

# sustainable

TRANSPORT

Winter 2018 | No. 29



**Dar es Salaam Leads a  
Breakthrough for African Cities**

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by transforming the ways they move and grow.*

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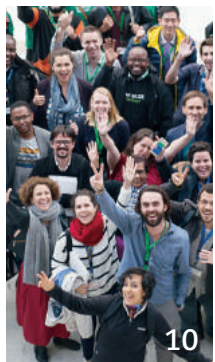
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Cover: Dar es Salaam Leads a Breakthrough for African Cities

Image: ITDP



# Cities Take the Lead on Climate Change

By Clayton Lane, CEO



Climate change is here. As our national leadership denies this reality, this summer brought Americans powerful images of climate-related loss: heroes carrying the vulnerable out of floods in Houston, grief from lost houses and relatives in the fires of California and Oregon, and US citizens struggling for clean water, food, and electricity after hurricanes in Puerto Rico and the Virgin Islands.

Extreme weather events have increased by 46 percent since 2000<sup>1</sup>. Seas have risen 8 inches and could rise 8 feet by 2100<sup>2</sup>, respecting no boundaries or politics. Worsening hunger, malnourishment, and the increasing spread of infectious disease already affect hundreds of millions of people globally. Solutions are urgently needed to protect lives and livelihoods today.

At the center of the issue is transport, the fastest growing sector of greenhouse gas emissions (GHGs), and a powerhouse of economic growth – making transport a major reason national governments find it so difficult to

reign in greenhouse gas emissions (GHGs). Transport emissions currently comprise 23 percent of global GHGs and are expected to double by 2050.

I was excited to see cities and regions take center stage at this year's COP23 climate summit in Bonn, Germany, pledging to deliver national climate pledges with or without country leadership. ITDP's joint research with UC-Davis shows that 83 percent of urban transport GHGs could be avoided by 2050 through compact land use and sustainable urban mobility – and that cities worldwide could save over \$100 trillion due to less infrastructure and lower vehicle and fuel costs.

ITDP is taking a leading role to support cities worldwide, helping to inspire and create iconic examples of innovative good practices, and scale them up by shaping national policy, spurring finance, and facilitating city-to-city learning. With climate change affecting human lives today, the need for cities to take bold action has never more urgent. From major parking reform in Mexico City to low-carbon urban development in India, where cities and regions are taking bold action to improve lives and curtail climate change.

We're thrilled to celebrate Dar es Salaam, for creating East Africa's first high-quality rapid transit corridor, complete with safe pedestrian infrastructure, dedicated cycle paths, the city's first formal bus system, and a Silver-standard BRT line expected to carry 400,000 daily passengers.



Pedestrian bump-outs, protected bike lanes, and road diets are just few design elements that Mexico City has implemented – in addition to eliminating parking minimums – to promote low-carbon walking and cycling.

Image: ITDP Mexico

<sup>1</sup> <http://www.lancetcountdown.org/the-report/>

<sup>3</sup> <https://science2017.globalchange.gov/>



The low-carbon, high-quality mobility gives hope to a city in great need – where urban population is expected to double to 10 million people by 2030. Dar plans to expand the system to several corridors citywide. Nairobi, Kampala, Addis Ababa, and Cairo are also developing BRT systems and looking to Dar for lessons and inspiration. Dar is winning the international 2018 Sustainable Transport Award for its bold step forward for East Africa, and is just one example.

Mexico City took a leadership role this year by abolishing parking minimums and charging fees for approaching new maximums. The policy, among the most progressive of its kind, will significantly curb greenhouse gas emissions by limiting car use, densifying the city, and generating enough revenue to build potentially one new bus rapid transit (BRT) line per year. The city has also reduced cyclist deaths by 78 percent and pedestrian deaths by 24 percent in just one year, by reducing speed limits citywide and reconstructing 50 dangerous intersections to improve safety for low-carbon walking and cycling.

Globally, dozens of cities are taking major steps to curtail car use. Not to be outdone, London recently pledged to eliminate all new parking construction in transit-accessible residential and office developments. Singapore recently banned new motor vehicle purchases until 2021 while the city expands rapid transit, and 14 Chinese cities are now restricting motor vehicle purchases or use.

Guangzhou, China, inspired by a study tour to Mexico City, has embarked on an ambitious \$450 million USD “complete streets” program to improve walkability and cycling citywide. Initial efforts include 48 walking and cycling demonstration projects on 114 city streets, as well as a recently published Street Design Guide that prioritizes non-motorized transport as a standard practice. In addition, Guangzhou is now planning an ambitious 72 Transit-Oriented Developments (TODs) to accommodate rapid population growth – livable, vibrant, compact neighborhoods built around rapid transit.

In China, private companies have deployed over 11 million dockless shared bicycles in Chinese cities over the past year, prompting a cycling

Pune budgeted \$150 million annually to non-motorized transport, drafted a Cycle Plan with public bike sharing, identified 27 km for “complete streets” in its Smart City proposal, reformed city-wide parking policies, and invested \$20 million to improve 13 bus terminals and depots along its new BRT.

renaissance. The dockless systems cost only a fraction as much as traditional bike share programs, as wireless technology replaces the need for expensive kiosks and docks. Anecdotally, cycling has risen dramatically near ITDP’s offices in Guangzhou and Beijing. Beijing’s cycle mode share has doubled to 11 percent in one year, while the city’s car trips have declined for the first time ever.

Dockless systems have encountered many operational and maintenance problems as companies have competed for market share. ITDP worked with Tianjin and Guangzhou to regulate bike parking, deployment, maintenance, and quality – two of the first cities to take such action. Today, 17 Chinese cities have issued similar regulations, and China’s Ministry of Transport also released a new DBS policy to guide their orderly deployment. Early lessons from China could help cities globally to ensure high-quality service and expand the benefits of low-carbon cycling.

India is also making massive progress. Five midsized cities – Coimbatore, Chennai, Pune, Ranchi, and Nashik – have committed over half their transport budgets to low-carbon walking, cycling, and public transport, a major shift from previous policy that favored cars. Combined with the national Smart Cities program, about \$500 million USD is shifting toward sustainable mobility. These five cities, along with several others in the Smart Cities program, will serve as “lighthouse” examples for replication nationwide.

We have entered a new era, when curtailing GHG emissions in rapidly developing cities affects our daily lives. Helping to lessen grief and economic loss worldwide, these cities and many like them are taking bold action to tackle climate change. They show us that massive progress is possible with or without US national leadership.

# Dar es Salaam

## Leads a Breakthrough for African Cities

By Jemilah Magnusson, ITDP & Chris Kost, ITDP Africa



Dar es Salaam, already the largest city in Tanzania, is one of the fastest-growing cities in the world. It is expected to more than double its population by 2030, reaching 10 million.

As Dar and other African cities continue to develop, there is a critical need to design efficient transport systems. A lack of formal public transport, growing sprawl, and massive traffic congestion, compounded by the challenges of complex and fragmented institutional structures, have kept Dar, as well as other African cities, from attaining higher levels of investment and development.

On May 16, 2016, the Dar es Salaam bus rapid transit system, or DART, opened the first phase of a BRT network that has the potential to transform rapid transit in African cities. The first world-class BRT in East Africa, DART comprises a 21-kilometer trunk route connecting residential areas to the city center, operating with 140 buses and moving more than 160,000 passengers

every day with speed, comfort, and reliability equal to those of the top rapid transit systems around the world. The DART system's dedicated busway makes the best use of the most contested and scarce city space, particularly in the city center.

By the middle of 2018, when the first phase becomes fully operational with more than 300 buses, the system is projected to carry an estimated 400,000 passengers per day. DART has reduced commute times by more than half for residents who previously faced upward of four hours stuck in traffic every day. At stations with passing lanes, some of the bus fleet provides express service to key destinations, saving even more time.

Serving the key axis of Morogoro Road and running through the city center, DART is more than a public transport system—it offers improvements for pedestrians and cyclists as well. The corridor includes cycle paths, sidewalks, and improved pedestrian safety with well-designed, at-grade pedestrian crossings that comply with universal access principles. The project

is being implemented in six phases that will bring high-quality BRT service and the accompanying cycling and walking infrastructure to the entire city. DART's second phase, with construction set to begin this year, is supported by the African Development Bank, and the planned third and fourth phases will be supported by the World Bank.

### Inspiring Replication Throughout Africa

Since DART's opening, Dar es Salaam has seen a steady stream of visiting delegations from throughout the region who have come to experience the system's innovative features, including express services, electronic fare collection, and world-class walking and cycling infrastructure. With cities across the region planning their own BRT systems—Addis Ababa, Cairo, Dakar, Kampala, Kigali, and Nairobi, to name a few—the DART system offers a unique opportunity to see a high-quality BRT in the African context.

Delegates from the Zambian parliament recently saw the opportunities that the system could bring to the coun-



The DART phase one corridor has already made a huge impact in the city, and in the region. The system includes best practice design features and the corridor makes space for cycling and walking.

spent a week in Dar es Salaam in June, developing a deeper understanding of the challenges around urbanization and learning from Dar es Salaam's innovations in meeting these challenges. The participants were able to see how the DART system functioned in comparison to the city's more common paratransit system, a loosely

organized fleet of minibuses known as dala dalas. BRT systems present an opportunity for the local paratransit industry to participate in system operations, thereby gaining new skills and improving working conditions.

In August, a group of ten Kenyan bus operators organized a trip to Dar es Salaam to travel on the DART system and learn how a similar system could be adopted in Nairobi. The next month, DART received a senior delegation led by Aggrey Bagaiire, the Ugandan State Minister for Transport. Bagaiire remarked to the local Citizen newspaper, "I have seen how this project works, and I am very impressed. It is not the question of whether we are going to

think about it, we are going to implement it immediately."

### Advancements in Transit-Oriented Development (TOD)

The great contribution of Dar to sustainable transport, however, may be in TOD as much as BRT.

Few examples of this type of TOD in Sub-Saharan Africa exist, primarily in the South African cities of Cape Town and Johannesburg. Dar's status as an economic hub and a rapidly growing city in East Africa puts it in an ideal position as a pioneer on TOD. Under the Dar es Salaam Metropolitan Development Project (DMDP) and supported by the World Bank and the Nordic Development Fund, the government is working with a large group of stakeholders to formulate a Corridor Development Strategy (CDS). The main objective of the CDS is to develop an integrated land use and transport plan along with guidelines for the detailed development and densification along the BRT network. It will also provide TOD guidelines and Pedestrian Oriented Development (POD) solutions for future BRT corridors. The CDS is expected to conclude by mid-2018. The next phase of the project will see the formulation of detailed proposals for the corridor, including urban planning and design guidelines, pilot TOD node proposals, implementation approaches, and possible business models for attracting private financing.

Once complete, the full DART network will serve more than 90 percent of the city's population. The expanded system will continue to inspire cities around the continent, demonstrating that investments in public transport are well worth the hard work, both economically and politically.

try's capital, Lusaka. In addition, ITDP organized a study tour for officials from Kampala, Uganda, and Addis Ababa, Ethiopia, building enthusiasm for BRT implementation in the East Africa region. According to Tewodros Tsegaye, head of the BRT Program Management Unit in Addis Ababa, "The study tour was one of the best opportunities for knowledge transfer with BRT stakeholders, and I gained experience in BRT implementation, starting from design up to operations so that we can consider every step in our case here in Addis."

