



# Sustainable Mobility



## **Good Practices Resource Book** **Sustainable Mobility**

**This publication is a collection of global good practices contributed by technical experts and the Program Management Unit in the CITIIS program.**

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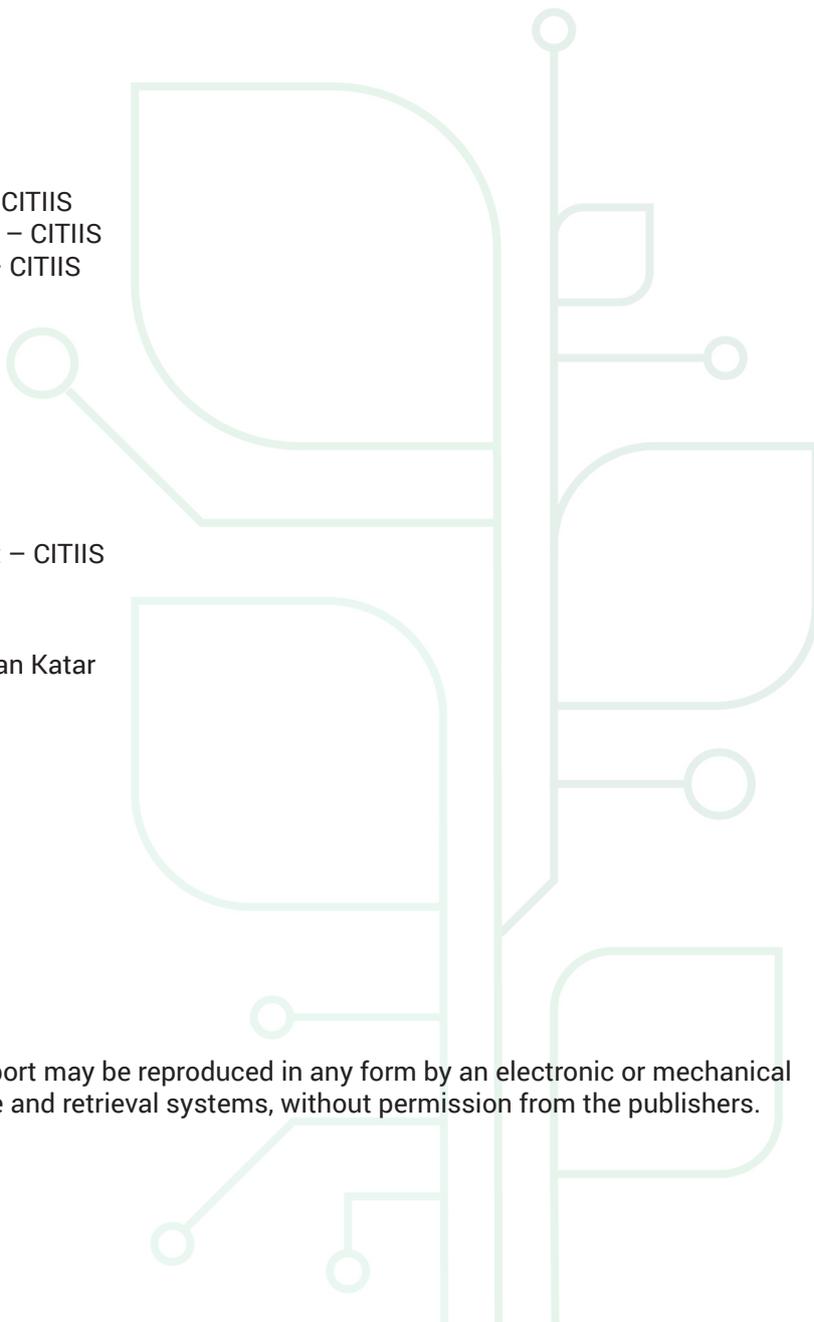
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# The Good Practices Resource Book

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The capture and transfer of knowledge has been an essential and catalysing element of the CITIIS mandate. In order to ensure that the CITIIS projects make significant contributions and have systemic positive impacts over and above the provision of finance, the program envisages to drive efficient knowledge management, encompassing the generation of new development-related and sector-specific knowledge, advancing the adoption of global best practices, as well as driving capacity enhancement across stakeholders.

Right from the conceptualisation of the program and through the Maturation Phase there has been emphasis on introducing and strengthening global best practices of project design, implementation, monitoring and evaluation, community engagement, as well as environmental and social safeguards in the program. This is done by the provision of technical assistance to the 12 Smart City SPVs in the program. The experts work with their cities to refine project quality in line with CITIIS principles of participation, integration, and innovation. With a strong emphasis on new strategies for partnerships and collaboration and enhancing institutional capacities for implementing projects, these experts have identified and contributed a vast number of global good practices to address a variety of urban challenges. Apart from the technical assistance, the PMU also takes the lead in disseminating best practices for learning and knowledge transfer.

This resource book comprises 11 good practices in Sustainable Urban Mobility from different regions of the world, shortlisted from an exhaustive inventory (See Annexure I). CITIIS shortlisted good practices for their specific characteristics, aligning with the values propagated by the program:



## **Inclusion**

Projects that targeted infrastructure creation in disadvantaged regions (equity and territorial cohesion), vulnerable communities (service access for all) and for the poorest (financial inclusion).



## **Innovation**

Projects that include measures that apply an approach beyond the common practice on sustainable transportation.



### **Governance**

Projects that target effective sectoral governance (planning, financing, management rules) for operations and maintenance; sound technical choices to boost local economies at a reasonable cost and over the long term.



### **Sustainability**

Projects that were designed to ensure safety and maximise the positive impacts and avoid, mitigate and compensate the negative impacts on the environment and aimed at accelerating the decarbonisation of the sector.



### **Physical Infrastructure Development**

New infrastructure creation, specifically optimisation of traffic flows (traffic management), improvements in quality of service (modernisation of bus and minibus fleets) and developing non-motorised transport modes (pedestrian sidewalks, bicycle lanes).

These good practices have specific characteristics of mobility measures that can effectively support decision makers in a greater uptake of innovative approaches to promote safe, inclusive, resilient, and sustainable mobility systems and are listed below for quick reference:

1. Biking Reforms in São Paulo, Brazil
2. Alwar Vahini (Vehicle): Mini Passenger Public Transport Services, Alwar, India
3. Safe Routes to School Movement, United States of America
4. Ecocabs - Innovative Urban Governance to Achieve Last Mile Connectivity, Fazilka, Punjab
5. Ecobici – Public Bike Sharing System, Mexico City, Mexico
6. hree Wheels United – Financial Inclusion of Auto Rickshaw Drivers, Bangalore, India
7. Mobilise Your City Initiative, Public Utility Vehicle Modernisation Program, Manila, Philippines
8. Electromobility, Shenzhen, China
9. Gender Responsive Urban Mobility – Case of Bogotá, Columbia
10. Reimagining streets through Tactical Urbanism, Coimbatore, India and Jakarta, Indonesia
11. Ensuring Universal Access - Cape Town Public Transport System, South Africa

# Testimonials

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**Hitesh Vaidya**

Director  
NIUA



*In our endeavour to promote sustainable urban infrastructure development, NIUA through the CITIIS program is facilitating the mainstreaming and adoption of good practices across sectors of mobility, public open spaces, social innovation, and urban e-governance. This is the first resource book in a four-part series that aims to share city-level learnings and experiences from a varied nature of mobility projects implemented across the world—ranging from low-carbon mobility solutions at a city-wide scale to provision of non-motorised vehicle fleet for last mile connectivity, and provision of safe and accessible pedestrian infrastructure. I hope that the readers will find it a useful resource on innovative practices and approaches in sustainable urban mobility.*

**Michael R. King**

Founder, Traffic Calmer, New York  
International Mentor – CITIIS program



*To me, sustainable mobility means minimising travel. Cities where you can reach most of your everyday destinations via foot or bike, by definition have sustainable mobility. Credit good land use and urban design. Of course, we want our transport systems to be sustainable, such as e-rickshaws and BRT, but this is merely a matter of technology, which is constantly evolving. The larger question is how society is organised. If the recent pandemic has taught us anything, it is that society can reorganise itself. In the face of climate change, we must organise ourselves so that we are not constantly going back and forth and here and there burning fossil fuels. I hope this resource book inspires your imagination.*

**Pranjali Deshpande**  
Domestic Expert - CITIIS Program  
Independent Consultant, The World Bank



*International and national best practices inspired the cities of Amritsar and Dehradun to thrive their concept idea further into a robust project. Amritsar's RAAHI project deals with informal public transport reforms for which they applied some of the learnings from Fazilka, Alvar, Manila, and Kochi case studies. The case studies and interactions with the experts from these cities helped the team to understand the challenges and mitigation measures behind the reforms process. Dehradun's child-friendly streets initiative is focused around 'walk to school' for which making streets pedestrian and child-friendly are the key objectives. The case studies of Pune, Bengaluru and European cities, as well as dialogues with the experts from Pune helped the team understand street design basics, engineering do's and don'ts and many tips on the participatory process.*

**Naim Keruwala**  
Program Coordinator and Team Lead - CITIIS  
NIUA



*The CITIIS program is underpinned by the core values of sustainability, participation, integration, and innovation in urban development and focuses on rooting capacities and organisational excellence through peer learning and knowledge sharing. This documentation comprises eleven good practices in sustainable urban mobility from around the world and is an effort to encourage the adoption of similar innovations by Indian cities.*

# Mobility - A Driver of Sustainable Urban Development

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## Feature Article

Mobility is a prerequisite for ensuring people's access to employment and basic services and an effective enabler for the local economy. The planning of the mobility of goods and people entails not just the provision of infrastructure and associated services, but an adequate regulatory framework and an enabling institutional environment, for people to benefit from effective, equitable, and sustainable mobility solutions.

Sustainable transport drives sustainable development. While being fundamental to meeting the needs of people in their personal and economic lives, while respecting the ability of future generations to meet their needs. The High-Level Advisory Group on Sustainable Transport, appointed by the UN Secretary General in 2014 defines sustainable transport as *'the provision of services and infrastructure for the mobility of people and goods - advancing economic and social development to benefit today's and future generations—in a manner that is safe, affordable, accessible, efficient, and resilient, while minimising carbon and other emissions and environmental impacts.'*

Transport is not an end in itself, but rather a means of allowing people to access what

they need: jobs, markets, social interaction, education, and a full range of other services and amenities contributing to healthy and fulfilled lives. By adopting the 17 Sustainable Development Goals (SDGs) in 2015, the United Nations Assembly offered a renewed vision of development with a universal and integrated dimension. In this vision, mobility stands out as a key focus area for SDG 11 (Sustainable Cities and Communities) which promotes *'cities and human settlements that are inclusive, resilient, safe and sustainable.'* Four out of 169 SDGs are directly transport related, while 15 are indirectly related to the transport sector (See Chart 1 for details). This shows that though transport does not have a dedicated SDG, it plays a critical role in enabling other SDGs and achieving growth and development. As an example, sustainable transport systems are necessary to provide access to education (SDG 4), food security (SDG 2), employment and empowerment for women (SDG 5), healthcare (SDG 3), and to curtail the global greenhouse gas emissions (SDG 13).

With growing aspiration for mobility, and the strong association between transport and economic growth,<sup>1</sup> there is renewed emphasis on implementing

<sup>1</sup> Calderón, C., and L. Servén 2004. "The effects of Infrastructure Development on Growth and Income Distribution." Washington, D.C.: World Bank. Available at: <https://openknowledge.worldbank.org/bitstream/handle/10986/14136/WPS3400.pdf?sequence=1&isAllowed=y>



Source: Sustainable Mobility for All, Implementing the SDGs. Available at: <https://www.sum4all.org/implementing-sdgs>

efficient solutions to meet the growing aspirations for the mobility of people and goods in a sustainable way. Sustainable transportation has the potential to improve the lives and livelihoods of billions of people—their health, their environment, and their quality of life—and to help minimize the effects of climate change.

Sustainable transport plays a fundamental role in overcoming the social exclusion of vulnerable groups. SDG target 11.2 explicitly calls on the international community to work toward sustainable transport for all people – ‘By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all,

improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.’ It is increasingly recognised by transport authorities, service providers and operators that improvements to the accessibility of the transport system as a whole mean a better quality of transport for all users. Higher quality vehicle design, infrastructure, driver training, information and many other factors contribute to a more equitable system, and, in this way, accessibility is a key element in ensuring the social sustainability of the transport sector.<sup>2</sup>

<sup>2</sup> International Transport Forum, 3-4 March 2016: The Economic Benefits of Improved Accessibility to Transport Systems Roundtable, Paris, France. Available at: [www.itf-oecd.org/economic-benefits-improved-accessibility-transport-systems-roundtable-0](http://www.itf-oecd.org/economic-benefits-improved-accessibility-transport-systems-roundtable-0)

## Global perspectives on sustainable mobility – key attributes

As per the Global Mobility Report 2017, which builds from the findings of the UN Secretary General’s High-Level Advisory Group on Sustainable Transport and the Sustainable Development Goals framework, there are four attributes for mobility to be “sustainable”: equitable, efficient, safe and green. These are global goals, accepted in the International Community while skewed figure.

Equity in transportation could be achieved by ensuring universal access and by accounting for distributional considerations and placing a minimum value on everyone’s individual travel needs.

The optimization of resources (i.e., energy, technology, space, institutions, and regulations) to generate an efficient transport system or network has the potential to achieve efficiency in transportation. Safe transportation systems would ensure avoiding fatalities, injuries, and crashes from transport mishaps across all modes of transport, thus averting public health risks, and social and economic losses associated with unsafe mobility, whereas green mobility options would contribute to address climate change through mitigation and adaptation by reducing both air and noise pollution.

The Global Mobility Report highlights that it is no longer enough for transport to aim at providing “access,” it has now to ensure that this access has all relevant attributes. With the shift to sustainable transport comes a paradigm-shifting focus on people and their quality of life—the concept of access through transport, as well as increased attention to safety and social equity in transport.

The global sectoral goals of achieving sustainable mobility – Inclusivity (Universal Access), Efficiency, Safety, and Green Mobility are multidimensional and elaborately explained in the next few paragraphs.



*Vision for Sustainable Mobility for All*

*Source: Adopted from the Global Mobility Report 2017*

### Inclusive urban mobility

Integrated mobility systems link territories and communities for movement of goods and people across different spatial scales. Such mobility systems have the potential to achieve territorial equity by connecting vulnerable populations with formal markets and trade opportunities. Moreover, by ensuring universal access, especially for women and children, persons with disabilities, and other vulnerable sections of society, sustainable mobility systems have the potential to create strong social links and ensure inclusion of all. Additionally, for mobility options to be sustainable they should be ‘affordable,’ for all. This calls for not only rethinking the fare structure, social policies and targeted subsidies, but also changing the ways in which transport operators function and are remunerated, or even introducing cross-subsidisation between individual and collective transport modes. In addition, the planning of transport infrastructure must involve effective stakeholder engagement right from the beginning that users’ needs are factored in and any negative impacts are anticipated, minimized or mitigated.

### **Green and low carbon mobility systems**

The transport sector produces 28 per cent of global greenhouse gas (GHG) emissions (all sectors and gases combined, equivalent to 6,677 Million Metric Tons of CO<sub>2</sub> in 2018) - the largest share of greenhouse gas emissions.<sup>3</sup> Transport infrastructures have by nature significant impacts on the surrounding environment which need to be evaluated, minimized at the design stage, and reduced or offset according to international best practice. Globally, there are four well known low-carbon mobility solutions that combine four aspects that are key to energy transition of the sector:

**AVOID** motorised trips of goods and passengers by reducing the number of trips (Immediate Intervention)

**SHIFT** trips to low-carbon mobility options (Medium Term Intervention)

**IMPROVE** the energy efficiency of vehicles (Immediate Intervention)

**ENABLE** these actions through effective, integrated and sound governance (Long Term Intervention)

### **Efficient mobility systems**

The efficiency and sustainability of transportation systems depends on technical choices made during the planning of infrastructure systems, the plan for

operations and maintenance, quality of governance, and institutional capacities for carrying out specific studies and for overall project management. The technical and financial capacity of project implementers have to be enhanced to ensure sound technical choices while designing infrastructure, as well as to ensure efficient operation and maintenance for ensuring the longevity of the infrastructure. An efficient institutional framework ensures efficient planning and a sustainable financing system - improved governance through an appropriate regulation.

### **Safe mobility systems**

The safety of transportation systems should be the utmost priority of a project implementation agency right from the conceptualisation stage of the project until its implementation and should be systematically embedded in projects. As an example, ensuring road safety requires knowledge about accident and fatalities data, and thereafter it is a matter of sound technical design, vehicle inspections, and raising commuter awareness to influence individual behaviour on roads. Lastly, a strong political will ensures sustained efforts for ensuring safe transportation systems. In addition, it is extremely important to apply a gendered lens while designing and planning mobility interventions to ensure safe and secure public transport for women.

<sup>3</sup> Sources of Greenhouse Gas Emissions, United States Environmental Protection Agency, 2018. Available at: <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>

## **CITIIS' Commitment to Sustainable Urban Mobility**

CITIIS recognises that there is a growing need for Indian cities to adopt new and fundamentally different pathways to provide clean, cost-effective, and efficient mobility services with the least environmental footprints and impacts on human health. The program recognises that there is a greater need to shift focus from only financing large scale infrastructure, to also finance projects that are less capital intensive but they have strong social and climate-related impacts and at the same time seek to incorporate a "gender" dimension and support for innovation.

CITIIS has financed two sustainable mobility projects to the tune of INR 126.4 crores (15 percent of the total financing in the CITIIS cohort), in the cities of Amritsar and Dehradun focusing on developing a green and sustainable public transportation system as well as ensuring safe commuter routes to schools for children respectively.

### **Amritsar**

**Rejuvenation of Auto Rickshaws in Amritsar through Holistic Interventions (RAAHI), Amritsar by Amritsar Smart City Limited (ASCL)**

Project cost: INR 108.33 crores CITIIS grant: INR 80 crores

The project aims to provide sustainable public transport in Amritsar city by replacing 12,000 old diesel auto rickshaws with e-autos. In addition to this, the project also aims to achieve mobility related, socioeconomic, environmental and institutional reforms, whilst providing better livelihood opportunities for auto drivers and their families. The goal is to provide e-mobility experience to commuters, reduce air pollution, and formalise the Intermediate Public Transport (IPT). Replacement of

diesel autos with e-autos would not only help in realising better mobility within the city, but would also contribute towards improving air quality and socio-economic conditions of the auto-drivers and their family members.

Read in detail about the project here: <https://www.niua.org/citiis/project/development-sustainable-and-green-public-transportation-amritsar-city>

### **Dehradun**

**Child Friendly City Project, Dehradun By Dehradun Smart City Limited (DSCL)**

Project cost: INR 58.00 crores, CITIIS grant: INR 46.4 crores

The Dehradun Child Friendly Project is an initiative to make the commute to schools, parks, and other public spaces safe for children with an emphasis on accessibility and mobility. The foremost goal of this initiative is to include child-friendly design aspects to ease mobility considerations, thereby mainstreaming the needs of school students in the urban policy and planning framework of the city. In a first-of-its-kind initiative, the project looks at co-creation of student's mobility needs in a comprehensive manner across thematic areas of health, safety and security, and mobility. The program aims to stimulate innovation and partnerships between city agencies, line departments, urban policy makers, planners, businesses, and civil society organisations to better address and prioritize children's needs around issues through practical and impactful interventions.

