

Kochi City, India

Ecomobility in one of India's leading Smart Cities



In the past, due in part to the lack of an integrated mass public transit system, transportation in Kochi has been characterized by polluted and congested roadways. A diverse complement of actors are working to change this reality, and the Kochi Municipal Corporation has started work on an integrated mobility plan befitting one of India's original Smart Cities.

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Kochi & ecomobility 'in context'

Kochi City (also known as Cochin) has been heralded as the Queen of the Arabian Sea. Kochi is located on the south-west coast of India in Kerala, is a center of industrial, commercial, touristic and academic activity within the region, and is one of the original 20 selections by the Government of India for the 100 Smart Cities Mission. The city is home to one of the three international airports within Kerala, as well as long-distance railway lines, a cruise ship terminal and a port. This combination of features and amenities factors has led to steady growth within the urban area; the McKinsey Global Institute has recognized Kochi as one of the 440 emerging global cities that will contribute 50 per cent of the global gross domestic product by 2025.

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.

To overcome this challenge, a variety of actors are contributing to the creation of an integrated transport network for the city. Actions already underway include the construction of an elevated metro railway system, the development of the world's second largest urban water-bus fleet, the planning of a comprehensive mobility and parking plan, and the creation of an agency responsible connecting the activities of the various actors working to create a sustainable transportation network for Kochi.

A wide range of actors in Kochi

Between the planned multi-modal transportation network, the Kochi Smart City project, and sustainable development in general, there are a wide range of implementing agencies in Kochi. While the Kochi Municipal Corporation is responsible for transport planning within its municipal boundary, planning at the city-region scale requires a greater number of actors. The development of the metro rail line is being led by Kochi Metro Rail Ltd. (KMRL), a joint venture between the Indian central government and the state government of Kerala. The involvement of higher levels of government is advantageous to facilitating the capital investment that is required for major infrastructure projects. Other major implementing agencies include the Greater Cochin Development Authority (GCDA) and Cochin Smart Mission Ltd.



Facts & Figures

Population

603,000 municipal boundary
2,120,000 city-region

Land area

94.88 km² municipal boundary
440 km² city-region

Modal split (2016)

Walking: 12%
Bicycling: 3%
Public transportation: 49%
Personal automobile: 10%
Motorcycle & auto-rickshaw: 26%



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and is a participant in
the EcoMobility Alliance

Description of activities: Integrated and smart mobility in Kochi

Aligning the work of multiple implementing agencies

To align the activities of the various actors in Kochi, the Unified Metropolitan Transport Authority (UMTA) is being created. Proposed as early as 2012, the UMTA has been developed over 2014-2017. The UMTA will provide a consistent legal and administrative structure for urban transportation in Kochi, including the metro, buses and boats. The advantage of this structure is that, while the public transportation operator may vary, end-users will benefit from a common timetable, single front-end, and a SmartCard for integrated payment. For the UMTA, the clear advantage is an integrated command and control center.

While the final governance structure of the UMTA is still being determined, it will be led by the KMRL, which is best positioned to align and add other services with the metro line. Nonetheless, a range of stakeholders, including the Kochi Municipal Corporation, the GCDA, other municipalities in the city-region, the State Water Transport Department, NGOs and other organizations involved in sustainable urban transportation have been involved in the discussions for drafting the action plan.

Kochi Metro Rail

The inaugural 13.4 km of the Kochi Metro Rail (KMR) line became operation in June 2017 following a ceremony attended by Prime Minister Narendra Modi [Image 1], with an additional 5 km being opened in October 2017. Construction on the first phase of the KMR began in June 2013 and will amount to 22 stations distributed across 25.6 km on track when completed. The KMR will significantly reduce traffic-related congestion in Kochi - the number of passengers each train can carry (975) would require a footprint of five bus lanes and twelve private vehicle lanes - while also decreasing journey time by upwards of 50 per cent.

A second line for the KMR which will provide an additional 11 stations been already been approved for construction, while a third line of 11 stations is currently in the planning phase. In line with the Kochi Smart City vision, the KMR has incorporated the technology for driverless trains and maintains the popular Kochi-1 Smart Card, which allows for cashless travel and will eventually be integrated for use across all forms of public transportation in Kochi, regardless of the operator of the service.



Image 1: Prime Minister of the Government of India, Narendra Modi, inspects the Kochi Metro during the inauguration ceremony Source: Kochi Metro Rail Limited (KMRL)

Kochi Water Metro

Part of the reason for the congested traffic situation in Kochi was the gradual decline of water-based transportation between parts of the city connected by waterways. In response to this trend, KMRL, through a partnership with the KfW Development Bank, has identified 16 routes which will rely on a fleet of 78 ferries to connect 38 locations throughout Kochi. In total, the network will amount to 76 km and will be implemented in two phases beginning in 2017. The service, officially known as the Kochi Water Metro, will provide feeder service to the Kochi Metro.

