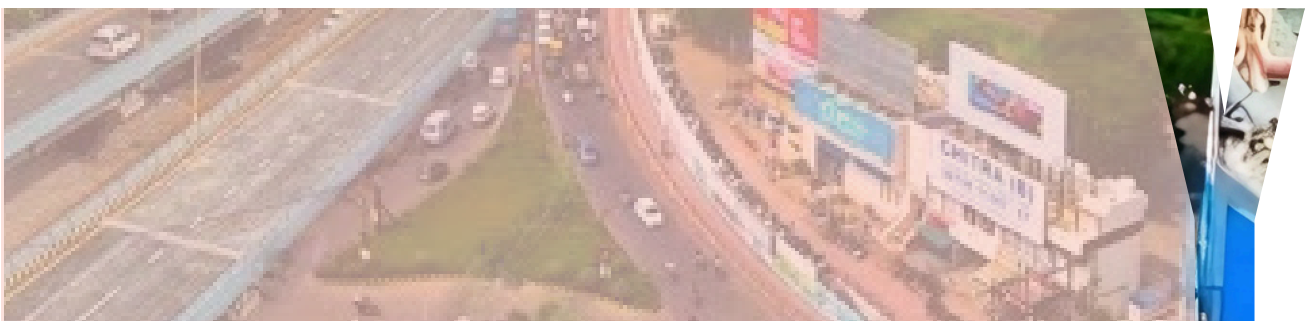
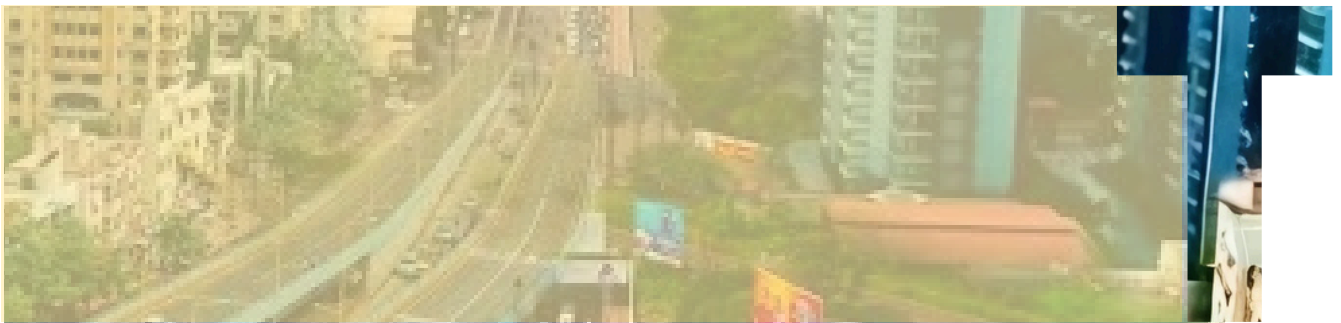
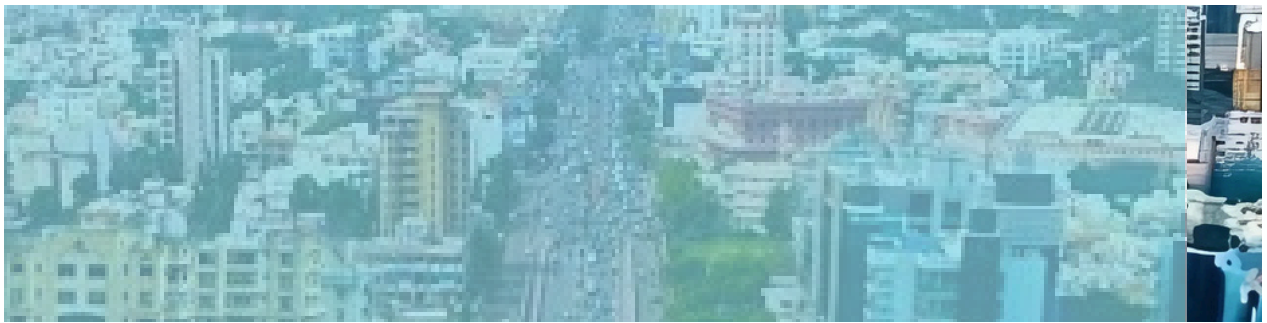


