

## UDAIPUR, INDIA

C



**TUMI E-bus**  
Mission City Network

**PROFILE**

## CITY FEATURES<sup>1</sup>



Considered one of the oldest cities in India and renowned globally as the 'City of Lakes', Udaipur serves as the district's administrative capital and is the only municipal corporation within it, covering an area of 64 square kilometers divided into 80 electoral wards. The city's connectivity and historic significance play a significant role in establishing it as an essential and renowned city in the region, attracting over 2 million tourists annually. The city is expanding towards the northeast and west along National Highways NH8 and NH76. With a population of 0.45 million as per the 2011 census, the city has experienced substantial development in the last two decades. It functions as the region's industrial, administrative, and educational centre.



Population  
**451,100**  
(2011)



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

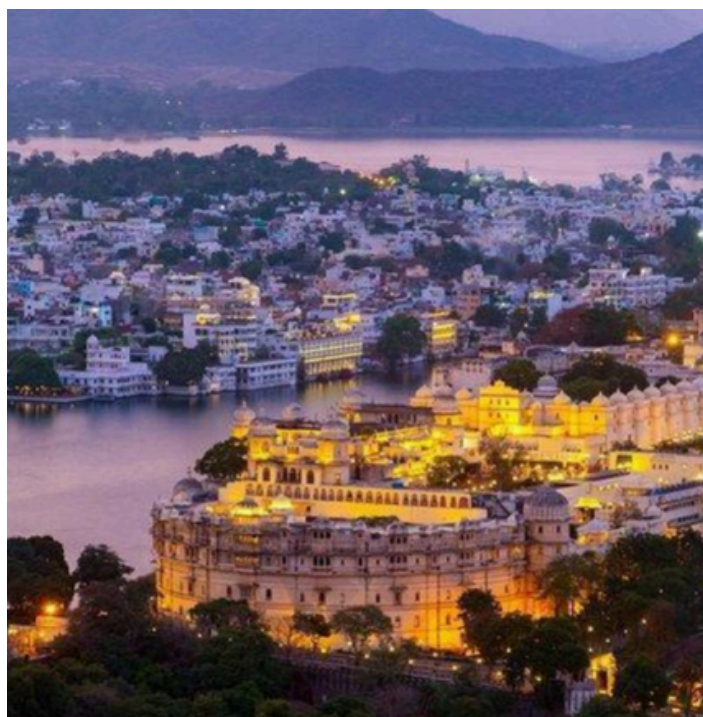


Average temperature  
**24.1 °C**

## TRANSPORT FEATURES

### Status quo and urban mobility trends<sup>2</sup>

Udaipur has 11 arterial roads and 26 sub-arterial roads that connect the major residential and commercial areas to other parts of the city. From the Right of Way perspective, 4% of roads are 30–50 meters wide, 16% of roads are 20 – 30 meters wide, followed by 15 meters at 18%, while 62% of roads are narrower than 10 meters. The number of registered vehicles in Udaipur has significantly increased from 212,000 in 2016–17 to 894,000 in 2021–22. Two-wheelers dominate vehicle ownership, accounting for 69% of all registered vehicles, followed by four-wheelers at 30%. Udaipur's transportation leans heavily on walking and cycling (48%), followed by two-wheelers (34%). Udaipur's current public transport system includes a limited supply of city bus services, with only 24 buses operating on six routes within the city. However, with rapid urbanization, the city plans to operate 35 buses on 16 major routes, connecting residential and commercial neighborhoods, educational and medical facilities, and markets. Moreover, the city is adding 50 electric buses along with the necessary supporting infrastructure by December 2025.

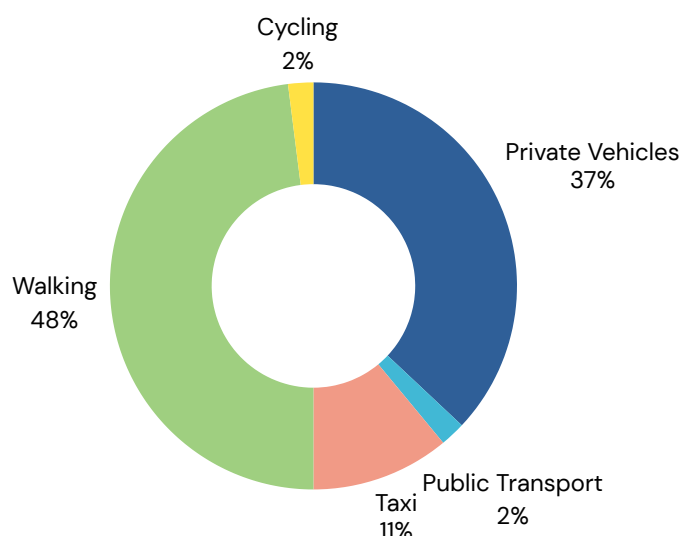


<sup>1</sup> City Development Plan (CDP), July 2014

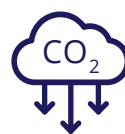
<sup>2</sup> Udaipur City Transport Service Ltd (UCTSL)