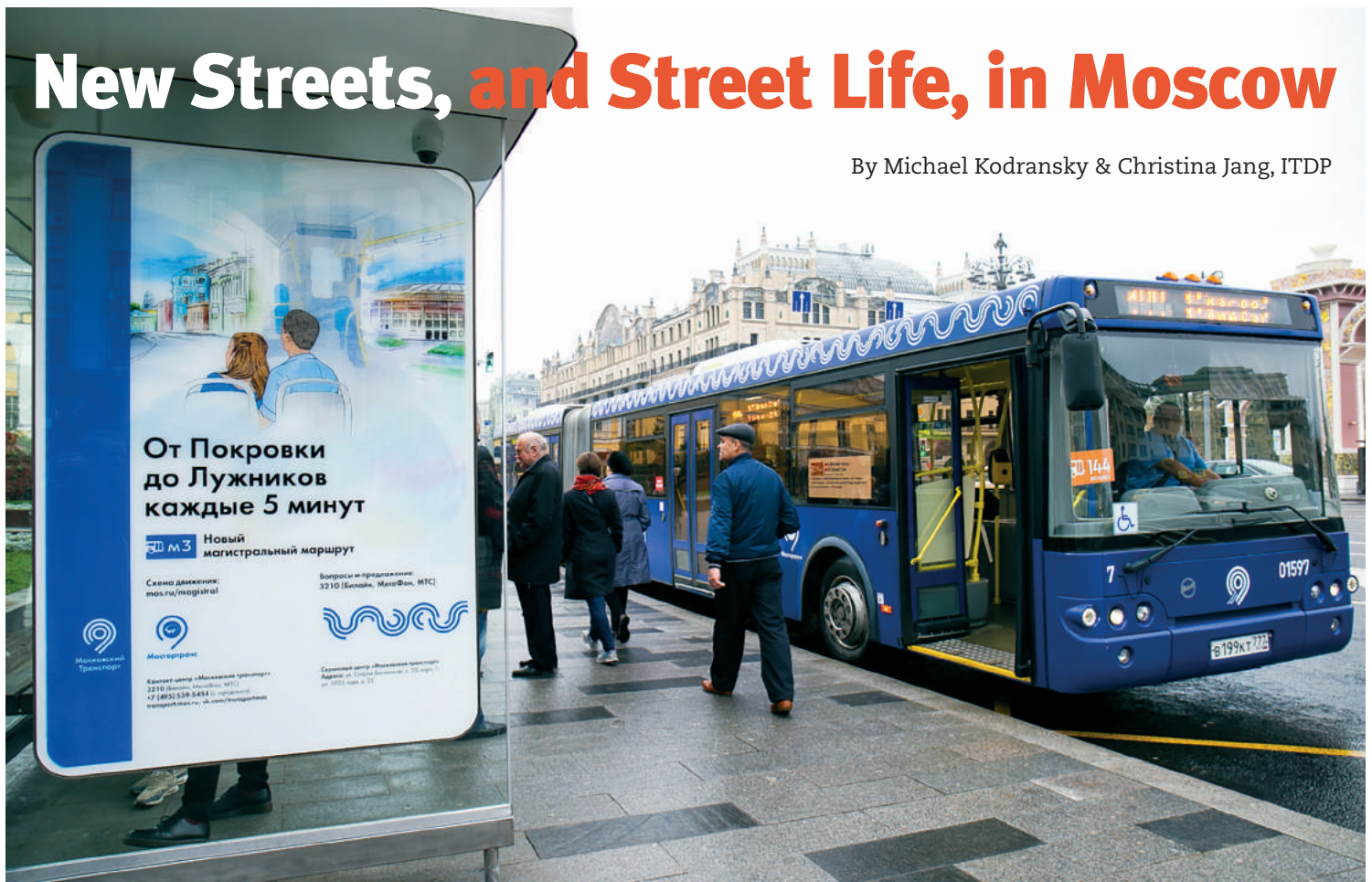
DART is also spurring a far-ranging conversation about cities and public transport in the region. Seventy-five journalists from 42 African countries



Delegations from Addis Ababa, Ethiopia and Kampala, Uganda, visit Dar es Salaam in an ITDP-led study tour.

# New Streets, and Street Life, in Moscow

By Michael Kodransky & Christina Jang, ITDP



Moscow, the capital and most populous city of the largest country in the world, is also the largest city on the European continent with an metro area population of 17 million, and the northernmost and coldest megacity on earth.

Like most megacities today, Moscow is dominated by wide boulevards filled with private cars. This is a result of the mid-20th century large-scale effort to “modernize” Moscow with a network of car-oriented boulevards, some over 10 lanes wide. The city also changed when the Soviet goal of providing housing for every family, along with rapid population growth, led to the construction of large, Le Corbusier-style modernist housing blocks.

Moscow has been making steady and impressive progress in restoring its heritage and reshaping its streets to be people-centered. Over the past year, the city has implemented many international best practices to humanize the streets and improve the quality of life in Moscow, including finding solutions for its notorious traffic congestion and long commutes. Pedestrians are often forced to use tunnels at intersection crossings to give cars priority to the street,

and along sidewalks, pedestrians were in near constant competition for space from parked cars in the previously unregulated environment. Fortunately, the city has now realized the value and potential of their streetscape for improving life in the city.

After years of steady advancement, 2016 was a breakthrough year for Moscow and its citizens. Updates to its public transit system have now made traversing the city a more reliable and enjoyable experience. Moscow introduced an integrated new train line, the Moscow Central Circle (MCC), a 54 km-long rail ring with 31 new stations. The Magistral bus network reorganization included updating bus routes in the city center by introducing 17 high-frequency routes, 11 intra-district connections, and seven routes linking social service and government sites. The new direct service bus network plan allows riders to reach destinations





Opposite page: The Magistral bus network was updated and reorganized in the city center with new high frequency routes and 11 new intra-district connections.

Above left & right: Under the “My Street” program, Moscow reconstructed 61 streets to be safer for pedestrians and cyclists, with new crosswalks and a parking management system.

without needing to take the metro.

The old and unsafe *Marshrutki*, as the city’s microtransit is called, were replaced with 2,000 new vehicles that were integrated with other public transport routes using an advanced ticketing system that includes free rides for eligible socio-economic groups. The integration makes travel more seamless between transport modes, and the new, attractive vehicles have given riders a dignified sense of inclusion in the greater city.

Just half a decade ago, Moscow had chaotic sidewalks with no parking policy. Informal valets operated a proto paid-parking system that served car drivers but marginalized pedestrians. Eventually, national laws changed to enable Russian cities to fine drivers for illegal parking, and Moscow introduced new parking regulations as well as multispace meters, including a pay-by-phone option that is now the dominant form of payment.

Pedestrians and cyclists have reclaimed the streets. Under the “My Street” Complete Streets program, 61 streets were reconstructed so they are safer for pedestrians, cyclists, passengers, and drivers by adding crosswalks, sidewalks, trees, streetlights, illuminated buildings, and renovated facades. The result—a more attrac-



tive and comfortable streetscape that supports vibrant public life.

In addition to these advances in complete streets and public transit, since 2005 Moscow has worked toward reducing motor vehicle emissions through the “Cleaner Air for Moscow” project. These accomplishments have earned them an Honorable Mention for both the 2015 and 2018 Sustainable Transport Award. Moscow exhibits world-class examples of integrated transit networks, collaboration between government and civil society, and engagement with the informal and unregulated sector of transport that cities from around the globe can look to for inspiration.

Above: Moscow introduced an integrated new train line, the Moscow Central Circle (MCC), a 54 km-long rail ring with 31 new stations, in 2016.

# At **MOBILIZE** Santiago, Just and Equitable Cities Are the New Normal

By Jemilah Magnusson, ITDP

In June, Santiago hosted ITDP's annual MOBILIZE summit, featuring 185 government, NGO, academic, and private sector representatives from 20 countries and 52 cities. They came together to learn from the mobility and access lessons offered by Santiago and discuss the theme of building just and inclusive cities.

Santiago won the 2017 Sustainable Transport Award (STA), the criteria for hosting MOBILIZE, by making improvements to walking conditions in the downtown area, enhancing access with transit-priority streets, and adding new kilometers of cycling lanes. In a region where much of the infrastructure has been car-oriented, Santiago is in the process of reprioritizing to improve access to the city. Inequality in city design produces concentrations of wealth and poverty, and two populations that experience the city very differently. Santiago is confronting a history of class divisions, showing how much progress can be made when city leadership along with a coalition of supporters give budget and policy priority to low-carbon, inclusive modes.



Top: Laura Ballesteros, Undersecretary of Planning at the Secretariat of Mobility in Mexico City, speaks with ITDP Mexico Director Bernardo Baranda and Carlos Pardo, head of the Colombian NGO Despacio. Middle and bottom right: Participants experienced Santiago's new cycling infrastructure during Cycle Santiago, the summit's most popular site visit. Above: Organizers, staff, and participants from ITDP and partners celebrate a successful MOBILIZE summit.

Images: Claudio Olivares Medina

MOBILIZE is the annual sustainable transport summit of the Institute for Transportation and Development, which brings together urban transport and development practitioners and world-class researchers to celebrate best practices and accelerate implementation of sustainable transport projects.

What makes MOBILIZE unique is its structure. The summit gives transport professionals and researchers from around the world an opportunity to experience the STA winning city as a learning lab with lessons on how to get world-class projects implemented. Interaction between researchers and practitioners fosters greater global resource allocation toward the goals of making streets, transport systems, and cities the best possible places for people.

Visit [MOBILIZESummit.org](http://MOBILIZESummit.org) for more information and to register for the 2018 summit in Dar es Salaam.



Left: A MOBILIZE participant tries out a Mobike dockless bike-share bike in the main hall of the conference.

Below: A plenary session at MOBILIZE features (L-R) Philipp Rode, Director of LSE Cities; Pranjali Despache of ITDP India; Guillermo Dietrich, Secretary of Transport of Argentina; Diane Davis of Harvard University; and Claudio Orrego, Governor of the Santiago Metropolitan region.



Bajos de Mena, Puente Alto

Ciudad Parque Bicentenario, Cerrillos



Images: Claudio Olivares Medina

Top: MOBILIZE participants on a walking tour of newly pedestrianized streets in the city center led by the planning department of the city of Santiago. Bottom left and right: ITDP Africa's Naomi Mwaura and ITDP China's Shanshan Li chat with participants during a coffee break.

# In India, the City of Pune Takes the Lead in Making Space for Transit and People

By Nashwa Nashaud, ITDP India

Pune is a flourishing green city of 6.5 million people in the western state of Maharashtra, a few hours from Mumbai. Since 2007, the city has set ambitious goals for a sustainable future, and 10 years out, there are big on-the-ground changes. In 2016, Pune was selected as one of 20 “Lighthouse Cities” under the nationwide urban renewal program, the Smart Cities Mission, setting an example for other Indian cities to follow.