Read in detail about the project here: <https://www.niua.org/citiis/project/child-friendly-commuter-centric-dehradun-smart-city-sustainable-mobility-plan>

## Regional Distribution of Shortlisted Best Practices

### USA

Safe Routes to School Movement  
2005



### Bogota

Gender Responsive Urban Mobility  
2000



### Mexico

Ecobici - Public Bike Sharing System  
2010



### Sao Paulo

Biking Reforms





# São Paulo, Brazil

## *Biking Reforms in São Paulo*



Dedicated cycling tracks established in the city of São Paulo. Photo Credits: Institute for Transportation & Development Policy.

### Key Values:



Governance



Physical  
Infrastructure  
Development

### Summary

Over twelve million inhabitants of São Paulo, the largest city in America, suffered traffic congestion caused by private car ownership, sprawl, and air pollution over the last few decades. As the city's cultural and economic role in Latin America continued to grow, the government of São Paulo changed direction and began to implement policies to put it on a more sustainable development path. Large improvements were made to cycling infrastructure with a new kilometre of bike lanes put in every week with the goal of 400 kilometres by the end of 2015.<sup>1</sup> Alongside bike expansions,

São Paulo expanded bus-only lanes and created a Bus Rapid Transit (BRT) corridor connecting the city's downtown to the southeast region of the city. Improvements were made for pedestrians with increases in sidewalk width in transit corridors. Additional measures such as introducing a new, simple permit system to encourage the proliferation of parklets around the city were ensured through a strong political will and continued community support.

In addition, São Paulo's 16-year Strategic Master Plan approved in 2014. Moreover, to address issues created by the city's

<sup>1</sup> Institute for Transportation & Development Policy. Available at: <https://www.itdp.org/city-transformations/sao-paulo/>

car-centric past, the plan promotes transit-oriented development by imposing regulations. Most impressively, the plan makes São Paulo the first city in the world to eliminate parking minimums city wide, and impose parking maximums along transit corridors – that allow only one parking space per residential unit and levies charges for additional spaces. Not only has this move reduced traffic, but also freed developers from having to build parking. Additionally, by reduction of at least 10 percent in the need for parking, the city has witnessed an improvement in street life and encouraged the use of public transit. In a major development, It formally recognised bicycling as a part of the city’s transportation system – also the focus of this documentation.

### Evolution of a bicycling movement in the city – a result of active civic engagement

Citizen participation in the political process created a positive and vibrant pro-bike culture in the city. To counter the usage of cars which had increased traffic congestion, environmental issues, citizens organised themselves to promote cycling as a better alternative to cars.

The movement was first organised as an egalitarian group called ‘Bicicletada’ that did mass rides, but later grew and started to inspire blogs, websites, NGOs, businesses, and other formal initiatives. The movement provided visibility to bicycling initiatives – bloggers, writers, photographers, professionals, and amateurs, started to write and publish about the growing bicycling culture in the city.

A weekly car free street program (*CicloFaixa de Lazer*) organised in the central neighbourhoods by citizens and other stakeholders, demonstrated the possibility of cycling as an option for transportation for all kinds of people. The event received support from the Institute for Transportation and Development Policy (ITDP),<sup>2</sup> Municipal government and Bradesco bank through sponsorship for promotional items, as well as assistance in building a website that

provides valuable information to citizens.

The establishment of *Ciclocidade*,<sup>3</sup> a formal NGO constituting active cyclists from the city, and advocates of cycling, brought together citizens and advocated for cycling reforms in the city. At the same time, the first bike sharing system was developed in the city and bike stations expanded over a period of time, covering large parts of the city. In order to financially make the projects sustainable, the city government utilized the space along the bike paths for commercial advertisement by collaborating with companies and mural artists.



*Bicicletada group poster that organised mass cycling rides in the city. Photo Credits: Carteles de Barcelona.w*

### Impact of political will

The continuous efforts of citizens for biking reforms had an impact on the mayoral election of 2012, when all major candidates pledged to support bicycle friendly policies and promote new bike infrastructure within the city. The *Ciclocidade* and other organisations presenting the parties with a pro-bike pledge – to ensure commitment on building bike lane networks and preparing a sustainable transport master plan across the city.

<sup>2</sup> Institute for Transportation & Development Policy. Available at: <https://itdpbrasil.org/>

<sup>3</sup> Ciclocidade Website. Available at: <https://www.ciclocidade.org.br/>



Cyclists explore art work situated along bike tours organised within the city.  
Photo Credits: Urban Bike SP team, Street Art and Parks Bike Tour

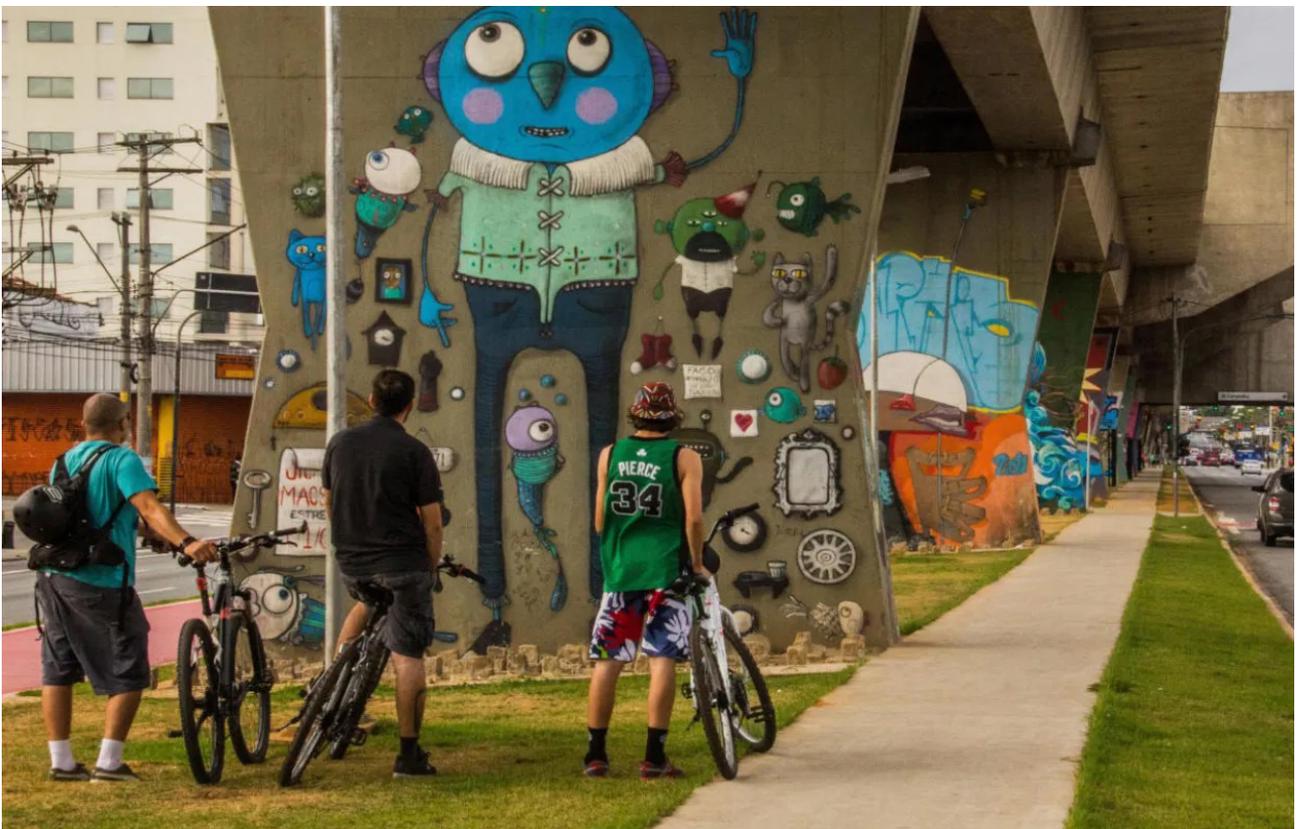


Photo Credits: Urban Bike SP team, Street Art and Parks Bike Tour

## Implementation and expansion of biking infrastructure

By 2014, more than 110 kilometres of bike lanes were constructed. In addition, the government also planned investments in support infrastructure, such as building docking stations and launch of bike sharing projects. Currently, Bike Sampa, a docked public bike-sharing system, provides seamless integration with the city's Bus Rapid Transit System. The system has 260 stations with around 2600 bikes across the city.<sup>4</sup> Startups such as Yellow, Tembici<sup>5</sup> and Bikxi<sup>6</sup> offer bike-driven ride services within the city along with development of dockless programs and bike sharing projects in Sao Paulo.

## Impact

With São Paulo's 320 new kilometres of exclusive bus lanes, public transit is faster

and more efficient. Average travel time for passengers on these routes has decreased 18.4 per cent as speeds have increased from 13.8 to 16.8 kilometres per hour. It is estimated that these improvements have reduced carbon dioxide emissions to 1.9 tons/day.<sup>7</sup> A survey among Bikxi users showed that most (59 per cent) use the service to commute, and without Bikxi, at least 36 percent would have used a car instead (private, taxi or on-demand like Uber).<sup>8</sup> As the perception of biking continues to evolve with new innovations in support infrastructure, some definite outcomes include a better quality of life for citizens, less congestion on streets, and more efficient cities.

## Lessons learnt

Sao Paulo's path to winning the Sustainable Transit Award in 2014 is a study in the importance of an active and engaged



Dedicated bicycle lanes set up on major arterial streets inside the city. Picture Credit: Institute for Transportation & Development Policy.

- 4 Pacheco, P; Batista, B. Bike Sharing Is Now a Viable Commuting Choice in São Paulo and Porto Alegre. The City Fix. March 2019. Available at: <https://thecityfix.com/blog/bike-sharing-now-viable-commuting-choice-sao-paulo-porto-alegre-priscila-pacheco-bruno-batista/>
- 5 Tembici. Available at: <https://tembici.com.br/>
- 6 Bikxi. Available at: <https://bikxi.com.br/>
- 7 2015 Sustainable Transport Award Finalist: São Paulo, Brazil, Institute for Transportation & Development Policy, January 2015. Available at: <https://www.itdp.org/2015/01/06/2015-sustainable-transport-award-finalist-sao-paulo-brazil/>
- 8 Pacheco, P; Batista, B. Bike Sharing Is Now a Viable Commuting Choice in São Paulo and Porto Alegre. The City Fix. March 2019. Available at: <https://thecityfix.com/blog/bike-sharing-now-viable-commuting-choice-sao-paulo-porto-alegre-priscila-pacheco-bruno-batista/>



*Bikxi, a startup within the city that offers bike-driven services. Photo credits: Joana Oliveira/WRI Brasil*



*Dedicated bike cycle lanes within the city. Photo Credits: Institute for Transportation & Development Policy*

citizenry as much as the astounding speed and breadth of improvements. A strong movement that claimed the importance of bicycle-friendly policies drove political will to timely implement projects. With a precedent of city initiatives and strong civic organizations in the city, Sao Paulo's example shows that citizenship and active participation of citizens embodies strong spatial dimensions and can inform policies and projects, and give citizens a legitimate claim on urban space.

# Alwar, India

## Alwar Vahini : Mini Passenger Public Transport Services



Fleet of Alwar Vahini vehicles during launch of the model in 2011. Photo Credits: Presentation by Pednekar, A.T., IAS, Collector, Udaipur-Rajasthan, Transforming Urban & Rural Transport – The Alwar Vahini Story

### Summary

The case of the privately funded Alwar Vahini (Vehicle) model in the state of Rajasthan, India, provided for an innovative Intermediate Public Transport (IPT) system. Implemented in 2011, the project aimed at replacing the old and polluting three-wheeler vehicles with ones that comply with Euro IV norms.<sup>1</sup> Launched with the idea of reducing congestion on roads caused by private vehicles, the project was a joint effort of several organisations, including the Regional Transport Office, a leading

National Indian Bank, Urban Improvement Trusts in Alwar and Bhiwadi, and Deputy Registrar Cooperatives, with each agency having a specific and distinct role in the project. The project was privately funded, with the District Administration playing a coordination and facilitation role. Designed on a model of **'minimum investment and maximum return,'** this project helped in transforming the public transportation sector in the city with minimum investment, while at the same time created jobs and provided last mile connectivity to people at large.

#### Key Values:



Inclusion



Innovation



Sustainability

<sup>1</sup> Euro emission standards define the limits of exhaust emissions from all types of vehicles.



Alwar Vahini vehicles inducted in city's intermediate public transport after the launch. Photo Credits: AlwarVahini, Facebook Page

### Formalisation of public transport

The project provided an opportunity to auto rickshaw drivers, already a part of the transport sector in Alwar, to exchange their old *vikrams* (three-wheeler autos) and upgrade to a newer and better means of transport. In a span of one year, over 720 vehicles were exchanged and scrapped under the project.<sup>2</sup> The process was incentivised for the rickshaw owners by offering them loan facilities at reduced interest rates from nationalised banks and financial institutions for the easy purchase of the new vehicles.

### Institutional arrangements—project financing and implementation

The first intervention within the *Alwar Vahini* scheme was to persuade three-wheeler auto drivers to shift from old vehicles to new Euro IV compliant Tata Magic and

Mahindra Maximo vehicles. To implement this, private automobile companies Tata and Mahindra, offered an exchange scheme, offering a discount of INR 45,000 for exchange of old vehicles with new Euro IV compliant vehicles. The project was financed by the Punjab National Bank, that offered a payback period of five years and interest rate of 14.25 per cent without any collateral amount for the loans taken to purchase the new vehicles. Under the Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE),<sup>3</sup> the State Government acted as the guarantor for those who applied for the loan under the scheme. The coming together of the bank, companies, state government, and auto drivers generated financial and trust within all the stakeholders. Moreover, the district administration through a consultative approach with auto unions, agreed to give preference to existing auto drivers in issuing permits and persuaded

2 Ghate, A.T; Singh, S.; Wilson, S.; Kumar, M. 2018. Taking Alwar for a ride: Mini passenger public transport service in Alwar. The Energy and Resources Institute (TERI). Available at: <https://www.teriin.org/case-studies/taking-alwar-ride-mini-passenger-public-transport-service-alwar>

3 The Credit Guarantee Fund Scheme for Micro and Small Enterprises (CGS) was launched by the Government of India (GoI) to make available collateral-free credit to the micro and small enterprise sector.



*Alwar Vahini drivers participating in the skill development programmes organised as part of the model. Photo Credits: AlwarVahini, Facebook Page*

them to shift towards adopting new vehicles. In April 2013, the total of *Alwar Vahini* vehicles was reported as 1,310, with an estimated increase to around 2,200 over the future course of implementation of the scheme.<sup>4</sup>

### Creation of adequate support infrastructure

In order to enhance the performance of the new vehicles, the Urban Improvement Trust of Alwar developed support infrastructure such as constructing new bus stands, redesigning roundabouts and junctions, constructing an advanced police control room and installing closed circuit television (CCTV) cameras for traffic monitoring. As part of route rationalisation, a fixed number of vehicles were allowed to run on different routes such that each vehicle owner gets an opportunity to ply the vehicle. The Regional Transport Office (RTO) issued permits based on the route rationalisation and ensured no bunching of vehicles takes

place at a particular location. A union was formed for each route to constantly monitor the movement of vehicles and maintain a constant frequency of five minutes. This led to optimum utilisation of resources and integration with other modes of public transport available within the city.

### Identity and branding

*Alwar Vahini* vehicles were pasted with stickers and painted in different colours based on the routes they follow to give a brand name and recognition from the people. Three types of *Alwar Vahini* services were started: *Sheher Alwar Vahini* vehicles operating within the city, *Gramin Alwar Vahini* - vehicles operating between city and nearby villages and *Mahila Alwar Vahini* - vehicles exclusively for women. Painted in attractive colours, every *Alwar Vahini* has a unique number prominently displayed on the exterior, which helps in easy identification in case of traffic violation.

<sup>4</sup> Transforming Urban and Rural Transport - The Alwar Vahini, Letter to Chief Secretaries of all States by the OSD Urban Transport, dated. 14 January 2013. Available at: [http://mohua.gov.in/upload/uploadfiles/files/Advisory\\_Follow\\_Alwar\\_Vahini.pdf](http://mohua.gov.in/upload/uploadfiles/files/Advisory_Follow_Alwar_Vahini.pdf)



Awareness generation and personality development workshop organised for Alwar Vahini drivers. Photo Credits: AlwarVahini, Facebook Page



Mahila Alwar Vahini vehicle, reserved exclusively for women was also launched. Photo Credits: Presentation by Pednekar, A.T., IAS, Collector, Udaipur-Rajasthan, Transforming Urban & Rural Transport – The Alwar Vahini Story

## Investments in skill upgradation

A cooperative society of all the Alwar Vahini owners was formed to help avail their rights and organise as a collective group. The society formed to organise them together, put forth their demands and avail their rights, ensured social security and a collective feeling of belonging to a unique group which serves the mobility needs of the city. The owners of *Alwar Vahini* were provided with free medical check-ups and insurance cover. The Urban Improvement Trust and the urban local body collaborated with an NGO for soft skill development of the drivers. As part of skill development, focus was given on driver behaviour and etiquettes, and drivers were advised to keep their vehicles clean, follow uniform dress code, and welcome passengers respectfully.

## Gender mainstreaming through the project

In 2012, *Mahila Alwar Vahini* was launched to provide livelihood to women and provide secure travel options to women commuters. The vehicles under the scheme are specially designed with red colour and a women driver to allow easy identification and safe commute for women.

## Impact

The scheme has been instrumental in transforming and solving the intermobility needs of Alwar City by providing a safe, comfortable, accessible, and affordable public transport system within the city. It has employed more than 3,000 persons directly and many more indirectly. The scheme has led to people opting for public mode of transport rather than private vehicles. Vehicle exchange programme policy has led to reduction in pollution levels within the city.

## Lessons learnt

The Alwar model can be adopted by small and medium sized cities which need to increase their public transportation systems, and reduce reliance on private vehicles. The project is significant as it took only four months from concept to project realisation phase. Taking into mind the financial constraint of municipal bodies in Tier I and II cities in India, the model provides an example of how private funds can be utilised to create a modern, safe, comfortable and self-sustainable public transport system in India. What has served to be an impressive intervention in Alwar Vahini is, mainstreaming gender concerns and providing safe, secure and economical public transport systems. There lies a great opportunity to study the Alwar Vahini model and replicate a similar strategy in small and medium towns of India that remain dependent on Intermediate Public Transport for most of the commute.

# United States of America

## *Safe Routes to School Movement*



*Movement focused specifically on school going children and promote a healthy lifestyle. Photo Credits: Safe Routes, National Center for Safe Routes to School.*

### Key Values:



Inclusion



Governance

### Summary

The Safe Routes to School (SRTS) concept began in 1970s in Denmark with a focus on improving the safety of children walking and going to school. Since its inception, the concept has spread to other countries in Europe, Australia, New Zealand, and Canada. In the United States of America (USA), the concept was adopted as a Safe Routes of School movement in 2005 as a response to the increasing obesity rates in children due to reduced walking, play, and cycling. The movement was manifested on the ground through implementation of different programs initiated across states in the United States of America (USA). After fifteen years of its launch, the movement has evolved in its structure and grown in scale, and has been implemented across various cities in the world. The movement aims to create a cultural change regarding

transportation and build enthusiasm and support among families, teachers, school administrators, and local government officials towards promoting physical activity and build healthy life habits by adopting cycling and walking as means of commuting. The movement focused on creating infrastructure for walking and cycling as well as enhancing behaviour among children, bus drivers, and parents.