# RAJKOT, INDIA



## CITY FEATURES



Rajkot, a town situated in Gujarat, India, with a population of 2,045,682 and a land area of 161.86 km<sup>2</sup>, experiences an average temperature of 26.4°C. Rajkot, an industrial hub in Gujarat's Saurashtra region, is the state's fourth most populous city. Located in western Gujarat, its flat topography is marked by the Aji River. Historically, industrial activity has driven its growth, with numerous small and medium industries in manufacturing, metal, and automobiles. The central area is dense with mixed land uses, while rapid urbanization over the last decade has spurred outward growth along major roads, increasing demand for multistory buildings. Predominantly residential, the city has mixed-use development along major routes. Industrial areas, including Bhaktinagar and Aji Industrial Estates, are concentrated in the south. Rajkot exhibits a ring-radial growth pattern, reflecting its expanding urban landscape and infrastructure development.



Population  
**2,045,682**  
(2021)



Land area  
**161.86 km<sup>2</sup>**



Average temperature  
**26.4°C**

## TRANSPORT FEATURES

### Status quo and urban mobility trends <sup>1</sup>

In Rajkot, sustainable transport modes account for over 60% of commuting, with walking at 38% and cycling at 10% at and public transport at 14%. Although the city boasts a Bus Rapid Transit System and urban bus network, motorcycles remain the most popular private mode of transportation. Vehicle registrations have surged from 0.45 million in 2011–12 to 1.8 million in 2023–24, intensifying pollution and congestion. However, Rajkot is transitioning to electric mobility: out of 224 buses, 124 are electric, with 100 more approved. Charging facilities include 35 Chargers and 5 Chargers at Existing Opportunity Charging Station. Due to rapid urbanization, the city's population rose from 1.28 million in 2011 to 2 million in 2021, and land area grew from 105 km<sup>2</sup> to 161.86 km<sup>2</sup>. This has led to a 14% annual increase in vehicles. Only 68% of the residents live within 400m of public transport, while 71% lack easy access to the city's 173 parks. Thirty-eight percent of Rajkot faces high air pollution levels. Key challenges include limited Non-Motorized Transport (NMT) infrastructure, insufficient parking, and poor public transport integration. Opportunities lie in expanding EV fleets, offering green mobility incentives, and enhancing public transport networks for resilience.

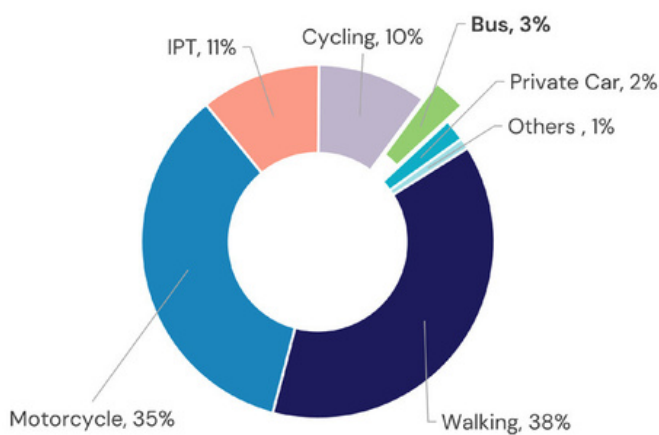


© Rajkot Rajpath Limited

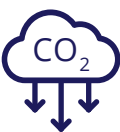
<sup>1</sup> CapaCITIES Project– Technical Study of the existing BRTS corridor for the last mile connectivity and pre-feasibility of potential electrification of the corridor, 2018

# TRANSPORT FEATURES

## Modal Split<sub>2</sub>



## GHG Emission Levels<sub>3</sub>



Total GHG emissions  
**2.615 million tCO<sub>2eq</sub>**

From road transport  
**0.55 million tCO<sub>2eq</sub>**

## Air Pollutant Levels<sub>4</sub>



|                               |                               |
|-------------------------------|-------------------------------|
| PM 2.5                        | NO <sub>2</sub>               |
| <b>47.04 µg/m<sup>3</sup></b> | <b>14.45 µg/m<sup>3</sup></b> |
| PM 10                         | SO <sub>2</sub>               |
| <b>93.54 µg/m<sup>3</sup></b> | <b>23.20 µg/m<sup>3</sup></b> |