In 2015, the city launched the Rainbow bus rapid transit (BRT) system promised in 2007. Today, the corridor runs 39 kilometers, serving 120,000 people per day. It has high-quality and best-practice design features, and has brought more than 12 percent of its ridership from other modes, primarily private cars. “Mass rapid transit is the most efficient way to transport large numbers of people around a city and is therefore essential for development,” says Commissioner Kunal Kumar of the Pune Municipal Corporation. “To improve accessibility and service, the city’s budget for 2016–17 and 2017–18 provides for extension by an additional 21km and retrofitting of existing BRT.” With massive investments proposed to expand the system through these city budgets, the Rainbow BRT network is expected to almost double in size and service an additional 48 kilometers by 2018.

Pune has also devoted significant resources to making its streets people-friendly. In 2009, under the JNNURM Mission city-modernization scheme, Pune began improving connectivity by creating a better network of roads equipped with infrastructure for non-motorized transport (NMT), such as footpaths and cycle tracks. The improved usage of these streets by pedestrians and cyclists sparked interest among decision-makers and officials to undertake similar street projects that would cater to the needs of all road users by developing a Complete Streets network.

“Streets are important public spaces that should be designed to respond to the various functions that they host, beyond being mere conduits for vehicles,” Kumar said. “The Pune Municipal Corporation is committed to an agenda of sustainable development of the city, and good

street designs are of critical importance in this effort. We thus decided to embark on the Pune Streets program to make Pune a model city for complete streets and one of the pioneering few Indian cities in this field,” he explained.

Under this program, a street network of 100 kilometers has been identified for redesign. Thinking ahead to ensure integration and quality, the city, with ITDP India’s assistance, empaneled four nationally acclaimed design firms and allocated each 25 kilometers from the network. ITDP developed the scope of work for the designers and is part of the committee to periodically review the designs.

The first phase of construction has begun with Jangli Maharaj Road, a busy 1.5 km-long street being redesigned by Oasis Designs, Inc. A 300-meter stretch along this street now sports a cycle track and a much wider footpath, made possible by streamlining the old haphazard parking. Green spaces serve as buffers to segregate the two modes of walking and cycling. “The design now celebrates the newly created public realm, giving people clear and buffered walking and cycling, and also incorporates outdoor seating areas for people to have a quick lunch, play areas for kids, and many seats for people to sit and enjoy the urban life of Pune,” explained Sujata Hingorani, principal landscape architect and partner, Oasis Designs, Inc. Better signage and street lighting are other features that collectively make JM Road a stellar example of street design in the country.



A wide and active footpath marks the edge of DP Road in Aundh, made possible by merging the frontage of the shops with the sidewalk.

**“I could have never imagined taking a walk on this road earlier,” said a local resident using the path. “Nowadays, I spend most of my evenings after work here, enjoying this active street. The chaos is no more; I can now walk and shop to my heart’s fill!”**

These dedicated efforts toward improving the quality of urban life for its citizens resulted in several accolades for Pune, including its selection as a Smart City. Among other initiatives, 27 kilometers of streets have been identified for redesign as Complete Streets in the Area-Based Development (ABD) area as part of the Smart City proposal, along with 18 kilometers of street retrofiting. In keeping with the city’s model of high-quality design, the 27km network encompassing three neighborhoods has been allotted to the designers.

One of the key objectives of the Smart Cities mission is to engage the community in the urban renewal process at all stages. One such important event in Pune was the seven-day trial run of the proposed pedestrian plaza in Aundh, a neighborhood bustling with activity and people reclaiming streets. Showing residents on the ground what their neighborhood could be helped convince the shopkeepers to agree to merge shop frontage with footpaths. The first segment of the bustling D.P. Road in Aundh has already been remodeled under this proposal. The footpath was widened by merging the



with 7,900 stations and 7,000 cycles. Furthermore, the regional streets on the periphery of the city are being redesigned into cycle-safe streets with funds from the state government.

Backing these design changes in the city are institutional reforms that help enhance the capacity of the government. A dedicated Street Design team of urban designers and planners will oversee general maintenance and design of streets in addition to designing neighborhood streets. The pedestrian policy adopted by the city, which now guides the development of high-quality pedestrian infrastructure, envisions Pune as a haven for those on foot. Most importantly, the Pune Municipal Corporation, with technical assistance from ITDP, has developed a unique set of Urban Street Design Guidelines that prioritize walking and cycling, leaving no doubt of Pune’s direction of development. While the city is rolling out these changes, the state of Maharashtra has encouraged all its cities to prioritize public transit and nonmotorized transit. According to this policy, walking, cycling, and public transport will account for at least 80 percent of all trips by 2027.

Pune is inspiring many cities in India to take measures for sustainability and equity. Nashik has hired urban design firms for its proposed Complete Streets network of 50 kilometers; Chennai is keen on expanding its complete streets into a network and setting up a BRT system, learning from Pune’s journey so far. The future of this journey looks bright and green for all of India, having already transformed people’s lives for the better in Pune, with a promise of more across the whole country.



Above: More than 12 percent of Rainbow BRT users have switched from other private modes of transport since the system opened in 2015. Right: Pune’s redesigned streets are for everyone, like these children in the play area of the footpath on JM Road.

frontage of the shops that line the stretch with the sidewalk. Before work began, city officials and designers engaged actively with the shopkeepers to explain the significance of a wide and good pedestrian pathway with respect to their sales. “I could have never imagined taking a walk on this road earlier,” said a local resident using the path. “Nowadays, I spend most of my evenings after work here, enjoying this active street. The chaos is no more; I can now walk and shop to my heart’s fill!”

In addition to creating high-quality footpaths, Pune is intent on improving its cycling infrastructure. The Pune Bicycle Plan, a masterplan for the construction of a 100-kilometer cycle-track network, has been drafted with technical support from ITDP and published for public opinion. To improve last-mile connectivity, a public bicycle-sharing system has been proposed

# Less Parking, More City: How Mexico City Became a Leader in Parking Reform

By Bernardo Baranda, ITDP Mexico

“The right to have access to every building in the city by private motorcar in an age when everyone possesses such a vehicle is the right to destroy the city.”

-Lewis Mumford (1957)

In February, at an event hosted by ITDP, the Mayor of Mexico City made a major announcement. As part of his mobility and development government strategy, the city would prioritize parking reform. This announcement was the first of several from the city, culminating in the implementation of a major, progressive policy change enacted on July 11th. The policy, called “limitation of parking spaces in the city construction code”, changes the law from requiring a minimum number of parking spaces in a development to setting a cap for how many can be built. This positions Mexico City, the largest city in North America, as the leader in rethinking land use policies that favor the car and prioritizing spaces for people in this rapidly growing city.

This groundbreaking policy change is the result of a decade-long campaign by ITDP called *Menos Cajones, Mas Ciudad* (*Less Parking, More City*), in collaboration with the Ministry of Urban Development and Housing, the Ministry of Mobility, and the Real Estate Association (ADI), among others. ITDP’s focus on parking is a challenge to one of the largest unintended consequences of the 20th century model of car-oriented cities – sprawl created in part due to the amount of space the car needs when it is not moving. The demand for parking and its enshrinement as a right in public opinion, and, often, in law, has resulted in more sprawl, less pedestrian safety, incentivizing driving, traffic



One of the benefits of removing parking is freeing up street space for more productive use.

congestion, pollution, and most of all, a reduction of the space available for the much more essential uses of housing and transit.

Mexico City was no exception. Since 2007, ITDP has been actively pushing on-street parking reform in the city as a first step to give priority to people. In 2012, we achieved our first milestone: the implementation of Ecoparq, an on-street parking enforcement and pricing

program. Before Ecoparq, unregulated or loosely regulated parking resulted in chaotic streets with illegal parking, cruising, and a perceived lack of parking availability. Ecoparq helped prove this parking saturation was, in fact, a demand management problem, and that the right policy can modify driving patterns towards a more sustainable vision and calmer streets. This was the key that opened the door to a very



Parking spaces were converted into a bike lane and seating area in Mexico City's historic center.

much needed conversation: the revision and reform of off-street parking laws. Neighborhoods that used Ecoparq saw the results of regulated parking immediately, and the program has continued to expand to nearby areas.

*Less Parking, More City*, a study released by ITDP in 2014 with the support of the UK's Prosperity Fund and the Ministry of Urban Development and Housing (SEDUVI), gathered evidence of the unsustainable trends of the city. More space was being built for parking spaces than for housing. In fact, the study found that more than 40 percent of Mexico City is actual parking spaces, above any other land use including housing. The city was using prime central city space for parking structures, while people were sent hours away to live in the periphery of the city, with few options but to commute by car.

The costs of this are both financial and societal. The average parking space in Mexico City costs \$150,000 MXN (8,500 USD) to construct. In the 251 big real estate projects analyzed between 2009 and 2013, we found that more than

250,000 parking spaces were constructed, with an estimated cost of 37,000 Million pesos. That is roughly the cost of about 12 lines of bus rapid transit that could move more than 2 million people per day.

On top of this, there is much less demand than supply, and that supply was mandated by minimum parking requirements, with an incentive to build more parking. In the great majority of cases, real estate developers try to get as close as possible to the minimum required—less than 10 percent of parking spaces above the required minimum. When the parking number went over the minimum, it was often because of constraints with the site. For example, a development has a minimum of 90 parking spaces required, but due to the size of the lot, the project fits 3 stories for parking with a capacity for 40 parking spaces on each, so it makes economic sense for the developer to just build the 120 parking spaces.

Once this kind of evidence was gathered and the best international practices were studied, the communica-

## How Did ITDP Mexico Do It?

**Data-driven:** A solid research process and technical analysis of the existing policy allowed stakeholders to understand the impacts of policy and helped build a future vision based on past lessons. The participation of technical organizations increased the credibility of the analysis and data and supported transformation based on evidence. It also fed a communications campaign with relevant data and content to make a strong case.

**Participatory approaches:** Cities often fail in including and communicating beneficial initiatives to key actors involved, as well as to citizens. Less parking, More City was a participatory process fostered by ITDP from the beginning. This approach brought a diverse group of stakeholders into the reform process, addressed their concerns early on and helping them become advocates for this change, instead of being on the outside at worst opposing change or not helping advance it.

**Strong communications campaign:** In a topic that could be considered arid in terms of social engagement, the building of a campaign can break down the messages in a way that different audiences can relate with and understand is key for a change of paradigm. In this case, evidence was so solid that almost led to an organic campaign that highlighted the impact of a city built for cars instead of people. We also met with a lot of influential journalists to explain them the campaign.

**Fund and transparency mechanisms:** The reform is attached to a Public Transportation Fund, in constant evaluation and mechanisms that helps society to follow up the use of resources and impacts of the new law.



Left, top and bottom: Massive parking garages and huge surface parking lots take up more city space in Mexico City than housing. They were built not to meet demand, but for outdated regulations that ITDP Mexico has played a huge role in changing.

Right: Ecoparq, first implemented in 2012, demonstrated the benefits of an organized system of parking.

tions campaign *Less Parking, More City* was born. It brought together a diverse group of agencies and actors that was needed to make policy reform happen. This collaboration made it possible for the messages to be developed and broadcast to a wide audience and was aided with a contest to re-imagine parking lots for people; an idea from the Mexican Institute for Competitiveness (IMCO), with the support of the strategic allies coming from private companies, civil society organizations, and a multidisciplinary jury of prestigious members: architects, urban planners, economists and public policy experts.