Through the SRTS concept emphasis was laid on creating physical improvements on streets for ensuring safe walkable streets to school, and in addition on educating students about the benefits of walking and cycling. The design of the program emphasised on planning approaches that lead to equitable outcomes, generating enthusiasm among students through events and activities, deterring unsafe

traffic behaviour and ensuring that benefits of the project reach all sections of society. The nature of interventions in the program were varied. Some projects focused on improvements in a single school while others took a regional approach to facilitate walking and bicycling from school to school and between districts. This has resulted in revolutionising transportation culture and has encouraged communities to adopt safe, secure and healthy modes of commuting.

### Adopting the Safe Systems Approach and Vision Zero

Safe system is an evidence-based approach on sustainable mobility focusing on infrastructure, vehicle regulation and speed limits designed to protect all road users. The approach embraces multi-modal transportation for better safety and environmental sustainability.

Vision Zero is a traffic safety policy, developed in Sweden in late 1990s and build on four critical components: ethics, responsibility, philosophy of safety, and creating mechanisms for change. In Vision Zero, the providers and enforcers of the road transport system are responsible to citizens and must guarantee their safety in the long term.

### Building blocks of the program

The Safe Routes to School movement is built on a number of key elements that has made it possible to reach out to maximum students and ensure its greater longevity and sustainability. With almost 70 per cent of the programs having a full time or part time coordinator, a dedicated task force, and advisory team is one of the important elements of the program. State or federal grants with TAP funding and local funds provided a stable and long-term financing for the projects.

### Evolution of the program

The Safe Routes of School movement evolved over a period of 15 years (2005-2020). The sustainability of the program was ensured through a dynamic funding mechanism, enabled by the three transportation bills. As a part of the first phase of the movement spanning between 2005 and 2012, *SAFETEA-LU* (Safe, Accountable, Flexible, Efficient Transportation Equity Act—A Legacy for Use)<sup>1</sup> was enacted that provided grants to the tune of USD 1 billion to all states for creation of SRTS infrastructure, including non-infrastructure grants to local schools and communities. Infrastructure projects included improving streets and routes, such as sidewalks, bike lanes, trails, lane narrowing, crosswalks, and other intersection improvements to



Children participating in cycling rides as part of the safe rides' movement in Michigan. Photo Credits: Safe Routes to School.

<sup>1</sup> Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) Extension Acts, Legislation, Federal Highway Administration, U.S. Department of Transportation. Available at: <https://www.fhwa.dot.gov/safetealu/legis.htm>



*A bike train where a group of children and adult leaders ride together to school.  
Photo Credits: City of Phoenix, Safe Routes to School Programs.*

enable universal access and safety. The program adopted an integrated approach by including non-infrastructure projects components, such as education, and enforcement programs for students and teachers, to inform them about safe walking and bicycling. The non-infrastructure components, included teaching students safe walking skills, sensitising bus drivers about improved driver behaviours, and activities to get more kids and families walking. Each state that participated in the SRTS had a state-level SRTS coordinator under their respective department of transportation.

As part of the second phase spanning between 2012 and 2015, MAP-21 (Moving Ahead for Progress in the 21st Century Act)<sup>2</sup> was enacted. The Act eliminated the stand-alone federal funding stream for SRTS and integrated the federal SRTS program and other bicycling and walking programs into

the Transportation Alternatives Program (TAP).

As part of the third phase spanning between 2015 and 2020, the program witnessed the enactment of the FAST Act (Fixing America's Surface Transportation Act),<sup>3</sup> retaining most of the provisions of the preceding legislation, with addition of a few provisions, such as making non-profits eligible for the funding and modestly increasing the total amount of TAP funding per year.

### **Ensuring a participatory design approach**

Innovative participatory mechanisms were deployed to ensure better participation across different levels - between authorities and department, between project implementer and the primary stakeholders i.e., the school committees, and students.

<sup>2</sup> Moving Ahead for Progress in the 21st Century, Federal Highway Administration, U.S. Department of Transportation. Available at: <https://www.fhwa.dot.gov/map21/>

<sup>3</sup> Fixing America's Surface Transportation Act or "FAST Act", Federal Highway Administration, U.S. Department of Transportation. Available at: <https://www.fhwa.dot.gov/fastact/>



*A walking school bus where a group of children walk to school with one or more adults.  
Photo Credits: City of Phoenix, Safe Routes to School Programs.*

The program teams across different states conducted activities to generate enthusiasm and engage students to walk or bicycle to school. Effective communications and outreach activities such as organising events like a ‘walk to school day’ and ‘bike to school day’, walking school bus or bike train where group of kids walk or bicycle to school together accompanied by one or more adults, bike skills clinic, walk audits and educating drivers about student safety ensured an outcome-oriented approach.

### **Rooting the program objectives in principles of inclusion and equity**

One of the criteria used for selection of schools under the SRTS initiative was using economic data to prioritise low-income schools or students. 68 per cent of the schools that received funding under Safe Routes to School are schools attended by children belonging to low-

income families. This was done to ensure greater equity and minimise the disparities between different students and schools. Some of the programs focussed on targeted outreach to ensure inclusion of students with disabilities, immigrants, girls or nonbinary students, refugees and low-income communities. As an example, the activities were conducted in multiple languages by partnering with organisations such as the Hispanic<sup>4</sup> Parent Teacher Association (PTA), Special Education PTA and school-based clubs. Girls in Gear (GIG) is a girls-specific program, implemented in Ohio, to empower adolescent girls (aged 9-15) by building confidence and self-reliance to encourage bicycle riding, public speaking and provide safe spaces. The efforts employed under these programs were creative, intensive, specialised so as to ensure maximum inclusion of albeit excluded communities.

<sup>4</sup> Hispanic refers to people who speak Spanish or who are descendants of those from Spanish-speaking countries.



Parents using dedicated walkways to drop their children to school. Photo Credits: Safe Routes Partnership, Facebook Account.

### Impact

The Safe Routes to School programme has been instrumental in creating a conducive atmosphere for children to walk and bicycle. The rate of student active travel to school is 32.4 percent in schools participating in Safe Routes to School programs compared to 20.2 percent in schools not participating in Safe Routes to School programs. The programme has successfully adopted sound financial mechanisms and equity principles to ensure better sustainability and inclusivity among low-income communities in the long term. The initiative has helped to develop healthy habits, reduce long term societal costs of chronic

lifestyle diseases, address climate change and make cycling and walking fun for students. An amount of USD 230 million is estimated to be saved in long-term health care costs due to injury prevention and additional USD 800 million- USD 1.2 billion in busing and driving costs. SRTS led to an increase in walking and bicycling to school between 31 and 43 percent,<sup>5</sup> and reductions in pedestrian injuries of 44 per cent<sup>6</sup> across the programs implemented in various states. The program resulted in 33 to 44 per cent decline in pedestrian injury among school children in areas with Safe Routes to School projects.

5 Noreen McDonald, Ruth Steiner, Chanam Lee, Tori Rhoulac Smith, Xuemei Zhu and Yizhao Yang, "Impact of the Safe Routes to School Program on Walking and Bicycling," 2014, Journal of the American Planning Association. Vol 80, Iss 2, p 153-167.

Orion Stewart, Anne Vernez Moudon, and Charlotte Claybrooke, "Multistate Evaluation of Safe Routes to School Programs," American Journal of Health Promotion, January/ February 2014, Vol. 28, No. sp3, pp. S89-S96.

6 DiMaggio, C. and Li, G., "Effectiveness of a Safe Routes to School program in preventing school-aged pedestrian injury," 2013, Pediatrics, 131 (2), pp. 290-296

## Lessons learnt

The diverse set of programs implemented under the pan SRTS movement across rural, suburban and urban areas provides a tremendous potential to expand the movement in other parts of the world. The inclusive active transportation program with targeted approach towards children can help developing countries to take a

pro-active approach towards addressing mobility issues surrounding children. The decentralised approach adopted through legal and policy measures by collaborating with local level government, teachers and schools is helping children develop healthy habits, reducing societal costs of diabetes, address climate change and create vibrant communities.

# Fazilka, Punjab

## *Ecocabs, Fazilka - Innovative Urban Governance to Achieve Last Mile Connectivity*



A rickshaw puller riding an 'Eco-cab' provided by Graduates Welfare Association, Fazilka. Photo Credits: Navdeep Asija

### Key Values:



Inclusion



Innovation



Sustainability



Physical Infrastructure Development

### Summary

Ecocabs project was launched in 2008 by the Graduates Welfare Association (an NGO dedicated to education, employment, environment and energy) in Fazilka, Punjab. Inspired by the Gandhian vision on sustainability of developing ultra-low-cost products for the world's poorest citizens while creating a profit and achieving sustainability, the project promotes fundamental principles of urban mobility such as accessibility, and quality of service, and inclusive technological intervention to enhance the overall quality of life. The project was a response to some

of the problems faced by cycle rickshaw operations in the city, such as unorganised network, unregulated tariff, poor quality of rickshaws, poor health, financial condition of the cycle rickshaw pullers, and high rate of interest financing offered to rickshaw pullers by local men and poor accessibility to residential areas as compared to other modes of intermediate public transport. The Ecocabs project aimed at organising and improving the old cycle rickshaw operations using modern, technological, and scientific management tools for promoting the cycle rickshaw as a sustainable mode of paratransit to act as a feeder to mass rapid

transit system in the city. Also, the project aimed at achieving the broad objective of achieving low carbon mobility at the city level. Since its inception, the project has positively impacted the lives of rickshaw pullers and has been instrumental in employment generation. The project proved to be a success and has been replicated in 21 other cities in the Indian state of Punjab. In 2011, Fazilka Ecocabs won the National Award for Excellence in Non-Motor Transport from the Ministry of Urban Development, Government of India. The project has also received international attention and was one of the 15 finalists for the SMART Mobility Enterprise.

### Ensuring efficient last mile connectivity

The Fazilka Ecocabs project is based on a sound and intelligent transportation system. The cycle rickshaw service is made available at one's doorstep by initiating the 'dial a rickshaw' facility. This facility comprises an integrated network of call centres that connect to the rickshaw pullers. The implementation was made possible by dividing the city into nine different zones with a distinct dial up code for each zone. Depending on the zone where the dialler is situated, the cycle rickshaw reaches the desired location within 15 minutes. The local government provides the infrastructural support to the organisation by setting up 'Ecocab stands' at different locations identified within the

particular zones of the city.

The Bharat Sanchar Nigam Limited (BSNL) sponsored prepaid phone connections to Ecocabs operators. The support from BSNL helped Ecocab operators to connect to each other free of cost. The association has developed an android app named 'Fazilka Ecocabs,' providing details on calling numbers, zone code, location of cycle rickshaw stands and other services. The web portal developed by the organisation regularly keep updates on the database management of rickshaw pullers, online registration for new entrants and other resources for customers. The QR code technology deployed by the organisation on ID cards of cycle rickshaw pullers provides easy communication for future usage of customer.

### Technological innovation

The first phase of the project focussed on improving the accessibility and quality of rickshaw operations. In the second phase of the project, new cycle rickshaws, including models called Femto and Nano, are designed based on ergonomic principles to offer universal accessibility. This includes introducing a light weight, low-floor cycle rickshaw, along with provision of facilities such as water, magazine, and extra luggage space for the passenger. Utilising the extra space for commercial advertisement helps the rickshaw pullers to earn additional revenue.

फ़ाज़िल्का ज़ोन-परिचय	ज़ोन	ज़ोन को फ़ोन करने वाली चौक/पार्क/सड़क चौक
फ़ाज़िल्का उत्तर-पश्चिम	ज़ोन 100	डा. विजय स्वामी चौक/शास्त्री चौक
फ़ाज़िल्का उत्तर-पूर्व	ज़ोन 200	मुख्य बस अड्डा
फ़ाज़िल्का उत्तर	ज़ोन 300	मलोट चौक
फ़ाज़िल्का उत्तर-मध्य	ज़ोन 400	वॉटर चौक
फ़ाज़िल्का उत्तर-दक्षिण	ज़ोन 500	वाण बाजार
फ़ाज़िल्का मध्य	ज़ोन 600	महाराज रोड
फ़ाज़िल्का मध्य-पूर्व	ज़ोन 700	संजीव सिनेमा चौक
फ़ाज़िल्का दक्षिण-पश्चिम	ज़ोन 800	मिन्नी सैकर्ट्री/एट/एट युजीयल
फ़ाज़िल्का दक्षिण-पूर्व	ज़ोन 900	महाराज अग्रसेन चौक

पहन लुगु पाट्टी धिटा भाटा परत भगु । दिवसु राति दुदि दारि दारिआ धेले मराल मरगु ।।

अतिथि देवो भवः

**Fazilka ECOCABS**  
समृद्धि पुरस्कृत से सम्मानित सेवा

अतिथि देवो भवः

घर बैठे-बैठे रिक्षा मंगवाने के लिए क्षेत्र अनुसार निम्नलिखित नम्बरों पर सम्पर्क करें

फ़ाज़िल्का उत्तर-पश्चिम <b>95309-98100</b> डा. विजय स्वामी चौक/शास्त्री चौक	फ़ाज़िल्का उत्तर <b>95309-98200</b> मुख्य बस अड्डा	फ़ाज़िल्का उत्तर-पूर्व <b>95309-98300</b> मलोट चौक
फ़ाज़िल्का पश्चिम <b>95309-98400</b> वाण बाजार	फ़ाज़िल्का मध्य <b>95309-98500</b> महाराज रोड	फ़ाज़िल्का पूर्व <b>95309-98600</b> संजीव सिनेमा चौक
फ़ाज़िल्का दक्षिण-पश्चिम <b>95309-98700</b> मुल्तानी चुंगी	फ़ाज़िल्का दक्षिण <b>95309-98800</b> महाराज अग्रसेन चौक	फ़ाज़िल्का दक्षिण-पूर्व <b>95309-98900</b> मिन्नी सैकर्ट्री/एट/एट युजीयल

सुझाव व शिकायत के लिए SMS करें **95309-98999**

[www.ecocabs.org](http://www.ecocabs.org)

A brochure prepared by Graduates Welfare Association to book a rickshaw for different zones within the city.

Photo Credits: Navdeep Asija



Annual family trips organised for Fazilka Ecocabs drivers and team. Photo Credits: Goyal, V.; Asija, N.

### Inclusive financial model

One of the success pillars of the Ecocabs projects is its financing model. The project allows each rickshaw puller to become a stakeholder in the project at an initial capital cost of INR 10,000. The rickshaw puller can avail a loan at a low annual rate of interest of 4 per cent under the Reserve Bank of India's differential rate of interest scheme, without any guarantee from any nationalised bank. Other financial schemes included distribution of district innovation funds by Ministry of Finance and additional revenue from advertisement. With daily instalments of INR 20 per day (which is less than what rickshaw-pullers pay to rent a rickshaw) and along with additional advertisement revenues, the scheme allows the rickshaw-pullers to reach the breakeven point within 10–12 months.<sup>1</sup> To be a part of the scheme, rickshaw pullers are first awarded temporary membership of the association for 30 days. After 30 days, the seven-member Ecocab management committee provides a permanent membership to rickshaw pullers under which they can avail benefits.<sup>2</sup>

Apart from generating a constant source of income, the Ecocab operators are provided with social benefits, including free accidental insurance up to INR 50,000, free health check-ups, discounted medicines, free legal aid and assistance from policemen, and education benefits for children. In addition, the Ecocab operators can also avail microcredit and finance schemes run by the leading public banks in India. The project helped increase the latent demand for cycle rickshaws and has contributed towards improved well-being of rickshaw pullers and their families. The association organised annual family trips for families of Ecocabs operators and runs Ecocabs canteen for operators to provide hygienic food at an affordable price.

### Impact

Ecocab project has successfully organised rickshaw pullers into a formal integrated public transport system and provides affordable mobility choices for the city residents. The project increased the demand for cycle rickshaw in the city and has been transformational in providing a

1 Asija, N., Fazilka Ecocabs: First "Dial-a-Rickshaw" facility (India), October 2012. Presentation available at: [http://www.codatu.org/wp-content/uploads/ASIJA-Fazilka-Ecocabs\\_World%E2%80%99s-First-Dial-a-Rickshaw-Service\\_CODATU.pdf](http://www.codatu.org/wp-content/uploads/ASIJA-Fazilka-Ecocabs_World%E2%80%99s-First-Dial-a-Rickshaw-Service_CODATU.pdf)  
 2 SUM Net India, Sustainable Urban Mobility Network in India. Available at: <https://sumnetindia.wordpress.com/2011/10/30/ecocabs-in-fazilka/>



Rickshaw pullers waiting at Ecocabs stand for clients. Photo Credits: Navdeep Asija

dignified employment to cycle rickshaw pullers. As reported by the Graduate Welfare Association, the scheme has generated employment for about three lakh families in Fazilka.<sup>3</sup> The project has led to significant carbon footprint reduction in the city. It is estimated that one Ecocab saves around 2.07 tonnes of carbon dioxide annually and over 1,000 litres of petrol daily.<sup>4</sup> The total earning calculated at a rate of 13 €/Per Ton of Carbon Credit is 9419€.

Ecocabs has provided a reliable, accessible and comfortable mode of intermediate transport for the residents, especially senior citizens and women.

### Lessons Learnt

Ecocabs is a case of successful branding and repositioning of green transport and provides an innovative model of restructuring the intermediate public transport across cities in India. The project demonstrates the successful integration of Non-motorised transport within the city's formal transport system. The integration helped to meet the transport demand in the city in a sustainable manner and improve financial status of drivers who otherwise fail to secure their livelihood in the city. Thus, the replicability of the model in emerging cities of India needs to be explored in order to have a green and sustainable mobility options.

3 Pant, P., Fazilka Ecocabs Offers New Paradigm for Non-Motorized Transport in Indian Cities, The City Fix, 2012. Available at: <https://thecityfix.com/blog/fazilka-ecocabs-offers-new-paradigm-for-non-motorized-transport-in-indian-cities/>

4 Asija, N., Fazilka Ecocabs: First "Dial-a-Rickshaw" facility (India), October 2012. Presentation available at: [http://www.codatu.org/wp-content/uploads/ASIJA-Fazilka-Ecocabs\\_World%E2%80%99s-First-Dial-a-Rickshaw-Service\\_CODATU.pdf](http://www.codatu.org/wp-content/uploads/ASIJA-Fazilka-Ecocabs_World%E2%80%99s-First-Dial-a-Rickshaw-Service_CODATU.pdf)

# Mexico City, Mexico

## *Ecobici – Public Bike Sharing System*



People participating in large numbers for mass cycling rides in Mexico City. Photo Credits: Archivo.Ciudad de Mexico(CDMX)

### Key Values:



Innovation



Governance



Physical  
Infrastructure  
Development

### Summary

*Ecobici* is a global best practice and considered the most successful public bike sharing systems, implemented to transform urban mobility in Mexico City. Introduced in 2010, the project is part of the many mobility initiatives implemented across Mexico City with the objective of providing an affordable, efficient, sustainable, and flexible mode of transport.

