Benefit from Compact, Electric Cities

Compared with a *BaU* scenario, *Electrification + Shift* would require significant investments into walking, cycling, and public transport infrastructure. While the upfront costs may be high, they will be more than balanced by the savings offered by decreasing car-centric road and highway development. In fact, the Roadmap suggests that over the next 30 years, an *Electrification + Shift* scenario could result in cumulative savings of over INR 400 trillion ($5 trillion USD). Of this, at least INR 150 trillion ($1.8 trillion USD) could be saved by national and local governments, which can be invested in other services like healthcare, housing, and education.

Even a *High Electrification* scenario would represent a major reduction in total energy consumption relative to *BaU*, because electric vehicles are much more efficient per kilometer than traditional vehicles. However, while total energy consumption would reduce, it would also result in an increase in the use of electricity. The focus on mode shift in an *Electrification + Shift* scenario that also prioritizes walking and cycling could reduce electricity consumption by almost a third, which would free up energy for the public and other uses. In addition to economic savings and lower energy demand, *Electrification + Shift* would create denser cities with more equitable transport, improving people's access to opportunities for education, employment, leisure, and cleaner air.

What Else Do India's Cities Need?

To achieve this future, India must enact policies at all levels to reallocate street space and transport funding from car infrastructure in favor of walking, cycling, and public transport.

— Compact city planning requires pedestrian, cycling, and public transport networks to be well-integrated and convenient. Image: ITDP

Simultaneously, the country can take more supportive actions, such as fee-rebate systems for electric vehicles, expanded public charging infrastructure, and improved emissions regulations. The Roadmap offers seven goals as part of achieving *Electrification + Shift:*

Cities are compact and reachable;
Every citizen gets a fair share of road space;
Walking and cycling are attractive;
Public transport is accessible and affordable;
Everyone breathes clean air;
Cities embrace green mobility;
Everyone moves around the city seamlessly.

While the scale of such transformations would be immense, it is also not unprecedented. Paris, France decreased car travel by almost 50% in 30 years by investing in modes like cycling and traffic control strategies. Cities like Jakarta, Indonesia; Tehran, Iran; and Bogotá, Colombia have each built public transport systems over a period of 15 years that now serve more than a million riders a day. Indian cities can certainly begin to do the same. In one promising step, India's *Long-Term Low Emission Development Strategy* launched by the government at COP27 emphasizes mode shift and electrification as strategies for more inclusive, low-carbon cities. There has also been momentum toward electrification with national programs like the *Faster Adoption and Manufacture of Electric Vehicles Scheme*, which has propelled 26 Indian states to adopt electric vehicle policies and produced a national e-bus effort to provide 10,000 e-buses across 160 cities.

ITDP is working closely with the national government through cycling, walking, and public transport programs—*Cycles4Change, Streets4People,* and *Transport4All.* All the programs have active participation from more than 50 cities, with major urban areas like Chennai and Pune now working towards becoming role models for sustainable mobility. To debut the insights from the *India Roadmap* and spark a national conversation, ITDP and UC Davis presented at the national Urban Mobility India Conference 2023, hosted by India's Ministry of Housing and Urban Affairs and attended by public officials, development banks, and technical experts.

It is crucial that India builds on its current momentum by encouraging more action from leaders at all levels of government. Decisions in urban planning can have lasting impacts for generations, and India's cities are now growing faster than ever. In many ways, a transition to compact, electric cities may even be more attainable in India than in countries where highways and sprawl are already well established. India has an opportunity *not* to build those highways at all and rein in sprawl before it happens—all they need is to put their two half-keys together.

