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# STA 2023 Spotlight: Bhubaneswar, India

Creating Integrated Public  
Transport Services that  
Leave No One Behind



Capital Region Urban Transport  
Bhubaneswar • Cuttack • Puri

# Timeline of Key Events and Interventions



Bhubaneswar, known as the Temple City, is the capital of the State of Odisha in India and forms one of the nodes of the Golden Triangle of Tourism in the State, along with the neighboring towns of Puri and Konark. It is one of the fastest-expanding cities in India, growing by 30% from 2011 to 2021. Naturally, that growth, coupled with accelerated increases in private vehicle ownership, has put increased burdens on the existing transportation infrastructure.

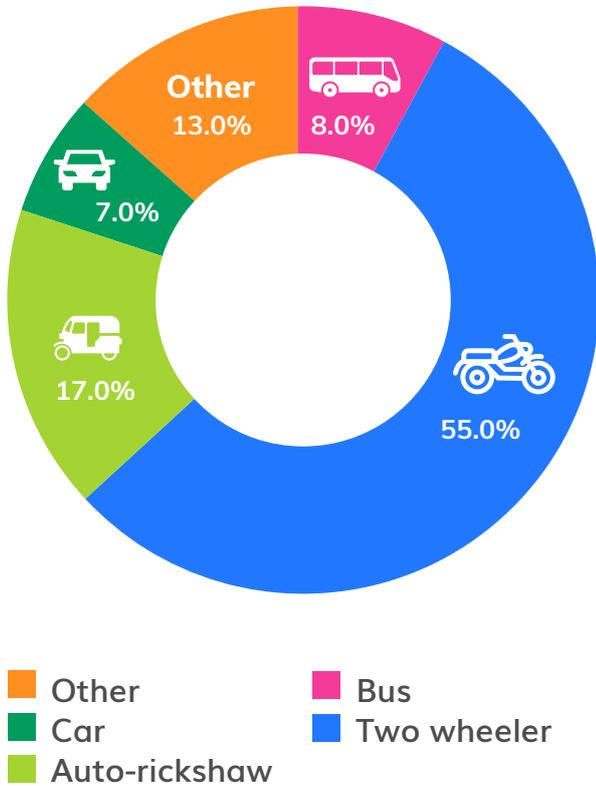
While most people, especially the most marginalized, are dependent on walking, cycling and public transport for daily travel needs, the streets are increasingly congested, sites of conflict, which also exacerbates the air quality in the city. While it is shaping into an emerging educational and tech hub, the pressures on the transportation systems will continue to grow as the current population of 1.25 million, is estimated to double in the next decade.



Bhubaneswar's streetscape with recent interventions in active mobility and public transport service. Source: ITDP India.



Modal split for the city of Bhubaneswar before modernization of its integrated transport system: Mo Bus and Mo E-Ride. Cars and two-wheelers accounted for 62% of all trips with buses only accounting for 8%. Source: CRUT.



Another challenge that the city wanted to tackle is the role of women and people who do not identify as male in the public space and increasing their access to public transport. They have unique mobility needs, coupled with concerns for their safety in public space. The underrepresentation of women and the transgender community in the transport sector was a focal point for the city of Bhubaneswar together with Capital Region Urban Transport (CRUT), the public transport agency. The pandemic in particular has illuminated the dangers of domestic violence and poverty, especially within the women and transgender community respectively. In the pandemic, disadvantaged groups of society were pushed further towards destitution as their sources of income failed.

The city has been working to strengthen and modernize its public transport services with

a focus on user experience, gender equity and providing more connected sustainable mobility options. It succeeded in increasing ridership on its services by 200% over four and a half years, with 57% of passengers shifting from private modes. Part of this success is because CRUT integrated Mo E-ride, e-rickshaw feeder services, to the Mo Bus system. Previously, no women worked in the transport operations. Now, 40% of all the conductors on the bus service are women, and women, transgender people, and people who are HIV+ are now drivers for the feeder system that uses e-rickshaws. Women passengers have reported feeling safer in part due to the women conductors, but also the buses have safety measures like CCTV and panic buttons. The government is committed to the idea that better public transport means a better city and invests in supporting the operations of the system.