The project, which commenced with the provision of 1,000 bicycles and 85 docking stations had expanded to over 446 docking stations and 6,000 bicycles by 2017.<sup>1</sup> In May 2019, *Ecobici* had registered a total of over 60 million rides since the project commenced and has shown positive environmental outcomes at the city level. The implementation of the project led to increase in the usage of bicycles,

<sup>1</sup> Figueres, N.V.R., What can the rest of the world learn from Mexico City's *Ecobici* bike-sharing scheme, London School of Economics International Development Blog, December 2017. Available at: <https://blogs.lse.ac.uk/latamcaribbean/2017/12/20/what-can-the-rest-of-the-world-learn-from-mexico-citys-ecobici-bike-sharing-scheme/>

and contributed to reducing the carbon dioxide emissions by 2,267 tons in the first five years. The key factors behind the success of *Ecobici* include its affordability, improved accessibility to public transport, and increased convenience in commute. Owing to the success of the project, it is being replicated in Mexico's second-largest city of Guadalajara and has been replicated in other Latin American cities as well. The project won the Ciclociudades (Cyclecities) Award in 2013 and the Global Model of Urban Renovation Award for creating mass bicycle parking in public transport in year 2017.

## The design process

Opening a space for bicycles in a megacity like Mexico City was a complicated process requiring the construction of social consensus, which would on the one hand endorse the decision, and on the other, win over the first users of an alternative that formerly was only used by a small number of urban cyclists. In the backdrop of increasing air pollution, traffic congestion,

private car users, and safety concerns, the Green Plan for Mexico City was introduced in 2007, with a focus on improving mobility and air quality. The plan recognised bicycling as a form of alternative transport to increase accessibility and reduce congestion in the city. To sensitise the society regarding use of bicycles, a program called *Muévete en Bici* (Move on a Bike)<sup>2</sup> was implemented on a prominent street within the city by reserving it exclusively for pedestrians, cyclists and people using other non-motorised transport on Sundays. The program created a massive change in the mobility patterns of the city by bringing different sections of people together, united by a single aim of promoting cycling in the city.

The system's planning period comprised of almost two years of study, reflection, design and creativity and was very important for the analysis of all the facets that the introduction of a new form of transport. This process included the participation of international experts, the staff of the Department of the Environment, as well as



*Bicycles available under the Ecobici bike sharing system within Mexico City. Photo Credits: Mariordo, Ecobici docking station 27 at Paseo de la Reforma, Mexico City, 2014.*

<sup>2</sup> Ward, D., *Muévete en Bici – Cycling in México*, Cycling West, Cycling Utah, April 2019. Available at: <http://www.cyclingutah.com/columns/speaking-of-spokes/muevete-en-bici-cycling-in-mexico/> Gehl, Denmark. Available at: <https://gehlpeople.com/>



As part of the ECOBICI bike sharing program, citizens can avail park and ride bicycle facility across different locations within the city.  
Photo Credits: Mariordo, Ecobici docking station 27 at Paseo de la Reforma, Mexico City, 2014.

the city government's finance and planning departments. Out of the many stakeholders brought on board for the project, Mexico City's Ministry of Environment responsible for developing cycling initiatives, took expert advice from Gehl – a company that implemented cycling initiatives across Denmark and other western regions, on creating cycling opportunities on streets and provisioning for adequate infrastructure. The Copenhagen Cycling Laboratory conducted a master class with representatives from the city and other prominent stakeholders. This provided a background and awareness on introducing a public bike sharing system within Mexico City.

### Launch of the project

Ecobici was introduced in 2010 as a bike sharing system that offered a flexible transport service for commuters. The project involved planning a dense network of cycle rental stations where users can take and return a cycle at any station part of the system by paying nominal charges. Dedicated bike lanes were created

throughout the city to ensure the safety of riders. The cycling network complimented the public transportation system available within the city through easy transfers between different modes of transport.

### Operations and maintenance

For efficient operations and maintenance of the created infrastructure and assets, a public-private model with street advertising was decided through an international bidding competition held for selecting the operating company, as practiced in Barcelona or Paris. The city government purchased assets for provision of bicycle stations, bicycles, and spare parts. The private company, Clear Channel Outdoors took the responsibility of operating the bike sharing system. The company operated the system with high tech software offering the possibility of paying for part of the maintenance costs with resources from a street advertisement concession. The financial model adopted in Mexico consisted of a government contribution of public funds combined with the concession of 150 outdoor advertising clocks (for



As part of the ECOBICI bike sharing program, citizens can avail park and ride bicycle facility across different locations within the city.  
Photo Credits: Mariordo, Ecobici docking station 27 at Paseo de la Reforma, Mexico City, 2014.

Phase I) and eight publicity screens (for Phase II) which pay for 25 per cent of the operation. The 400-peso monthly user fee also helped to cover the cost of the system. The adoption of mixed service model provided an advantage of the company's experience in other cities of the world, state-of-the-art technological development, ongoing innovation, and not depending on yearly public funding fluctuations.

### Provision of support infrastructure to ensure user safety

Bicycle lane network was created around the city to facilitate mobility, comfort, and safety of cyclists. By 2012, under different initiatives, Mexico City had built around 100 miles of bike paths within the city.<sup>3</sup> To keep a check on bicycle theft and achieve lowest rates of theft incidents, it was made compulsory for users to provide a debit card, credit card or telephone bill as a security instrument to access the

system. The focus of the project was on developing appropriate bicycle signage, implementing measures for slowing down traffic in the area, implementing an extensive communication campaign, as well as ongoing training and supervision by the Traffic Police Department. In addition, in the case of Mexico City, *Ecobici* was one of the first bicycle systems in the world to provide all its users with insurance for related medical costs.

Mexico City's car-free Sundays have created a culture of sustainable mobility that has spread well beyond the weekend.  
Photo Credits: Carlos Alejandro Figueroa

### Phased implementation strategy

The strategy of phased implementation was followed to reflect on the response and implementation of policy and the future replicability of the system at the city level. This allowed the authorities to adjust the number of bicycles per station, setting up of

<sup>3</sup> McConville, M., Mexico City Launches Ecobici Bike-Sharing Program, The City Fix, February 2010. Available at: <https://thecityfix.com/blog/mexico-city-launches-ecobici-bike-sharing-program/>



Facility available on the streets to avail a bicycle under bike sharing program. Photo Credits: Mariordo, Ecobici docking station 27 at Paseo de la Reforma, Mexico City, 2014.

bicycle stations and construction of bicycle lanes. To favour inter-transport mobility, the system was interconnected with subway stations, BRT, electric transport system, taxi and transport corridor zones within the city.

## Branding and marketing

The *Ecobici* brand was created with all its content and value that communicates ecological, sustainable, healthy, and fun state-of-the-art attributes. The *Ecobici* brand has become iconic to Mexico City. In order to develop the brand, innovative and participatory methods were deployed on the field. In order to generate interest within the public to use bike sharing systems, political and social influencers, sports personalities and movie stars participated in bike cycling initiatives implemented across the city. The short duration (three years) of municipalities in Mexico City, made it a priority for officials to make cycling plans as soon as they got elected into office.

## Keeping the momentum

The 2019 Strategic Mobility Plan laid out by the Ministry of Mobility, set a number of initiatives towards improving

non-motorised transport infrastructure, including the installation of 129 radar speed signs around schools as a traffic-calming measure, the inauguration of new bike racks near transportation hubs and improved connectivity among bicycle networks. In 2018, the system launched an electric bicycle fleet, offering an additional and more convenient option for users travelling longer distances and providing affordable mobility options. To incentivise people to cycle, points are awarded to users of bike sharing system which can be exchanged for rewards like movie tickets, music gift cards, or books. Several steps have been taken to change the image of bicycle in the city such as branding the scheme as ‘the intelligent way to travel’: it’s healthy, helps the planet, and reduces travel time, address aggressive driver behaviour through a campaign to educate drivers on the benefits of bicycles. Messages included, for instance, “One cyclist is one less car on the road for you to arrive to work faster” and “One cyclist is one more parking spot open to you.”

## Impact

*Ecobici* public bike sharing system that started with 84 docking stations and



Women have enthusiastically taken part in adopting bicycle for daily commuting to work and other purposes.

Photo Credits: Institute for Transportation & Development Policy.

1,200 bicycles, has now expanded and comprises 480 stations and 6,800 bicycles within an area of 38 square kilometres, benefitting more than 220,000 residents and tourists annually. In 2018, the system launched an electric bicycle fleet, offering an additional and more convenient option for users travelling longer distances. In May 2019, *Ecobici* had registered a total of almost 60 million rides and had contributed to avoiding the emission of 4,541 tons of carbon dioxide. As per the *Ecobici* perception survey conducted in 2014, the number of users that stopped using cars for *Ecobici* increased to 300 per cent. 8 out of 10 users surveyed, have felt an improvement in quality of life due to *Ecobici*. 5 out of 10 users do not live in the *Ecobici* area and 15 percent of the *Ecobici* users live in the metropolitan area, thus serving the city center with hinterland areas.<sup>4</sup>

Intermodality - 9 out of 10 *Ecobici* trips are combined with other modes of transport such as suburban train, bus rapid transport and subway. The average travel distance saw an increase of about 200 percent, with 2.53km in 2014 compared to 1.12km in 2010.

The first five year of implementation of the public bike sharing system led to reduction of about 2267 tons of CO<sub>2</sub> emissions equivalent to 6801 trees.

Out of the total number of users surveyed in 2014, 40 percent are women. The number of women riding bikes has increased by 122 percent. Safety is one of the most important factors for women using the *Ecobici* system as they do not feel any violence or face any type of harassment.

## Lessons learnt

*Ecobici* provides a successful example to promote a transition away from private motorised vehicles towards a more environmentally efficient, sustainable, and shared mobility option. The public private model adopted by the Mexico City to provide supporting cycling infrastructure as well as an effective operational and maintenance system, helped in successfully establishing a public bike sharing system within the city. The integration of bike sharing system with other modes of public transport further created a suitable network of public transportation system within the city. *Ecobici* can be used as a successful model for cities in the global south especially in the post-pandemic area, where cities are exploring to shift from private to non-motorised public transport systems within the city.

4 Lanza, I.D.L., *Ecobici: Sharing Mobility*, Ministry of Environment, Mexico City. Available at: <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKewjOudfBisjvAhWPXSsKHcb6A-IQFjACegQIAxAD&url=https%3A%2F%2Fgo.itdp.org%2Fdownload%2Fattachments%2F47647326%2FEcobici.pdf%3Fapi%3Dv2&usg=AOvVaw3DHUSZ2-QWarbIPMIkTlZr>

# Bangalore, India

## Three Wheels United – Financial Inclusion of Auto Rickshaw Drivers



Auto drivers with new fleet of electric auto vehicles launched by Three Wheels United (TWU). Photo Credits: Praveen Sudevan

### Summary

Alarmed at the environmental pollution caused by auto rickshaws and limited earning potential available to drivers in Bangalore city, the Three Wheels United (TWU) was founded in 2009 to attend to the social and environmental challenges posed at the city level, and economic conditions of auto-drivers. The objective of the enterprise was to increase the income

of drivers and their families by over 70 per cent and provide access to a formal and secure financial system in India.<sup>1</sup> TWU initially focused on shifting autos to four stroke engines and have now moved into adopting more environmentally friendly electric auto rickshaws.

According to a study done by Indian Institute of Science's Centre for infrastructure,

<sup>1</sup> Presentation by Ramesh Prabhu, CEO of Three Wheels United India Services Private Limited. Available at: [https://www.grihaindia.org/grihasummit/tgs2016/presentations/19feb/getting-around-city/Ramesh\\_Prabhu.pdf](https://www.grihaindia.org/grihasummit/tgs2016/presentations/19feb/getting-around-city/Ramesh_Prabhu.pdf)

### Key Values:



Inclusion



Governance



Innovation



Sustainability

Sustainable Transportation and Urban Planning (CiSTUP) on the auto rickshaw sector in India, 90 percent live in rented houses paying between INR 2000-5000 as rent, 52 percent of drivers have paid fines/bribes to the police that accounts for INR 100-500 per month and a majority or 62 percent are the sole earning members of their family supporting anywhere between two and five members. The enterprise through background studies learned that 75-80 percent of all autos are not owned, but rented and there are many drivers who after 10-18 years still did not own the autos because of poor access to formal mechanisms of funding.<sup>2</sup>

With an aim to provide stable financial mechanisms to auto drivers, TWU aims to improve living conditions of auto drivers and ensures a shift to cleaner and greener autos through financial inclusion and facilitating self-ownership. Having worked with over 30,000 drivers, financing 3000 plus rickshaws and helped reduce 22,000 tonnes of carbon dioxide, the enterprise further aims to finance over 100,000 vehicles by 2024.

### **Innovative financing model achieved through stakeholder partnerships**

The success of the Three Wheels United lies in the financial mechanism deployed for providing a stable loan to auto rickshaw drivers. The model incorporated loan facilities, setting up of a savings bank account and recurring deposit account for auto drivers. Funding for the initial phase of the project came from DOB Foundation, Netherlands<sup>3</sup>, Enviu<sup>4</sup> and individuals, that added strength to the underlying foundation of the business model and ensured that the project remained sustainable in the long term.

TWU acting as guarantor, partnered with public banks such as Corporation Bank,

Pragati Gramin bank to provide loans at 11 per cent for a five-year tenure. Later, the scheme was supported by Punjab National Bank and SIDBI for the initial purchase of the vehicle. TWU tied up with NGOs/cooperative societies of specific residential areas to organise drivers in groups of 4-5, and adopting a microfinance principle of joint liability, one driver responsible for the loan payment of other drivers. One among the group was elected as a leader on rotation basis and became responsible for the loan payment of others. Auto rickshaw drivers made a daily payment of Rs 200 to the NGO partners for renting the auto. Of this, Rs 15 was kept by the enterprise for operational expenses, and another INR 20 in a recurring deposit to build a corpus for maintenance. The remainder amount was used to service the loan availed by the autorickshaw drivers. It was estimated that, at INR 200 per day, the loan would be repaid by drivers in just 37 months. Another potential revenue-generation scheme deployed by TWU was to tie-up with corporates for advertisement, thus helping them earn extra income of around INR 1,500 per auto per month. 50 percent of the revenue earned by advertisement was kept by the enterprise and the rest 50 percent to buy life and health insurance for the drivers.<sup>5</sup> In its initial roll out phase, loans were provided to drivers who had been living in the same area for 2-3 years, with known family members through their partner NGOs organisation and not to migratory drivers. Each driver had a license, auto badge and necessary documents. As the enterprise grew over a period of time, it has financed over 3,000 vehicles, maintaining default rates below 1 percent compared to 30 per cent in the market.

### **Addressing social needs through community formation**

The business model adopted by the enterprise provides social security in the form of life insurance to all beneficiaries

2 Moses, N.V., Three Wheels United: helping Bangalore's auto drivers go green and earn extra money, SocialStory, September 2013. Available at: <https://yourstory.com/2013/09/namma-auto-helping-bangalores-gogreen-earn-money/>

3 DOB Foundation. Organisation details available at: <https://www.devex.com/organizations/dob-foundation-48854>

4 Enviu organisation details available at: <https://www.enviu.org/>

5 Kumar, A., How Ramesh Prabhu's Three Wheels United empowers auto drivers in Bangalore to get loans, The Economic Times, February 2014. Available at: <https://economictimes.indiatimes.com/small-biz/entrepreneurship/how-ramesh-prabhus-three-wheels-united-empowers-auto-drivers-in-bangalore-to-get-loans/articleshow/30450407.cms>

with attractive premium policies. One of the building blocks of the model is co-creation, whereby community and relationship-building activities are undertaken through regular meetings, forging a sense of unity among drivers with the cause. The aim is to provide a sense of ownership amongst the drivers so that they can become joint owners in the long run by holding shares in the enterprise. To provide microfinance options, technical support and housing loans, TWU planned to collaborate with other companies to create a collective movement to improve the lives of drivers and their families. Auto rickshaw drivers are imparted with life-skills training in terms of etiquette, dress sense, mannerisms and traffic rules, so as to focus on customer satisfaction.

Apart from financing the vehicles, TWU assisted in establishing a registered cooperative society of auto rickshaw drivers. The cooperative society successfully helped in providing loans to its own members, conducting lobbying activities and ensured a common responsibility within the community. The formation of a compliance team, comprising members within the co-operative society, ensured that drivers made their payments on time. TWU engages in community building initiatives that boost drivers' livelihoods by providing a financial and social safety net, adding integrity to their jobs, and providing them a platform for voice. The following initiatives reduce the chance of auto-rickshaw drivers getting trapped in taking exploitative loans from money lenders. Drivers are also trained in customer service and are assigned a code of conduct which is displayed on their respective vehicles.

### Adopting cleaner technology

To address the air pollution caused by environmentally harmful two-stroke autos, the enterprise promoted towards adopting an efficient four-stroke variety of auto rickshaws. TWU planned to tie up with a company that manufactures electric and solar autos, low on sound and pollution and are cheaper to operate. The autos roped in would run as 'share-autos,' providing inter mobility to metro and bus systems within



*Auto drivers discussing the financial model through formation of cooperative society. Photo Credits: Three Wheels United Foundation Blog. Community Building.*

the city to provide last mile connectivity in the city. The transport department of Karnataka planned to phase out two-stroke rickshaws by April 2018.<sup>6</sup> Though the complete phasing out is yet to be completed because of drivers' reluctance to replace their vehicles, TWU has come up with a tailored financing mechanism for income-generating electric vehicles in the city.

### Safety and security of drivers

During the COVID 19 pandemic, TWU created a mobile application to provide drivers with training and information about how to run their vehicle safely. Vouchers were also provided to drivers to download mobile payment services, where they can get cashback and go for a cashless payment system. The successful completion of

<sup>6</sup> Sudevan, P., Cedrick Tandong's Three Wheels United helps auto drivers switch to sustainable vehicles, The Hindu, December 2020. Available at: <https://www.thehindu.com/news/cities/bangalore/cedrick-tandongs-three-wheels-united-helps-auto-drivers-switch-to-sustainable-vehicles/article33453099.ece>

training concluded with receiving a safety kit that includes masks, hand sanitizer, soap, vehicle disinfectant, cleaning cloth, and transparent screen between drivers and passengers.<sup>7</sup>

## Impact

The cornerstone of the model adopted by the enterprise lies in the sustainability and business viability. Three Wheels United has successfully organised more than 3,000 drivers, provided 700 plus loans at a repayment rate of 98 per cent.<sup>8</sup> For this, the enterprise has pioneered a yearly event dedicated to auto drivers to collectively mobilise them. Recognising the efforts put in by TWU for social and economic upliftment of auto rickshaw drivers, European Commission under their Switch Asia Program, 2015 awarded Euro 1.25 million grant to financially support the enterprise in their social cause. TWU also won the second prize in the Rickshaw Rising Challenge for social enterprises in India, organised by Shell foundation and Embarq, winning a cash prize of USD 25,000 in 2014.<sup>9</sup> Three Wheels United has conducted pilots in Chennai, Hyderabad, and Bangalore to test scenarios that can lead to a more sustainable auto rickshaw system. The initiative undertaken by the



*Distribution of safety kits to auto drivers during COVID-19 pandemic. Photo Credits: Three Wheels United Foundation Blog. COVID-19 Safe Auto Rickshaws.*

Three Wheels United provides an example of how social and environmental concerns can go hand in hand with normal business operations of an enterprise and improve the living conditions of auto rickshaw drivers.