The list of supporters is long – this is what it takes to achieve major policy change. Agreements were made with the National Association of Supermarkets, Convenience and Departments Stores and also with the National Chamber of the Industry of Development and Promotion of Housing with the intention to reach win-win agreements. The Legislative Assembly recognized the need to reform the policy, and the support of civil society was incredibly important. Bicitekas, WRI, editorial house Arquine and, of course, IMCO, were all key to creating this more powerful, cross-cutting and lasting public policy.

This policy shift is a huge win for Mexico City, once again placing it in the vanguard of progressive cities addressing sustainable and equitable urban

## Latin American Cities Taking the Lead on Parking Reform

### São Paulo, Brazil

In 2014, São Paulo became the first megacity to eliminate parking minimums, and set certain maximums. The city allows one parking space per new housing unit if located near an accessible transit corridor, requires street-level retail and public spaces in residential complexes, and limited parking spaces to one per 70 square meters of commercial developments. The amendment was included as a component of an ambitious city-planning instrument; the Strategic Master Plan (SMP). SMP is guiding São Paulo through a Transit-Oriented Development policy for the next 13 years.

### Medellín, Colombia

Colombia's second largest city passed parking reform in 2014 in connection with the enactment of a new Territorial Order Plan (TOP). The TOP sets a series of urban districts called Strategic-Intervention Areas (SIA) that seek compact and dense neighborhoods with access to short com-

muties and transit capacity. SIA eliminated minimum parking spots among the new classification of apartment units at the same time they negotiated a maximum parking standard with developers. Other measures include a requirement to bicycle parking in any new parking development.

### Guadalajara, Mexico

In 2016, Guadalajara city got rid of most of its minimum parking regulations, along with a progressive TOD policy. Parking spots are no longer required in new buildings with less than a 90 square meter construction perimeter; buildings in the Cultural Heritage Catalog; and new buildings that interact with pedestrian and “traffic-calming” street design. There is a maximum of two parking spots per new apartment unit located at TOD-Central zones. In addition, on street-parking facilities related to non-residential and commercial land use can be repurposed for public space, sidewalks or bicycle parking.

development. To guarantee a constant evolution and success of the reform, ITDP Mexico will continue to work with the city and our partners to educate residents on the advantages of this new policy, supporting a shift to transit. We'll measure the direct impacts of the policy with regards to enforcement,

traffic reduction, and the uses of this newly-available space, advocating for affordable housing and improved public spaces. We will also, as always, continue to improve the options of sustainable urban mobility, specifically mass transit, which is the backbone of any truly equitable city.



# The Future of Transport Is Sustainable Shared Mobility

By Jacob Mason, ITDP



**When you make something cheaper, people use more of it. When applied to solo car travel, this could be disastrous, increasing the amount of solo vehicle travel (at the expense of other modes), increasing congestion, and reducing mobility.**

It has been clear for decades that compact, mixed-use cities centered on walking, cycling, and public transit provide the greatest, most equitable access for everyone, and at greatly reduced cost to society.<sup>1</sup> Technologies like on-demand e-hail services have already had a huge impact on our travel patterns, and others, such as automated vehicles (AVs), may have even larger consequences, both good and bad. Robin Chase, founder of Zipcar, has best exemplified this situation with her often-cited “Heaven or Hell” scenario. “Heaven” is a future where automated vehicles are completely shared, reducing congestion and improving streets and accessibility for everyone, while “Hell” is more privately owned vehicles clogging the streets, even more car-oriented land use, and increased sprawl. Similarly, technology is a tool, and depending on how that tool is used, it can be helpful or harmful.

Let’s start with “hell.” Poor implementation of new technology could lead to dramatically less efficient and sustainable transportation. Vehicle automation and electrification significantly reduces the cost of travel. Electricity is cheaper than gas, and electric vehicles (EVs) have many fewer parts, making them much cheaper to maintain. Without the need for a driver, automated vehicles are cheaper to operate, both in terms of the economic cost of a driver and the opportunity cost of driving itself (as opposed to working, sleeping, etc.). When you make something cheaper, though, people use more of it. When applied to solo car travel, this could be disastrous, increasing the amount of solo vehicle travel (at the expense of other modes), increasing congestion, and reducing mobility. Zero-occupancy vehicles could circle the city making deliveries and waiting for pickups, further increasing vehicle kilometers.

The “heaven” scenario is what ITDP calls Sustainable Shared Mobility, and it requires the effective implementation of new technologies and making full use of the benefits

AVs and EVs by focusing on supporting walking, cycling, and public transport. In this scenario, cost reductions are applied to public transport and other higher-occupancy vehicles and not to solo driving and other

low-occupancy modes. Lower costs on high-capacity modes leads to a combination of lower fares and better service, which in turn attracts more people to use them. With more people on these more space-efficient modes of transportation, everyone is able to get where they are going quicker, and the transportation system becomes much more equitable.

Sustainable Shared Mobility is achieved in two ways; by discouraging inefficient (low-occupancy vehicle) travel and by encouraging efficient travel (e.g., walking, cycling, public transport). There are a variety of ways to discourage inefficient travel, including road pricing, congestion pricing, and high vehicle registration fees and taxes. These are vital to counteract the saving from new mobility technologies. Efficient travel is encouraged in a variety of ways, including planning and zoning for compact, mixed-use cities centered around public transport, as well as the construction of infrastructure that supports and prioritizes walking, cycling, and public transport.

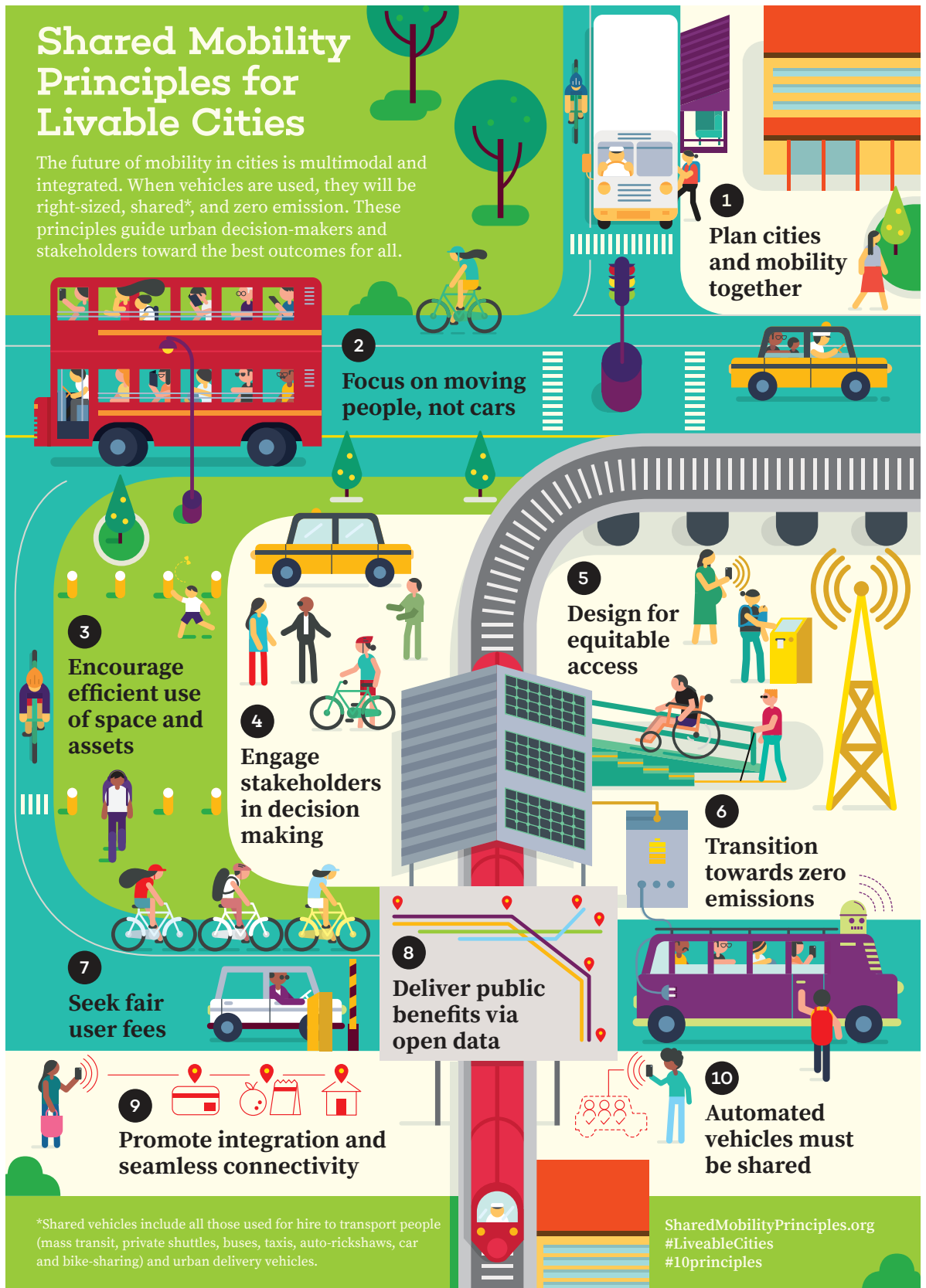
## Cheaper, Better Transit

Through Sustainable Shared Mobility, new technology could greatly expand the reach of transit, save money and free up precious urban space. Lower operating costs would result in a combination of more transit service and lower fares, if funding levels are kept constant. Better service drives higher ridership and more efficient use of urban space. Service on high-demand

<sup>1</sup> Mason, Jacob, Lew Fulton, and Zane McDonald. “A Global High Shift Cycling Scenario: The Potential for Dramatically Increasing Bicycle and E-bike Use in Cities Around the World, with Estimated Energy, CO2, and Cost Impacts.” (2015). <https://www.itdp.org/the-benefits-of-shifting-to-cycling/>

# Shared Mobility Principles for Livable Cities

The future of mobility in cities is multimodal and integrated. When vehicles are used, they will be right-sized, shared\*, and zero emission. These principles guide urban decision-makers and stakeholders toward the best outcomes for all.



1

**Plan cities and mobility together**

2

**Focus on moving people, not cars**

3

**Encourage efficient use of space and assets**

4

**Engage stakeholders in decision making**

5

**Design for equitable access**

6

**Transition towards zero emissions**

7

**Seek fair user fees**

8

**Deliver public benefits via open data**

10

**Automated vehicles must be shared**

9

**Promote integration and seamless connectivity**

\*Shared vehicles include all those used for hire to transport people (mass transit, private shuttles, buses, taxis, auto-rickshaws, car and bike-sharing) and urban delivery vehicles.

