

CITY FEATURES



Navi Mumbai is a planned city and part of the Mumbai Metropolitan region. It acts as a counter magnet of Mumbai and has been developed as an independent, fully self-contained metro city. Navi Mumbai has been planned and developed by City and Industrial Development Corporation (CIDCO) to meet the infrastructural needs of a modern metropolis. The city has designated industrial areas for chemical, pharmaceuticals, textile and engineering units and is home to many economic activities. Since it is a planned city, the land use is compatible with one another and has a balanced set of growth within its jurisdiction. The city is expanding towards the northern and southern end of municipal limits and its western edge is constrained by Thane Creek of Arabian Sea.



Population
1,120,547
 (2011)



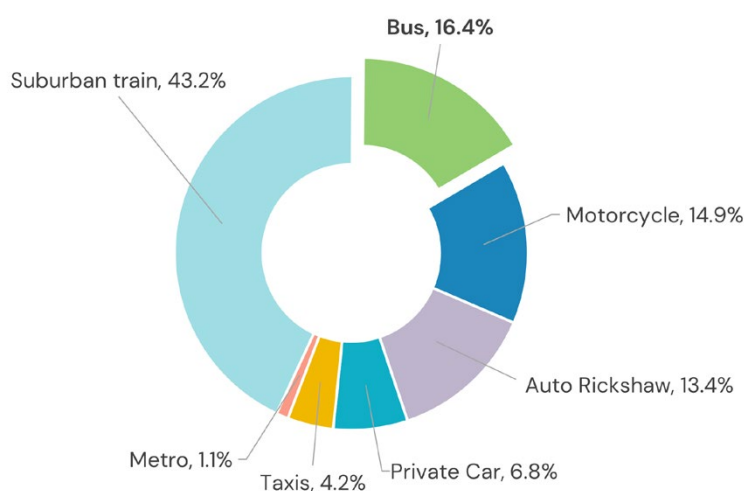
Land area
162.5 km²



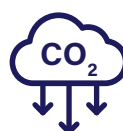
Average temperature
29.8°C

TRANSPORT FEATURES

Modal Split¹



GHG Emission Levels²



Total GHG emissions
2,806,141.82 tCO_{2eq}
 From road transport
509,470 tCO_{2eq}

Air Pollutant Levels³



PM 2.5	NO ₂
46 µg/m³	43 µg/m³
PM 10	SO ₂
141 µg/m³	29 µg/m³

Navi Mumbai has a well planned road network and the public bus transport needs are served by the municipal bus services in the city. The population has grown by around 59 percent from 2001 to 2011, showing rapid population growth, resulting in a higher rate of vehicle registration with trends towards private motorisation. In 2009–10, there were 231,449 vehicles registered in Navi Mumbai, which increased to 510,884 in 2018–19. Due to an increase in trip length and dependency on the nearby town for work and education purposes, Navi Mumbai Municipal Transport (NMMT) has introduced 180 electric buses and planned to phase out all the diesel buses, with only CNG and electric buses in its public transport fleet.

1 Updation of Comprehensive Transportation Study for Mumbai Metropolitan Region, 2021. Note: *Modal share without non motorised transport (NMT) are of the Mumbai Metropolitan region, and Navi Mumbai is part of this region.*

2 Report on Carbon Inventory of Navi Mumbai, TERI, 2013

3 Central Pollution Control Board, Delhi, 2022

BUS SYSTEMS OUTLOOK

Bus Trips Features

 Number of bus trips
 2018 **300,000**
 2022 **500,000**

 Average distance
216 km

NMMT operates the city buses within the Navi Mumbai Municipal Corporation area and outside the corporation limits, including areas of Mumbai, Borivali, Bandra, Mantralaya, World Trade Center, Andheri, Mulund, Thane, Dombivali, Kalyan, Badalapur, Kharghar Kalamboli, Panvel, New Panvel, Khopoli, Ulve Node, Karanjade, Koproli, and Uran. There are half a million passengers, on average, using buses per day. The main bus users include working professionals in Navi Mumbai and in nearby towns, as well as, students, and captive users. The NMMT buses cater to almost all kinds of trips, including educational trips, work trips, social trips etc. The buses connect all the major destinations within Navi Mumbai and nearby towns. Bus trips generally take 10-20 minutes more than the scheduled time, due to traffic conditions on road.