Several aspects played a role in realizing the success of those initiatives of the public transport system including:

- ▶ Strong Communications with Users: CRUT evaluates and builds on user needs through feedback and participatory channels to inform design and operations of the city bus system,
- ▶ Public Private Partnerships: CRUT is able to streamline the operations of the bus system through collaboration of different stakeholders,
- ▶ Integration: CRUT works to integrate the bus service with other essential transport systems to provide inter-regional and inner-city connectivity, and
- ▶ Inclusive Workforce Development: CRUT has created programs for workforce development that would increase participation of women and transgender community.

## ► Reimagining the Public Transport Service as an Accessible, Sustainable and Inclusive System

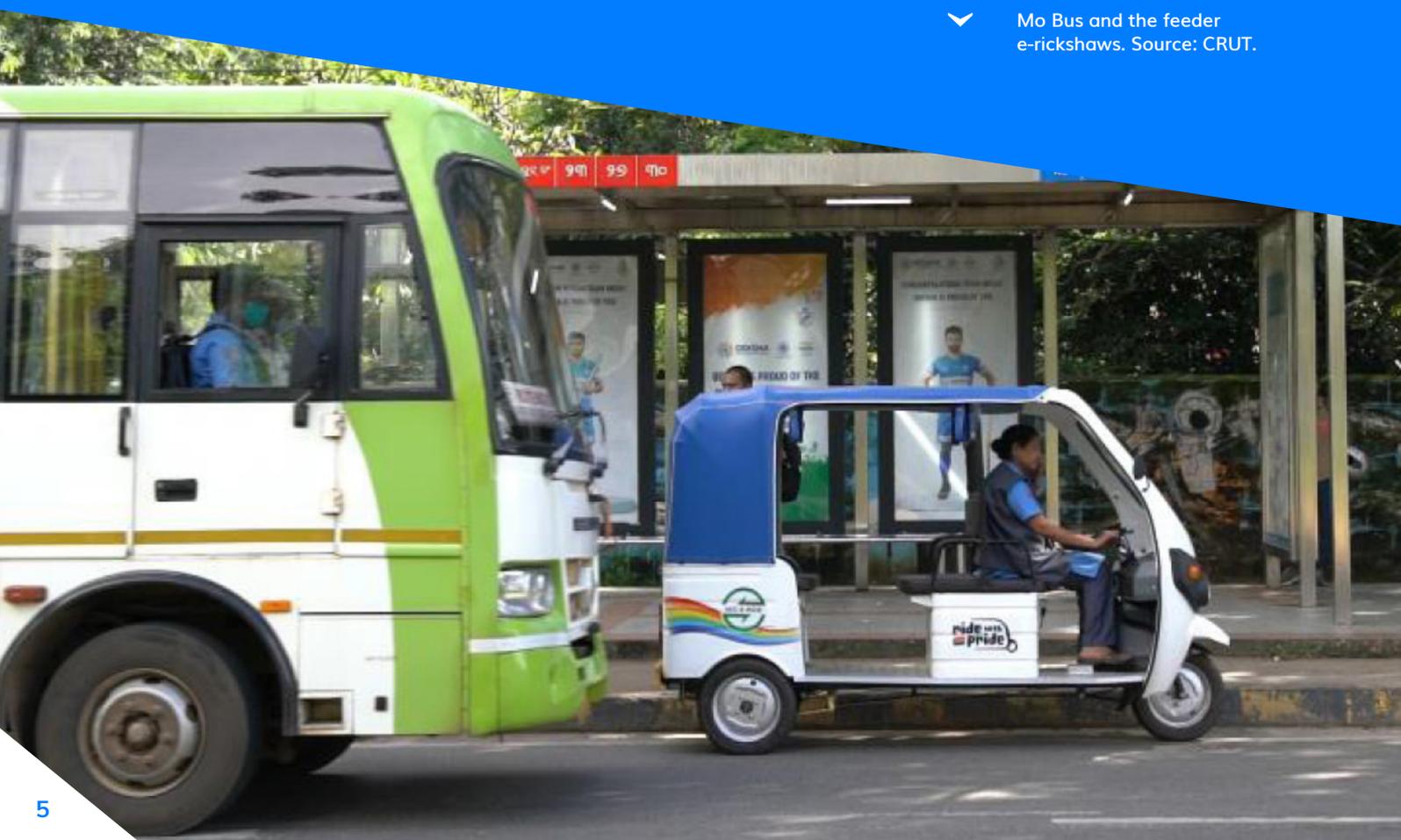
Over the last couple of years, Bhubaneswar has worked to counteract patterns of decreasing quality of public transport services and increasing private vehicle use. In 2018, the Government of Odisha rebranded the Bhubaneswar Puri Transport Services (BPTS) into CRUT, which stands for Capital Region Urban Transport. This agency is now responsible for developing strategies and interventions to further modernize infrastructure and strengthen inter- and intra-city connectivity. The focus of Bhubaneswar's transport system lies on sustainability, user experience and multimodal transport, while also supporting last-mile connectivity.

