



# Urban Pathways

## THE PROMISE OF ELECTRIC MOBILITY: GREEN AND CLEAN MOBILITY FOR KOCHI



**Wuppertal  
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**UN HABITAT**  
FOR A BETTER URBAN FUTURE

**UN**  
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**The Urban Pathways project helps delivering** on the Paris Agreement and the NDCs in the context of the New Urban Agenda and the Sustainable Development Goals. It has established a facility in close cooperation with other organisations and networks active in this area to support national and local governments to develop action plans and concrete implementation measures to boost low-carbon urban development. This builds on UN-Habitat's role as "a focal point on sustainable urbanisation and human settlements including in the implementation and follow-up and review of the New Urban Agenda". The project develops national action plans and local implementation concepts in key emerging economies with a high mitigation potential. The local implementation concepts are being developed into bankable projects, focusing on the access to urban basic services to create a direct link between climate change mitigation and sustainable development goals.

**The project follows a structured approach to boost** Low Carbon Plans for urban mobility, energy and waste management services that deliver on the Paris Agreement and the New Urban Agenda. The project works on concrete steps towards a maximum impact with regards to the contribution of urban basic services (mobility, energy and waste management) in cities to global climate change mitigation efforts and sustainable and inclusive urban development. This project makes an active contribution to achieve global climate change targets to a 1.5°C stabilisation pathway by unlocking the global emission reduction potential of urban energy, transport and resource sectors. The project will contribute to a direct emission reduction in the pilot and outreach countries, which will trigger a longer term emission reduction with the aim to replicate this regionally and globally to make a substantial contribution to the overall emission reduction potential.

**This project implements integrated urban services** solutions as proposed in the New Urban Agenda providing access to jobs and public services in urban areas, contributing to equality and social coherence and deliver on the Paris Agreement and the Sustainable Development Goals. This is the first dedicated implementation action oriented project, led by UN-Habitat to deliver on inclusive, low-carbon urban services. Securing sustainability and multiplier effect, the project aims to leverage domestic and international funding for the implementation projects that will follow from this initiative

## Project concept

## Project aims



# Urban Pathways



## Urban Pathways Project and Replication Cities

# VISION

Embrace electric mobility as a tool to promote shared mobility and clean transportation and ensure environmental sustainability, pollution reduction, energy efficiency and conservation thereby creating an ecosystem for manufacturing EV components in the city of Kochi.

Kochi is historically a water-based city which has grown along its water network. The water network of the city consists of three national waterways and 14 inland waterways. Kochi had more than 60 active jetties and water routes including the passenger boats and ferry services. However, with the advancements in land transport, the city has slowly moved towards motorized land transport. This led to the step-by-step depletion of the waterbased transport system. Currently, the city of Kochi is experiencing increased dependency on private motor vehicles, leading to increased vehicular congestion and emissions. Various traffic and transportation studies conducted for Kochi indicate inadequate transport infrastructure and a high growth in the private vehicle share in the city and surrounding region. In 2017, the Kochi urban area experienced 2,107,218 daily trips with a per capita, per day trip rate of 1.06, an average trip length of 10.8 km, and an average speed of 23 km/h. Personal motorized vehicles (two-wheelers and cars) constitute a phenomenal 79 percent of the total vehicles, whereas public transport vehicles (buses) constitute only 4 percent. That being said, this 4 percent of buses carry 49 percent of the trips.

The modal split for transport in Kochi indicates that the majority of trips taken in the city are by bus; however, in the absence of a multi-modal transportation system, bus transportation has proven to be inefficient and the public transportation share has been decreasing at 5.6 per cent per annum. This has led to the steady growth of alternative modes of private transport, primarily in the form of auto-rickshaws. The transport sector in Kochi accounts for 20.2 percent of the PM2.5 concentration in the city. Autorickshaws are the most noteworthy contributor to the

city’s transport-related emissions at 93 tons per day. This mode is also responsible for emitting significant amounts of harmful pollutants per day, including carbon monoxide (3.1 million grams, g), Particulate Matter 2.5 (148,000 g) and nitrous oxide (384,000 g)\*.

The city, through the Urban Pathways project, formulated a vision to provide safe, secure, efficient, reliable and seamless connectivity that would support and enhance economic, social and environmental sustainability and the city chose to promote **electric mobility**. Kochi explored the various alternatives to mainstream electric mobility in the city. One of the identified projects was the introduction and implementation of e-rickshaws for the first and last mile connectivity in the city.