The modal split of Rajkot city highlights a strong reliance on non-motorized and two-wheeler transport. Walking constitutes the highest share at 38%, indicating a pedestrian-friendly environment or limited public transport options. Two-wheelers account for 35%, reflecting their affordability and convenience in urban mobility. Intermediate public transport (IPT), including auto-rickshaws, contributes 11%, serving as a crucial mode for last-mile connectivity. Cycling, at 10%, suggests moderate bicycle usage, potentially influenced by infrastructure and road safety conditions. Public transport holds a minimal share of 3%, indicating a need for enhanced services. Private vehicles account for only 2%, suggesting either low ownership rates or congestion deterrents, while taxis and other modes make up the remaining share. This distribution underscores the necessity for improved public transport and cycling infrastructure to support sustainable urban mobility.

## Bus Trips Features<sub>2,5</sub>



Number of bus trips  
2021  
**80,665 BRT**  
**373,030 Non-BRT**



Average time  
**30 min (BRT)**



Average distance  
**190 km**



Trips by purpose

|          |            |
|----------|------------|
| Work     | <b>53%</b> |
| Study    | <b>26%</b> |
| Shopping | <b>16%</b> |
| Others   | <b>5%</b>  |

Only 3% of total trips in Rajkot are made by bus. The city bus service, covering major areas, carries more passengers than the Bus Rapid Transit (BRT) system. BRT buses take 30 minutes per trip, covering 190 km daily per bus, while city buses take longer. The primary users are students from the medium-income group (SEG-2), mainly commuting for education. Peak travel hours are 9–11 AM and 5–7 PM. Buses provide end-to-end connectivity to key city activity nodes, but usage remains low. Rajkot has 667 bus stops which include 39 smart bus stops, 78 bus stands, 450 pick up/drop stops, 100 request stops and also 19 BRTS bus stops, improving accessibility, enhancing efficiency and affordability could increase ridership.

2 Low Carbon Comprehensive Mobility Plan, Rajkot 2014  
3 CapaCITIES Project- Rajkot GHG Emission Inventory, 2020  
4 Gujarat State Pollution Control Board, 2021

5 RRL Office, Rajkot

## BUS SYSTEMS OUTLOOK

### Fleet and Infrastructure <sub>5</sub>



Number of buses

**224**

**22** BRTS **202** RMTS



Number of bus routes

**1** BRT **78** Non-BRT

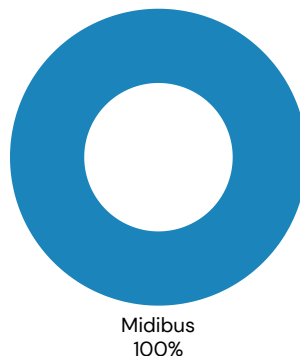


**19** BRT bus stops

**667** Non-BRT bus stops

**3** Bus depots

Buses by fleet type



Buses by fuel type



Rajkot has a total bus fleet of 224 buses, including 22 Bus Rapid Transit System (BRTS) buses and 202 Rajkot Municipal Transport Service (RMTS) buses. The fleet comprises 100 CNG buses and 124 electric buses, equally distributed between gas (45%) and electric (55%). The city operates a midibus fleet, each ranging 8–10 meters in length with a capacity of 20–40 passengers.

The public bus network includes 79 routes—one BRTS route and 78 non-BRT routes—served by 648 bus stops (19 BRTS and 667 RMTS). There are three bus depots supporting operations. Rajkot's BRTS (Rajpath), launched in 2012, features a 10.7 km Blue Corridor along the 150-foot ring road with 22 e-buses and 19 stations. Traditional buses (RMTS) run on 79 routes, serving more than 25,000 passengers daily. Expansion of electric buses and improved infrastructure remain key priorities for Rajkot's sustainable mobility.