*Driver training and branding programmers organised for auto drivers. Photo Credits: Three Wheels United Foundation Blog. Driver Training and Branding*

7 Three Wheels United. Available at: <https://www.threewheelsunited.com/post/how-you-can-help-us-impact-lives>

8 Three Wheels United Capital. Available at: <https://www.threewheelsunited.com/capital>

9 Presentation by Ramesh Prabhu, CEO of Three Wheels United India Services Private Limited. Available at: <https://www.grihaindia.org/grihasummit/tgs2016/presentations/19feb/getting-around-city/Ramesh-Prabhu.pdf>



*Safety net installed by auto drivers of Three Wheels United during COVID-19 pandemic. Photo Credits: Three Wheels United Foundation Blog. COVID-19 Safe Auto Rickshaws.*

### **Lessons learnt**

Three Wheels United model has shown a path on how a stable financial mechanism to auto drivers can help in providing a sustainable and economically efficient transport model in a city. The model not only helped to improve the living condition

of auto drivers, but also increased the financial security by imbibing a sense of ownership and formal banking facilities. The model provides an opportunity for cities to build a healthy relation with informal transport workers and include them in the formal transportation network of the city.

# Mobilise Your City Initiative

## Public Utility Vehicle Modernisation Program, Philippines



A Jeepney Vehicle in Manila, Philippines. Photo Credits: Eschborn, S.S., Changing Transport, facilitating climate actions in mobility.

### Key Values:



Inclusion



Innovation



Sustainability

### Summary

Mobilise Your City (MYC) initiative was launched at the United Nations Climate Change Conference - COP21 held in Paris in 2015 to promote sustainable forms of urban mobility in 100 cities across 20 developing countries. The initiative is supported by France, Germany, and the European Union (EU). It brings together 100 cities across 20 countries to achieve the objective of promoting sustainable forms of mobility around the world. Alternative

modes of transport reduce greenhouse gas emissions and pollutants in a move to contribute to the Sustainable Development Goal (SDG) 11 that calls for 'making cities and human settlements inclusive, safe, resilient, and sustainable.'

The Partnership was founded by Agence de l'Environnement et de la Maitrise de l'Energie (ADEME), Agence Française de Développement (AFD), Coopération pour le Développement et l'Amélioration

des Transport Urbains et Périurbains (CODATU), Centre d'études et d'expertise sur les risques, l'environnement, la mobilité et l'aménagement (Cerema) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. This is an international transport initiative under the UN Marrakesh Partnership for Global Climate Action.

The initiative aids local governments in developing sustainable urban mobility in order to create more inclusive, liveable and economically efficient cities and while lowering greenhouse gas emissions. Its goal is to help cities cut at least 50 percent of their urban transport related emissions by 2050 compared to the business-as-usual estimates.

The initiative offers a methodological framework, financial and technical assistance with the help of a coalition of international partners. The objective of the initiative is to reduce the number of urban trips by conventionally fuelled transport modes, promote modal shift towards active modes and public transport and improve vehicle energy efficiency through acceleration of significant technological advances and regulation.

## Program objectives and coverage

The Mobilise Your City partnership aims to improve urban mobility for their citizens and decarbonise transport to fight the global climate crisis and has the following objectives.<sup>1</sup>

1. Accelerate the transition to sustainable urban mobility in countries of the Global South by following the avoid-shift and improve paradigm: reducing unnecessary urban travel, encouraging the use of low-carbon and non-pollutant transport modes and stimulating the shift towards low-carbon vehicle technologies.
2. Foster more comprehensive, integrated and participatory urban mobility planning at both local and national levels through the development of Sustainable Urban Mobility Plans

(SUMPs) and National Urban Mobility Programs (NUMPs).

3. Facilitate access to sustainable financing for large-scale mobility projects. We support the development of integrated, comprehensive policies and development plans for sector transformation with clear linkage to budgeting and financing concepts to increase chances of financing.
4. Close the investment gap for sustainable mobility. Although the Transport sector accounts for 25 per cent of GHG emissions, it only receives 3 per cent of climate financing. The Mobilise Your City Partnership advocates for increased resources and action to support cities to decarbonise urban transport.

By assisting cities and countries in the planning and implementation of effective measures to decarbonise urban transport, the Partnership supports the goals set forth under the United Nations Framework Convention on Climate Change (UNFCCC) dialogue and many urban-related goals specified in the New Urban Agenda as well as the SDGs. In particular, the initiative contributes to the following goals:

**SDG 11** "Makes cities and human settlements inclusive, safe, resilient and sustainable"

**SDG 3.6** "By 2020, halve the number of deaths and injuries from road traffic accidents"

**SDG 8.4** "Endeavour to decouple economic growth from environmental degradation"

**SDG 9** "Develop quality, reliable, sustainable and resilient infrastructure"

**SDG 13.2** "Integrate climate change measures into national policies, strategies and planning"

**SDG 17.3** "Strengthen the means of implementation and revitalise the global partnership for sustainable development"

<sup>1</sup> Mobilise your City Partnership Website. Available at: [https://www.mobiliseyourcity.net/about\\_the\\_partnership](https://www.mobiliseyourcity.net/about_the_partnership)

## Operational structure of the initiative

The partnership supports cities and countries through three main service areas.

### 1. Policy support and project preparation through technical assistance

- a. Technical assistance for Sustainable Urban Mobility Plans (SUMP) and National Policies and Programmes (NUMP) – the partnership supports national member countries to develop national urban mobility policies and investment programs (NUMPs), and member cities to develop sustainable urban mobility plans (SUMPs).
- b. Access to finance – In addition to receiving technical assistance, member cities and countries are supported to identify accessible and affordable financing solutions by either directly financing certain parts of the SUMPs and NUMPs or through banking partners and/or linking investments to other potential financiers of mobility infrastructure and equipment.

### 2. Methodologies and capacity building through communities of practice

The partnership offers technical and methodological resources to develop capacity and enabling knowledge sharing through an online knowledge platform.

### 3. Advocacy through outreach and communication

The partnership advocates for a change in how cities and countries approach mobility by using the enable-avoid-shift-and improve model (EASI).

## Case Study - Public Utility Vehicle Modernisation Program – Philippines

Philippine is a partner country of the Mobilise Your City programme. The Public Utility Vehicle Modernisation Program (PUVMP) was launched in 2017 by the Department of Transportation (DOTr) in Philippines under the Philippine Urban Mobility Programme (PUMP). The PUMP

aspires to create ‘people-oriented cities’ that are ‘enabled by effective, dignified, and long-term mobility.’

PUVMP is a large-scale modernisation programme aimed at phasing out of ageing ‘jeepney’ vehicles, with modern minibuses or buses meeting Euro IV<sup>2</sup> emission standards and new safety standards. *Jeepney* is the popular mode of public transport service in the Philippines but considered as uncomfortable, unsafe, and highly polluting.

Along with improving the quality and environmental sustainability of public transport operations within the Philippines, the PUVMP includes wider reform, with the inclusion of planning and rationalising of public transport routes, transforming route franchise issuing procedures and promoting industry consolidation, and professionalisation to enhance service levels.

## Program components

### Regulatory Reforms and route realignment

- As part of the regulatory reforms and new regulations, public utility vehicles under PUVMP are required to meet minimum safety and emission standards, with certain on-vehicle technology requirements. Under the new franchising guidelines for transport operators, the Land Transportation Franchising and Regulatory Board (LTFRB) issued a franchise on a route-by-route basis rather than present a fragmented system where multiple operators serve the same route, operating in competition with each other. The new guidelines enable the Board to issue franchise only to a corporation or an operator cooperative, thus requiring individual operators to consolidate and provide necessary number of vehicles to operate on a specific route.

**Vehicle upgradation** - Consolidation of operators is one of the core pre-conditions to achieve overall reform objectives and ensure sustainable financial mechanism. The modernisation programme includes providing a safe, efficient and dignified fleet that are compliant with Euro IV emission standards and are equipped with CCTV, GPS and Automated Fare Collection System (AFCS).

<sup>2</sup> Euro emission standards define the limits of exhaust emissions from all types of vehicles.



*Modernised public utility vehicles in Philippines that are eco-friendly and high-capacity vehicles. Photo Credits: Mariano, P., Modernising Public Transport in the Philippines: The Jeepney + NAMA*

**Industry Consolidation** - In order to bring together the highly fragmented Jeepney sector which characterised of a large number of small-scale operators, the new regulatory arrangements issued franchise of modern jeepneys only to a corporation or a cooperative. This led to shifting of individual franchise holder to consolidated operator cooperative or a corporation.

**Financing Model** - The financial model of the PUVMP is based on '5,6,7,8 model' – 5 per cent down-payment, 6 percent annual interest, 7-year amortisation term and subsidy of 80,000 PHP (Philippine Peso) for surrendering old franchise. The Philippine government has partnered with leading National Development Banks, Development Bank of the Philippines (DBP) and Landbank to develop a financial assistance programme and support operators in running modern Jeepney vehicles.

**Procurement of Vehicles** - In 2019, 30 routes are operating across six regions, with a modern jeepney vehicle fleet of 500 vehicles. The modern jeepney vehicles procured by operators have 30 maximum capacity, greater than traditional jeepney with a capacity of 16-24 seats and no standing facility. The vehicles are equipped with automated fare collection system (AFCS), closed circuit television (CCTV) and Wi-Fi.

**Financing Mechanism** - Though the initial cost and investment requirement is higher for modern jeepneys than traditional ones, majority of the operator took advantage of PUVMP financing support offered by national development banks. The loan amount extended under the scheme covered 95 per cent of the vehicle cost, requiring only 5 per cent deposit from operators. The operators who exchanged the old fleet of jeepneys received a grant of up to 5 percent of the vehicle cost, to a

maximum of 80,000 PHP, thus reducing the upfront capital required from the operator's side.

**Route rationalisation** - The route rationalisation involved combination of new and old jeepney routes. The existing route selected for roll out of pilot operations facilitated a shift from vehicle-based to route-based franchising, featuring a dominant operator, may be a cooperative. The new routes called 'development routes', served evolving traveller demand patterns and facilitated move to route-based franchising. The route rationalisation led to significant improvement in daily operating hours, vehicle utilisation, vehicle capacity, fuel economy, daily ridership and days of operation per week.

### Impact

The shift from individual vehicle ownership to collective ownership enabled the single route operator to manager service levels on the route and reduce the adverse impact of driving competition on streets. The modernisation programme led to increase in daily operating hours of vehicle from 14

hours to 19 hours. The vehicle capacity also increased from 20 seats to 30 seats for the passengers. The drivers, conductors and operating staff received a regular salary along with associated benefits, representing a shift from irregular and uncertain daily driver income. Though the cost of modern jeepney vehicle outstrips the traditional vehicles, the provision of preferential financing arrangement minimised the upfront capital requirement and provided a loan repayment period of seven years for operators. The increased operational intensity of new vehicles motivated operators to shift towards new fleet as drivers and conductors had a stable salary and social security benefits. The greater vehicle capacity of the modern jeepney and increased intensity of operations significantly increased the daily fare box revenue from 2,500 PHP to 7,500 PHP. Though the return on the investment in the project will be realised over a longer term once the vehicle finance has been settled, the daily fare revenue and initial operational efficiency has shown successful results and the potential for replicability and scalability in other cities in Philippines.



Traditional and modern jeepney in Manila. Source: GIZ

### Comparison of operational characteristics of traditional and modern jeepney vehicles

Average (range)	Traditional Routes	Modern Routes	Average (%) change
Daily operating hours	14 hours (13-15 hours)	19 hours (11-22 hours)	36%
Vehicle utilisation	127 km (60 km-190 km)	150 km (80-220 km Euro IV diesel) (80-120km E-Jeepne)	18%
Days of operation per week	5.6 days (5.5-6 days)	6 days	7%
Staff per vehicle/day	1 driver (1-2 drivers)	2 drivers, 1.5 conductors (1-2.5 drivers, 0-2.5 conductors)	350%
Daily staff earnings	650 PHP (11.57 EUR) (574-755 PHP – 10.21-13.44 EUR) (non-salaried)	600 PHP (10.68 EUR) + benefits (537 M/W-1,000+ PHP – 9.56-17.80+ EUR) (salaried)	
Vehicle capacity	20 seats (16-24 seats)	30 seats max. (22-24 seated)	50%
Fuel economy	5.9 km/l (4.2-7.8 km/l)	5.2 km/l (4.2-6.2 km/l)	-12%
Fuel economy per passenger/km	111 km/l	156 km/l	41%
Daily ridership Pax./day/vehicle	300 (150-350)	460 (Euro IV Jeep 300-750) (E-Jeepney 200-25)	53%



Modernised jeepney vehicles undergoing inspection. Source: GIZ

## Lessons Learnt

Mobilise Your City is a global level initiative helping countries to shift towards sustainable forms of urban mobility. The initiative, through a wide spread collaborative effort of organisations and support from France, Germany and the European Union has helped countries to follow the avoid-shift model and shift towards low-carbon vehicle technologies. Countries located in Asian region have successfully participated in the initiative and been able to encourage use of low-carbon and non-polluting modes of transport. Programmes such as the Public Utility Vehicle Modernisation Program in Philippines has helped in phasing out the albeit highly polluting and unsafe mode of informal transport and replace with vehicles that are more environmentally sustainable and economically efficient. Though developing countries face similar type of fragmented and poorly managed informal public transport, but the PUV Modernisation Program of the Philippine Government can create an important showcase for formalising (semi-)informal public transport systems towards a low-carbon pathway.

Some other projects that have been financed under the MYC program are listed below for reference.

### **Cameroon**

Sustainable Urban Mobility Plans, Yaoundé and Douala, <https://www.mobiliseyourcity.net/node/306>

### **India**

Climate Change Mitigation Strategy for Urban Transport (CCMSUT) in India, currently implemented in four cities i.e., New Delhi, Ahmedabad, Kochi and Nagpur, <https://www.mobiliseyourcity.net/node/318>

### **Thailand**

Thai Clean Mobility Programme, <https://www.mobiliseyourcity.net/thailand>

### **Santo Domingo**

Sustainable Urban Mobility Plan for the Great Santo Domingo, <https://www.mobiliseyourcity.net/node/415>

### **Ukraine**

Integrated Urban Development in Ukraine, <https://www.mobiliseyourcity.net/node/303>

# Shenzhen, China

## Electromobility



Shenzhen's fleet of electric buses. Photo Credits: Webb, A., All Shenzhen Buses and Taxis to Be Electric in Five Years, Plugincars, 2011

### Summary

Against the background of increasing air pollution in cities and high energy consumption in the transport sector, electromobility is seen as a contribution to solving both transport and environment challenges. Electromobility can be defined as a road transport system based on vehicles that are propelled by electricity. Reducing carbon emissions from fossil fuel-based vehicles is one of the critical components of transitioning to a low-carbon global economy. Electromobility's high energy efficiency, combined with decentralised, regenerative power generation, provides tremendous potential for reducing

transportation-related greenhouse gas emissions.

Shenzhen, a city in China's Guangdong province has been at the forefront of adopting electronic vehicles globally. The city not only developed an electric bus mobility system but also moved towards adopting electric vehicles for goods transportation. At the beginning of 2015, approximately 300 operative electronic logistics vehicles (ELVs) were registered in Shenzhen. By the end of 2018, that number had grown to 61,857, accounting for 24 percent of all the electric vehicles (EVs) registered in the city. As a result of this

#### Key Values:



Innovation



Sustainability



Physical Infrastructure Development



Taxis charging in Shenzhen. Photo Credits: Billy H.C. Kwok

rapid expansion, Shenzhen has become the world's largest market for ELVs, prompting the logistics sector, the power grid, and local policymakers to quickly develop new business and regulatory models. In 2017, Shenzhen became the first city in the world to electrify all public buses with a view to cutting emissions, reducing noise pollution and improving air quality.<sup>1</sup> In 2019, Shenzhen became the first city in the world to turn nearly all of its buses and taxis electric.<sup>2</sup> More than a million electric vehicles were sold in China in 2018, which is more than three times the number sold in the United States of America.<sup>3</sup> One of the significant reasons behind such a dramatic rise in growth of electric vehicles is the innovative policies adopted by Shenzhen throughout the life cycle of the project.

## Adopting a multipronged policy approach

Shenzhen's idea of promoting electromobility was to reduce economic and political dependency on fossil fuels as well contribute to internationally and nationally determined climate targets. The city adopted a comprehensive approach to make electric vehicles an economically viable alternative to fossil fuel run vehicles. The approach was multipronged and comprised the following elements.

1. **Electrifying the public bus system** – The development of electric bus system can be attributed to national and local policies such as the Shenzhen New Energy Industry Development Plan 2009-2015, the Shenzhen New Energy Industry Development Policy and the

1 Shenzhen, Switching to an electric mobility system in the city. Ellen Macarthur Foundation, March 2019. Available at: [https://www.ellenmacarthurfoundation.org/assets/downloads/Shenzhen\\_-\\_Case-Study\\_Mar19.pdf](https://www.ellenmacarthurfoundation.org/assets/downloads/Shenzhen_-_Case-Study_Mar19.pdf)

2 McLane, R; Mullaney, D. Shenzhen: A city miles ahead in electrification, Rocky Mountain Institute, 2019 Available at: <https://www.greenbiz.com/article/shenzhen-city-miles-ahead-electrification>

3 Vincent, D. The uncertain future for China's electric car makers. BBC News. March 2020. Available at: <https://www.bbc.com/news/business-51711019>



Shenzhen Electric car being used during the Summer Universiade, a world student games event. Source: Langqing, Shenzhen Universiade

13th Five-Year Plan for Strategic New Industry Development,<sup>4</sup> that together reinforced priority on developing sustainable transport sector. In 2011, two years after being selected as a pilot city for introducing electric vehicles, Shenzhen hosted the Summer Universiade,<sup>5</sup> a world student games event, at which 200 e-buses and 300 e-taxis were deployed. The first fully electrified bus route was launched in 2012. Starting in 2015, bus companies have been able to rent e-buses and batteries from manufacturers through service models, relieving the bus companies of large upfront investments and the need for technological expertise, thereby increasing the uptake of vehicles.

**2. Enabling innovation through new financial models** - Through the use of

service models, third-party financial institutions enabled the purchase and renting of to bus operating companies, relieving them of large upfront capital investments. For example, eight-year rental agreements are arranged through a third-party financial institution which, for a limited time period, take on the financial risk if the vehicle or components fail. Shenzhen Eastern Bus Company (a state-owned organisation) and Shenzhen Western Bus Company Ltd (a public-private organisation) have both rented e-bus services from locally headquartered Build your dreams (BYD)<sup>6</sup> and other manufacturers via third-party financial institutions such as China Development Bank Leasing and China Construction Bank Financial Leasing. In such service models, manufacturers remain responsible for maintenance and repair of the key components, keeping

4 Center for Security and Emerging Technology. National 13th Five-Year Plan for the Development of Strategic Emerging Industries. December, 2019. Available at: <https://cset.georgetown.edu/research/national-13th-five-year-plan-for-the-development-of-strategic-emerging-industries/>

5 International University Sports Federation (FISU), 26th Summer Universiade 2011. Available at: <https://www.fisu.net/sports/results/summer-universiade/26th-summer-universiade-shenzhen-2011-main-results>

6 About the BYD company. Available at: <https://www.byd.com/en/CompanyIntro.html>

them in use. It also incentivises circular designs for durability and reuse. Bus manufacturers are also provided with national government subsidies, which are matched by the city government.