We felt that the electric three wheelers should spread even to the non-metro areas in the whole city. The idea was to have a scalable model which can be replicated in the whole city. Through the Urban Pathways project the city planned for introducing electric three wheelers in non-metro influence areas, starting with a pilot for around 100 vehicles in Kadavanthra and Elamkulam areas (which will cover Chelavanoor, Jawahar nagar, bund road, Gandhi nagar, Girinagar, Jawahar nagar etc), Fort Kochi and Thopumpady. Under the project the vehicles was purchased and is being operated by the Ernakulam Auto Rickshaw Drivers Cooperative Society (“Society”),



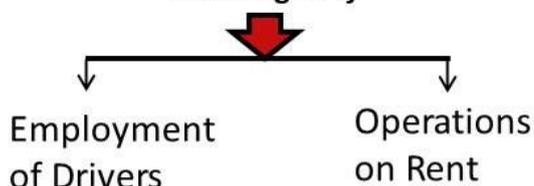
**Model 1**

**Pure Infrastructure Model**  
Only charging/ parking infrastructure provided by Govt.



**Model 2**

**Stakeholder-led Model**  
Drivers Association Purchases Vehicles with support / subsidy.  
Land for Charging by Local Body / Govt Agency.



formed by six different auto driver unions in the city. It was decided that the society will take the benefit of subsidy available from the Kochi Municipal Corporation and the Centre for Heritage, Environment and Development (c-hed) with the support of UN Habitat via Urban pathways project and GIZ for Rs. 50,000 per auto for Pilot project autos. This would act as down payment for purchasing the auto on a loan by the Society. The charging infrastructure for 15 locations was set-up by the Kochi Municipal Corporation with the support of Kerala State Electricity Board (KSEB).

The E-Autos will be operated by the society itself on designated routes on shared basis. The designated routes will have sign boards and stops showing the route. Electric autos would be operated on rent model by society. All auto is now equipped with GPS in the form of device. Society will be monitoring the vehicle operations on a control screen which will show the location of the vehicles. The E-Autos also has AuSA application. AuSa is a ride booking app similar to that of online cab booking platforms. It helps passengers avail auto services, besides enabling them to pay a pre-fixed fare for the ride. They can also track the route, use digital mode of payment, and have a safe journey since it has an SOS facility, said sources. It will provide seamless first- and last-mile connectivity to commuters of metro, buses, and other modes of public transport.

#### Piaggio'S E Auto—

Piaggio started selling its Ape E City variants in Kerala State from August 2021 and in the seven months of 2021-22 /operations it has sold in all 80 Ape E City in Kerala State out of which 30 passenger variants. and 50 cargo variants.



Piaggio Ape E City Ex. Showroom price is 2.84 lakh in Delhi (In Kochi also its price is almost similar). It is a 3-wheeler commercial vehicle. It is available in 2 variants. The Ape E City Auto Rickshaw is compliant with the BS-VI emission standards. Other key specifications include wheel base of 1920 mm, Power of 7 hp. Vehicle and mainly its battery comes with a warranty of 3 years / 100000 kms. Its batteries can be charged anywhere as it comes with a 15 A portable charger.

On the basis of scoping report prepared by with the support of GIZ, KMC, and workers unions decided to go for a model in which a Society of Auto Drivers will procure e-autos through subsidy (GIZ/UN Habitat) as down payment and KMC will provide a land for parking. Two other factors also supported this option –

- a. Due to low CIBIL scores of 95% drivers, banks were hesitant to provide loans to drivers. Even if they provide loan, it will be for short duration 30 to 36 months as a result banks will charge high interest rates which will make repayment difficult. Auto Drivers society will form a single point of accountability and will make it easier to secure a loan at reasonable interest rate
- b. Auto Drivers Society will also form a single point of contact for consumers. It will also facilitate integration and aggregation of E-Auto drivers to create a digital platform and enable digital payments. Such society will make it easier to implement further initiatives.

## **STATUS:**

- The Society will own all 100 electric vehicles, will receive subsidy from KMC, will take loan from the financial institutions/banks, will undertake charging and maintenance of these vehicles and will rent out these vehicles to the members of the society on basis of daily/monthly fixed rent.
- Currently the Society is planning to operate the vehicles in 2 shifts of 12 hours. The Society will rent of E-Auto to its members for a rent of Rs 300 per shift (rent has been arrived on basis of Rs. 175 loan cost, Rs. 40 GST, Rest battery and vehicle maintenance cost). If the model works well and more drivers show interest to take part in the initiative, then the shifts will be increased to 3 (each shift of 8 hours).
- The Society has selected swappable E-Autos manufactured by Piaggio. The cost of one vehicle is around 2.4 Lakhs exclusive of GoK subsidy which is Rs. 30000 and Rs. 50000 will be donor (GIZ, UN Habitat) subsidy thus net cost of a E-Auto will be Rs. 1.6 lakhs.
- Sun Mobility have set up five Bulk Charging Stations to serve swappable battery E-Autos procured by the Society and others.
- KMC has partly funded the setting up of the Charging Stations / points in collaboration with Kerala State Electricity Board (KSEB). A 1400 KV sub stations will have to be set up to support the project.

## **LAUNCH:**



The Kochi Municipal Corporation rolled out its first batch of pilot electric autorickshaws at the Ernakulam Town Hall on 15th Nov 2022, Tuesday. Hon’ble Minister for Registration, Cooperation and Culture, Sri. V.N. Vasavan handed over the keys of first batch of E-Autorickshaws.