The Government of Odisha has played a key role in shifting the transport planning

paradigm in Bhubaneswar to one that promotes connected and sustainable mobility. It aims to transform the socio-economic and environmental conditions of the Capital Region, supporting inclusive and resilient mobility options. As part of the rebranding, CRUT changed its focus to be on customers and the amenities necessary to create an impact within the community. Especially in recent years, CRUT has worked on closing the gap between the growing number of public transport passengers and the number of buses available, with a focus on specific populations. Women, senior citizens, people with disabilities, transgender, and HIV-positive people form part of CRUT's target group.



Mo Bus and the feeder e-rickshaws. Source: CRUT.



## ► Building Out Accessible and Sustainable Mobility Systems

The innovative initiatives of CRUT include Mo Bus and Mo E-Ride, an integrated network of public transport. The fleet of [390 buses covers a network of 600 km along 67 routes](#). With a public-private partnership using a gross-cost contract model, where bus operators and partner agencies are paid based on fixed fee, dependent upon service provided and performance, the city of Bhubaneswar can now ensure efficient and reliable public transport service. The network connects diverse neighborhoods in Bhubaneswar, as well as neighboring cities. It serves more than one million people. In addition, the e-rickshaw fleet known as Mo E-Ride has been working as a feeder service for the primary Mo Bus routes, facilitating last-mile connectivity. This ecosystem of integrated multimodal mobility solutions is smart, safe, affordable and accessible to all. It has revived a formerly declining rate of passengers – and it is the reason why Bhubaneswar was nominated for the Sustainable Transport Award 2023 and received an honorable mention.

The city's transport system uses the strengths of Bhubaneswar, including its inherent urban morphology. As one of the very few planned cities in India, the city has evolved to have a dense population and mixed land use. More than 50% of daily trips are less than 4 km, providing the opportunity to maintain a compact city design through an effective public transport system. Sustainable transport was [already common in 2013](#), for example, when over 60% of daily trips occurred on foot, bike, cycle rickshaws, buses and auto rickshaws.

Sustainable and well-connected mobility options allow for more resilient and accessible communities. They decrease dependency on fossil fuels, offer greater flexibility and adaptability, enhance social mobility, and build stronger, more connected communities. CRUT is a great example of a transport company focusing on user

experience, gender equity, and connectivity. Together with the city, CRUT has streamlined the operation of the Mo Bus system in the city and integrated it into a connected mobility system together with the Mo E-Ride. This has resulted in a 200% increase in ridership since CRUT started operations, with an estimated 100,000 trips per day.

As a response to the challenges of private vehicle ownership, congestion, air pollution, and the underrepresentation and safety of women and transgender persons, the city of Bhubaneswar is developing a better mobility system. This is based on the city's [Low Carbon Mobility Plan from 2019](#), which was developed in partnership with the Housing and Urban Development Department, the Government of Odisha, the Bhubaneswar Development Authority and the Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ), the German development agency. The plan puts in place a comprehensive mobility blueprint and clear vision for the future, setting 2040 goals, targets and proposals for policies and measures. It envisions a transit-oriented and child-friendly city with a compact urban form that promotes active, connected and sustainable mobility choices. CRUT is focusing on interventions defined in the Low Carbon Mobility Plan to increase the environmental sustainability of the city's public transport system, by providing better and more intermediate public transport, changing travel behavior, and supporting electric mobility. This will help reach environmental goals such as improved air quality, innovative technologies to reduce CO2 emissions, and intermodal integration to support the use of public transport.

In addition, the [Odisha Electric Vehicle Policy 2021](#) serves as a detailed policy framework to encourage people to switch to EVs. The policy is paving the way toward greener mobility solutions and a sustainable lifestyle.