### Quality of Service

The bus transport system in Rajkot is well-connected, linking major origin and destination points across the city, including fringe and core areas. The Bus Rapid Transit System (BRTS), operating on 10.7 km of dedicated lanes, ensures faster travel and timely arrivals. However, city buses use shared carriageways, leading to 10–15 minute delays during peak hours due to traffic congestion. The fare structure is affordable for all income groups, making public transport accessible. While bus rides are generally comfortable, peak-hour crowding remains a challenge. GPS tracking and onboard cameras enhance safety, making buses a secure mode of transport for all passengers. Future plans aim to expand preferential lanes and improve service efficiency for better urban mobility.





## Existing Business Model <sup>6</sup>

In Rajkot, the Gross Cost Model (GCM) is the primary business model, where Rajkot Rajpath Limited (RRL) contracts PMI India to operate and maintain e-buses, paying a per-km fee. The government owns the fleet and infrastructure, while fares are collected by the operator's conductors. FAME-II and CM Urban Bus Scheme subsidies help cover costs.

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

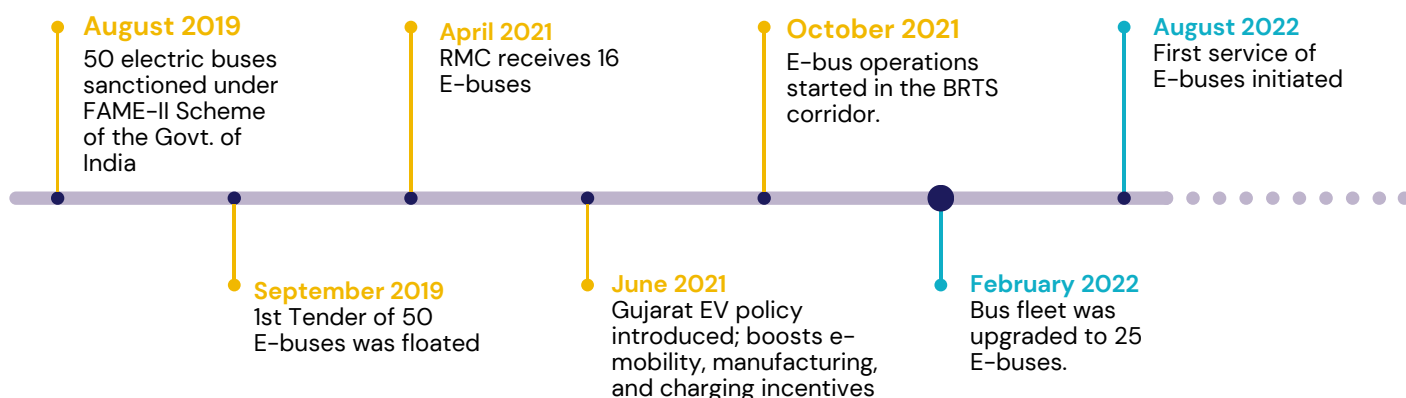
**Model E:** Government-run system

B

With the divided responsibilities, the public sector owns the bus fleet and the private sector is responsible for the operation and maintenance of the buses via public concession. The ownership of the fleet will remain with Rajkot Rajpath Limited after the end of the contract.






## E-BUS ADOPTION APPROACH <sup>7</sup>



<sup>6</sup> Based on Accelerating a market transition in Latin America: New business models for electric bus deployment, P4G, Zebra and Dalberg, 2020

<sup>7</sup> E-mobility City Action Plan Rajkot, ICLEI South Asia, 2022

## E-Bus Fleet Technical Features<sub>8</sub>

|   |   |   |   |                                 |
|---|---|---|---|---------------------------------|
|   | <b>Model/Brand</b>                                |   | <b>Number of buses with this Technology</b> |                                 |
|   | Type A<br>(midi/PMI FOTON)                        | Type B<br>(midi/PMI FOTON)                        | 50 buses Type A                             | 49 buses Type B                 |
|  | <b>Passenger capacity</b>                         |   | <b>Charging System</b>                      |                                 |
|   | Type A<br>24+2 pax                                | Type B<br>32+2 pax                                | Type A<br>1 charger per 5 buses             | Type B<br>1 charger per 5 buses |
|  | <b>Battery features</b>                           |   | <b>Price</b>                                |                                 |
|   | Type A<br>Capacity 151 kWh<br>Range 120 km/charge | Type B<br>Capacity 151 kWh<br>Range 120 km/charge | 1.1 cr (123,431.85 €)                       |                                 |