## **PROJECT IMPACT:**

The Kochi Municipal Corporation will be procuring another 100 electric autorickshaws with funds from its Plan Fund but this time they will be focusing on the select individual beneficiaries for the same.

# ISSUES & RECOMMENDATION

With various business / financial models worked out regarding charging infrastructure and E-Autos, there is a clear indication that both EV charging infrastructure and E-Autos are financially viable and capable of providing very good rate of return on investment. In spite of financial viability of EV charging infrastructure and especially of E-Autos both at national/state and local city level are moving in a slow pace.

Higher cost even after various demand subsidies, concerns about the durability of battery, unavailability of spare parts, and lack of service and support are some of the reasons pointed out by people in general for the reluctance in owning e-vehicles. Lack of financing in terms of availability of loans for purchasing e-vehicles, high interest rates, high insurance cost, lack of specialised finance options etc. are the specific reasons for non-adoption of EVs and non-working of E-Autos. As a result of all these reasons / issues (which have been discussed in the report) even though Government of India and Various State Governments including Kerala Government have provided to reduce the upfront cost of EVs, adoption of EVs has been far from the target.

The Kerala state budget for 2019-20 had proposed to increase the number of e-vehicles to one million by 2022. As per the data with the Motor Vehicles Department, the state has around 7,850 electric vehicles in August 2021.

## **Issues at Kochi Level with regard to E-Auto adoption**

E-Autos and Charging Infrastructure in Kochi, confirms/ validates a few main issues / reasons for non-adoption of E-Autos in Kochi –

First, lack of special concession for E-Autos – Compare to all other types of EVs, E-Autos have additional dimension of livelihood. E-4W or E2W are for private consumption, while E-Buses form public transport service run by the public (government) sector, but E-Autos form livelihood option for people (especially for lower income group and poor people). In this context E-Autos should get additional concessions as they are going to be owned and operated mainly for lower income and urban poor people as a livelihood option. Unfortunately, E-Autos get same kind of

subsidy under FAME II and GoK subsidy for EVs. This is a very important policy lacuna which need to be addressed.

There is lack of avenues for financing E-Autos for public transport – Public and Private Scheduled Banks are reluctant to provide loans for E-Autos because of the risks that are both real (e.g., uncertainty of resale value) and perceived (e.g., product quality). As a result, even if financing is available, EV buyers are unable to obtain terms (i.e., interest rates and tenures) that are comparable to ICE vehicles. Few NBFCs and financing arm of OEMs (Mahindra Finance) are providing maximum 30 to 36 months loan at much higher interest rates (14 to even 20 %). High interest rate, shorter loan period and difficulties getting loans are disincentivising people to go for E-Autos.

The lack of institutional and risk sharing mechanism – any new technology adoption requires going beyond the demand and supply subsidies/incentives through innovative solutions which can be different from place to place and case to case. Such solutions can be financial or non-financial but mainly of institutional cum risk mitigating support in initial phase to facilitate adoption of new technology. This fact is also true for adoption of EVs and especially for E-Autos. Such a support was envisaged under UN-Habitat - GIZ – KMC initiative of piloting 100 E-Autos. There is need for such initiative and the initiative which has been contemplated can be and should implemented with suitable changes.

Non-Application / non-resourcing of NULM support - E-Autos are different from other EVs – E-Autos are livelihood option, E-Autos can be very good source of livelihood. GoI with the help of the State and Urban Local Governments (KMC) is running National Urban Livelihood Mission to skill and provide viable livelihoods to urban poor. It is very much possible to provide subsidised loans under NULM for E-autos without any change in mission guidelines or operations. KMC could have used NULM for overcoming E-Auto financing issues. This source can be and should be used to support E-Auto adoption by urban poor as a livelihood.

## **Recommendation :**

1. To declare EV as a priority sector by Reserve Bank of India. This status to EVs can address the lack of availability of finance.
2. Subsidies should be provided for the E-Autos by the GoK which will encourage E-Auto adoption in the city.
3. The government agencies like KSEBL and KMC should take the lead to provide mini-charging station in the city that will create a confidence in public that if E-Auto or EV is purchased there will be no problem regarding charging of it.
4. Discussions need to be held with the banks, NBFCs and other government financing agencies to reduce their risk perceptions and to work out joint informal mechanism to ensure recovery of loans given for E-Autos.
5. There should be mechanisms and facilities that partly or entirely cover possible losses associated with financing EVs (due to their unclear resale value) that can be capitalised at the national or multilateral level. These would distribute risk and provide the individuals with an opportunity to build their trust in the sector.
6. There should be provision under NULM (National Urban Livelihood Mission) to lower the interest that will motivate urban poor / beneficiary to take E-Auto loan but the main benefit of loans under DAY – NULM will be availability of the



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