The Vyttila Mobility Hub

At the recommendation of the Centre for Public Policy Research, Vyttila Station was moved and expanded in order to create a fully integrated hub for various modes of transport. The Vyttila Mobility Hub now incorporates a Metro station, a boat jetty for the Water Metro, and serves as the hub for long-distance buses. The relocation of the station provides the added benefit of decreasing congestion by keeping long-distance buses out of the center of the city, while ensuring that all passengers can find a suitable mode of transport from the Hub to their final destination. The Hub is operated by the Kerala State Road Transport Corporation (KSRTC).

Strategic planning

With a considerable amount of the operation and implementation of the public transportation network being conducted by third-party operators, the Kochi Municipal Corporation has focused on the development of a number of strategic plans and has established the ambitious target of having a pollution-free public transportation system by 2020.

To support the achievement of this target, the Comprehensive Mobility Plan (CMP) and Parking Master Plan both focus on decreasing road congestion and increasing road safety both for pedestrians and drivers. The Non-Motorized Transport Master Plan, which was submitted in to the 2015 intake of ICLEI's Transformative Action Platform (TAP), will identify a network for walking and cycling facilities, along with area improvement proposals to encourage active use of public spaces, walking, cycling and use of public transport systems. Stakeholder engagement conducted by the city indicates that close to 94 per cent and 73 per cent of residents surveyed within the project area have showed their willingness to shift towards walking and cycling respectively, so long as safe, accessible and comfortable infrastructure is provided. Pilot projects include the modernization of footpaths, the creation of cycle tracks, the installation of bicycle docking stations and the establishment of a Green Transport committee.

The Kochi Municipal Corporation is also investigating the procurement of electric buses and minivans in order to avoid gas emissions and reduce dependence on private vehicles.

Results

Putting the 'eco' in ecomobility

All 22 stations of the KMR, as well as the coach-yard, have solar PV panels installed on their rooftops. The total capacity of these installations is 4 megawatts (MW), accounting for 25 per cent of the power required to operate the KMR. The KMRL has already signed a power purchase agreement to procure this electricity.

Because the development of the infrastructure required to build the KMR required the removal of 477 trees, a deal was signed to plant ten trees for every one removed. The KMRL has also installed a vertical garden on every fourth pillar along the Metro line.

Awards and recognition

On October 2017, Kochi Metro was recognized as the Best Urban Mobility Project in India by the Urban Development Ministry. A major factor for the jury in selecting the Kochi Metro for the award was the fact that the Kochi station-placement model managed to ensure that no part of the city was further than half-a-kilometer from a Metro Station.

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Kochi Municipal Corporation



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Costs and financing

The total cost of the Kochi Metro is USD \$860 million. In November 2013, the KMRL accepted a USD \$180 million loan from Canara Bank to fund the KMR. In 2014, Agence Française de Développement (AFD) provided a 180€ million loan for a period of 25 years and a two per cent interest rate to the KMRL for the Metro. In 2016, AFD issued a second loan on 175€ million for the extension of the Metro and technical support for the UMTA reforms.

The total cost of the Kochi Water Metro is USD \$130 million. 85€ million will be provided by the KfW Development Bank, while the remainder will be provided by the Kerala State Government.

Challenges and lessons learned

More roads is not always the answer for improved service. The construction of bridges, which seemed to be a faster alternative than water-based transport, and new roadways only led to greater road congestion in Kochi due to the increase in private vehicles that resulted from the loss of a valuable service. The new multi-modal set-up will optimize the existing traffic on roadways and alleviate the pressure on the existing public transit infrastructure.

Having a wide range of service providers in the city created a need for coordination. While in principle, a range of operators should complement each other in order to provide comprehensive service and coverage, the Kochi experienced bus operators competing with each other for fares. With the UMTA now established to coordinate activity, the KMRL has proposed a model which would allow operators to self-organize into a group, total the fares collected by that group, and then share the dividends equally. The hope is that less competition will result in more efficient service and fewer unnecessary accidents on narrow roads.

KMR stations have been established both along the existing high-density areas, a key characteristic of Transit Oriented Development, as well as in those areas where the city is projected to expand. This reflects a new paradigm for decision-making in Kochi, wherein the city will follow the Metro. Making the KMR the focal point of planning in Kochi will make certain transit routes redundant, but this will provide an opportunity to redesign bus networks and schedules so that they feed into the more efficient and effective mass transit systems.

References and further reading

ICLEI, 2016. EcoMobility Days 2016. Quito Report.

ICLEI, 2017. EcoMobility Alliance Report: 2016-2017.

ICLEI, 2017. The Kaohsiung Strategies for the Future of Urban Mobility.

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