## ► Rollout of the Mo Bus Service

Mo Bus, meaning “my bus”, was launched by CRUT in November 2018. This bus system provides reliable, safe, comfortable, and affordable transportation, connecting intercity and intracity neighborhoods around the state capital. As on date, CRUT has rolled out 390 Mo Buses over a 600-kilometer network that includes 67 routes. With a focus on user experience, employee development, smart technology, and environmental quality, Mo Bus serves Bhubaneswar and provides connections to the neighboring heritage cities of Cuttack, Konark, and Puri which form a part of the Capital Region of the State. Mo Bus daily ridership has increased over the years, from 33,326 since its launch in 2018 to over 100,000 in 2022, reflecting a significant **200% increase in daily ridership**.

The Mo Buses come in different versions: standard (12-meter) and midi (9-meter) buses, both offered with and without AC.

All buses are equipped with CCTV, emergency panic buttons, priority seats for women with children and older people, first aid box, online ticketing systems, and an automated fare collection system through which disaggregated ticketing is done for the purposes of data collection on user groups. Passengers also benefit from discounts if they are senior citizens or persons with disabilities. There is also a smartphone application called Mo Bus App with real time tracking, journey planner and online ticketing system at discounted rate to promote digital payment among the passengers.

In July 2022, the CRUT launched 50 electric buses to complement the existing fleet of conventional (diesel-run) buses. The Electric AC midi buses have 30 seats each. They support the vision of a more sustainable transport for Bhubaneswar.



▲ Two types of Mo Bus vehicles: 12-meter (left) and 9-meter midi buses (right). Source: CRUT.



▲ Example of a 9-meter midi e-bus of the Mo Bus System. Source: ITDP India.

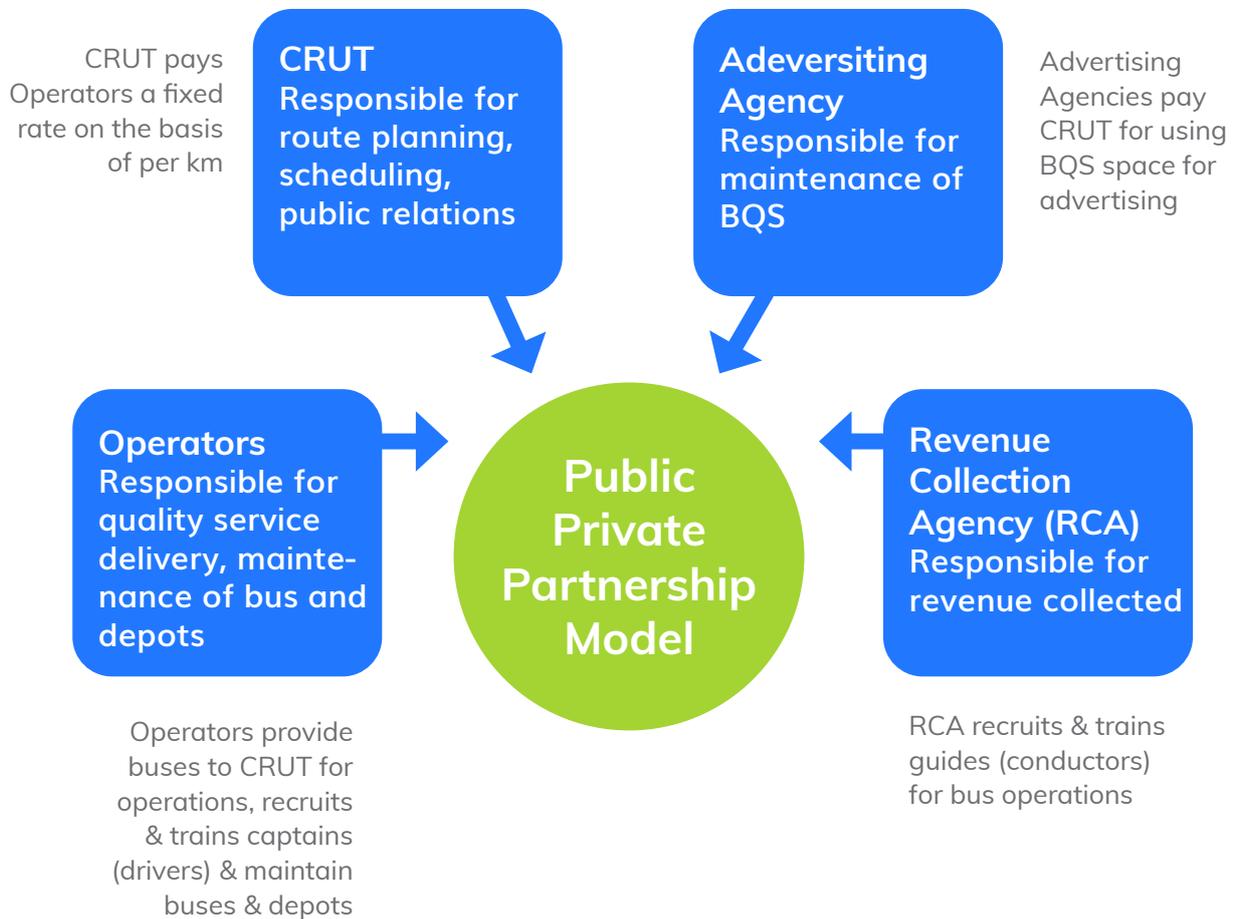
To facilitate comfortable and safe waiting areas for the passengers of Mo Bus, there are 200 Bus Queue Shelters (BQS) across Bhubaneswar. These shelters are well lit, equipped with dustbins for segregated disposal of waste and benches for passengers, have a toilet and bike parking located nearby, and use a Public Information