SharedMobilityPrinciples.org  
#LiveableCities  
#10principles

Image: Sustainable Shared Mobility Principles

A consortium of transport experts, led by Robin Chase, created the 10 Shared Mobility Principles for Livable Cities, which are designed to help guide urban decision-makers and stakeholders toward the best outcomes for all.

routes could become more frequent, creating more profitable routes, which could lower costs or subsidize less profitable routes. More service on other routes could attract or retain more users, leading to more profitable service, allowing for more service. This creates a virtuous circle of

expanding transit use and more efficient use of transportation resources. On very-low-demand, heavily subsidized routes, which exist primarily in wealthy countries, there is potential to replace some fixed-route services with more on-demand shared car or van services. These services may be able to provide better access to very-low-demand areas at lower cost than fixed-route services. If these on-demand services are connected

**Lower costs on high-capacity modes leads to a combination of lower fares and better service, which in turn attracts more people to use them. With more people on these more space-efficient modes of transportation, everyone is able to get where they are going quicker, and the transportation system becomes much more equitable.**

to other fixed-route transport services, these could expand the coverage of public transport, serving more people. It should be stressed, though, that this only applies to very-low-demand, heavily subsidized services.<sup>2</sup>

Paratransit users would similarly benefit from Sustainable Shared Mobility. Paratransit, or government-supplied and subsidized door-to-door transportation, is essential for people with mobility issues that prevent them from using public transport. In many places, government agencies are poorly equipped to run such services but are legally mandated to do so. The result is incredibly high costs and poor service, which must be scheduled days in advance and within a large time window. In the United States, the average cost for agencies to provide a paratransit trip was \$29.30.<sup>3</sup> By using on-demand ride-hailing technology with drivers and vehicles capable of moving mobility-impaired people, the paratransit trip operating costs could be cut dramatically and the convenience for users greatly increased. Instead of inflexible and inconvenient scheduling, users could book trips virtually on demand. With more demand for drivers and vehicles, wait times decrease, leading to greater freedom and autonomy for paratransit users. Vehicle electrification and automation could further reduce costs, although assistants would remain necessary to help those requiring assistance.

### **Better, Safer Cycling**

Across the world, the recent explosion of interest in urban cycling has led to better infrastructure, which has, in turn, led to more cycling. From Pune, India, to Dallas, Texas, cities are investing in high-quality cycling infrastructure. However, one of the biggest barriers to building more comprehensive cycling infrastructure has been the vigorous objection from car owners and politicians to repurposing car space. Even seldom-used parking spaces are defended. Near ITDP's office in Washington, DC, bicycle lanes were nearly defeated in order to preserve parking spaces that sat empty 92 percent of the time.<sup>4,5</sup> The advent of shared vehicles and automated vehicles presents an exciting opportunity to repurpose street space for bicycles, but this is only possible through Sustainable Shared Mobility.

In a Sustainable Shared Mobility future, the increase in vehicle utilization will reduce the need for car parking. Currently, most automobiles are

parked for 95 percent of the time<sup>6</sup>, and in the U.S. the number of parking spaces is estimated to be around 500 million, with some speculating that it could be as high as 2 billion.<sup>7</sup> With 263 million passenger vehicles in the U.S., that's at least two spaces per car. In a Sustainable Shared Mobility future, each vehicle will be used by multiple occupants each day, greatly reducing the amount of time the vehicle is idle and needs parking. This would free massive amounts of space in urban areas, and particularly on-street parking spaces, which are well-suited for bicycle infrastructure. This shift is most dramatic in the densest parts of the city, where parking is most expensive to build and where bicycle infrastructure is most critical and demand is highest for safe cycling. Fewer solo car trips and more people per vehicle will lead to fewer vehicles on the streets and less space needed for driving. This allows more space to be devoted to cycling, with less political resistance from drivers to repurposing excess space to cycling.

In addition, the safety benefits of automated vehicles are largely undisputed. The death toll of human-driven vehicles is staggering, estimated at 3 million people in 2015<sup>8</sup>—a public health crisis that goes unreported because it has been around for so long. Since automated vehicles can be programmed to follow the road rules more precisely and do not become sleepy, distracted, impatient, or angry, they should result in a dramatic reduction in road injuries and deaths. This, too, should lead to a safer environment for cycling, although much work remains to ensure that people on bicycles are well-incorporated into automated driving patterns.

There are, of course, many challenges to address. The loss of employment for transit drivers and paratransit schedulers, for example. There is also a potential loss of accountability when services are contracted to private corporations, although this could be managed through improved regulation. Despite these and other real challenges, the benefits are overwhelming. Focusing on compact cities and prioritizing walking, cycling, and transit will harness the full benefits of Sustainable Shared Mobility to create virtuous transportation cycles that improve access, safety, and equity for everyone.

See more at [sharedmobilityprinciples.org](http://sharedmobilityprinciples.org).

<sup>2</sup> <http://humantransit.org/2017/05/the-receding-fantasy-of-affordable-urban-transit-to-your-door.html>

<sup>3</sup> GAO. 2012. "ADA Paratransit Services: Demand Has Increased, But Little Is Known About Compliance." GAO-13-17, November. <http://www.gao.gov/assets/660/650079.pdf>

<sup>4</sup> <https://ggwash.org/view/32465/alexandria-delays-king-street-bike-lanes>

<sup>5</sup> <https://www.alexandriava.gov/localmotion/info/default.aspx?id=74320>

<sup>6</sup> Shoup, Donald C. The high cost of free parking. Chicago: Planners Press, 2005.

<sup>7</sup> <http://www.nytimes.com/2012/01/08/arts/design/taking-parking-lots-seriously-as-public-spaces.html>

<sup>8</sup> <http://www.who.int/mediacentre/factsheets/fs310/en/>

# Elevated BRT: Is Higher Better? Lessons from China and Indonesia

By Maulana Ichsan & Karina Saraswati, ITDP Indonesia



The Xiamen BRT has shown high ridership since opening in 2008, but is still plagued with integration and operational problems.

A bus zooms down a city street in its own lane, oblivious to traffic, stopping briefly to pick up and discharge passengers who enter and exit from every door with just a step forward.

Those are the telltale signs of a well-run bus rapid transit (BRT) system that meets ITDP's best practice standards. Such systems are an increasingly common sight in cities around the world, but carving out an entire lane exclusively for buses can still be a political challenge. As a result, some cities are adding a new twist, with mixed results: elevated BRT.

Xiamen, a southeastern Chinese city, opened an elevated busway in 2008. It consists of three main corridors serving 42 stations along 53 kilometers, including a 5.5-kilometer bridge and tunnel section with dedicated BRT lanes. With such elaborate infrastructure, Xiamen is home to the first genuine "trunk and feeder" BRT system in Asia. The city opted for elevated BRT largely because its light-rail plans didn't get central government approval. Instead, it built elevated BRT corridors with the intention of later upgrading to light rail; once the BRT proved successful, however, the upgrade plan was shelved.

As with most Chinese BRT systems, Xiamen provides user-friendly passenger information, smart-card fare collection, and shiny new vehicles that are a radical improvement on earlier bus systems. So far, the elevated busway is delivering strong results. With 9,850 passengers an hour per direction, it has the second-highest passenger flow of any BRT system in Asia behind Guangzhou. What's more, peak period operational speeds are very high—around 27 kph.

However, Xiamen is still plagued with problems that have nothing to do with the elevated nature of the system. The transfer mechanism between trunk and feeder is still rudimentary. Information on feeder routes is provided in



Some cities are adding a new twist with mixed results: elevated BRT, but elevated or on the street, any transit system without proper integration is not going to provide the best service.

system maps, but there is no physical integration other than the close proximity of the feeder bus stops, and passengers transferring from trunk to feeder routes have to pay twice, with no transfer discount. Also, the BRT stations have relatively small platforms, which severely limits both carrying capacity and the number of buses that can serve passengers simultaneously at the same station. The small number of access ramps to the elevated busway constrains the operational options, too. Elevated or on the street, any transit system without proper integration is not going to provide the best service.

Elsewhere in Asia, the massive metropolis of Jakarta started riding BRT in 2004. Since then, the Indonesian capital has developed a citywide mass transport system with 12 BRT corridors, more than 1,500 buses, and over 400,000 passenger daily. But dedicated lanes are not always respected, and the police have been known to direct private car drivers into bus lanes during peak hours. That makes an elevated system an enticing prospect.

Transjakarta, the city-owned BRT system, opened its first elevated lane this year, called Corridor 13. The project began in late 2014 and was due to be finished in 2016, but land disputes pushed completion to mid-2017. Corridor 13 connects the transit hubs of Ciledug in Tangerang and Tendean in South Jakarta, and it is built almost entirely as an elevated corridor. Transjakarta buses travel on an elevated road an average of 12 meters above street level and in some places up to 25 meters.

However, the first elevated BRT lane in Indonesia is not without issues. The elevation means slower bus speeds—negating one of the key advantages of BRT. Three different contractors worked on the project, which created some design and color differences that might confuse passengers, though the entire system is structurally fine. While Corridor 13 overlaps with the four other Transjakarta corridors, there is no actual integration or connecting link to the other corridors. As this corridor is built without an exit and entry ramp in the middle, buses will only be able to enter the corridor from the very beginning or the end. Without physical integration, passengers cannot easily change their route in the middle of their trip,



Top left: Transjakarta BRT Corridor 13, the first elevated BRT in the Jakarta transit system, opened in 2017.

Above: Jakarta's elevated BRT corridor does not offer adequate access for everyone. There is no elevator at this station.

which discourages them from using this corridor. The corridor also has accessibility issues, especially for disabled and elderly passengers. There is no elevator, and a picture of a steep access staircase went viral on social media.

These drawbacks appear to be hurting ridership. Projections of 40,000 daily passengers have fallen way short—the number of passengers in September 2017 was just 9,500 per day. These poor numbers are evidence that BRT should not be elevated if it all possible. BRT works well because it's a swift mode of surface transportation that's easily accessible for people at street level. Elevated rail systems built in an earlier era cast long shadows over streetscapes, and newly built BRT would do the same. But some transit is better than no transit, so as an absolute last resort, Xiamen and Jakarta show that elevated BRT is possible.

# Why Gender Matters

By Clarisse Cunha Linke, ITDP Brazil

*The following is an edited version of a live talk given by ITDP Brazil Country Director Clarisse Cunha Linke at the Velo-city global cycling summit in Arnhem-Nijmegen, the Netherlands, in June 2017.*

I saw more pregnant and elderly women on bikes in Holland in five days than I had seen in my entire life. At that moment, I realized the importance of the environment when it comes to women accessing transport in cities.

The streets were safe and designed for bikes. The public spaces were open and inviting, and the transport options were abundant. However, this is the exception, not the rule. In Latin America, women still spend hours out of their day traveling on poor-quality transit systems. Very few of them cycle, despite the majority of them having the desire to do so. Clearly women enjoy cycling and find it a good solution for their transport needs, as demonstrated in Holland. The problem isn't cycling in itself, but the environment. We live in spatially segregated cities, agglomerated in ghettos where private property matters more than lives. Where speed is still the synonym of efficiency, men thrive, and women are left behind. Simply put, cities are built in a way that makes them obstacles for women, not places that are safe, accessible, and vibrant.

While the lack of gender neutrality in city and transport infrastructure is widely acknowledged, women still do not have adequate access to public transport. Meetings with planners, decision-makers, and representatives from the private and public sectors rarely address the difference in experience between women and men when it comes to comfort and ability to move around their cities. The fact of the matter is, in today's world, we still imagine that women's experience regarding transport method selection and usage is the same as men's. We don't consider gender.

