

CITY FEATURES



Kochi (Cochin) is a major port city on the west coast of India and a part of the Ernakulam district in the state of Kerala. Kochi is the most densely populated city in the state and is part of the Greater Cochin region with a population of 2.1 million, the largest urban agglomeration in the state. Many economic activities are linked with the port. The city is the gateway for export to other countries and more than 80 percent of the products from the hills of Kerala are exported through its port. Major industries like Fertilisers, Travancore Cochin Chemicals, Hindustan Machine Tools and Apollo Tyres, are located in the Kochi Planning Area. In the recent past, the growth of the city is evident within and outside of the municipal limits.



Population
602,046
 (2011)



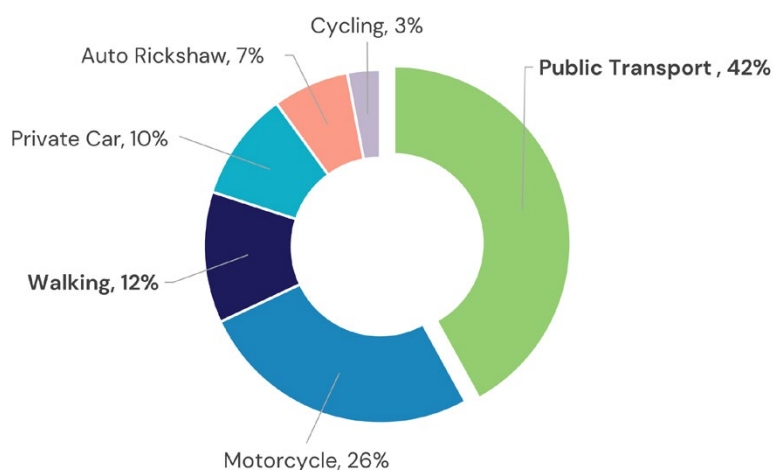
Land area
94.88 km²



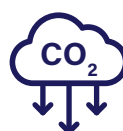
Average temperature
26.5°C

TRANSPORT FEATURES

Modal Split¹



GHG Emission Levels²



Total GHG emissions
5.08 million tCO_{2eq}
 From road transport
2.9 million tCO_{2eq}

Air Pollutant Levels³



PM 2.5	30.28 µg/m³	NO ₂	10.63 µg/m³
PM 10	54.05 µg/m³	SO ₂	8.19 µg/m³

More than 2 million passenger have travelled daily with an average trip length of 6.65 km, as mentioned in the Comprehensive Mobility Plan 2017. The share of public transport is 42 percent, including buses and ferries operated in the city. The majority of residents commute by bus in the city. The bus transport services are provided by KSRTC and private operators. The bus transport has served the needs of Kochi and neighbouring satellite towns. The region has a high rate of urbanisation and shows an upward trend in using private modes to commute within the city. It is also evident from past studies that the public transport share has been reduced from 83 percent in 2001 to 49 percent in 2015.

1 Comprehensive Mobility Plan, Kochi 2017. NOTE: As the study conducted in 2017 for Comprehensive Mobility Plan, at that time the metro was not operational. Metro came into operation in 2022.

2 Retrieved from Kochi City Profile, Ecologistics Project 2018

3 Central Pollution Control Board, Delhi 2021

BUS SYSTEMS OUTLOOK

Bus Trips Features



Number of bus trips
887,000 (2021)
(Greater Cochin region)



Average travel time
35 min

Kochi's public transport consists of a bus system operated by KSRTC, KSBL (special purpose vehicle (SPV) of private operators) and other private operators. The main bus users are students, working professionals and tourists. The bus trips in the city are categorised as educational trips, work trips, social and health trips. As per the comprehensive mobility plan of Kochi, there are 276 bus routes originating or terminating at major locations in the city. The majority of these routes originate and terminate at Aluva, Fort, Edakochi, Thripunithura, Vytilla, and Menaka, among others. The most popular route is the Aluva-Fort Kochi route, with the Menaka bus stop having the highest number of passengers. There is no route numbering system, instead, all buses carry destination boards with important bus stops marked on their board.