System so riders can see in real time the arrival of buses. The BQS are located strategically by the road at points that serve as a safe waiting area for everyone.

- Mo Bus queue shelter incorporating street furniture, travel information, and pedestrian and cycling infrastructure. Source: ITDP India.



All funding for the Mo Bus comes from the Government of Odisha. The connected mobility system is deployed in an innovative public private partnership model:



All additional funding for the system comes from the Government of Odisha

▲ Funding scheme of the bus operation for the Mo Bus service showing the Public-Private Partnership Model. Source: CRUT.

CRUT uses a gross cost contract (GCC) model that pays the operator per kilometer of service performed for Mo Bus to ensure that the best service is provided. To this end, CRUT has devised a first-of-its-kind financing mechanism where 75% of the fleet acquisition cost was given to the operators as soft loan at the rate of 6% interest per annum from the government.

The soft loan is being recovered from the operators as equated monthly installments (EMI) deducted from charges the agency is to pay to the operators based on the contract over the entire contract period. This has reduced the operator's dependence on external agencies for funding. The buses are hypothecated, or pledged, to CRUT by operators throughout the contract period.

This innovative public-private partnership plays an important part for the efficient operation of the city's public transport. As the regulatory body, CRUT is responsible for planning and scheduling Mo Bus routes. It pays operators the fixed per kilometer rate based on agreement signed. The operators are responsible for procurement, operations and maintenance of the vehicles, the maintenance of depots, and the recruitment of bus drivers. CRUT earns revenue generated from fares. It hires the revenue collection agencies, which are also responsible for recruiting conductors and ensuring that there is no leakage in the collected revenues.

Advertising agencies are responsible for maintaining the 200 Bus Queue Shelters across Bhubaneswar.

CRUT earns its non-fare revenue from the advertisements in these shelters. This has also helped to keep Mo Bus and Mo E-Ride fares at a nominal value that is affordable to everyone. CRUT has an in-house checks and balances team, including technical inspectors, that maximizes operational efficiency. Overall, CRUT has a revenue recovery rate of almost 50% of the expenditure. The remainder is covered by the Government of Odisha as viability gap funding, in part because they want the system to be affordable for most people and in part because of the belief that investing in public transport will lead to a better, less congested, less polluted, healthier city.

## ➤ Addition of the Mo E-Ride Feeder System

Bhubaneswar implemented an important addition to the Mo Bus system, the Mo E-Ride. These electric rickshaws provide last-mile connectivity to the inner pockets of

the city and serve as a critical feeder service for Mo Bus passengers, helping them reach their origin or destination in a comfortable, safe, and secure way.