— In Indonesia, ITDP worked closely with diverse community groups to gather feedback on mobility challenges. Image: ITDP

How Indonesian Cities Are Prioritizing Inclusive Public Transport

By Annisa Dyah Lazuardini, Deliani Poetriayu Siregar, and Fani Rachmita, ITDP Indonesia

The lack of holistic data on how marginalized and differently-abled groups move in major cities is often a barrier to developing more inclusive urban transport systems. At the same time, studies have shown that such groups are the primary public transport users in many regions, with Indonesia being no exception. A sustainable, equitable future for Indonesian cities must start with standardized planning processes that are based on the needs of those traditionally excluded from transport planning, such as women, children, caregivers, people with disabilities, and older people. Only by developing guidelines and frameworks that center inclusivity and accessibility for all can public transport systems increase ridership and serve the needs of its users, regardless of gender, race, ability, or age.

A 2020 *Global Future Cities* survey of Bandung, the capital city of West Java, found that over 53% of public transport users were women. Women in Bandung also reported that their commutes, often as caregivers, involved complex trips to and from work, school, and other essential destinations. In the central Java city of Surakarta, ITDP research showed that 56% of passengers of the local Batik Solo Trans Surakarta system were women. In Jakarta, 49% of Mikrotrans (Transjakarta's microbus) passengers were elderly or older people, according to ITDP research from 2021. Despite populations like women and older people being the most reliant on public transport, many systems' designs and facilities do not consider these groups' transfer needs, multimodal trips, physical abilities, and destinations. For the millions living in Indonesia's cities, a future of sustainable, equitable transport starts with ensuring that all populations are recognized and respected.

To help city officials and governments address these challenges, technical recommendations were developed by ITDP and its partners for major Indonesian cities like Jakarta, Bandung, Semarang, and Medan, specifically engaging vulnerable and underrepresented communities to understand their needs and mobility patterns. By elevating the perspectives of these groups through in-depth discussions and surveys, the cities were able to gather critical feedback to form a foundation for more inclusive, accessible transport actions.

Jakarta

In Jakarta, ITDP helped develop new inclusive components of the city's wayfinding guidelines by collaborating with a research team from Universitas Indonesia and engaging the Indonesian Association of the Blind and Low Vision (PERTUNI) to develop special transport signage for visually- and hearing-impaired users in Transjakarta stations. The experts from the Association were compensated and engaged in weekly meetings, prototype development, and field assessments to ensure the design of the inclusive signage, fabrication of materials, and placement of signage met the needs of the people with vision challenges. In 2023, Transjakarta is further adapting this community-driven planning process to pilot one of resulting prototypes, Braille-lined handrails, in 13 bus stations that were chosen based on user demand. Transjakarta subsequently hired PERTUNI as a quality controller to assist with the future production of accessible signage.

Semarang and Medan

Similarly, the cities of Semarang and Medan worked with local community groups and ITDP to develop policies like the *Semarang Inclusive Mobility Plan* and the *Medan Inclusive Mobility Plan,* which include recommendations based on engagements and discussions with marginalized groups and people with disabilities. Since 2016, both cities have been working to improve their bus rapid transit (BRT) systems and non-motorized transport infrastructure with ITDP's support to create policies prioritizing diverse community needs. Project teams conducted field surveys and studies to assess the conditions in both cities' transport systems, including informal discussions with passengers to understand the barriers they face during their commutes.

Acting on these recommendations, Semarang has been working to improve public transport connectivity and accessibility in its Kota Lama (Old Town) area to create a new low-emission and pedestrian- and cyclist-friendly zone. ITDP partnered with local agencies and transport operators to conduct site visits throughout Kota Lama and helped decision-makers experience the everyday conditions while capturing valuable data on road safety, street security, and accessibility. Area residents, transport users, and pedestrians had the chance to provide input on their mobility challenges and the services they would like to see in an inclusive street environment.

Similar community engagement processes were also employed in the city of Medan. ITDP and local partners collaborated with

— Interventions piloted by the project team include handrails in transit stations with Braille signage. Image: ITDP

A future of equitable transport starts with recognizing the needs of diverse populations.

women's and community groups through surveys, interviews, and stakeholder meetings to develop the *Medan Inclusive Mobility Recommendations* which facilitates more accessibility and equity on public transport. The recommendations were presented to the Medan city government in 2022 and received a positive reception from policymakers. The head of the Medan Transport Agency, Iswar Lubis, expressed the agency's hopes for implementing the plans and stated: "All city agencies, from the Public Works to the Environmental Department, should collaborate and commit to making Medan a city for all of its people."