Particularly looking at Latin America, women have less access to transport modes than men do. Women need to travel more kilometers daily to meet the demands of their many roles, including paid work and unpaid work, including familial and community-based responsibilities. Recent studies in Brazil showed that women work five hours more per week than men in unpaid work, and they dedicate twice as much time to household-related activities. Dedication to unpaid work (two out of the three roles) affects the ability for women to experience financial growth. In fact, in Latin America and most other societies, low-income women hold all three of the aforementioned roles. These roles involve shorter and more frequent trips per day, normally during scattered and off-peak times. Men tend to make more linear trips fixed origin and destination points (normally home to work and vice versa). This coupled with their lack of income to use toward purchasing a car adds to women's reliance on public transport and cycling infrastructure, yet women have difficulty accessing public transit and do not cycle much at all.

Research conducted by São Paulo University shows that on average, less than 10 percent of women cycle. Research done by Ciclocidade in São Paulo also have found a low incidence of women cycling—a maximum of 15 percent in areas some areas, such as Paulista Avenue, and as little as 2 percent in less central areas. So how do we increase female biking in developing countries? A good way to start is to more specifically understand what makes the environment so undesirable



A survey in São Paulo, Brazil showed that women cite road safety as the main reason for not cycling, and that those who do cycle only consider it safe when using protected bike lanes.

In many low-income neighborhoods of Rio there are virtually no economic opportunities or services. Residents commute up to three hours per day in poor transit conditions.

to cycle in. We can look at this issue through the lens of Brazil, which can be applied to many other countries in the global south.

Cities in Brazil, and the global south as a whole, are designed to be spatially segregated. This means that poor women, who usually live far from public transport, are continuously excluded. In Rio de Janeiro, an average of 31 percent of the population is in the transit catchment area (a maximum of 1 kilometer from stations) but only 23 percent of the lowest income group is included, while 55 percent of the highest-income group falls in the transit access area. In many low-income neighborhoods, you can say that there are no economic opportunities or services—these are found in the southern part of Rio de Janeiro, where the poorest populations have to commute one to three hours a day to access them. That is one to three hours a day that women who live in these areas need to spend to perform at least one of their three roles. Many of them struggle to reach transit stations and then once there, they struggle with the quality



of the transit system itself. Moreover, there are no bike lanes or bike-shares in these areas to leverage good-quality urban design and convenient connections to transit systems.

Not only are cities spatially segregated and highly inaccessible, they are not safe. Cities are car-oriented and molded to protect private property, not people. Over the last 50 years, cities in Latin America have turned into bunkers where people hide behind walls, fences, and gated communities with cameras and barbed wires. There has also been an increase in the dichotomy between private and public space. While private space holds quality, comfort, safety, and convenience, public spaces are dangerous. This growing desire to protect private property and assets has actually created the inverse in the feel of the city by creating more hostile and dangerous environments. Cars act in the same way: SUVs and other large vehicles in particular are treated as defensive capsules against the dangers of the city. More people are afraid, especially women, as safety is one of their biggest daily concerns.

A recent study by ActionAid that included four Brazilian cities showed that 75 percent of female respondents

**So how do we increase female biking in developing countries? A good way to start is to more specifically understand what makes the environment so undesirable to cycle in.**

have changed their route because they were afraid in a street without proper lighting and 70 percent have opted not to go out in the street in the evening because they were afraid of being harassed. What is even worse is that bus stops and walkways, among other areas including alleys and squares, are considered the most unsafe spaces by women. Another study from ActionAid showed that an alarming number of women in many other countries have been harassed on the streets. Topping the list is Brazil at 86 percent. Political and economic priorities are continuously going toward private space, creating a lack of trust and confidence in public ones and reducing the occurrence of spontaneity, flexibility, and vibrancy—



Images: Top - Danielle Hoppe, ITDP Brazil; Bottom - Stephano Aguiar

**It is clear that we need to build cities that address the needs of women and men. These types of cities make sure that everyone has equal access to resources, knowledge, and technology, and that all individuals can flourish and make their own decisions on how to live their lives based on choice not limitations.**



Events such as car free streets are much more gender balanced than everyday commute cycling, which is more male – dominated.

important factors that contribute to the positive aspects of urban living.

Lack of safety on the road also adds to the lack of comfort for women to bike. Cities are increasingly designed to be seen at high speed from inside a vehicle. These cities are harsh environments for women, as well as children, the elderly, and the people with disabilities. A survey in São Paulo also done by the NGO Ciclocidade showed that 76 percent of women who do not cycle indicated road safety as the reason why. For the ones who do cycle often, 60 percent of them find it safe or very safe only when cycling in dedicated infrastructure.

While Rio, cities in the global south,

and most of the world are not safe spaces for women, there are strides being made. In São Paulo, the construction of bike lanes boosted the number of total cyclists by 188 percent and created a dramatic increase in women cyclists. Transporte Ativo studies also show increases in women cyclists in Rio once infrastructure was implemented in Copacabana, and there was a 20 percent increase in women cyclists in Santiago, Chile (10 percent to 30 percent), after a six-year investment in infrastructure with dedicated funds. Increasingly, cities are also expanding the network, providing cycling infrastructure for the last mile and integrating it into public transport systems.

It is clear that we need to build cities that address the needs of women and men. These types of cities make sure that everyone has equal access to resources, knowledge, and technology, and that all individuals can flourish and make their own decisions on how to live their lives based on choice not limitations. For an individual and a community to flourish, a city needs to have improved access to health, education, economic opportunities, services, social engagement, and participation. Transport is the direct channel to access these things—it is the link to the city. It is the hope that by implementing features that make streets safer—such as reducing speed, decreasing crossing distances, improving lighting, and creating more open space, as well as improving public transport and bike infrastructure—these cities can exist. In order to build on improvements, cities need to start to listen to the needs of all its people, not just a lucky few.



# Before #MeToo, There Was #MyDressMyChoice

By Naomi Mwaura, ITDP Africa



On July 19, 2017, a court in Nairobi, Kenya, sentenced three men to life in prison for stripping, robbing, and violently sexually assaulting a female commuter on a public bus. The incident, which took place in 2014, rose to national attention because the men were bold enough to film themselves and post the video online. This is one of two landmark court cases in Kenya involving the assault of women in the public transport system. In the other incident, a street vendor was sexually assaulted, robbed, and stripped of her clothes at a bus terminal.

The harsh sentence sends a strong message to perpetrators and encourages victims to report incidents. Moreover, it makes clear that violence against women is a criminal act and that women have the same rights as anyone else to access public spaces and transport services. This may seem obvious, but to the men who bragged about their crime with video evidence, it clearly was not. Nairobi, like many cities around the world, has been plagued by various forms of gender violence in public spaces and on public transport.

Outrage about sexual harassment has taken many forms recently, including, of course, on social media. In Nairobi, this has been the #MyDressMyChoice campaign. Members of the famous women-only Facebook group Kilimani Mums, which has more than 25,000 active members, rallied and held a peaceful procession to stand in solidarity with the survivors. On November 17, 2014, this culminated in thousands of women protesting on the streets of Nairobi about sexual violence against women in the public transport system.

The demonstration in the center of Nairobi prompted Kenyan leaders to respond. William Thwere Okelo, chief of state of the Inspector General's Office, denounced the mob in the videos as "criminal[s]" and promised the public that "the police will take action." Kenyan deputy president William Ruto

Thousands of men and women took to the streets of Nairobi protesting sexual violence against women in public transport. The protests prompted a serious response by Kenyan leaders.

denounced the attack as "barbaric" and ordered a criminal investigation, leading to the arrests.

The pressure generated by the #MyDressMyChoice campaign led to a number of critical reforms. The Kenyan Parliament passed a law against forcible "stripping", making it punishable by 10 years in prison. Eleven operators were arrested and 240 matatus were grounded pending remedial actions. The National Transport and Safety Authority adopted a new driving school curriculum, and civil society organizations are working with matatu operators to expand access to driver training programs.

Social media continues to play an increasingly key role around the world in spurring and expanding collective action, especially around "explosive" issues. #MyDressMyChoice and campaigns like it also show that social media can be part of more profound and long-term changes—even when it comes to issues that are as persistent and deeply rooted as social norms regarding gender. These campaigns contribute toward a larger goal of achieving equal rights to transport and public spaces for everyone.

# Making the Case for Road Safety: A Tale of Three Cities

ByCarolynn Johnson, ITDP

According to the World Health Organization, global road deaths equaled 1.25 million in 2015 – more than the number of people killed annually in homicides.

Road safety advocates are striving cut the number of deaths and injuries from road traffic crashes in half by 2020. To reach that ambitious target, ITDP has been working in Brazil, China, and Mexico using the latest ideas to place people ahead of cars and make roads safer for everyone.

The modern road-safety movement began with Ralph Nader’s 1965 book *Unsafe at Any Speed*, which called out car manufacturers for failing to include seat belts and other safety features in vehicles. Next came the drunk-driving campaigns of the 1980s and 1990s, led by Mothers Against Drunk Driving (MADD). Personal stories of losing children transformed the conversation around road safety, and the organization became one of the most effective and recognizable advocacy charities in the United States. A new revolution is happening around road safety as streets are redesigned and reengineered to place people—not cars—at the core of their use.

Three exciting ITDP projects are spearheading the efforts of this revolution: supporting

Vision Zero in Mexico City; taking a child-friendly approach to design in Changsha, China; and changing the way citizens interact with their streets in São Paulo, Brazil.

In 2015, Mexico City became the first city in a low or middle-income country to adopt Vision Zero. This approach to road safety proposes that collisions are not “accidents” but preventable incidents that can be avoided by systemic action. Sweden launched the concept in the 1990s and watched its traffic deaths drop from 7 per 100,000 to less than 3 per 100,000 in 2014. The approach has been successfully adopted in cities throughout Western Europe too, and more recently in North America.

Before Vision Zero policies were implemented, traffic collisions in Mexico City killed around 1,000 people per year—almost three people a day—more than half of them pedestrians or cyclists.<sup>1</sup> To address this challenge, ITDP worked with a coalition of stakeholders to support Vision Zero adoption. As a result, the city set an ambitious target of reducing fatalities by 35 percent through a combination of law enforcement, street design, and sustainable mobility.

<sup>1</sup> [http://www.dgcs.unam.mx/boletin/bdboletin/2016\\_547.html](http://www.dgcs.unam.mx/boletin/bdboletin/2016_547.html)

**In 2015, Mexico City became the first city in a developing country to adopt Vision Zero. This approach to road safety proposes that collisions are not “accidents” but preventable incidents that can be avoided by systemic action.**

A tactical urbanism intervention in Mexico City shows the potential of simple design for improving road safety and providing space for people.



Image: ITDP



Paulista Avenue in São Paulo, Brazil, as it currently is (left), and a rendering of how the street will be improved (right), adding pedestrian space, cycle lanes, crosswalks.