**3. Subsidies for electric vehicles -**

Beginning in 2013, at the National level, the Ministry of Industry and Information Technology and the Ministry of Finance provided subsidies, while at the local level, Shenzhen Municipal Government offered subsidies on purchase of electric vehicles for users. The post-subsidy purchase cost of an electric van is 77,800 RMB<sup>7</sup> (Chinese currency, Renminbi) compared with 62,670 RMB for a similar gasoline vehicle, and 160,000 RMB for an electric light-duty truck versus 144,598 RMB for a comparable diesel model. With lower operating costs, ELV capital recovery periods are typically one to one and a half years. In order to incentivize the utilization of ELVs, Shenzhen leads as the first city in China to carry out operational subsidy standards. Fleets that own 300 or more trucks and at least 100 ELVs can earn the subsidy if each truck has a mileage of more than 15,000 km. The subsidy is based on battery size, and will not exceed 75,000 RMB in a consecutive three-year period.

**4. Subsidies for charging infrastructure –**

Instead of providing a broad subsidy to anyone, the city adopted a more targeted subsidy that seeks to encourage large charging providers to rapidly deploy aggregated charging infrastructure for fleet vehicles. From 2013 to 2015, the municipal government provided a subsidy to charging facilities equivalent to 30 per cent of the facility cost. This resulted in rapid growth of a robust charging network.

**5. Road restrictions on vehicles with internal combustion engines (ICE) -**

Shenzhen strictly restricts the time and routes that ICE, particularly diesel, trucks may drive in order to manage the congestion and air pollution that those vehicles cause. Preferential

road access rights permit ELVs in Shenzhen to operate on certain routes and at certain times that ICE trucks are banned. Priority access represents a significant advantage for ELVs in terms of operational efficiency and improved customer service. In addition to route restrictions, Shenzhen also improves access for ELVs by providing free parking. In Shenzhen, all EVs, including ELVs, have one-hour free curb side parking in the city and two hours of free parking in city-owned parking lots, which reduces the cost of stopping to make deliveries and to charge.

**6. Preferential electricity rates and fee exemptions for charging operators**

– Concentrated stations<sup>8</sup> receive a preferential electricity rate set by Shenzhen Development Research Centre, where they are able to purchase electricity at industrial and commercial rates, ranging from 0.17 RMB/kWh to 1.03 RMB/kWh, depending on the time of day and the voltage required. This puts fast-charging stations at an advantage relative to stations with slow chargers and disincentivizes ELV operators from installing chargers at their homes, where overnight charging would be viable.

**7. Mandates and targets at the city and district levels for the number of chargers to support growth of the charging network**

– Guangdong provincial and Shenzhen municipal governments have set a series of specific targets for the future construction of ELV charging facilities in the city. At the provincial level, three important targets have been formulated by policymakers. First, by 2020, 300 additional charging stations shall be completed exclusively for logistics and sanitation vehicles in the province. Second, all newly built commercial buildings and public parking places shall reserve no less than 30 percent of proposed parking spaces for EV charging facilities. And third, the province has planned to construct 108 pairs (one on each side of the road) of intercity highway fast-charging stations

<sup>7</sup> 1 RMB equals 11.50 Indian Rupee and 0.15 US Dollar (April 2021)

<sup>8</sup> Concentrated station is a charging station must have at least three chargers with a total capacity of at least 350 kW and have a minimum of a three-year contract with the parking lot where the chargers are located.



A vehicle uses a new charging station. Photo Credit: McLane, R; Mullaney, D. Shenzhen: A city miles ahead in electrification, Rocky Mountain Institute, 2019

in 2018–2020. At the municipal level, the 2018 ‘Shenzhen Blue’ Sustainable Action Plan mandated that Shenzhen will complete the construction of an additional 13,400 chargers by 31 December 2018.

## Supporting infrastructure and the ELV market

Apart from policy level initiatives, Shenzhen built on the supporting infrastructure and adopted a leasing model.

1. **Adopting a leasing model** - The ELV market in Shenzhen adopted a leasing model where leasing companies own and deploy 98 per cent of ELVs in Shenzhen. The companies typically bundle provision of the vehicle, maintenance of the vehicle, provision of charging infrastructure, and, at times, even the driver of the vehicle. The rationale behind adopting the leasing model was to reduce significant upfront capital needed to acquire ELVs, policy preference for commercial ownership rather than personal ownership of vehicles, give access to subsidies

and utilise the expertise of leasing companies in maintaining and servicing ELVs.

2. **Building a network of charging stations**- In order to keep pace with the rapid growth in ELVs, Shenzhen is actively deploying an extensive network of charging stations. As of the end of 2017, 40,622 chargers had been installed citywide.
3. **Due to the aggressive policy incentives, many start-ups have entered the market.** Currently more than 40 charging station owners are operating in Shenzhen. This high fragmentation has led to disorderly market conditions. In response, the government has implemented policy, as discussed earlier, aimed at driving consolidation in the market.

## Impact

Shenzhen’s ability to lead the way in urban logistics electrification, as well as record and share its insight, paves the way for other cities in the world seeking to incorporate electric mobility as an option in

the transport sector. The transition towards electric mobility through developing an e-bus system has helped Shenzhen to contribute towards mitigating climate impacts. The average GHG emissions per e-bus kilometre is 40 per cent less than a diesel vehicle, which, as of 2017, had reduced carbon emissions in the city by 0.63 million tons.<sup>9</sup> Further, reduction in noise and heat produced by e-buses has contributed to a reduction in urban heat island effect. As countries look for ways to recover from the unprecedented disruption of the COVID-19 pandemic, multi-faceted electric vehicle policy packages can help pave the way to a more robust industry and safer, more sustainable streets.

### Lessons learnt

Shenzhen's innovative policies such as providing subsidies, installing public infrastructure for charging vehicles, innovative financial models paved a way in promoting electric vehicles within the city. Though the experience of Shenzhen's in promoting electric mobility is unique and can't be exactly replicated, the aggressive innovative policies can still provide valuable lessons to other cities who want to accelerate mobility electrification.

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<sup>9</sup> Shenzhen, Switching to an electric mobility system in the city. Ellen Macarthur Foundation, March 2019. Available at: [https://www.ellenmacarthurfoundation.org/assets/downloads/Shenzhen\\_-Case-Study\\_Mar19.pdf](https://www.ellenmacarthurfoundation.org/assets/downloads/Shenzhen_-Case-Study_Mar19.pdf)

# Bogotá, Columbia

## Gender Responsive Urban Mobility – Case of Bogotá



Bogotá's bus rapid transport system serving the main arteries of the city. Photo Credit: Transdev Colombia, the mobility company.

Bogotá's experiment with promoting non-motorised transport (NMT) and introducing world-class bus rapid transport (BRT) system 'TransMilenio',<sup>1</sup> is a demonstrative story in sustainable and inclusive transport policies. Since the inauguration of its first phase in 2000, *TransMilenio* has decreased the average travel time by 32 per cent, increased property values along its primary operating line by 15-20 per cent, enhanced tax revenues, created thousands of direct and indirect jobs, reduced traffic accidents by 50 per cent on all corridors, improved air quality, and even generated approximately USD 894.737 per year in direct carbon credits.<sup>2</sup>

However, the city's public transport system was not safe for women to access as they faced sexual harassment in crowded buses and felt unsafe to walk on streets. Studies carried in Bogota suggested that six out of ten women in Bogota travel by public transport and that 51 per cent of the total trips were made by women on foot. As per the survey, nine out of ten women in Bogotá feel unsafe in public spaces with 90.5 per cent of respondents feeling unsafe on public streets, followed by public transportation stations. In 2014, a study done by *SDMujer* (Secretariat for Women and Gender Equality),<sup>3</sup> 64 per cent of the respondents claimed that they were

### Key Values:



Inclusion



Innovation

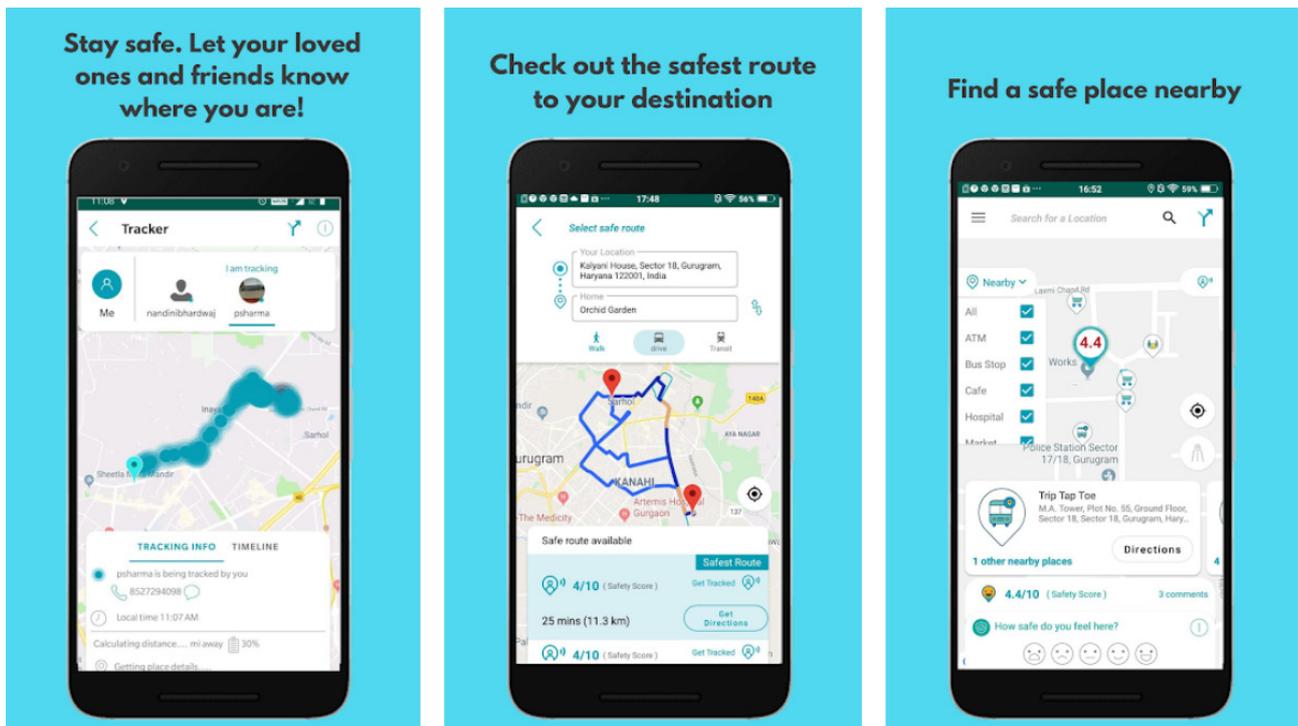


Physical  
Infrastructure  
Development

1 About Transmilenio, Available at: <https://www.transmilenio.gov.co/>

2 Tran, T.M. 2018-2019. The ICLEI Case Stories Series. Available at: [https://www.transformative-mobility.org/assets/publications/TUMI-winner\\_City-profile-and-story\\_Bogota.pdf](https://www.transformative-mobility.org/assets/publications/TUMI-winner_City-profile-and-story_Bogota.pdf)

3 Secretariat for Women and Gender Equality (SDMujer), Bogota. Available at: <https://www.sdmujer.gov.co/>



SafetiPin app available on Google Play Store.  
Picture Credits: Google Play Apps

victims of sexual harassment while on public transport.<sup>4</sup>

The glaring findings of the studies, the city government of Bogotá implemented a series of initiatives to improve quality of life, safety and mobility experience for women. The initiatives were led by the Secretariat for Women and Gender Equality (*SDMujer*), the District Department of Mobility (SDM) and *TransMilenio* SA (TMSA), and are discussed in detail below.

### Safe bus rapid transport system

As a first major intervention to provide safe mobility experience, Bogotá introduced women-only sections in its *TransMilenio* buses. Awareness campaigns and training for workers, such as ticket vendors, drivers, and advertisers were conducted to sensitise about women's safety in public transport system. This helped to highlight the issue of sexual harassment in public transport and turned it into an issue that remained to be addressed immediately. Around the

same time, an 'elite group *TransMilenio*', a squadron of plain clothes officers, was established and patrolled the *TransMilenio* buses and bus stops. The aim of introducing such a group was to apprehend the rising number of sexual aggressors in public places. The 'elite group' captured 16 men red-handed in the first 20 days of operation. The focus of these initiatives was not to create women-only spaces and provide methods for victims to reduce their risk, but to target men and perpetrators of sexual crimes, who did not consider sexual harassment a crime in public spaces.

### Leveraging technology to map and create a Night Safety Index

The city of Bogotá, in 2014, used two innovative, real time, web-based mapping applications called '*MySafetiPin* and *SafetiPin Nite*'<sup>5</sup> that helps to help to document how safe women feel throughout the city and share the information with a crowdsourced map built by other participants.

4 Dekovic, A. 2019. Bogotá's Fight for Gender Equality and Safe Public Transport. Impakter. Available at: <https://impakter.com/bogotas-fight-for-gender-equality-and-safe-public-transport/>

5 My SafetiPin: Complete Safety App. Google Play Store. Available at: [https://play.google.com/store/apps/details?id=com.safetipin.mysafetipin&hl=en\\_IN&gl=US](https://play.google.com/store/apps/details?id=com.safetipin.mysafetipin&hl=en_IN&gl=US)



Streets being painted by Women and children as part of *Me Muevo Segura* campaign.  
Photo Credit: *Me Muevo Segura*, TUMI, Photo Album, 2018.

*SafetiPin*<sup>6</sup> is an innovative, real-time mapping app developed in India and helps to collect, analyse, and disseminate information to make public spaces safe for women. Through a mechanism of safety audit, the app collects data on nine parameters that include lighting, public transport, visibility, and security, and creates a pin which appears on the app with its safety score.

The city of Bogota translated the app from English to Spanish and mounted mobile phones of five taxis that drove around Bogota for three months. By taking pictures automatically every 50 meters, about 17,000 pins were collected and categorized. Bogotá's road network comprises 15,547 kilometres, out of which taxis can drive only 4,000 kilometres. The safety score collected through the app was correlated with the data about locations of police stations in different zones of the city. The findings pointed out that the number of women out at night was low in many parts of the city. As a response, Secretariat for Women and Gender Equality (*SDMujer*) held five-night events '*Women take back the night*', symbolic to address the issue.

The Secretariat for Women and Gender Equality (*SDMujer*) collaborated with the women's security council of each district to help point out unsafe areas, such as river banks, not accessible by car. Bicycles were also used for safety audit by taking advantage of extensive bike-paths network in Bogotá city. This led to the audit of 400 kilometers and the improvement of bikers' safety with measures such as fixed lights, bike racks, stoppage points and CCTV cameras. The data collected from *SafetiPin* was further used to educate and sensitise *TransMilenio* staff on the need to focus on women's safety, and to clear the path for future change.

### Project '*Me Muevo Segura*' (I move safely)<sup>7</sup>

*Me Muevo Segura* (I move safely), implemented in 2018-19 in the city of Bogota, is a project of the District Women's Secretariat, the German International Cooperation Agency (GIZ) and the Latin American Development Bank CAF to expand city's safe travel network with *SafetiPin*. The aim of the project is to promote

6 Safetipin, Supporting Safer Cities, Case Study – Bogota. Available at: <https://safetipin.com/case-study-bogota/>

7 Project details '*Me Muevo Segura*'. Available at: <http://omeg.sdmujer.gov.co/mms/index.html>



Volunteers working towards improved safety for women in Bogota. Photo Credit: Dekovic, A. 2019. Bogotá's Fight for Gender Equality and Safe Public Transport. *Impakter*.

security with a gender perspective and to prevent violence and sexual harassment against women in public spaces at night. The project consisted of a night-time measurement of 16,145 kilometres of vehicle routes, 537 kilometres of bicycle routes and a survey of 14,311 women on their perception of security in 19 urban locations in Bogotá through *SafetiPin*. The project was declared as the winner of the Transformative Urban Mobility Initiative (TUMI)<sup>8</sup> Global Urban Mobility Challenge, instituted by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and TUMI to implement *SafetiPin* data collection in Bogota city.<sup>9</sup>

The project started with preparation of data collection through establishment of an independent project advisory board and consultation with other city entities on data collection strategy and development of questionnaires for interviews and training

of staff. 13 vehicles and two teams of four cyclists were used for mapping of highways, arterial, intermediate, local roads and cycling network. Perception surveys and focus group discussions were also conducted with women at 47 bus stops and 46 *Transmilenio* (BRT) stations. The mapping data collected was transmitted to *SafetiPin* app for analysis and development of the Night Safety Index.

As part of the program, extensive outreach and campaign programs were conducted. A '*Me Muevo Segura*' toolkit<sup>10</sup> was developed with information on sexual harassment in public transport and awareness events were conducted in neighbourhood through radio and social media. The toolkit was distributed at *Transmilenio* stations and an international event was organised to disseminate the project's approach and results. Through tactical urbanism strategy, the project proponents collaborated with

8 Sustainable Mobility for a better Future, Transformative Urban Mobility Initiative. Available at: <https://www.transformative-mobility.org/>

9 SafetiPin, Supporting Safer Cities, Case Study – Bogota. Available at: <https://safetipin.com/case-study-bogota/>

10 Prevention of Violence and Sexual Harassment Against Women in Public Spaces. Final Report, TUMI Challenge Colombia, 2020. Available at: [https://www.transformative-mobility.org/assets/publications/Colombia\\_Final-Report.pdf](https://www.transformative-mobility.org/assets/publications/Colombia_Final-Report.pdf)



A volunteer interviewing one of the women as part of 'Me Muevo Segura' program. Photo Credits: Me Muevo Segura, TUMI, Photo Album, 2018.

local authorities to identify unsafe spaces to introduce design interventions through participatory planning. The project has immense potential for critical learnings to be documented and shared. Hence, the project approach was disseminated to a large group of Latin American leaders at an international 'Me Muevo Segura' seminar, which hosted more than 170 city leaders.

## Impact

Bogotá is the first city in the world that mapped its complete street and cycling network and carried out georeferenced perception interviews. The *SafetiPin* map has collected more than 19,000 audits to date that grade different locations throughout the city on metrics such as illumination, gender diversity and 'eyes on the street' that help promote women's safety.<sup>11</sup> In 2017, the city partnered with the Observatory for Women and Gender Equity<sup>12</sup> and Dove to launch 'Aclara Bogota', a campaign that installed self-sustaining solar lights in dark public spaces where women felt unsafe. The data collected

through *SafetiPin* provided a solid information basis to city of Bogotá on the magnitude and geography of women's safety and security. The city made strategic and targeted investment into street lighting, walkways and other improvements of public space and transport for more security.

## Lessons learnt

Having recognised the lack of safety for women on Bogotá's streets and public transport system, the city undertook drastic measures to provide a safe and secure transport system for women in the city. Leveraging the use of technology and community efforts, Bogota successfully managed to reduce the violence and crime against women in public places. Bogotá's experiment through data-driven solution and engaging with local women's organisation provides an interesting model that can be replicated in cities across the world to provide a safe transportation system for women.

