

# Nagpur, India

Technical Assistance

Completed

## Basic information

Urban area	→	217 km <sup>2</sup>
Population	→	2,893,000
Growth rate	→	1.5%
Region capital city		
GDP per capita	→	USD 3,000

### Modal share

Formal public transport	→	9.8% <sup>1</sup>
Informal public transport (autorickshaw, minibus, school bus, chartered bus, etc.)	→	26%
Walking	→	9.5%
Cycling	→	6%
Private motorbikes or 2-wheelers	→	42.6%
Private cars	→	5.7%
National GHG emissions per capita	→	2.41 (tCO <sub>2</sub> eq)
Exposure to climate change	→	HIGH



## Context

Nagpur is the Orange City of India, the third largest city in Maharashtra and the state's second capital. Nagpur lies precisely at the centre of the country, with Zero Milestone indicating the geographical centre of India. It is a major commercial and political centre of the Vidarbha region of Maharashtra. With nearly 3 million people, Nagpur accounts for 6.5% of the state's urban population. The total population, including the surrounding towns of Kamptee, Kalmeshwar, and Hingna, was 3.6 million in 2021.

Nagpur is the state's main commercial centre and an important trading hub. The city is also home to various food manufacturing units. The city is undertaking the Multi-Model International Passenger and Cargo Hub Airport at Nagpur (MIHAN) project, the most significant economic development project currently underway in India in terms of investment.

Nagpur is one of the Indian cities that has a Metro Rail System. Phase I of the Nagpur metro was sanctioned in 2015, and its construction began in December 2020. Nagpur Metro started commercial operations in 2022 at 16 stations, and overhead electrification works for Phase 2 have begun. Nagpur Metro has undertaken initiatives to integrate the metro system with other

modes, such as station and area design for physical integration and a digital app and card for fare integration.

Apart from the metro, the city bus service is a crucial mode of transport run by Nagpur Municipal Corporation (NMC), and its electrification is well underway. NMC procured the bus service, which provides connectivity within the city and to suburban areas such as Butibori, Katol, Kalamna, etc. NMC also procured electric buses under the “Tejaswini” scheme, a bus service exclusively for women. The Smart City Corporation of Nagpur (Nagpur Smart and Sustainable City Development Corporation Ltd) is also working to improve transport conditions in the city with various proposals, such as PBS, Smart Parking, MLCPs, etc. It is working with AFD on preparing a transition plan for electric buses. Over the next few years, Nagpur plans to go fully electric and phase out all diesel buses.

A proposal was also sent to the Maharashtra Government for establishing a Unified Metropolitan Transport Authority (UMTA) in Nagpur. The proposal is under consideration. Like other municipal corporations in India, the Nagpur Municipal Corporation has the mandate and responsibility to finance bus transport infrastructure, and can borrow from international financial sources as well. The performance of bus services is monitored and evaluated periodically by municipal corporations.

Whereas the ongoing development of a new phase of the metro will provide a new leap in public transport to counterbalance the negative impact of the increase in private vehicle traffic and provide more sustainable mobility solutions for the future, the city still faces significant challenges, such as the financial sustainability of the public transport system, insufficient electric vehicle charging infrastructure, and its very low walkability due to the lack of pedestrian infrastructure. Beyond investment and technology, a transformation of mindset and system is required to move beyond the current reliance on individual mobility, for which increased public awareness on the benefits of a more sustainable mobility system will be critical.

Given that the last comprehensive mobility plan (CMP) was prepared in 2013 and since CMPs are revised every 10 years, a new version should be prepared in the upcoming years. Further mobility needs, patterns and challenges have evolved with the introduction of the metro in the city and warrant an updated planning framework. In addition, the old CMP did not focus on e-mobility, which has gained traction in recent years.

## Support from the Partnership

**Technical Assistance:** Mobility plan update, mobility observatory and complementary study

**Funded by:** European Union through the EU Asia Investment Facility (AIF)

**Funding amount:** EUR 350,000

**Implemented by:** Agence Française de Développement (AFD) through the MobiliseYourCity India Programme

**Local counterpart:** Nagpur Municipal Corporation via Nagpur Smart and Sustainable City Development Corporation Ltd.

### Supported activities:

- Update of the existing Comprehensive Mobility Plan (CMP)
- Development of the Transition Plan of Municipal Buses to Electric Buses
- Creation of a mobility observatory