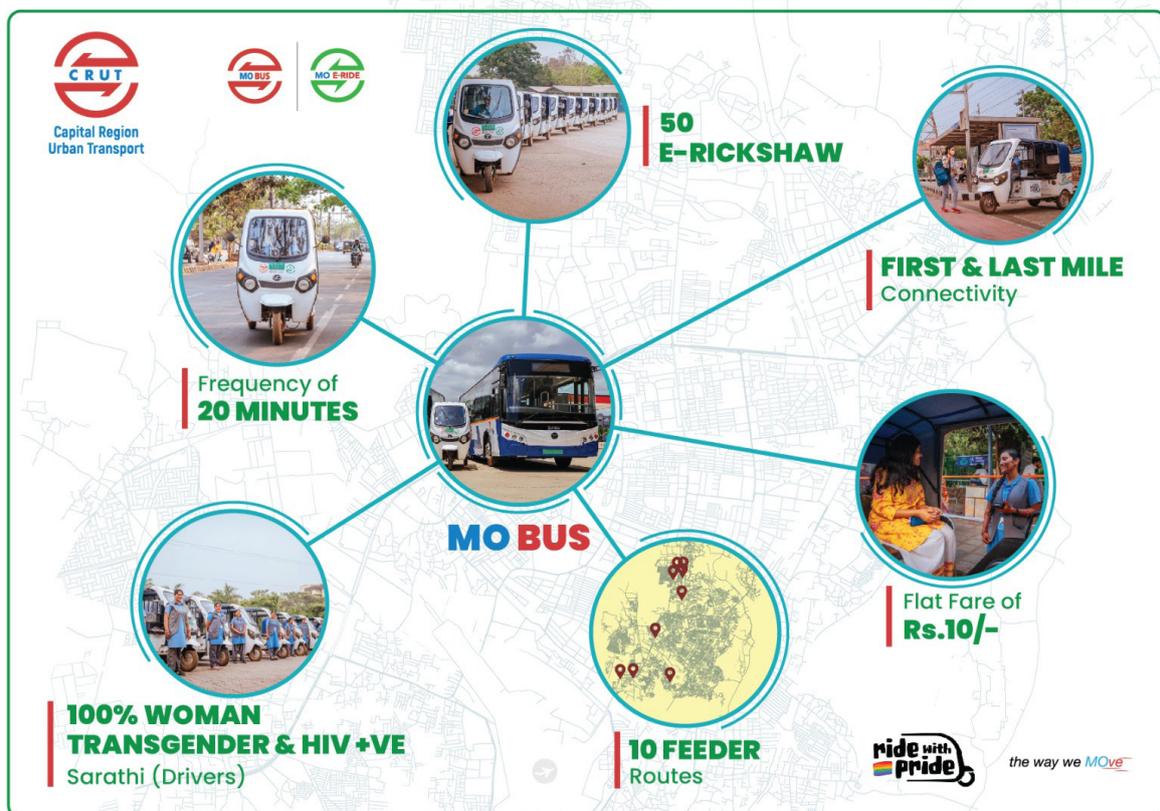
➤ E-rickshaws are an important first and last mile connectivity mode, which also helps boost ridership on Mo Buses. Source: CRUT.



The e-rickshaw fleet of 50 pilot vehicles facilitates a “hub-and-spoke” concept for the primary Mo Bus routes, thus providing integrated multimodal e-mobility. The rickshaws either originate in the hub or are sent to the hub to pick up passengers. From there, they travel outward to custom locations called spokes, always depending on the destination of the passengers.

This feeder service has been key for CRUT to revive a previously declining number of passengers in public transport. The pandemic in particular showed the need for a safe last-mile connection. Based on the increase in cases of domestic violence against women and increased violence towards the transgender community, CRUT took action to mainstream and empower those affected.

The Mo E-Ride project is spearheaded by women and transgender people driving the e-rickshaws. In just 18 months, the identification, induction, and training of 150 beneficiaries of the initiative were completed, allowing the e-rickshaw system to be set up quickly. Currently, 80 women, transgender people, or HIV-positive people are working as drivers for the feeder system.



▲ The hub and spoke model of the integrated system. Source: CRUT.

## ➤ Promoting Inclusion Through Gender Mainstreaming

# 3

Bhubaneswar, like many cities in India, struggles with having women join the workforce. According to the World Bank, only 1 in 5 women in India works, which is due to factors such as a cultural belief that women should not work outside the home, women being responsible for care work, and a lack of appropriate and accessible workplaces for women. CRUT and the city of Bhubaneswar tackle this through integrating gender perspectives, needs, and interests into planning and decision-making

processes at every level, and by setting high benchmarks for increasing women representation in the transport workforce. At the same time, Bhubaneswar is aiming for a transport system designed for the most vulnerable parts of the community in order to benefit everyone. This way, a safer and more accessible system for everyone is designed, leaving no one behind.

▼ CRUT's gender mainstreaming encourages more female participation in the transport system as users and as the workforce. Source: CRUT.