National Efforts

Back in 2018, the national government developed Indonesia's *Technical Guidelines for Pedestrian Facilities* to guide the implementation of pedestrian facilities in cities. However, the *Guidelines* did not reflect the needs of people with disabilities and other marginalized groups, resulting in inaccesible street designs and sidewalk infrastructure. Unforunately, in many places, these types of recommendations still often do not incorporate the perspectives of people with mobility challenges.

To address this, ITDP worked with the National Public Accessibility Movement (GAUN), UN Women Indonesia, the Ministry of Public Works and Public Housing, and other agencies to review the *Technical Guidelines* and develop new standards for pedestrian facilities to make them safer and more accessible to all Indonesians. This work included participatory planning events, community outreach, language assessments, and visualizations to help planners and officials understand the importance of implementing universal standards for public space designs.

The updated national *Guidelines* were published in May 2023 and are now more reflective of the interests and views of different Indonesian communities, while providing more precise and transparent guidance for cities. Over 40 public agencies and organizations representing 12 provinces participated in constructive dialogue as part of the process, offering meaningful suggestions and feedback. Participants included government departments, disability rights advocates, pedestrian activists, children's groups, women's organizations, and community-based institutions. The new updates include recommendations such as level crossings for streets, more wheelchair- and stroller-friendly sidewalk ramps, and improved street lighting and security.

When cities provide safe, inclusive mobility for all types of people, they are made more sustainable, equitable, and resilient. To ensure that public environments are indeed created for everyone, planners and policymakers must take action to elevate the perspectives of the people most reliant on public services and most often excluded from decision-making. In these Indonesian cities, ITDP's on-the-ground experience demonstrates the value of working collaboratively with stakeholders from the bottom up to co-create plans and policies that reflect the mobility needs of all people.

Ideamos: Piloting Innovative and Data-Driven Mobility Solutions

By Eloy González, ITDP Mexico

— One Ideamos pilot, *Movin Reforma,* encouraged private companies to promote sustainable mobility amongst employees. Image: ITDP

In the rapidly urbanizing country of Mexico, over 100 million people live in or near cities. As cities expand, mobility, access, and sustainability issues are at the forefront of many Mexicans' minds. Just last year, the country ratified a *National Law on Mobility and Road Safety* as part of a significant effort to reduce the number of deaths from traffic crashes, promote road safety, improve public transport, and reduce transport emissions across the country. As part of this momentum in recent years, the Inter-American Development Bank (IDB), the IDB Lab, and ITDP launched the innovative Ideamos program in early 2020 to help incubate and pilot creative technology- and data-driven mobility projects for the future of Mexico's cities. The program concluded in 2023 and, despite the challenges presented by the COVID-19 pandemic, generated successful research and pilot projects in collaboration with transport network companies (or TNCs, which provide digital applications for services like bikeshare and rideshare), public authorities, private organizations, and civil society groups. Each of the resulting pilots, guides, studies, and digital tools was co-created by Ideamos-backed partnerships to help cities identify and test creative solutions for climate- and people-friendly mobility.

The Pilots

Eight Ideamos pilots sought to address issues ranging from last-mile delivery to the 'digitalization' of public transport. The *Rolling Help* pilot focused on the logistics of food distribution

to low-income people impacted by the pandemic through sustainable vehicles, including mechanical and electric cargo bicycles. Similarly, the *Rolling Together* pilot used digitalization tools, skills training, and advocacy in partnership with seven local courier services to increase bicycle-based deliveries and improve worker conditions. The *Move Up* pilot worked closely with government agencies and three Mexican universities to develop inter-university transport options by creating new electric bus routes and using mobile-based applications.