11 Dekovic, A. 2019. Bogotá's Fight for Gender Equality and Safe Public Transport. Impakter. Available at: <https://impakter.com/bogotas-fight-for-gender-equality-and-safe-public-transport/>

12 Columbian Women's Observatory, Bogota. Available at: <http://www.observatoriomujeres.gov.co/en/OAG>

# Coimbatore, India and Jakarta, Indonesia

## Reimagining streets through Tactical Urbanism



Top view of the 'Big Bazaar' street after tactical urbanism measures taken by the authorities. Photo Credits: Presentation by Ranjith Parvathapuram, Webinar on Tactical Urbanism, February 2020. Short Term Action to Long Term Change – Tactical Urbanism on Big bazaar street, Coimbatore, Tamil Nadu.

### Key Values:



Innovation



Governance



Physical Infrastructure Development

### Summary

Tactical urbanism is a citizen-led, quick, and affordable way to test and demonstrate short-term, low-cost and scalable interventions as a way to catalyse long-term change. Mike Lydon is said to have come up with the phrase 'tactical urbanism' and it is described in his book *Tactical Urbanism: Short-term Action for Long-term Change* (Lydon & Garcia, 2015): "Tactical Urbanism

*is an approach to neighbourhood building and activation using short-term, low-cost, and scalable interventions and policies. It makes use of an iterative development process, the efficient use of resources, and the creative potential unleashed by social interaction.... In many ways, Tactical Urbanism is a learned response to the slow and siloed conventional city building process."*<sup>1</sup>

<sup>1</sup> Bolton, L. 2020. Tactical urbanism in Low-and Middle-Income Countries (LMICs). Knowledge, evidence and learning for development. Institute of Development Studies. August 2020. Available at: [https://opendocs.ids.ac.uk/opendocs/bitstream/handle/20.500.12413/15652/854\\_Tactical\\_urbanism.pdf?sequence=1&isAllowed=y](https://opendocs.ids.ac.uk/opendocs/bitstream/handle/20.500.12413/15652/854_Tactical_urbanism.pdf?sequence=1&isAllowed=y)

## Tactical Urbanism

This chart illustrates the progression of an iterative approach to project delivery. Though not all projects need to follow this exact model, it can be helpful to see how each project type builds towards the next, using incremental steps to deliver a capital project intended to create long-term change.

				
<b>Project Type</b> (time interval · relative cost)	<b>DEMONSTRATION</b> (1 day - 1 month · \$)	<b>PILOT</b> (1 month- 1+ year · \$\$)	<b>INTERIM DESIGN</b> (1 year - 5+ years · \$\$\$)	<b>LONG-TERM/CAPITAL</b> (20 years - 50+ years · \$\$\$\$)
<b>Project Leaders</b>	Anyone (city, non-profit, business owner, students etc.)	Government / organizational leadership + involvement required	Government / organizational leadership + involvement required	Government / organizational leadership + involvement required
<b>Permission Status</b>	Sanctioned or unsanctioned	Sanctioned	Sanctioned	Sanctioned
<b>Materials + Maintenance</b>	Very low-cost, typically low-durability. May be borrowed, easily made, or purchased; no maintenance required	Relatively low-cost, but semi-durable materials to maximize design flexibility while minimizing maintenance needs	Low and moderate cost materials, designed to balance design flexibility, performance outcomes, and maintenance	High-cost, permanent materials that cannot be adjusted easily; maintenance needs vary tremendously
<b>Public Involvement</b>	Optional before project implementation, Recommended during brief project lifespan	Required, frequent before implementation and frequent during evaluation period	Recommended, frequent before implementation, required during initial evaluation period, optional thereafter	Required before implementation, recommended during implementation and initial evaluation period, optional thereafter
<b>Flexibility of Design</b>	High: organizers expect project to be adjusted and removed within a short timeline, typically one week or weekend	High: proponents expect project to be adjusted; it <i>may</i> be removed if it does not meet goals upon initial evaluation	Moderate: organizers expect project to be adjusted, but it is intended to remain in place until capital upgrades are possible	Low: project is considered a permanent capital upgrade that is unlikely to be adjusted significantly once installed
<b>Data Collection / Evaluation</b>	Qualitative: optional Quantitative: optional	Qualitative: required Quantitative: required	Qualitative: recommended Quantitative: required	Qualitative: optional Quantitative: recommended

Step by Step process to project development under Tactical Urbanism approach. Source: Mike Lydon, Street Plans. *Tactical Urbanism: A Tool for Crisis Management?* <https://www.transformative-mobility.org/assets/publications/Street-Plans.pdf>

Tactical urbanism can be executed in multiple ways. It can be initiated by the community as a form of breakthrough in delivering their aspirations by demonstrating various possibilities of change efforts in the city. The interventions can also be led by government, developers, and non-profit organizations to involve the community in planning the project that is or will be carried out or as an instrument to test a project before long-term investments are carried out.

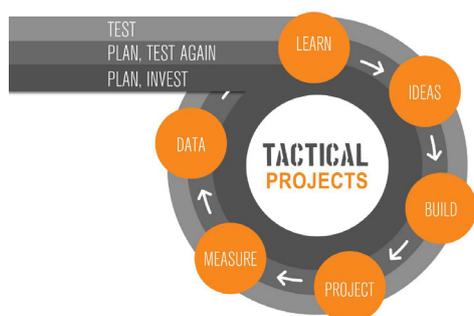
A typical tactical urbanism project includes the following four key stages:

- Site selection
- Site context appraisal
- Design and preparation for implementation
- Implementation and post-implementation evaluation

The tactical urbanism interventions can range from reducing conflict between mobility and liveability by fixing intersections, streamlining carriageway, pedestrian crossing and implementing traffic calming measures; improving access to public transport by marking bus lanes and improving bus stops; connecting people to public places by street redesigning and extending sidewalks; placemaking to improve liveability by providing shade structures, seating, landscaping, lighting, art activities in public places.

A tactical urbanism project for its effective implementation requires close coordination between different stakeholder groups

### Build | Measure | Learn



<https://www.transformative-mobility.org/assets/publications/Street-Plans.pdf>

throughout different stages of project designing, execution and implementation phase.

### Case Study 1: Coimbatore - Kovai Connect - Celebrating Public Spaces

'Kovai Connect-Celebrating Public Spaces', is part of the larger project called 'Integrated Sustainable Urban Transport Systems for Smart Cities (SMART-SUT)',<sup>2</sup> aimed at creating a city-wide Non-Motorised Transport (NMT) network plan in Coimbatore City. Coimbatore City Municipal Corporation (CCMC) in association with the Coimbatore City Traffic Police and German International Cooperation (GIZ), applied tactical urbanism as a transformative strategy to reclaim street space and, providing safety and comfort for pedestrians and cyclists through this initiative. The non-motorised transport network plan prepared for Coimbatore city focused on identification of cycling routes and pedestrian hotspots, design measures for core area and citywide network, and integrate street level plans with wider city level plans. The preliminary studies carried out as part of the project in Coimbatore city suggested that over 50 per cent of trips are made by public transport and non-motorised transport and the existing non-motorised infrastructure is inadequate and required a complete street design across the city. The municipal corporation before implementing the project at city level, undertook a tactical urbanism pilot on one of busiest streets of Coimbatore city called 'Big Bazaar'.

#### Preparatory stage

Appropriate site selection is critical to the success of a tactical urbanism intervention. Big Bazaar Road – a famous, centrally located streets in the heart of Coimbatore city, has historical significance and witnesses' activities ranging from commercial, to recreational, education and health facilities. The street serves as the shortest connecting route between Coimbatore railway station and city's commercial centre. Owing to its high visibility, the street has high volume

of pedestrian movement throughout the day. The street was selected as a pilot for implementing tactical urbanism for a period of 14 days. To understand the mobility scenario on the street, 16-hour traffic survey was carried out for the pilot. The survey helped to identify the peak pedestrian timings, vehicular flow on the street, identification of primary, secondary and tertiary users based on amount of time and activities undertaken on the street. Primary and secondary users included shopkeepers, vendors, working population, shoppers and homeless people which remained on street for around 8-12 hours in a day. Tertiary users included temple visitors, students and cinema hall visitors that remained for around 4-6 hours on the street. Cross sectional street designs were also prepared to know the existing usage pattern of the street.

- Peak hour boarding/alighting – 2450 persons/hour
- Average bus frequency – 1 minute
- Peak period – 5p.m. to 7p.m.
- Vehicular flow on big bazaar road (both directions) – 36856

#### Implementation Stage

After analysing the preliminary mobility findings, Coimbatore City Municipal Corporation (CCMC) along with GIZ brainstormed on the types of interventions to be proposed.

**Pooling in volunteers** - Coimbatore City Municipal Corporation (CCMC) officials pooled in volunteers for street redesigning such as painting the streets, spreading awareness amongst users on the road. The volunteers were debriefed about activities to be undertaken, with high safety provided to them round the clock to avoid any unwanted incidents. The project activities were undertaken for three days from 11 p.m. to 5 a.m., to ensure that users are least impacted during day time.

**Using recycled materials** - Recycled materials such as tyres, sarees, rickshaw cart, flower pots, were used as a low-cost solution to provide shade, seating arrangement for users on the road.

<sup>2</sup> Ministry of Housing and Urban Affairs (MoHUA), Government of India, and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH are jointly implementing the technical cooperation project "Integrated Sustainable Urban Transport Systems for Smart Cities (SMART-SUT)", commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ).



*Volunteers painting the streets and installing safety measures during night time as part of tactical measures. Photo Credits: Presentation by Ranjith Parvathapuram, Webinar on Tactical Urbanism*

**Compliance to street redesign guidelines**

- The authorities studied all the guidelines and provisions for pedestrian redesign and all the paintings on street adhered to those guidelines.

**Traffic calming measure** - To ensure safety of passengers at crossings and intersections, turning radius was reduced for buses so that buses slow down near intersection.

**Activities for children** - In order to make it attractive for students, games were designed on footpath so that children interact with each other and socialise on

road. Bright colours were used instead of using barricades to observe behaviour of people.

**Post implementation**

The rationale behind undertaking pilot project was to get a feedback mechanism from users, if such a project is undertaken at a large scale. The implementing authority conducted user engagement survey, intercept survey, opinion polls and activity-based surveys as part of its strategy to measure the project acceptance and impact on people. The authorities hired pushed carts to show case the design elements and concept of the project.



Top view of one of the busiest intersections on Bazaar street. The tactical measures provided a safe space for pedestrians to cross roads and travel safely. Photo Credits: Presentation by Ranjith Parvathapuram, Webinar on Tactical Urbanism



Colourful sarees and plants put on sidewalks to create a favourable and safe travel for pedestrians. Photo Credits: Presentation by Ranjith Parvathapuram, Webinar on Tactical Urbanism



Pushcarts hired by the authorities to explain the project designs and components to users of the street.  
 Photo Credits: Presentation by Ranjith Parvathapuram, Webinar on Tactical Urbanism

Architecture students from colleges as part of their learning experience helped in to explain the project through pictures, maps, and conceptual drawings in local language. People were asked to vote or suggest ideas on what kind of permanent design do they want. The authorities received suggestions such as providing railing for segregation between pedestrians and motorised vehicles to provide safety. Other innovative ideas suggested include designing footpath

beside plants, vending stalls and street art to make streets livelier and user friendly. Safety was given the top priority by users.

#### Impact

After redesigning of the street, the path width increased by 2 metres, with segregated bus lanes, two motor vehicles, parking lanes and wide pavement on either side of the road. The adequate parking space for two wheelers ensured that

business activity of local shopkeepers is not impacted by project activities. During the 14 days implementation phase of the project, none of the bus drivers stepped on to the pedestrian routes and remained on the bus lane. The redesigning of street created plazas, and reclaimed unused spaces. The successful implementation of the project can be realised from the fact that shopkeepers from other streets asked authorities to implement the same type of tactical urbanism project in other parts of the city. The project provided more safer, segregated and streamlined use of street. Coimbatore case study demonstrated the

power of tactical urbanism that can be used as a tool for urban activists, planners, and policy-makers for shaping urban spaces in a new way and improve safety and comfort for pedestrians and cyclists.

## Case Study 2: Jakarta – Creating pedestrian and bike friendly neighbourhood

### Summary

*Kampung Kota Bersama*<sup>3</sup> is a program initiated by ITDP Indonesia to help organize a number of urban kampung in



Women and children actively taking part in redesigning of streets in one of the neighbourhoods. Photo Credits: Siregar, D.P., 2019. *Jakarta's Urban Villages: A Community Based Approach to Urban Mobility*. Institute for Transportation & Development Policy.

3 Siregar, D.P., 2019. *Kampung Kota Bersama*, Institute for Transportation & Development Policy, Indonesia. Available at: <https://www.itdp.org/wp-content/uploads/2019/06/Kampung-Kota-Bersama-English-Print-2.pdf>

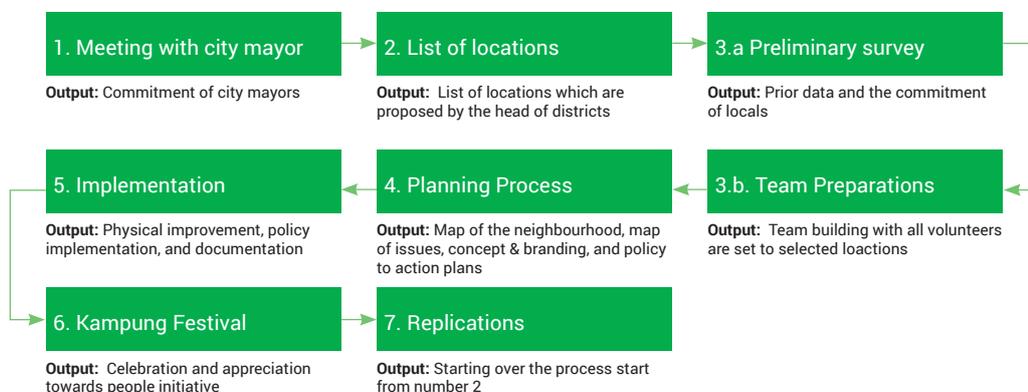
Jakarta to be friendlier to pedestrians and cyclists. Under the program, several pilot projects were implemented to provide better access to public transportation modes, create safe environment for children to access schools and prioritise pedestrians in public spaces.

Urban Kampung area has a population of around 13,000 people in an area of approximately 15.6 hectares. The area constitutes a dense and compact neighbourhood with mixed-use activity along the streets. Lack of reliable public transit, safe intersections, public spaces

and illegal parking makes it difficult for children, women and citizens to use streets safely.

The goal of the program was to create a pedestrian and bike friendly neighbourhood, cultivate a sense of belonging for the resident community, focus on capacity building and knowledge transfer to people and emphasize on direct role of women and children within the process through a quick and low-cost intervention. The program was started with the hope that similar activities can also be replicated in many places both in DKI Jakarta and surrounding areas.

## Steps and the outputs



*Local people participating in design proposal ideas for street redesigning in their neighbourhood. Photo Credits: Institute for Transportation & Development Policy*

## Preparatory phase

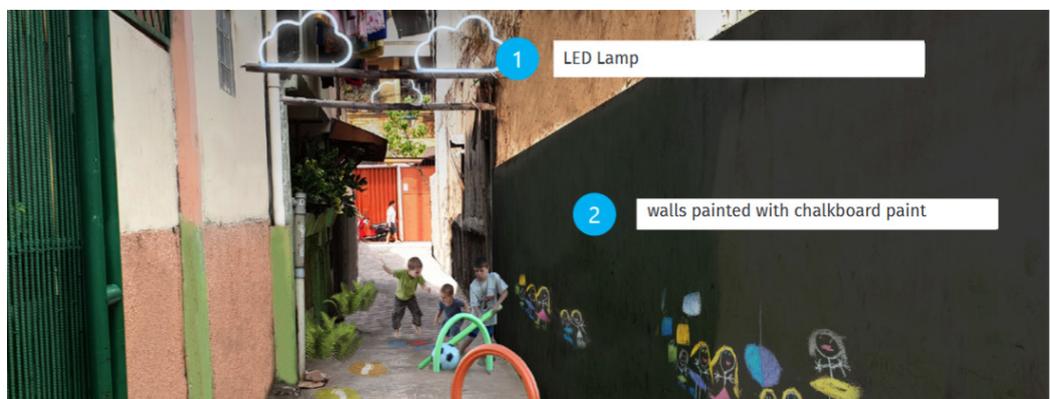
The program planning started in 2018, with **ITDP Indonesia**<sup>4</sup> mentoring the process and adopting community and activity-based development methods by collaborating with villagers. A perception survey, field survey, travel diary and discussion activities were carried out to introduce the program among the local community. Stakeholder meetings were conducted with officials of SDLH (Suku Dinas Lingkungan Hidup, Provincial Environment Service) and SDBM (Suku Dinas Bina Marga, Provincial Regional Road Service). This was followed by a participatory mapping exercise was document issues and community concerns. Coordination with the local government

was done to ensure the intervention is well received by all stakeholders. Governor of DKI Jakarta City, Mayors of DKI Jakarta, ITDP Indonesia, UN Women officials, Academia, local community came together to further discuss the replicability of such program at larger level. A need of minor, inexpensive road improvement was also solved through collaborating with the road construction and management and transport sub-agencies. The ideas and recommendation were subsequently framed through collection of local initiatives, incorporating concept such as placemaking in the design proposals. Finally, the plan was implemented with

<sup>4</sup> Institute for Transportation & Development Policy (ITDP), Indonesia. Available at: <https://www.itdp.org/where-we-work/east-se-asia/indonesia/>



Local people participating in design proposal ideas for street redesigning in their neighbourhood. Photo Credits: Institute for Transportation & Development Policy



A proposed schematic layout of tactical. Photo Credits: Institute for Transportation & Development Policy

## Traffic & parking management alley



## Child-friendly alley



Photo Credits: Institute for Transportation & Development Policy

participating of local people, women and children to paint streets, conduct awareness drives. A festival kampung was organised to celebrate and appreciate the improvements made by community people.

### Implementation process

To generate ideas amongst the local people, sketch-on-photo illustrations were shown to residents and local stakeholders. On-site discussion involving local leaders was also conducted to plan the implementation process. To get high participation from local residents, the implementation day was conducted in the format of *Kerja Bakti* a monthly clean-up activity in the scale of a local neighbourhood. Volunteers known as *'Relawan Kampung'* were deployed into several teams at various locations to provide technical assistant for the locals.

A street adopting program called *'Adopsi Gang'* was organised for people to adopt streets, paint alleys and conduct activities.

Focus group discussion were organised among students, elderly, disabled people, and women as they stayed longer on the streets and were amongst the most frequent users. Around 150 participations took part for 7 hours ranging from local residents including women and youth communities, local government officers, field workers of city's technical agencies, MRT Jakarta, ITDP in one of pilot projects implemented under the program.

### Impact

One of the major highlights of the program was keeping children, students and women at the centre of every pilot project



*Child Friendly Theme adopted as part of the Tactical Urbanism intervention. Photo Credits: Institute for Transportation & Development Policy*

implemented under the program. The painted pedestrian path was used by 98 per cent of students who walked from their home, as the road marks make them, and their parents, feel safer in one of the pilot projects. The painted area in front of the school gate aims to raise the awareness of motorised vehicles by introducing speed bumps and traffic calming measures.