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▲ Electronic ticketing system on buses track the demographic profile of the passengers. In this method, the guide (bus conductor) manually adds the information on users in the electronic ticket machine  
Source: CRUT.

## ► Informed Decisions Through Disaggregated Tickets and Data Collection

CRUT is the first public transport authority in India to use a disaggregated ticketing system, meaning they are able to categorize passengers into demographics such as gender, age and physical disability. This shift to more detailed data tracking contributes to better informed decision-making. Disaggregated ticketing systems can help to identify patterns in women's travel behavior, such as time of day, frequency, and duration of travel. It can also help identify travel preferences, such as the mode of transportation they prefer and the routes they take.

This information can be used to design transportation services that are more

responsive to women's needs, such as increasing frequency, extending operating hours during times when women are more likely to travel, reaching destinations that women may frequent, the targeted use of female conductors to help women passengers feel safer, etc. In addition, the data helps CRUT and the city to assess the impact of gender responsive policies. This, in turn, enables the city government to allocate resources more effectively. For example, it could decide to increase the number of buses on routes in and around Bhubaneswar that are popular among women.

## ➤ Gender Mainstreaming in the Workforce

Inclusiveness is one of the core values with which CRUT functions. With the crew forming the face of the brand, CRUT became the flagbearer of changing the notion of male dominance in the public transport sector. CRUT established a target policy of 50% of the city bus conductors to be female. At present, 40% of Mo Bus conductors are women.

CRUT highly encourages women to become a part of its crew and there are several outreach activities held – both on-ground as well as in social media platforms to sensitize the people on the significance of gender sensitive public transport system.

In fact, survey data state that women commuters feel safer to travel late at night in Mo Bus due to the presence of women staff members.

On the other hand, CCTV surveillance inside Mo Bus and Depots along with provision for separate washrooms in the depots and major terminals for the gender diverse crew ensures conducive working environment for the workforce. Periodic training and capacity building and regular counseling are done where gender sensitive passenger management forms an integral part of the sessions.

➤ CRUT's 50% policy target for employing female conductors on Mo Bus has already contributed significantly to the female workforce within the city's bus system with 40% of all conductors being women. Source: CRUT.



## ➤ Ride with Pride

The e-rickshaw (Mo E-Ride) project was conceptualized and implemented during the pandemic. The lockdown led disadvantaged sections of society to be pushed further into a state of destitution. The transgender community, which largely survives through begging or sex work, was amongst the worst-hit communities. Additionally, there were several reports on the increase in cases of domestic violence against women during the lockdown. These instances made the authorities in CRUT feel that something must be done urgently to mainstream and empower these people. The one-of-its-kind gender inclusion and empowerment through Mo E-Ride initiative, promotes women, transgender and socially disadvantaged people like people who are HIV positive as 'Sarathis' (drivers), providing a respectable and safe livelihood alternative.

The "Ride with Pride" initiative was deployed within a span of 18 months including identification, induction and training, and finally launching of the project. CRUT was recognized for its gender inclusive initiative and won the United Nations Public Service Award 2022 in the category of 'Promoting Gender-Responsive Public Services to Achieve the Sustainable Development Goals (SDGs).' Additionally, for four consecutive years in a row, CRUT has been awarded by the Ministry of Housing and Urban Affairs, Government of India, for 'Best Urban Transport Project' at the Urban Mobility India Conference.



*Kavita Mitra: "I used to work in a jewelry shop but became jobless during lockdown. I took the Mo E-Ride opportunity because opportunities need to be taken advantage of or else it's our loss. My family is supporting me to stand on my own feet. This will definitely help me to provide a good future for my child. People will say many things but we have to choose our own way to fulfill our requirements."*

▲ Sarathi driver of the Mo E-Ride e-rickshaw. Source: CRUT.

# ► Keeping Momentum During the Pandemic

# 4

CRUT has consistently and consciously invested in improving its transit services. Even during the lockdown in 2020, when a halt in regular Mo Bus services was necessary, the company continued to engage with the public and with its staff. The 'Bus Pathsala', which was a virtual training and capacity building program for the crew and staff, was held during the lockdown in 2020. Over 5 weeks and 100 hours, all stakeholders of Mo Bus were engaged. Over 1,200 staff and crew of CRUT, along with eminent personalities in the field of urban mobility, came together in a common virtual platform to engage and discuss various issues related to gender sensitization, passenger-centric approaches, and better maintenance practices for bus operations,

sensitivity, and empathy while dealing with commuters, data analytics in bus transport, etc. All the delegations held **were compiled in the form of a book** which is the first of its kind to be done by any public transport provider organization.