In the city of Mérida, a *Digitalization of Public Transport* pilot demonstrated the benefits of employing technology to improve public transport operations and safety. New night-time public transport routes were debuted in Mérida as part of the pilot, from which user and ridership data was collected, along with a new system of speed-focused alerts to improve driver safety. The *Movin Reforma* pilot helped develop an institutional-level mobility plan with eight private companies based along Mexico City's famed Paseo de la Reforma corridor. The partnership assessed the commutes of the companies' employees to encourage shifts away from driving to walking, cycling, and public transport services.

The Digital Tools

Ideamos also harnessed the power of new platforms and data collection methods to develop digital tools to help planners, officials, and policymakers make better transport decisions. For example, the Ideamos team developed an *Urban Accessibility Visualizer*, which helps users understand residents' ease of access to essential services such as healthcare, schools, recreation, and employment in over 20 cities. The *Visualizer* also allows comparisons of travel times, available transport modes, emissions data, and costs. A *Mobility Diagnosis Platform* was also created as an open-access platform to enable cities and institutions to develop and customize mobility surveys with sample populations of any size. With it, users can obtain detailed data and visualizations from survey feedback, including commuters' origins and destinations, kilometers traveled, modal split, and CO2 emissions.

The Guides and Studies

In addition to the pilots and tools, Ideamos produced knowledge products for officials and partners to better understand Mexico's mobility landscape. A *Guide for the Regulation of Dockless Shared Scooters and Bike Systems* offers design and regulatory recommendations for enhancing dockless bikeshare systems, which have the potential to encourage more micromobility usage. A *Guide to Implement Actions with a Gender and Inclusion Perspective* highlights the challenges and needs of women, girls, and older populations, suggesting more ways to integrate their views into urban mobility projects and policies. Another *Guide for the Development and Implementation of Institutional Mobility Plans* seeks to promote sustainable mobility behaviors internally within organizations and companies by encouraging employees to choose low-carbon commutes.

A comprehensive study on *Best Practices in Data Management* combined lessons from across the Ideamos pilots and other methodologies to offer guidelines for mobility data management, describing technical needs for software and hardware and the importance of data quality and standards. Finally, a study of the *Diagnosis of Mobility Barriers for Older Adults* provided valuable insights into the challenges that older adults in Mexico City face when walking, cycling, or using public transport systems.

Visit *ideamos.mx* to learn more about the program and its research and pilots.

Lessons Learned

Over three years, Ideamos succeeded in fostering a collaborative ecosystem comprised of 22 TNCs, 28 private companies, 13 government institutions, 14 NGOs, and even hospitals and universities across the cities of Mexico City, Mérida, Xalapa, Puebla, and Toluca. The feedback of over 21,400 everyday people in these cities was collected and integrated into the pilots, guides, and tools. The pilots alone helped achieve a combined reduction of 4,658 tons of CO2 emissions, nearly equivalent to the annual emissions of 940 motor vehicles, according to the US EPA's Greenhouse Gas Equivalencies Calculator.

The best practices and lessons from this program offer valuable insights to any urban stakeholder looking to improve mobility and transport in their cities. The successful management of multi-sector partnerships was critical to Ideamos' success. In six pilots, at least one TNC, one government institution, and one company or university/hospital participated. ITDP and project managers needed to balance each strategic alliance so that every partner could express and utilize their unique perspectives and skills. Ideamos also crafted its guides and studies with the lens of diversity, equity, and access in mind, and the methodology behind this was published for officials and planners to use across other mobility projects.

Of course, the integration of technology and data was the foundation for all of Ideamos' efforts. Moving from analog processes to digital ones requires close collaboration, capacity building, and data assessment to develop evidence-based value propositions and to inform better decisions. While digitalization does require considerable investment and infrastructure, the Ideamos team has helped demonstrate that, with the right resources and political will, technology applications can provide clear evidence for the positive benefits of sustainable transport.