Fleet and Infrastructure

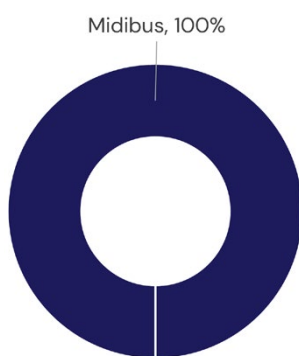


Number of buses
481 City Buses
380 MOFussil Buses



Number of bus routes
276

Buses by fleet type



Buses by fuel type

The private operators run the ICE buses using diesel fuel, while KSBL which is SPV for e-bus operations is operating the electric buses as feeder routes to the Kochi metro and other selected routes in the city. The share of electric buses is very less in comparison to diesel buses.

Quality of Service

The coverage of public transport buses in Kochi includes all the major tourist spots, activity areas, government and educational institutions. The buses are operated to reach destinations that are scattered throughout the city and also include the suburbs of Kochi. In general, the journey using the bus service within the city is comfortable and convenient, but during rush hours, buses are packed, making travel slightly uncomfortable. The city buses run in mixed traffic, so especially during peak hours in these conditions, a bus trip adds more than 10-15 minutes to the scheduled time. The fares of public transport buses are cheaper and budget friendly for all the income groups of the city. The buses are safe and accessible for women, children, and elderly people.



Existing Business Model⁴

A

Model A: Vertically integrated, private operator in BRT/integrated system

B

Model B: Divided responsibilities in BRT/integrated system

C

Model C: Large, more formal, private operator in traditional service

D

Model D: Small, informal, private operator in traditional service

E

Model E: Government-run system

D

The private operators have been assigned the responsibility to operate the buses on specific routes in the city. The route permits have been granted by the Regional Transport Office (RTO) to private operators. In this model, the investment is purely from the private operators who invest in buses and operate on selected routes. The risk associated with the operation is purely with the operators. The fares collected from passengers are used to meet the operational expenditure of buses.

E

The Kerala State Road Transport Corporation (KSRTC), a department that works under the Government of Kerala, is running the bus fleets in the city. The procurement, operation and maintenance of buses have been done by the KSRTC. There are provisions of some funds and budgetary allocations by the government to finance these buses. In addition to that, the fares collected from passengers have been used to meet the operational expenditure of buses.

B

The Kochi Metro Rail Limited (KMRL) is a government entity responsible for running the electric bus service in the city. It has outsourced the operation to a SPV named Kleen Smart Bus Limited (KSBL) to operate 10 electric buses. The SPV is formed by private operators and performs all the functions related to the operation of electric buses.



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E-BUS ADOPTION APPROACH

December 2019

Contract to vendor for electric buses

March 2022

5 more electric buses started their operation

February 2021

Electric bus service started with 2 buses as feeder service to metro

⁴ Based on Accelerating a market transition in Latin America: New business models for electric bus deployment, P4G, Zebra and Dalberg, 2020

E-bus Fleet Technical Features



Number of e-buses in operation

7 (BYD Olectra)



Passenger capacity

32 pax



E-bus Business Model

Kleen Smart Bus Limited (KSBL) operates electric buses in Kochi. The electric buses serve as feeder service to the metro on selected routes. The KSBL has been granted a license from Kochi Metro Rail Limited to operate 10 electric buses and out of these, 7 buses have started their operations in the city. The bus stops and other associated infrastructure are maintained by Municipal Corporation Kochi. The fare is collected by KSBL employees deployed with buses. The financial assistance under the FAME-II scheme of the national government has supported the procurement of these electric buses.

Opportunities and Challenges to Scaling E-Bus Fleets



Opportunities

- The subsidy available under FAME – II has supported the procurement of electric buses. It also helped in the transition and promotion of electric buses. It will act as an opportunity to increase the fleet size of electric buses.
- The willingness of public transport users in Kochi to shift towards electric buses has drawn the attention of authorities towards the demand for electric buses and strengthened the real time information system for its end users.
- The spread of the public bus transport network is the backbone of commuters in Kochi and the suburbs of the city. It can act as an essential element for the scalability of the transition towards electric buses.



Challenges

- The operation of electric buses is hampered and faces operational issues since depot operators, drivers and private operators lack the technical expertise of this new technology. The city has to overcome such challenges to adapt to the change.
- Due to the lack of intermediate charging stations, the range anxiety of electric buses among operators acts as an obstacle in the transition at optimum pace towards electrification of public transport.

Acknowledgements

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About the TUMI E-Bus Mission

Funded by the German Ministry for Economic Cooperation and Development (BMZ), a core group of organizations supports cities in their transition toward electric bus deployment. For more information please contact: tumi-network@iclei.org or visit <https://sustainablemobility.iclei.org/tumi/>