What's more, after only seven months of implementation, the policies have led to an 18 percent decrease in road deaths overall.<sup>2</sup>

Despite this initial success, Vision Zero in Mexico City is at a critical juncture. ITDP is working with the FIA Foundation to address data gaps, vulnerable areas such as school zones, and most importantly, the upcoming mayoral elections. As Mayor Miguel Ángel Mancera turns his focus to the national stage in 2018, Mexico City will be left without its original Vision Zero champion. ITDP will address this gap directly and work during the campaign to put people-centered street design—and the lives saved through Vision Zero policies—on candidates' agendas.

ITDP is taking a different approach to road safety in Changsha, a city in central China. A startling statistic - according to China's Department of Transportation Statistics, more than 18,500 children under 14 years old die in traffic every year - led ITDP to work with the City of Changsha to adopt road-safety measures under the Child-Friendly City initiative. These include street design improvements in school zones and road-safety measures incorporated into the city's long-term development plan for 2050. So far the city has implemented recommended designs in pilot schools, such as improving the walking space around the school and creating waiting areas for parents picking up their kids. The city has committed funding to make additional improvements to sidewalks, intersections, traffic management, and public spaces around

schools throughout the city that will put children firmly at the center of street design strategies.

Finally, in early 2017, ITDP's efforts in São Paulo to promote Zone 40, or areas of reduced speed and people-centered street design, looked like they had hit a wall. Mayor João Doria took office in January 2017 after explicitly running—and winning—on a campaign aimed at dismantling Zone 40 policies. When one of his administration's first actions was to reinstate faster speeds on key expressways in São Paulo, the situation looked even bleaker. However, ITDP didn't give up. As a result of strategic engagement and education about the benefits of people-centered street redesigns for Zone 40 in the low-income neighborhood of São Miguel Paulista, the mayor not only embraced the redesigns but also became an advocate. He has now made an ambitious commitment to scale up the project throughout the city. This turn of events is good news for Paulistas, as early tests of street redesigns show dramatic improvements in the pedestrian experience.

These exciting examples from around the world are just a few of the ways that ITDP is helping cities rethink the way they design their urban environment. As 2018 unfolds, ITDP will move forward with these projects and many more through our field offices. After nearly a century of building for cars, it's time for cities to put people first.

**Early tests of street redesigns in São Paulo, Brazil show dramatic improvements in the pedestrian experience.**

<sup>2</sup> El Universal. Destaca SSP disminución de accidentes con nuevo reglamento de tránsito. August 8, 2016 .<http://www.eluniversal.com.mx/articulo/metropoli/cdmx/2016/08/11/destaca-ssp-disminucion-de-accidentes-con-nuevo-reglamento-de>

# Changsha, China Puts Children's Safety First

By Jinglu Zhu, ITDP China

“My city should be full of happy, colorful and clean, with my family, my friends and close to the nature”—a Grade 5 student in Changsha Yuelu No.1 Primary School

In Chinese cities, as in many growing cities around the world, the expansion of cities has been accompanied by rapid motorization, with a 17 percent annual growth in private car ownership from 2005 to 2014, reaching 124 million in 2014, and an increase in distances traveled and a steady decline in the percentage of biking and walking trips. Urban design has also given growing priority to cars in the streetscape. At the same time, China aims to transition to high-income status with 1 billion people, or 70 percent of the population, living in cities by 2030—adding a further 250 million people in the 13 years after that. While motorization initially brought gains in terms of mobility and convenience, it has also brought about adverse economic, environmental, and social impacts, including increased road accidents, traffic congestion, air pollution, fossil fuel consumption, social isolation, and disconnection among residents and their communities, and especially to children, the most vulnerable members of society.

Children, and other vulnerable members of society should be given priority and in urban planning and public policies. But according to the World Health Organization, more than 10,000 children under 15 years old die of traffic collisions in China every year—that's 2.5 times the number in Europe and 2.6 times in the U.S. Among many other reasons, poor walking conditions are a key factor leading to these tragedies. Even worse, the urban environment in most Chinese cities is showing the



The participation of children and the community in the child friendly cities project has been crucial to implementation.

same bias toward the “single male traveler” that has been well-documented elsewhere: There is a lack of accessibility to public space and few thoughts about diversity of age and gender, and public facilities are designed without consideration of their mobility needs.

While many cities around the world have started to address these issues, the first in China is the city of Changsha, in the south-central region of the country. Thanks to Changsha's awareness of the importance of creating better transport infrastructure for children and ITDP China's advocacy, the Changsha Urban Planning Bureau included a Child Friendly City (CFC) initiative in the Changsha Long-Term Development Plan 2050 and began to launch a series of transit improvement projects. With ITDP's assistance, Changsha is not only the first to address the issue, it is the

first city in the nation to officially enact CFC measures based on interaction with children. Many other Chinese cities are expected to follow Changsha's footsteps to implement innovative actions and become child-friendly.

Child Friendly Cities was officially launched by UNICEF in the 1990s, to require cities to be livable for everyone, and especially for children. To support local national committees to develop and strengthen implementation of the Child Friendly City and Communities Initiative (CFCI), UNICEF has developed a CFC Toolkit that can promote a more harmonized approach across countries, strongly anchored in children's rights. It provides practical guidance to promote implementation of the Convention on the Rights of the Child at local level and to encourage improved monitoring and evaluation of CFCI.

Since International Children's Day in June 2016, ITDP China has been working for the Changsha CFC project with Changsha Urban Planning Bureau, Shenzhen New Land Tool (SZNLT), and many other local design institutes. ITDP China provided technical support, including preliminary training for government officials and local design institutes and the professional review for 10 pilot demonstration school proposals. The proposals included 186 implementation items: 121 short-term items with a 19.085 million yuan (2.8 million USD) investment and 65 long-term items with a 108 million yuan investment. These improvements consist of walking spaces, crossings, traffic organization, transport infrastructure, and public



The Changsha Child Free Cities logo and cover of the guidelines document that lays out the vision for Child Friendly Cities.

spaces around schools, all aiming to establish a better environment for children to study, live, and play.

The Changsha CFC School Area Urban Planning and Design Guide, mostly created by ITDP China and SZNLT, was issued by the Changsha Urban Planning Bureau to provide design guidelines at the city level for any newly developed or regenerated school development. Changsha city has also released Changsha CFC Action Plan, and Changsha CFC Planning Guidelines led



Safe sidewalks around schools, with bollards or fences to protect children from cars, were implemented as part of Child Friendly Cities. Before (left) and after (right).

by the City Urban Planning Bureau.

"The Child Friendly Cities and Communities Initiative is a powerful and strategic tool to strengthen awareness and implementation of children's rights and, most importantly, to enable children's voices to be heard," explains Gérard Bocquet, director of the Private Fundraising and Partnerships Division of UNICEF. He points out the significance of CFC compared to other pedestrian safety programs in the world, like Vision Zero.

ITDP China has also helped the Changsha Urban Planning Bureau and local design institutes to host a series of events to spread the word about CFC, such as classes open to the public in the Changsha Urban Planning Exhibition Hall and presentations to the Urban Planning Bureau, the Education Bureau, local design institutes, etc., to advocate for children's rights. As a result, the city government responded strongly, with increased resources and plans, which created a lot of media and public buzz. One of the most exciting results from the campaign has been the public participation, particularly from the children, during the design process.

Within a year, the Changsha Urban Planning Bureau implemented improvements to a wider area around the schools, including a pedestrian refuge area on the street, parking demand management, traffic organization for peak hours, sign integration, and public

space upgrades.

In early September 2017, the China CFC Construction Guideline draft for public comment was released, led by China Child-Friendly Community Work Committee. It provided 15 criteria and 46 metrics for all Chinese cities on three dimensions: policy, urban space, and service. Based on extensive consultations with local and international specialists, researchers, and representatives from various fields such as public policy, community management, urban planning, social work, and family education, this document will become a milestone in the Chinese CFCI program when interest in and the implementation of the CFCI becomes much higher in China.

Changsha's contribution to CFC, including this project, which won the 2017 China's CFC Community Service Projects Award issued by the China Child-Friendly Community Work Committee in April, has increased a lot of Chinese cities' awareness of CFC. In the coming years, ITDP will continue to work with national and city-level local operators to ensure this success continues by building a closer relationship with national committees and local potential cities. ITDP will promote more CFC demonstration projects in other Chinese cities, assisting with scale-up of CFC guidelines around the country, and documenting best practices in China to share with UNICEF and other international audiences.

# Can Private and Public Bike-Share Coexist? A Cautionary Tale from China

By Deng Han, Liu Shaokun, Li Wei, Huang Runjie, ITDP China

Disruption has come to the once calm and steady business of municipal bike-share, where the Chinese experience is a harbinger of the future for cities everywhere. Virtually overnight last year, red, yellow, and blue bikes sprang up on seemingly every corner in Guangzhou. But they had one crucial difference from the traditional public bike-share system that has been offering residents two-wheeled mobility since 2010: They were dockless.



Dockless bike companies are increasingly taking over public spaces for private use, creating serious problems for Chinese cities.

These bikes could be found – and left – anywhere in the city, thanks to a built-in lock that released when the user reserved the bike via a smart-phone app and a QR code.

On the surface, this degree of convenience compared to traditional bike-share with its dedicated docking stations seemed a brilliant innovation in delivering a solution to the perennial “last kilometer” problem. After all, people who own bicycles lock them as close as they can to their destination – outside the office, on campus, at a bike rack near the grocery store – rather than leave them at designated locations. But the introduction of a private innovation did not come without headaches. For one, it seems there can be too much of a good thing, as bikes flooded the streets; for another, the sudden rush of rogue bikes for rent onto the streets of Guangzhou also upended municipal plans for expansion of the public system.

Guangzhou’s traditional public bicycle system launched in June 2010. With stations located along the Zhongshan Avenue BRT corridor, the system appeared to meet an obvious need in the neighborhood. According to data provided by the Guangzhou public bicycle company, as of December 2016, the system contained 8,850 bicycles and more than 110 docking stations. That’s an increase from the initial launch of 1,000 vehicles and 18 docking stations. A total of 35,382,400 trips have been made using this service.

With five successful years under its belt, Guangzhou proposed a major bike-share expansion in 2015. The city government planned to launch 100,000 traditional public bicycles, which would make it one of the largest systems in the world (New York’s Citibike, for example, has 12,000 bikes). However, as of January 2016, there were still only 10,000 bikes. What happened?

Since September 2016, the privately-owned dockless companies Mobike, ofo, Xiaoming, Bluegogo, U-bicycle, and Coolqi Bike have been players in the Guangzhou market. With a simple per-ride price and convenient smart-phone payment, these dockless bike-sharing systems have grown explosively. By the end of May 2017, more than 700,000 dockless shared bikes could be found on Guangzhou streets, with more than 7.5 million registered users and more than 4 million daily trips.

The impact of dockless bike-share on cycling culture has been remarkable. ITDP conducted a survey of bike volumes along the Zhongshan Avenue BRT corridor. Measured in June 2017, over a year after dockless bike-sharing came to Guangzhou, the volume of bikes in the vicinity of Gangding Station and Tangxia Station is up more than 500 percent and 100 percent respectively than in previous years. Crucially, about 55 percent of rides are on dockless shared bikes and only 2 percent are on traditional public bikes. Daily trips by the public bike-share have plummeted from 14,000 to 9,000 per day since the advent of private dockless bike-share.