Mexico's new national mobility policy was, in part, the result of input and advocacy from ITDP and its Ideamos partners. The innovation and collaboration spurred by the program certainly do not conclude with the program itself. If anything, it has sparked more inspiration, motivation, and interest from the public and private sectors to transform Mexico's cities for the greater good.

— (Above) One Ideamos pilot, *Rolling Together*, promoted sustainable cargo deliveries along with fair labor conditions. Image: ITDP
— (Below) During the pandemic, Ideamos pilots used bicycle courier services to deliver essential goods around Mexico City. Image: ITDP

— Chelsea, MA, USA's renovated bus shelter demonstrates the power of human-centered design to enhance public spaces. Image: Ad Hoc Industries

Bringing Comfort and Joy to Public Transit with Human-Centered Design

By Lauren O'Connell, ITDP US, and Ann Sussman and Abigail Sekely, The Human Architecture and Planning Institute (theHapi)

This past year, cities around the world experienced record-breaking heat. July 2023 was the hottest documented month in history, with August clocking in at a close second. As climate change advances and countries come together to limit global warming to 1.5°C, all extreme weather patterns—not just heat—will continue to impact communities, with especially significant disruptions to vulnerable populations. Expanding public transport and supporting transit-dependent communities is vital to mitigating the climate crisis, reducing emissions from the transport sector, and providing a more dignified experience to those who will endure extreme weather while waiting for the bus, train, or other transit. Bus shelters are one area where advocates, agencies, and municipalities can focus on improving comfort, coverage, and escapes from extreme weather.

A Human-Centered Approach

Urban design and transit planning throughout the 20th century often ignored the human experience and essential aspects of human evolution. This model has resulted in cityscapes (including wide highways and long stretches of sidewalks) that are both physically uncomfortable to pedestrians and cyclists and uninteresting and unengaging from the street level. Twentieth-century design also rarely considered the biological human need to walk and move about. According to some evolutionary biologists, humans are hardwired for socializing and walking—19 kilometers a day for men, and 14 kilometers a day for women.

Fortunately, urban planning has advanced significantly, and we now have tools and resources available to promote human-centered design and guide the development of healthy and enjoyable cities that align with our instincts. Human-centered design acknowledges that human biology has not significantly changed in 40,000 years, so when we create spaces and services in the modern day, we can prioritize and accommodate what we already know about human needs, capabilities, and behavior. Car companies have been using this framework in developing their campaigns and vehicles (with success) to perpetuate decades of car culture. Amid the climate crisis, now is the time to apply this same science to developing more people-focused public transit, greenways, cycle lanes, and walkable cities.

— With the help of VAS software, the team was able to assess people's visual engagement with redesigned elements of the bus shelter and crosswalk. Images: theHapi /Ad Hoc Industries

Technology, Transit, and Art Unite in the Boston Region

ITDP began working in the Boston region ten years ago through the BostonBRT Initiative to help advance these goals: delivering a more human-centered urban experience to all residents, especially transit-dependent communities. Through partnerships with municipalities and advocates, ITDP has advanced the implementation of dedicated bus lanes, platform-level and all-door bus boarding, and other elements of bus rapid transit (BRT) with notable activations in the cities of Arlington, Everett, and Chelsea. Just north of Boston, Chelsea is one of Massachusetts's most densely populated, transit-dependent cities, with one-third of residents lacking access to a car and 80% of residents categorized as essential workers. Despite service improvements being on the horizon, riders often endure lengthy commutes, the need for reliable transit services has never been more apparent.