Fleet and Infrastructure

 Number of buses
606 (operational - **567**)

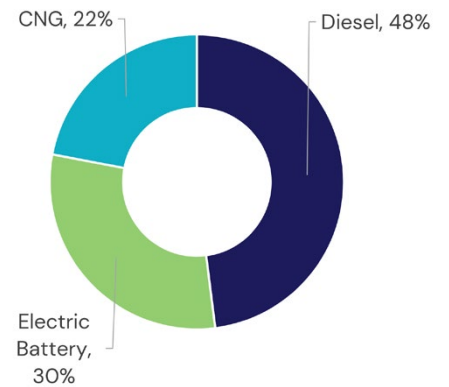
 Number of bus routes
67

 **1145** Bus stops
3 Bus depots

Buses by fleet type

Navi Mumbai currently has three different bus fleet types in operation. Most buses fall under the standard bus category, while other buses come under the midi and mini bus category.

Buses by fuel type



Quality of Service

The city's bus network is a reliable mode of transport that caters to all trip purposes, including work, educational, social, and health trips. With extensive coverage of the city's urban and suburban areas, the bus system offers a comfortable and convenient ride for its passengers. However, due to the shared carriageway and traffic congestion on road, each trip tends to exceed the scheduled time. During peak hours, buses are often crowded. Despite this, the overall bus experience remains pleasant. One notable feature of the city's bus system is its emphasis on passenger safety. The installation of CCTV cameras on buses has helped to create a safer environment, especially for women, children, and the elderly. These cameras are monitored from a central Control Centre, ensuring swift and effective responses to any security incidents or emergencies. Overall, the city's bus network plays a crucial role in facilitating the daily commuters, offering cost-effective and accessible transportation.



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Existing Business Model⁴



B The bus fleet is owned by the public sector and responsibilities are shared with the private sector which is responsible for the operation and maintenance of the buses via public concession. Electric buses and some diesel buses are operating on the Gross Cost Contract (GCC) model, which are maintained and operated by selected private operators.

E Navi Mumbai Municipal Transport (NMMT), a department that works under Navi Mumbai Municipal Corporation (NMMC), operates the existing city bus system. The government runs the system where NMMT owns, operates and maintains buses. The NMMT is responsible for the planning and scheduling of public transport buses. The responsibility of assets, related infrastructure and its maintenance belongs to the NMMC. The fare has been collected by NMMT staff and it is used for day to day operations. The capital investment for procurement is done through NMMC budgetary allocation and the subsidies available in various schemes which are implemented by the state and national government.



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E-BUS ADOPTION APPROACH



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

180 Midibuses + Standard buses
(JBM, model Ecolife)



Passenger capacity

Midibus	Standard bus
25 pax	30 pax



Battery range

Midibus	Standard bus
160 km/charge	200 km/charge

E-bus Business Model

NMMT owns the electric bus fleet in the city. NMMC has purchased the first 30 e-buses in the Outright Purchase (OP) model with FAME I subsidy, along with an annual maintenance contract (AMC) for 10 years, including battery maintenance. Another 150 electric buses have been procured on the Gross Cost Contract (GCC) model. NMMC maintains the infrastructure like bus stops. Fares are collected by NMMT and the operator maintains the buses. The negative aspect of the GCC model for city transport is that the cost of the bus is included and the per km fee is charged by the operator, resulting in an increase in operation cost for NMMT. In the OP model, the entire capital cost was paid out of the municipal budget, along with FAME I subsidy by NMMC, so that NMMT only pays for maintenance and the operational cost. Under the GCC model, electricity cost is paid separately by NMMT.

Opportunities and Challenges to Scaling E-Bus Fleets



Opportunities

- The technical clarity over procuring and contracting for electric buses has reduced the risk of technology transition and maintenance charges. The authority is confident about contracting and managing the fleet with an annual maintenance contract, included even in the OPEX model, at the initial procurement process.
- The strong financial base of NMMC and willingness to transition towards clean and electric public transport of NMMT has shown potential for procuring electric buses.
- The FAME I scheme of the national government had been supported financially and FAME-II has been supported financially and technically, so both acted as catalysts for transitioning towards electric buses.



Challenges

- The drivers and bus operators, including depot managers, worried about range and opportunity charging.
- The technology transition, like the change in charging technology, will increase the extra cost, which also seems like a problem for operators.

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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/>