As a feedback, local residents suggested to have more traffic calming measures to

reduce speeding motorcycles. 33 out of 35 respondents found the intervention helpful. The painted alleyway with additional convex mirror and lightings helped reduce noise unlike the earlier case when motorcycles used horns in the L-shape alley. Zebra crossing and speed humps were added to reduce the speed of motorised vehicles passing through the school's T-junction. Also, the pilot projects implemented under the program provided an opportunity for a wider collaboration with other institutions

and possibility of implementing large-scale tactical urbanism projects<sup>5</sup> in Indonesia.

### **Lessons Learnt**

Tactical urbanism involves shifting towards a more human-centered idea of urban planning in Indian cities. With a local context, short-term commitment, low-risk and high reward values, tactical urbanism can help in better public participation and acceptance of project proposals within a community. However, an important lesson to be learnt from tactical urbanism projects is that they cannot be applied anywhere. It requires a strong community support and continuous coordination

and collaboration between city officials, NGOs, civil society groups and different partner groups supporting the project. The bottom-up approach followed in most of the tactical urbanism projects help in ease of implementation of projects and provide a sense of ownership amongst residents of community. The low cost, quick solution and effective feedback mechanism helps to manoeuvre the project design to be replicated at larger level within a city. A tactical urbanism project is therefore a catalyst for change that cities must recognise in order to enhance the quality of life in public places of a city.

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5 Other Projects: Lazuardini, A.D., #JalanJakarta: Improving Access to MRT Jakarta Stations through Tactical Urbanism, Institute for Transportation & Development Policy. Available at: [https://www.itdp.org/wp-content/uploads/2020/02/Tactical-Urbanism\\_-ITDP-Indonesia.pdf](https://www.itdp.org/wp-content/uploads/2020/02/Tactical-Urbanism_-ITDP-Indonesia.pdf)

# Cape Town, South Africa

## Ensuring Universal Access - Cape Town Public Transport System



Low floor public transport buses inducted as part of the MyCiTi bus rapid system. Photo Credits: Wheelchairtravel.org

### Key Values:



Inclusion



Sustainability



Physical Infrastructure Development

### Summary

The public transport strategy of South Africa's Department of Transport, stands out for its commitment and ability to build an inclusive, accessible and safe transportation system in the city. The strategy for improving accessibility in public transport for 13 major municipalities, is part of the innovative policies around the

world that are part of the Zero Project.

The Zero Project was initiated by the (ESSL) Foundation (Martin and Gerda Essl Sozialpreis Gemeinnützige Privatstiftung)<sup>1</sup> in 2011 with the mission to support the implementation of the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD)<sup>2</sup> and to work for a

- 1 ESSL is a private, not-for-profit foundation that works with a mission to support social innovation, social entrepreneurship and persons with disabilities. Website: <https://www.esslsozialpreis.at/en/about-the-foundation/>
- 2 Convention on the Rights of Persons with Disabilities, Department of Economic and Social Affairs, United Nations. Available at: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html>



Dedicated bus lanes and low floor buses in Cape Town. Photo Credits: City of Cape Town

world without barriers. The approach of the Zero Project is to research and share innovative practice and policies worldwide, by engaging with a worldwide cross-sectoral network of innovators, decision-makers and opinion leaders.

South Africa's Public Transport Strategy was developed over three phases. Beginning 2007 to 2010, to the second phase spanning between 2010-2014 and third phase lasting up to 2020 and beyond. The strategic focus of the policy was to guide, support, and monitor municipalities in implementation of accessible public transport system.

Cape Town city has been at the forefront of implementing the current national level strategy with marked improvements in public transportation system. It was realized by transport authorities in Cape Town that current transport network, infrastructure and services, has historically not been designed to incorporate special need users such as elderly, children, and physically disabled. This further resulted in lack of participation of these users by limiting general access to opportunities and services, and imposing reliance on others to assist those with special needs to move around the city. Across Cape Town,

persons with disabilities faced a constant stream of obstacles to mobility and access, including poorly designed footways, long travelling distances, non-existent or obscure transport information, dangerous road crossings and inaccessible buses, mini-bus taxis, trains, public transport facilities and over-crowding.

The Cape Town General Household Survey, 2011 indicated that almost 15 per cent of the city's population was categorised as severely disabled and sight related disabilities affected the largest proportion of the population. The same survey also indicates that around 40 per cent of employed disabled persons use public transport to get to work and 4 per cent walk to work.<sup>3</sup> Subsequently, Cape Town city has undertaken significant steps to provide a safe, inclusive, and accessible public transport system in the city.

### Overarching vision of achieving universal accessibility

Persons with disabilities received a consistent attention in Cape Town's Local, Provincial, and National laws. The goal of providing universal accessibility to create more equitable and inclusive city was at the core of all policies and legislative

<sup>3</sup> Tukushe, E. Universal Access Policy for the City of Cape Town, Policy No: 17958, 2014. Available at: <https://tdacontenthubstore.blob.core.windows.net/resources/0c6d5a40-01a9-4bf4-bf3a-abf7059eadb7.pdf>



Safe tactile pavements and on-boarding facility for wheelchair users at bus stops.

Photo Credits: South Africa Wheelchair Accessible Travel Guide, Cape Town Public Transportation.

framework. The city drafted relevant local legislative documents in line with provincial and national documents for universal access such as the Promotion of Equality and Prevention of Unfair Discrimination Act, 2000 (Act No 4 of 2000), the National Land Transport Act, 2009 (Act No 5 of 2009) and City of Cape Town: Constitution of Transport for Cape Town By-Law, 2013.

Apart from legislative documents, policies, strategies, frameworks and guidelines were framed at national, provincial and local level. Some of them are: The National Land Transport Strategic Framework 2006-2011, Integrated National Disability Strategy White Paper of November 1997<sup>4</sup>, the Implementation Strategy for Accessible Public Transport 2011, PRASA Universal Access Policy 2011, Cape Town Spatial Development Framework 2010, and the

Draft Parking Policy for the City of Cape Town, 2013. In 2007, the Department of Transport emphasised that 'Integrated Rapid Public Transport Networks (IRPTNs)' or the Bus Rapid Transit (BRT) was the only viable option that can ensure sustainable, equitable, uncongested mobility in liveable cities and districts. The 2006-2011, National Land Transport Strategic Framework set a goal of providing a 'public transport system that is accessible to special categories of passengers including persons with disabilities, the aged, pregnant women and those who are limited in their movements by children.' The Universal Access Policy for the City of Cape Town, 2014<sup>5</sup> acts as a guiding document for policy makers to improve connectivity and increase efficiency and productivity in the City of Cape Town.

4 South African Human Rights Commission Report, Towards A barrier-free society, November 2002. Available at: [https://www.westerncape.gov.za/sites/www.westerncape.gov.za/files/documents/2004/11/towards\\_barrier\\_free\\_society.pdf](https://www.westerncape.gov.za/sites/www.westerncape.gov.za/files/documents/2004/11/towards_barrier_free_society.pdf)

5 Tuskushe, E. Universal Access Policy for the City of Cape Town, Policy No: 17958, 2014. Available at: <https://tdacontenthubstore.blob.core.windows.net/resources/0c6d5a40-01a9-4bf4-bf3a-abf7059eadb7.pdf>



The level boarding system at the bus stops provides a safe space for wheelchair users to access buses.  
Photo Credits: Accessible to All, MyCiTi.

## MyCiTi – accessible bus rapid transport system

In 2007, the 'Towards 2020: Public Transport Strategy and Action Plan' focused on upgrading existing public transport and on Integrated Rapid Public Transport Networks whilst highlighting the need for 100 per cent accessibility. In addition to the new system, the transport reforms included two other key components. First, the reforms granted the municipal government more control over regional public transport and building professional capacity to manage that system. Second, restructuring the existing public transport industry by including incumbent operators as stakeholders in the new BRT system, while phasing out minibus taxis and Golden Arrow buses from the streets. The Cape Town's Bus Rapid Transport System – 'MyCiTi'<sup>6</sup>, was opened in 2010, also the year the city hosted the FIFA World Cup. In 2010, Cape Town approved the Business Plan for the MyCiTi Integrated Rapid Transport

System, along with the Universal Access Policy.

- The system was designed to be universally accessible to people with disabilities, wheelchair users, the elderly and parents with baby strollers.
- The system consists of 40 routes, 41 stations and more than 600 bus stops. The system designed, concerns the entire passenger journey, including getting to the bus stop from a distance of 50 metres from the journey's origin, boarding vehicles, arrival as well as reporting any problems along the way.
- The buses designed were primarily low-floor, and had a system of ramps to permit barrier-free entry for wheelchair users.
- The 41 MyCiTi stations were located in high accessibility areas, with many stations serving as nodal exchange points between multiple bus routes.
- The stations were enclosed buildings or platforms with automated fare gates

6 A-Z of using the MyCiTi bus, Discover MyCiTi. Available at: <https://www.myciti.org.za/en/home/>



Wheelchair spaces inside the MyCiTi bus. Photo Credits: Wheelchairtravel.org

at the entrances and exits and each station has wheelchair accessible fare gates. The Automatic fare collection system 'EMV card' not only acts as a debit card, but enables quick 'tapping on' and 'tapping off' while using the buses and stations.

- Station platforms were elevated at a level with the bus such that ramps extend from the bus to bridge the gap between platform and bus, thus offering a barrier-free entry route for wheelchair users.
- The buses have dedicated wheelchair spaces with a seatbelt/securement system. All the buses are equipped with audio light emitting diode (LED) screens; as well as service information in a wide variety of formats, door-to-bus-stop infrastructure (way finding/signage, including tactile signage, tactile paving, and on-demand services) and dedicated customer support staff.

The system was designed to be rolled out in four phases for completion within 15 to 20 years. Phase-I (2010-2013) became

operational by March 2013, with a world class BRT infrastructure and a feedback mechanism was established for users with special needs to constantly improve the system in later phases.

#### Services supporting MyCiTi Public Transport System

Apart from developing a public transport system, the city launched a Dial-a-Ride dedicated kerb-to-kerb public transport service for people with disabilities who cannot board other modes of public transport for their commute to and from work. To avail the service, the person who wants to make use of the Dial-A-Ride service are required to phone the Transport Information Centre to complete an application form, certifying that the user cannot access conventional public transport on his own. The transport authority after verification of application issues a number to the user who can then avail the service. Currently, Dial-a-Ride transports 350 regular users and 2,270 passengers on a need's basis.<sup>7</sup> The service is integrated with MyCiTi which is

<sup>7</sup> Dial-A-Ride, MyCiTi. Available at: <https://www.myciti.org.za/en/routes-stops/dial-a-ride/>



*New feeder buses inducted under MyCiTi bus rapid system, illustrating the universal access system. Photo Credit: Bruce Sutherland*

capable of accommodating passengers in wheelchairs. The local municipal traffic department also provides disabled users to avail disabled parking bays by issuing a disabled parking disc.<sup>8</sup> Depending on the nature of disability and certification from a doctor, the authorities issue parking disc which allows users to park in allocated disability parking bays and exempts from parking provisions in certain circumstances. The additional services designed in the city addresses issue of last mile connectivity and provide seamless integration with public transport system of the city.

### **Impact**

Since the launch of MyCiTi in 2010, approximately 8.5 million passenger journeys have been made via MyCiTi rapid transit system.<sup>9</sup> Under Phase I of MyCiTi,

15,000 daily passengers were recorded and all the stations and roadside bus stops are universally accessible. All 35 MyCiTi stations and the 161 roadside bus stops were universally accessible, and all 379 busses had level boarding, spaces for wheelchairs, and an audio LED screen.<sup>10</sup> Around 22 kilometres of accessible walking and cycling pathways are developed to support the public transport system in the city. The public transport system has been able to provide accessible public transport, enabling equal treatment and providing easier access to jobs and local amenities. The transport strategy implemented by Cape Town can be used as a best practice example, addressing inequalities in existing transport sector and providing equal opportunities for the disabled. MyCiTi's Universal Accessibility Policy received an award from Scientific Advisory Board of

<sup>8</sup> Department of Transport and Public Works, Western Cape Government. Available at: <https://www.westerncape.gov.za/dept/tpw/services/1027/17937>

<sup>9</sup> Bulman, A; Greenwood, G; Kingma, R. 2014. MyCiTi Bus Rapid Transit It is Not Just About the Bus. Proceedings of the 33rd Southern African Transport Conference (SATC 2014), Pretoria, South Africa, July 2014. Available at: [https://repository.up.ac.za/bitstream/handle/2263/45541/Bulman\\_Myciti\\_2014.pdf?sequence=1](https://repository.up.ac.za/bitstream/handle/2263/45541/Bulman_Myciti_2014.pdf?sequence=1)

<sup>10</sup> Improved Mobility: How Cape Town is Leading the Way, City of Cape Town, October 2020. Available at: <https://destination.investcapetown.com/improved-mobility-how-cape-town-is-leading-the-way/>

Zero Project, for its commitment to ensure easy of accessibility to special needs passengers.

### **Lessons Learnt**

Cape Town's long-standing efforts towards promoting an accessible and safe transportation system for disadvantaged sections of society is one of its kind examples to build an inclusive transportation system. The city undertook drastic reforms through legal mechanisms

such as laws, statutes, guidelines, policies at the local, provincial and national laws to pave way for equitable public transport system. MyCiTi, the bus rapid system, further made elaborate efforts and paid consistent attention to person with disabilities by providing infrastructure such as accessible bus stops, ramps and wheelchair spaces in buses. A city located in global South, provides an opportunity for cities in developing countries to initiate similar efforts and build an accessible and inclusive mobility system.

## Best Practices in Sustainable Mobility prepared in CITIIS

Sr. No.	Project	City/Country	Project Description
1.	Pune cycle plan	Pune, India	Pune Cycle Plan was prepared in 2016 to create a city-wide cycle track network and cycle-safe streets. The project is financially supported by the Government of India and the Pune Municipal Corporation.
2.	Street Design Project	Nanded, India	Under Street Design Project, about 50 kilometers of street in Nanded are being redesigned and built across the city. The project is based on the principle of equitable space allocation for all road users with a “focus on people rather than automobiles”.
3.	Safe Bicycle Riding Promotion plan	Tokyo, Japan	Safe Bicycle Riding Promotion Plan was formulated in 2007 by the Tokyo Metropolitan Government to develop bicycle paths, reduce illegally-parked bicycles and develop bicycling facilities on public roads and sidewalks.
4.	Bicycle Planning, Ecobici	Mexico City	Ecobici is the most successful public bike sharing systems introduced in Mexico City in 2010 with the objective of providing a cheap, efficient, sustainable, and flexible mode of transport.
5.	Biking Reforms	São Paulo, Brazil	São Paulo biking reforms include large scale cycling infrastructure, strategic master plan and a bicycling movement in the city that was a result of decade long civic engagement through active political processes.
6.	Helmcken Greenways project	Comox, Canada	The Comox-Helmcken Greenway aims to improve pedestrian and cyclist safety, connecting parks, schools, community centres. The project encourages people of all ages and abilities to explore the city by foot, bicycle, and wheelchair, in a comfortable, and convenient way.
7.	A Greenway Network	Singapore	The Greenway Network focuses on redesign of existing streets to accommodate cyclists, including infrastructural interventions, such as new and upgraded traffic signals, new street paving, and upgraded street amenities such as seating, and planting trees.
8.	Emerald Network	Boston	Emerald Network creates safe, non-motorised pathways, parallel routes that, many people travel for commutes, pleasure, and exercise. The network opens connection to transit, jobs, and open spaces, and has the power to transform how people get around in the city and the region.
9.	NMT network	Guangzhou, China	Under the non-motorised network plan, dedicated bike lanes, tied to the Bus Rapid Stations are provided in the city. There is a provision of 5500 bike parking positions as part of the first plan of BRT station design.
10.	Design Standard and specification	NACTO - National Association of City Transportation Officials	Global Street design guide provide guidelines on speed, variations for different types of modes and level of comfort. The guidelines focus on providing sufficient protection from travel lanes, taking into account speed differential and vehicle volume.

Sr. No.	Project	City/Country	Project Description
11.	Three Wheels United	Bangalore	Three Wheels United was founded in 2009 to tackle the environmental pollution caused by auto rickshaws and limited earning potential available to drivers in Bangalore city.
12.	Bicycle taxi	Africa	Bicycle taxi are enhancing mobility in the east African countries by providing a low-cost transportation option to the people. The program has helped in enhancing the socio-economic conditions of the taxi drivers.
13	Alwar Vahini: Mini passenger public transport services	Alwar, India	Alwar Vahini program was implemented in 2011, with an aim of replacing the old polluting three wheelers with vehicles that comply with Euro IV norms. The project helped in transforming the public transportation sector in the city with minimum investment, while at the same time creating jobs and providing mobility solutions to people at large.
14.	Eco cabs	Fazilka India	Eco cabs project was launched in 2008 by the Graduates Welfare Association that promotes fundamental principles of urban mobility such as accessibility, and quality of service, and inclusive technological intervention to enhance the overall quality of life.
15.	Safe Routes to School Movement	United States of America	The Safe Routes to School (SRTS) movement was started in 2005 with an aim to create a cultural change regarding transportation and build enthusiasm and support among families, teachers, school administrators, and local government officials towards promoting physical activity and build healthy life habits by adopting cycling and walking as means of commuting.
16.	Mobilise Your City Initiative	Philippines	Mobilise Your City (MYC) initiative was launched at the United Nations Climate Change Conference– COP21 held in Paris in 2015 to promote sustainable forms of urban mobility in 100 cities across 20 developing countries.
17.	Electromobility	Shenzhen, China	Shenzhen adopted a comprehensive approach to make electric vehicles an economically viable alternative to fossil fuel run vehicles, reduce economic and political dependency on fossil fuels as well contribute to internationally and nationally determined climate targets.
18.	Gender responsive transport	Bogota, Columbia	To promote safety for women in public transport system, Bogotá's experiment with promoting non-motorised transport (NMT) and leveraging technology, is a demonstrative story in sustainable and inclusive transport policies.
19.	Tactical Urbanism	Coimbatore and Jakarta	Tactical urbanism projects in Coimbatore and Jakarta, are citizen-led, quick, and affordable experiments to test and demonstrate short-term, low-cost and scalable interventions as a way to catalyse long-term change in urban mobility.
20.	Accessible Public Transport	Cape Town, South Africa	Cape Town's accessible public transport system aimed to build an inclusive, and safe transportation system in the city. The interventions exclusively focused on providing accessible transport system to persons with disabilities.
21.	Energy efficient travel with Rickshaw	Dhaka	Dhaka's case study involved focusing on achieving social sustainability for rickshaw pullers by integrating them with Bus Rapid Transport system of the city and provide an opportunity for inclusion.



City Investments To Innovate, Integrate, and Sustain (CITIIS) is the main component of the 'Supporting Smart Cities Mission for a more Inclusive and Sustainable Urban Development in India Initiative' launched by the Ministry of Housing and Urban Affairs (MoHUA), Government of India in 2018. The program is supported by the Agence Française de Développement (AFD) and the European Union (EU), and is being coordinated and managed by the Program Management Unit (PMU) at the National Institute of Urban Affairs (NIUA). External aid to the tune of EUR 100 million has been provided to twelve Smart City SPVs in the form of loan, and EUR 6 million has been made available for technical support to the program.



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