Understanding the importance of bus shelters to transit users, ITDP partnered with the city of Chelsea, the Human Architecture and Planning Institute (theHapi), BostonBRT, and others to apply burgeoning human-centered design techniques to a prominent bus shelter to implement tangible improvements alongside art activations. The project, officially launched in August 2023, delivered a new level-boarding bus platform, a custom-designed wood bench and tables, trees and plants, street art, and an immersive art and nature experience. Each step of the planning process used human-centered design by employing new eye-tracking tools, which helped predict how people would engage with this installation. These tools, which can assess the built environment's impact, including bus stops and crosswalks, have become increasingly accessible through software updates and plug-ins. The project team initially used 3M's Visual Attention Software (VAS), which uses tailored algorithms constructed by how our brains typically take in media, to predict what people will look at first when taking in any scene. VAS analysis of the bus shelter before the intervention indicated that it was often ignored by the human eye, creating a safety concern for riders and pedestrians and confirming the original design's static elements. The team ran various design proposals, colors, and layouts through the software and selected the options with the highest engagement. Following the launch, preliminary VAS results have indicated that the intervention draws more attention to the bus shelter and its art, resulting in a more engaging transit experience.

While the project will be further evaluated through additional biometric tools, including eye tracking using iMotions-Online, the initial results confirm what human-centered design advocates already know to be true: when we let human biology and evolution guide design, the resulting spaces and services will be more enjoyable for all people. Happiness and comfort might not be critical metrics for most transit agencies, but they are essential to providing a dignified service to the people most reliant on public transport. When combined with tactical, accessible improvements like level platforms or all-door boarding, these innovative designs can also attract new riders.

Transit as a Service *and* a Destination

This pilot study marks a significant paradigm shift, where human experience and positive feelings, such as joy, are acknowledged and prioritized. Since we can now measure biological responses to the environment and determine when and how positive and negative engagement occurs, we have an incredible opportunity to enhance well-being and show the way forward to building cities that encourage individuals and communities to flourish. The scope of human-centered design extends beyond one bus shelter in the Boston region. It is a practice—with corresponding tools and technologies—that can integrate into urban planning.

Safe crosswalks and intersections, navigable train platforms, welcoming public parks, and exciting greenways are just a handful of the elements that make a climate-friendly city, and the scientific tools at our fingertips can support the development of these facilities. Biotechnology can provide concrete data in support of initiatives that protect riders from extreme weather and road violence, or even initiatives that encourage mode shift on a larger scale. ITDP and local partners are also employing similar design software in a mobility hub and art activation project across seven bus shelters in the city of Lynn, MA in 2023. This project will contribute additional evidence to this growing body of research.

Two goals of climate resiliency are to reduce our contributions to climate change and support the frontline communities most impacted by extreme and changing weather. Human-centered design offers all of us—planners, advocates, policymakers, and municipalities—the tools to implement better urban services and spaces that prioritize the resilience of our residents and built environments. It can all begin with a single bus shelter.

ITDP's Reading List

New resources, publications, and research from ITDP's teams worldwide.

The BRT Standard – Third Edition

First released in 2012, the *BRT Standard* was developed when more and more bus rapid transit (BRT) systems were being developed. The *Standard* was developed to help cities understand BRT and the critical elements of a high-quality system. The third edition of the *Standard* reflects the changing nature of the world, a better understanding of key elements of quality BRT and public transport, and a more nuanced view of how different people use public transport. This edition also aims to help cities create resilient rapid transit for the future while also meeting today's urban challenges, such as climate change, public health, and inequity in access.

Learn more about the *Standard* at **BRTStandard.org**.

The Opportunity of Low Emission Zones: A Taming Traffic Deep-Dive

In recent years, low emission zones (LEZs) have grown in popularity as a potentially impactful strategy for cities to reduce dependence on motor vehicles and offer clean, affordable, accessible alternatives. Building on ITDP's *Taming Traffic* report, *The Opportunity of Low Emission Zones* offers a closer look at LEZ strategies to provide context for decision-makers and planners interested in understanding the potential of these policies.

Access the report in English, Chinese, and Portuguese at **ITDP.org/Publications.**

Breaking the Code: Off-Street Parking Reform Lessons Learned

Bringing the supply of parking, especially off-street parking, closer to actual demand is crucial to creating more compact cities that are needed to limit global warming. The goal of parking reform is not to eliminate parking altogether but to ensure valuable urban space is used most efficiently, equitably, and sustainably. This report documents the stories of six cities and one country in their journey to reform off-street parking, with particular emphasis on removing parking minimums and adopting complementary reforms.