## E-Bus Business Model

Rajkot Rajpath Limited (RRL) operates electric buses under a Gross Cost Model, where PMI India, a private operator, manages operations and maintenance. The city government owns infrastructure like bus stops, lanes, and depots. Conductors collect fares using electronic ticketing machines, with revenues managed by RRL. The national (FAME-II) and state (CM Urban Bus Scheme) governments subsidize capital and operational costs. RRL sets fares, routes, and schedules. While the model ensures structured oversight and sustainable transit, challenges include private sector dependency and operational costs, though it supports emission reduction and enhanced public mobility in Rajkot.

## Opportunities and Challenges to Scaling E-Bus Fleets



### Opportunities

- Existing E-Bus Fleet: Currently, 124 out of 224 city buses are electric, with scope for further expansion.
- Charging Infrastructure: Expanding the network of charging stations across the city can support E-bus adoption.
- Ridership Growth Potential: Improving Last Mile connectivity and enhancing transportation hubs can increase public transport usage.
- Government Subsidy: The Chief Minister Urban Bus Service Scheme offers INR 30 per km, significantly reducing operating costs.
- Sustainability Goals: According to LCCMP Rajkot, public transport should account for 20% of total trips, compared to the current 3% share for buses.
- Lower Operating Costs: E-buses have lower operating expenses than Internal Combustion Engine (ICE) buses, making them a cost-effective alternative.



### Challenges

- Operations & Maintenance (O&M): Scaling up requires an efficient O&M framework to sustain reliable e-bus services.
- Supply Shortages: Limited availability of electric buses and components slows deployment.
- Lack of Technical Knowledge: Private operators lack sufficient expertise and consider e-buses risky to adopt.
- Public Perception Shift: Increasing preference for private vehicles is reducing public transport demand.
- Financial Uncertainty: The absence of a long-term financial roadmap makes private investment in e-buses challenging.

## OVERALL FRAMEWORK

### Policy

Rajkot has replaced all of its Diesel Buses with Buses based on Green Fuel in 2022, aiming to shift 10% of total passengers from private transport to public transport with 244 additional e-buses by 2030 as part of the Rajkot Climate Resilience City Action Plan (2024) towards a Net-Zero future. This initiative aligns with the city's sustainable mobility goals, focusing on reducing emissions, improving air quality, and enhancing public transport efficiency. The policy supports Rajkot's broader efforts to increase the share of public transport, integrate renewable energy for EV charging, and create a resilient, low-carbon urban transport system that benefits both commuters and the environment.

### Financing

Rajkot's transport electrification and sustainable mobility initiatives are funded through national and state schemes. Key programs include FAME II for EV adoption, V-VMP for vehicle scrappage, and the Chief Minister Urban Bus Scheme, which subsidizes e-bus operations. The Gujarat State EV Policy 2021 promotes EV infrastructure, while the PM E-Bus Sewa scheme supports fleet expansion. Funding sources include the national and state governments, third-party organizations, and NGOs such as ICLEI South Asia and the Swiss Agency for Development and Cooperation (SDC). These initiatives aim to enhance sustainable mobility, reduce emissions, and improve public transport efficiency.

### Impact

Rajkot has set clear goals for climate action and sustainable mobility, aiming for a safe, low-emission transport system. A GHG baseline assessment has been conducted, with targets to increase non-motorized transport by 5% and shift 10% of passengers from private to public transport by 2030. Plans include adding 244 e-buses and ensuring 80% of commercial vehicles and two & three-wheelers are electric, with 50% powered by renewables. Emissions could be reduced by 25% by 2030 under a net-zero pathway. The Gujarat EV Policy provides financial incentives, and the CapaCITIES project supports marginalized groups through subsidies, awareness campaigns, and stakeholder engagement, ensuring an inclusive and equitable transition.





# TUMI E-bus Mission City Network – Profile

## RAJKOT, INDIA



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The publication should be cited in full as:  
"ICLEI – Local Governments for Sustainability (2025). TUMI E-bus Mission City Network – Profile: Rajkot, India. Bonn, Germany".

### Publisher

ICLEI – Local Governments for Sustainability.  
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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.

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