# Status of project implementation

**Project start:** 2018 Q4

**NUMP adoption date:** 2023 Q4

## Completed outputs:

- MoU signed - August 2018
- Local Steering Committee meetings were held during November 2019, December 2019, and December 2020 and the Technical Task Force committee settled in March 2019
- 8 Trainings and capacity building workshops - July 2019, December 2019 and February 2020
- Online webinars were conducted from June 2020 to Jan 2021
- Elaboration of a Transition Plan for Municipal Bus Network In Nagpur
- Final report "Pre-feasibility study for electric buses deployment"

## With the support from AFD, the Nagpur Municipality has developed a transition plan that aims at progressively replacing existing internal combustion buses with e-buses

The transition plan to electric buses builds on Nagpur's Comprehensive Mobility plan, which envisaged a progressive increase of the bus fleet size by almost 90% in 2018 and up to 4.5 times its current size by 2041, for a total of 2,418 buses.

The transition plan not only addresses the electrification requirements of a significant share of the bus fleet, but also includes recommendations on route rationalisation to better integrate with the recently introduced metro and adaptations to the contractual framework to guarantee the operational and financial viability of the new system.

The pre-feasibility study focused on the electrification impacts and operational requirements for the bus fleet to be replaced by 2022, as foreseen in the existing contracts. In total, 237 standard diesel buses shall be replaced with 202 newer vehicles. For this purpose, three scenarios were assessed:

- Reference scenario: Replacement with new standard diesel buses
- Scenario 1: Replacement with new electric buses of 350 kWh battery capacity
- Scenario 2: Replacement with new electric buses of 400 kWh battery capacity

The pre-feasibility study showed that all modernisation scenarios required higher OPEX and CAPEX. The e-bus scenarios require significantly higher resources than the reference scenario. This difference is caused by a significantly higher CAPEX for e-buses relative to diesel buses, offset by lower OPEX for the former.

To close this funding and financing gap, both the study and the transition plan recommend three potential solutions:

- **Increased cost efficiency through improved contractual frameworks:**  
Such adaptations could include extending the contract duration from 5 to 10 years, providing additional incentives to increase operational efficiency and

renegotiating existing contracts or launching new competitive tenders for the new electric buses.

- **Investment subsidies:** The Nagpur Municipality could leverage different sources to cover rising costs, including advertising revenue, land-value taxes, and international support in the form of soft loans and grants for capital expenditures from sources such as the Green Climate Fund or the Clean Technology Fund. The study, however, did not include any of these sources in its financial analysis; hence, their potential remains unclear.
- **Increased fare box revenue:** Currently, Nagpur's tariff levels are relatively low compared to agglomerations with similar characteristics, as the city has prioritised service affordability by relying on public subsidies to close the ensuing gap. According to the study, the current conditions provide some flexibility for potential fare increases, assuming that these are progressive and that their impact on ridership remains limited.

The necessary investments to electrify the bus fleet can be justified by non-quantified positive externalities, such as improved health and air quality and reduced GHG emissions. Even with high emission factors from the electricity grid, battery electric buses have the potential to reduce CO<sub>2</sub> emissions by 30% compared to diesel buses and could save approximately 100 ktCO<sub>2</sub>e over 15 years.

Nagpur's transition plan and the pre-feasibility study can be accessed in the MobiliseYourCity Knowledge Platform using this link.

## Urban Mobility Observatory:

Finalised in 2023, it showcases the data collected during the technical assistance period, providing an overview of transport-related information in Nagpur. A set of 20 indicators has been defined and is presented through graphs and maps on an interactive website. The Nagpur Urban Mobility Observatory is available online.<sup>1</sup>

## Core impact indicators baselines

Indicator	Baseline - N/A
<b>Total annual transport related GHG emissions (Mt CO<sub>2</sub>eq)</b>	507,300 Mt CO <sub>2</sub> eq
<b>Annual transport-related GHG emissions per capita (kg CO<sub>2</sub>eq/capita)</b>	197 kg CO <sub>2</sub> eq / capita
<b>Access</b> Increase in the proportion of the population living within 750 m or less of a mass transit stop	3.8%
<b>Air pollution</b> Mean urban air pollution of particulate matter (in µg PM <sub>2.5</sub> ) at road-based monitoring stations	49.2 µg/m <sup>3</sup> of PM <sub>2.5</sub>
<b>Road safety</b> Annual traffic fatalities in the urban area, per 100,000 inhabitants	10 fatalities / 100,000 hab
<b>Affordability of public transport</b> Percentage of disposable household income spent on public transport for the second quintile household income group	12%

**Last updated December 2025**

<sup>1</sup> <http://transitec.oslandia.io/sump/mobility-indicators/nagpur>