Access the report at **ITDP.org/Publications.**

Women On Wheels: A Study of Gender and Cycling in Chinese Cities

There persists a gender gap in cycling that prevents women from choosing cycling as a primary transport mode in many regions of the world, whether due to personal safety concerns, economic factors, or lack of basic infrastructure. In 2021 and 2022, ITDP China conducted several cycling-related projects in three different cities: Beijing, Guangzhou, and Nanning. Through volume counts at 45 locations within these cities, ITDP found that less than 30% of the cyclists were women. In *Women On Wheels*, ITDP assesses the challenges that women and girls face in cycling in China and identifies opportunities for improvement.

Access the report in English and Chinese at **ITDP.org/Publications.**

Protected Bicycle Lanes Protect the Climate

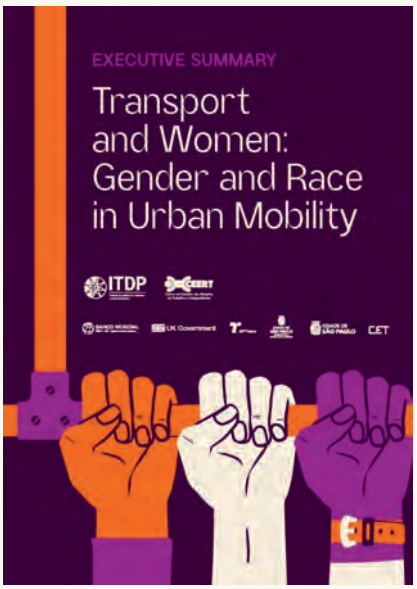
As part of ITDP's Cycling Cities campaign and with support from the FIA Foundation, this report finds that networks of protected bicycle lanes in middle-income cities reduce greenhouse gas emissions, lower transport costs, and prevent premature road fatalities in a highly cost-effective way. Connected networks of physically-protected bicycle lanes, rather than disconnected, unprotected lanes or other policy measures, are the most important factor in increasing cycling usage. This study provides quantitative evidence to support this by examining the impacts of citywide networks of protected bicycle lanes in two cities in middle-income countries—Bogotá, Colombia and Guangzhou, China—and offers one of the first-ever empirical measures of GHG reductions from networks of protected bicycle lanes.

Access the report and modeling tool at **ITDP.org/Publications.**

Transport for All: Gender and Race in Urban Mobility in Brazil

ITDP Brazil collaborated with CEERT (Center for the Study of Labor Relations and Inequalities) on the *Transport for All: Gender and Race in Urban Mobility* to better understand the race and gender impacts of mobility planning in the city of São Paulo, particularly for low-income Black communities. This project and its resulting resources aim to reduce gender and racial inequality in Brazil's transport sector by raising public awareness, building capacity, and promoting more advocacy around these issues.

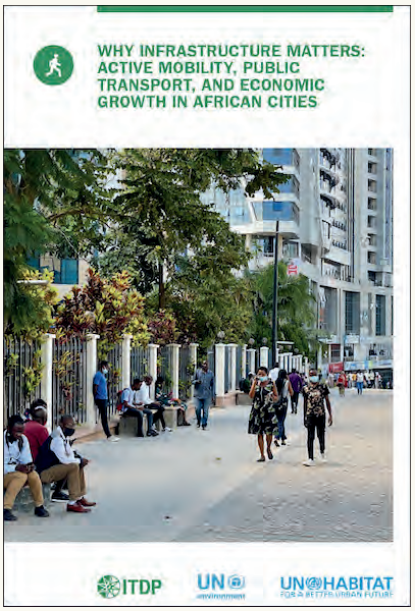
Access the report and resources in Portuguese and English at **ITDPBrasil.org.**