While this growth might suggest that private dockless bikes are a superior product to traditional public bike-share with docking stations, the Guang-



The impact of dockless bike-share on cycling culture has been remarkable. Measured in June 2017, over a year after dockless bike-sharing came to Guangzhou, the volume of bikes in the vicinity of Gangding Station and Tangxia Station is up more than 500 percent and 100 percent respectively than in previous years.



Guangzhou experience makes it clear that dockless bike-sharing companies value rapid launch over long-term management. With large deployments, shared bikes are put on the street in a disorderly manner with the hope of cornering the market. Operational costs are in turn transferred onto the back of the city, which must use its resources to keep the clusters of bikes from clogging streets, sidewalks, and public spaces. Newspapers have even reported that users are wedging private dockless bikes into the public system's docking stations. The Guangdong/Guangzhou Consumers Commission claims that 73.9 percent of respondents expressed support for the development of dockless bike-sharing. However, at this time there is no formal agreement with the city, and these companies pay no fees to the city.

Recognizing the impact of dockless bike-share, the Guangzhou Communications Commission issued technical guidelines for parking urban bicycles in the city center and a blueprint for standardizing Internet rental bikes in Guangzhou. Meanwhile, the public system has undergone a transformation, driven in part by the innovations of the private system. At the moment, the Guangzhou traditional public bicycle system is building up its IT infrastructure to accept Yang Cheng Tong (a local transportation payment card), as well as

mobile payments via WeChat, APP, and Alipay.

As private bike-share expands outside China – it can already be found on the streets of Seattle and Washington, DC – there's debate over whether these two competitors can coexist. We think they can. Traditional public bicycle and dockless bike-sharing have their own advantages and disadvantages, and they learn from each other as a result. Traditional public bicycles are learning to go dockless and adopt online convenience from the dockless bike-sharing systems, while dockless bike-sharing is shedding its chaotic approach in favor of a more rational approach to growth and street parking. There are definitely advantages to having a set location for bikes (docked) and also more flexible bikes (dockless), but they can only work together if there is an intentional plan, with regulations for dockless to complement docked and to reserve precious space for pedestrians. Ideally, traditional public bicycles and dockless bike-sharing will become an organic blend offering a convenient service for the public's "last kilometer" and short trips.

Progress is underway. Xiaoming, Mobike, and other companies are recognizing their mistakes and working on a virtual "geo-fence" to comply with new bike parking requirements. The public and private models are coming from opposite directions, but will hopefully meet in the middle to strike a compromise in both convenience and order, providing the best experience for all of the city's mobility needs.

Dockless bike share bikes' surge in popularity in cities such as Guangzhou, where ITDP observed 55 percent of riders on a given day using a dockless bike, and only 2 percent using the city's bike share bikes.

# In China, A New BRT for The Green City

By Xianyuan Zhu & Xi Lin, ITDP China

Nanning is a midsize city of more than 7 million in southern China and is known as “the Green City” for its lush, tropical landscape. The city has seen explosive growth of the e-bike, a successful bike-sharing system, sidewalk improvement, and improved pedestrian crossings, and all of these are helping to grow the city into an important hub in the region for industrial, economic, and technology development. Early this year, the city opened Phase 1 of its bus rapid transit (BRT) corridor, a project that ITDP considers a best practice in public/private partnerships (PPP).

The Nanning BRT runs from the Nanning Railway Station along a 13-km corridor with 17 stations spaced at an average of 650 meters to the Nanning Dong High-Speed Railway Station. Using a direct service operation model that allows bus routes in and out of the corridor, the Nanning BRT system operates a total of 22 BRT routes and 448 buses. The trunk route runs both 12- and 18-meter buses. Eight months after it opened, operations are running smoothly and daily passenger volume is 132,000, including an increase on the main trunk route of more than 60 percent. Average peak-hour speed is 15.6 km/h, or a 38 percent improvement over bus speeds before the BRT.

Nanning BRT is the first PPP for an urban public transport infrastructure project in Guangxi province, and it is the first in China to integrate investment, construction, and operations using best practices. The governmentally run Nanning public transport company set up the Special Purpose Vehicle (SPV), which provided 90 percent of construction and operations costs. The SPV is responsible managing the project financing, construction, and operation, as well as the maintenance of BRT facilities. It receives the operations income until the concession period is over, when the facilities will be transferred to the government without charge.

The concession period for this project is 11 years, including the construction period of 16 months (three months for preparation; 12 months for civil engineering, traffic engineering, and equipment installation; and one month for system debugging and trial operation). Dur-



ing the concession period, the SPV will balance investment and income through operation income (ticket revenue, advertising revenue, etc.) and payments and subsidies from the government. The government conducts regular performance appraisals of the SPV and pays a service charge to the SPV each year based on the results.

Two terminal stations of the Phase 1 corridor—Nanning Railway Station and Nanning Dong High-Speed Railway Station—provide transfers to metro line 1 stations. Nanning Dong High-Speed Railway Station, in particular, integrates well with the metro, BRT, regular bus, and bike-sharing systems. The Nanning “citizen card” also connects these modes with its fare payment.

Protected and continuous bike lanes are provided along the entire corridor, and dockless bike-sharing systems—such as Mobike, Ofo, and Cool Qi bikes—are spread all over the city center. This also helps connect the different traffic modes.

The corridor has many best-practice features that provide high-quality service. ITDP China was heavily involved in the conceptual design with Guangzhou Municipal Engineering Design and Research Institute and conducted impact analysis, offered TOD and TDM optimization advice, and supervised the whole construction process. The smooth operations of





The Nanning BRT corridor is significant not only as a best practice of BRT but also in its integration with other traffic modes, driving them to improve together.



Opposite page: Nanning's streets are considered among the safest for pedestrians in Chinese cities. Wide surface crossings along the BRT corridor give priority to pedestrians.

Left: The BRT Station and corridor of the Nanning BRT, featuring best practices including passing lanes and median-aligned stations.

Right: The BRT has sliding doors and level platform boarding, as well as live bus information.

Nanning BRT are furthered by its excellent design and high-quality facilities, such as clear signage, separated and dedicated bus lanes in the center of the roadway, and passing lanes at stations. These improvements include the sliding doors and off-board fare collection system, the real-time passenger information system, a CCTV system that monitors the operation of the whole station, climate control in the stations, complete way-finding systems for both in and outside the station, platform-level boarding and alighting, footbridges covered with shades, and elevators for better access for the elderly, disabled commuters, and people with strollers. Most of the BRT stations even support online payment via WeChat, a popular Chinese social media and messaging app.

The Nanning BRT Phase 2 corridor started construction in September. When completed, it will have 18 stations as well as 16 footbridges and one tunnel to help passengers access the stations along the 17.2 km corridor. The Phase 2 corridor will improve access with elevators at every station, and it will operate electric or hybrid buses with solar panels to achieve its “no emissions” goal. Phase 2 will connect to metro lines 2, 3, and 4 and open in July 2018 to serve the upcoming Nanning Garden Expo. The Phase 2 corridor is also a PPP project—the estimated investment for the preliminary design of the project is about 1.3 billion RMB. Phase 3 is planned to start construction in 2018 and open in 2020. These three corridors will function as an extension to the metro system, forming the main frame of Nanning’s urban transit network.

As the first PPP BRT project, the Nanning BRT corridor is significant not only as a best practice of BRT but also in its integration with other traffic modes, driving them to improve together.

In addition to metro and BRT, e-bikes are very popular in Nanning, with ownership at 2 million. Nanning has required an e-bike license since 2013, and it has invested significant time in educating riders about

traffic behavior. ITDP China conducted surveys about e-bike in Nanning in 2016 and found that 45 percent of private car owners prefer to use e-bike for trips within the city. The official Nanning bike sharing system is massive, with 896 stations and 25,000 bikes spread over six districts in the city and covering 70 percent of the roads, and the fifth phase of the Nanning bike-sharing system is now in preparation. More stations and bikes will be distributed along metro lines 1 and 2 and BRT corridors to connect the stations and supplement the distribution of the first four stages.

The most interesting best practice in the city of Nanning, however, may be what is known in China as “courtesy driving.” In Chinese cities (as in many other places), it is common for drivers to ignore crosswalks, and the onus is on pedestrians to avoid harm. Nanning is an exception, with officials taking an active role and enforcing traffic laws on drivers. A citizen volunteer team also helps maintain traffic order at main intersections during peak hours. More than 2 million volunteers have participated in “courtesy driving” activities, and all the 4,350 bus drivers and 18,000 taxi drivers have signed the letter of acceptance of “courtesy crossing.” So whether you prefer to walk, bike, take transit, Nanning is the place to be.

# New Resources from ITDP

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## The BRT Planning Guide

The new BRT Planning Guide is the most comprehensive resource there is for planning a bus rapid transit (BRT) system. Over seven volumes and 33 chapters, the guide provides best practices and technical assistance from planning a system to maintaining it.

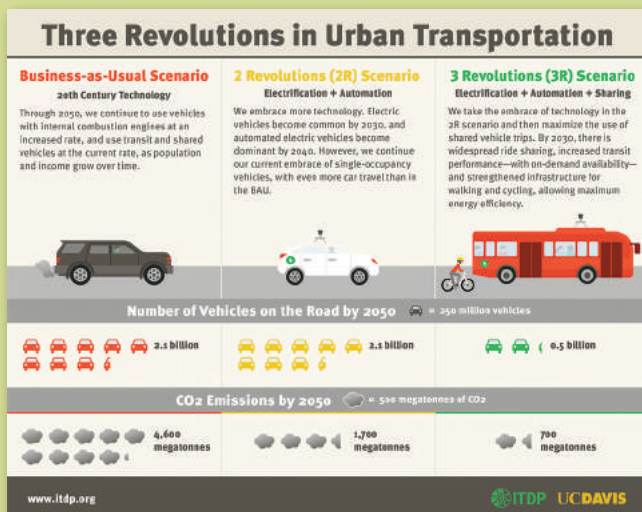
The fourth edition of the guide is a fully online, searchable document that includes contributions from a wide range of professionals and practitioners with direct experience in designing, building, and managing BRT systems all over the world. Earlier versions of the guide were used to assist in the planning of many BRTs, including the Tehran BRT in Iran and the Rea Vaya BRT in Johannesburg, South Africa.



## The TOD Standard 3.0

Transit-oriented development (TOD) is an answer to the unsustainable, car-dependent, and transit-poor urban sprawl that has characterized the growth of cities around the world in the last century.

The TOD Standard outlines eight core principles of urban design and land use, each supported by specific performance objectives and easily measurable indicators or metrics. Together, they promote safe, balanced, and vibrant neighborhoods around stations; short and well-connected pedestrian and cycling networks; densities that ensure strong customer bases for local services and public transport; and minimal car traffic and parking interference.



## Three Revolutions in Urban Transportation

There can be an 80 percent cut in CO<sub>2</sub> emissions if cities embrace three revolutions (3R) in vehicle technology: automation, electrification, and, most importantly, ride-sharing. This report examines analysis from ITDP and UC Davis showing how 3R synergy would provide a 40 percent reduction in urban vehicle transportation costs globally by 2050. Ride-sharing and renewable energy sources are critical to its success.



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