At the same time, CRUT organized shuttle services to specifically serve frontline workers during the pandemic. Mo Bus shelters were converted to vegetable vending zones, and the buses provided services such as 'Grocery on Wheels' for residents of the containment zones in Bhubaneswar.

▼ Bus shelters and vehicles were used during the pandemic to help distribute groceries to people. Source: CRUT.



## ▶ Lessons Learned and Conclusion

# 5

The last few years have shown that despite the challenges of Super Cyclone Fani and a pandemic, CRUT has managed to establish a socially and environmentally sustainable connected mobility system in Bhubaneswar.

Next, the city wants to expand its share of electric vehicles. CRUT already has plans for expanding its fleets of electric buses and rickshaws to significantly increase

the share of green mobility in the city. Rather than investing in a high capacity and costly transport system like the MRTS, Bhubaneswar will focus more on its successful Mo Bus and Mo E-Ride system. It has become a model for the Government of Odisha with plans to initiate Mo Bus services in other major cities of the State.

▼ Different users enjoy a safe and comfortable ride on the Mo Bus. Source: CRUT.



## Key lessons learned include:

- ▶ Large scale outreach initiatives, both online and offline, were key to making Mo Bus popular amongst citizens of Bhubaneswar. People wanted to participate and see their feedback incorporated into the services of CRUT.
- ▶ CRUT's responsiveness, reliability and affordability played a major role in making people switch from private transportation to Mo Bus.
- ▶ Once the first women joined the crew, the foundation for a new norm was set. Through CCTV surveillance and emergency panic buttons, as well as bathrooms for different genders, women and transgender people were encouraged to join the crew.
- ▶ The support of the Government of Odisha has been key for CRUT to bring the much-required reforms in the public transport sector. Financial support is key to achieving a "socio-economic environmental rate of return" with a 200% rise in ridership in just 4.5 years and a shift of 57% of commuters from private modes to Mo Bus.
- ▶ The public-private partnership system and the payment of operators and agencies on a performance basis result in an innovative financing mechanism, which is further supported by CRUT's in-house mechanism of checks and balances.
- ▶ CRUT earns its non-fare revenue from advertisements in the Bus Queue Shelters, which are maintained by advertising agencies. This helps keep bus fares affordable.
- ▶ According to CRUT, a robust public bus network forms the basis of any mobility plan. It does not have to be "fancy:" buses and rickshaws are enough to create a sustainable public transport ecosystem in Bhubaneswar. Historically, Tier II cities in India (around one million inhabitants) show better return on investment from the expansion of bus services rather than from metro rails, which are more costly and have higher fares.
- ▶ Public and private transport systems are very different from each other. Government-run public transport agencies aim at making transport accessible to all at an affordable fare rather than making maximum profits. Therefore, tax exemptions and fiscal benefits should apply to ensure the minimization of losses.
- ▶ Urban transport systems from other cities cannot be copied and imposed. Rather, planners must conduct extensive surveys and feasibility studies to understand local characteristics and preferences.
- ▶ Urban planning should happen in sync with transport planning. The mixed use and compact urban fabric of Bhubaneswar is an evidence of a more holistic approach to urban development. Yet, departments need to ensure collaboration. For example, constructing new roads by raising the elevation of the ground can lead to water logging in the surrounding area, which is why interdepartmental work is necessary. By working with all the concerned departments of government, a holistic plan can be developed.

Through Mo Bus and Mo E-ride, the city of Bhubaneswar has set a vision for inclusion that it plans to carry forward. Future objectives for Bhubaneswar's public transport and street design include becoming a child-friendly city through traffic calming strategies that ensure more safety. In addition, officials are looking to better manage traffic in the city, for example through parking fees levied at strategic locations to discourage citizens from using private vehicles and switching to public transport instead. Multi-level parking based on traffic flow studies will be constructed to make better use of space.

CRUT, the government of Odisha, and the city of Bhubaneswar have really brought the focus on the full public into its planning, using a bottom-up approach of hearing from people of the city, coupled with a desire to have their own system emulate the goals of inclusion that they set. They have truly created better transport for all and a better city for all and are on track to continue doing so. Their transformation of the public transport system is helping transform their city and society.

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