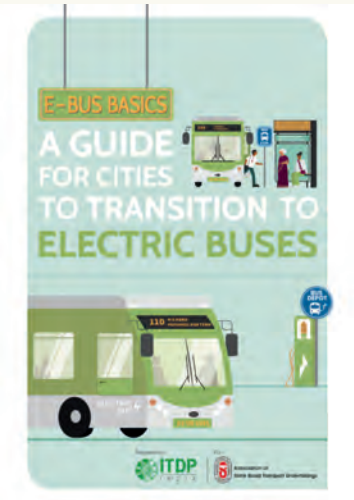


Why Infrastructure Matters in African Cities

As walking, cycling, and public transport are low-carbon and low-cost modes of mobility, investments in these modes can help cities achieve many social, economic, and environmental goals. This infrastructure study from ITDP Africa and its partners explores the benefits that can result from cities prioritizing active mobility and public transport, rather than motor vehicles. It quantifies the benefits of walking, cycling, and public transport in the Africa region, comparing alternate investment scenarios for 188 of the largest African cities.

Access the report at **Africa.ITDP.org.**





E-Bus Basics: A Guide for a Transition to Electric Buses

Launched at a national workshop for State Transport Authorities organized by ITDP India, this illustrated guidebook provides essential information required to plan for, procure, and operate e-buses and accelerate the electric transition in India. Not only do e-buses help reduce pollution and limit emissions, they also offer a lower cost per kilometer, better fuel and energy efficiency, and improved quality of service for users.

Access the guidebook at **ITDP.in.**

Mejores Calles Para México (Better Streets for Mexico)

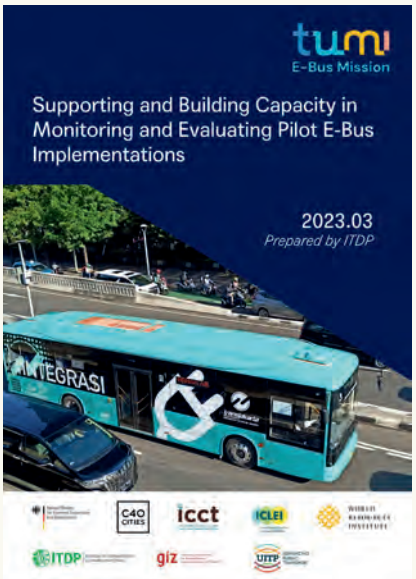
Promoting the design and implementation of 'complete streets' in cities means creating safer, more comfortable, and more accessible spaces that cater to the mobility needs of all types of people while giving priority to walking, cycling, and public transit. In 2022, ITDP Mexico created its #MejoresCallesMX competition, seeking street redesign proposals from cities nationwide that would open up access to public space, improve mobility, and enhance quality-of-life. A total of 58 proposals were received from 37 municipalities across Mexico.

Access the program's report and resources in Spanish at **Mexico.ITDP.org.**

Supporting and Building Capacity for E-Bus Pilots in Jakarta

ITDP Indonesia, together with TUMI E-bus Mission partners, developed a technical assistance plan to support the pilot e-bus monitoring and evaluation project in Jakarta. The team developed an evaluation methodology consisting of four areas: vehicle performance, operating performance, environmental performance, and social and gender equity. Using the data provided, the project team analyzed vehicle performance on different days, months, and routes. The survey results revealed an urgent priority to increase capacity for e-bus monitoring and Intelligent Transport Management Systems, while also highlighting the limited technical and financial support from Transjakarta and government officials.

Access the technical report at **ITDP-Indonesia.org.**



Keeping Pace: Opportunities for Change within Greater Boston's Bus System

ITDP US and LivableStreets Alliance released this report to show that Greater Boston's bus service has not kept up with surging demand and outlines key recommendations to get it back on track by 2030. The report is a call-to-action to stakeholders at all levels to work together and prioritize Greater Boston's bus system to best serve the riders who expect and deserve improvements in the coming years.

Access the report at **ITDP.org/Publications.**

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Through our transport projects, policy advocacy, and research publications, we work to reduce carbon emissions, enhance social inclusion, and improve the quality of life for people in cities.

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