## TRANSPORT FEATURES

### Modal Split<sup>3</sup>



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



Total GHG emissions

**1.15 million tCO<sub>2eq</sub>**

From road transport

**309,350 tCO<sub>2eq</sub>**

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



PM 2.5

**61.19 µg/m<sup>3</sup>**

NO<sub>2</sub>

**45.04 µg/m<sup>3</sup>**

PM 10

**123.72 µg/m<sup>3</sup>**

SO<sub>2</sub>

**8.36 µg/m<sup>3</sup>**

Udaipur's modal split indicates a significant reliance on private transport (37%) and non-motorized options (50%), highlighting the dependence on walking, particularly within the walled city. This mainly results from narrow roads, undulating terrain, and the proximity of most tourist hotspots within the walled city. Public transport accounts for merely 2%, reflecting the limited availability of reliable city bus services. Taxis contribute approximately 11%, facilitating inter- and intra-city trips, primarily to tourist destinations. The substantial share of private transport, especially within the walled city, combined with narrow roads, inadequate traffic management, and insufficient parking spaces, presents daily challenges for locals and tourists attempting to navigate the area.

### Bus Trips Features<sup>5</sup>



Trips by  
gender

Men **72%**  
Women **28%**



Average cost per  
travel by bus

**₹5**



Average  
distance  
**8.5 Km**



Average time

**11 min**



Udaipur's public transport system currently operates 24 buses on six routes. In response to rapid urbanization, the city plans to expand to 35 buses on 16 major routes, linking residential areas, commercial hubs, educational institutions, medical facilities, and markets. Typically used by Economically Weaker Section (EWS), Low Income Group (LIG), and Middle-Income Group (MIG) commuters, the average travel distance is 8 km, taking about 30 minutes. The system has not yet attracted higher-income travelers. Educational peak hours are from 8:00 to 10:00 AM and 2:00 to 4:00 PM, while occupational peak hours are from 8:30 AM to 10:30 AM and 4:00 PM to 6:30 PM.

<sup>3</sup> Climate Resilient City Action Plan (CRCAP), 2019

<sup>4</sup> Central Control Room for Air Quality Management – All India, Central Pollution Control Board (CPCB)

<sup>5</sup> Low-carbon Comprehensive Mobility Plan for Udaipur (LCMP, 2014)



## BUS SYSTEMS OUTLOOK

### Fleet and Infrastructure<sup>6</sup>



Number of buses  
**24** buses



Number of bus routes  
**6** routes



Number of bus stops  
**100** bus stops

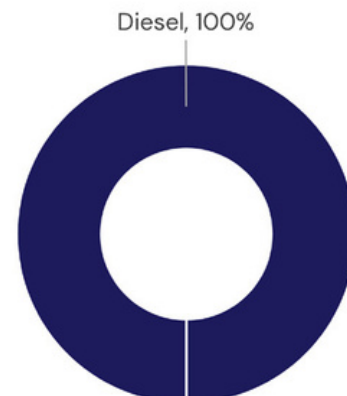


Number of bus depots  
**1** Bus Stop

Buses by fleet type<sup>7</sup>



Buses by fuel type



Udaipur's current public transport system comprises 24 low-floor, standard 11-meter diesel buses with a seating capacity of 52 passengers and compliant with BS VI standards. These buses operate along six routes and are complemented by 100 smart Bus Queue Shelters (BQS). The city is acquiring 50 e-buses and is also working on opening new routes and extending the existing routes by a few kilometers for the convenience of its users. Based on the new routes and the extension of existing ones, the city will also have an additional 50 BQS.

### Quality of Service

Traveling by public transport in Udaipur is inexpensive, quick, comfortable, and safe, with an average route length of approximately 15 km. The longest route spans 24.3 km, while the shortest covers 11.5 km. Additionally, due to rapid urbanization and growth in peripheral areas, along with a significant influx of daily wage workers from surrounding villages, the city is extending specific routes and adding new bus services to enhance public transport connectivity. The buses feature low floors for easy access and comfortable travel. Furthermore, all existing Bus Queue Shelters (BQS) offer level boarding for effortless access and egress for individuals of all age groups, thereby fulfilling universal accessibility norms.



<sup>6</sup> Udaipur City Transport Service Ltd (UCTSL)

<sup>7</sup> Udaipur's city bus type is a mix between standard (12m) and midibus (8–10m), featuring 11m low-floor, BS-VI buses with 52 seats

Existing Business Model<sup>8</sup>

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

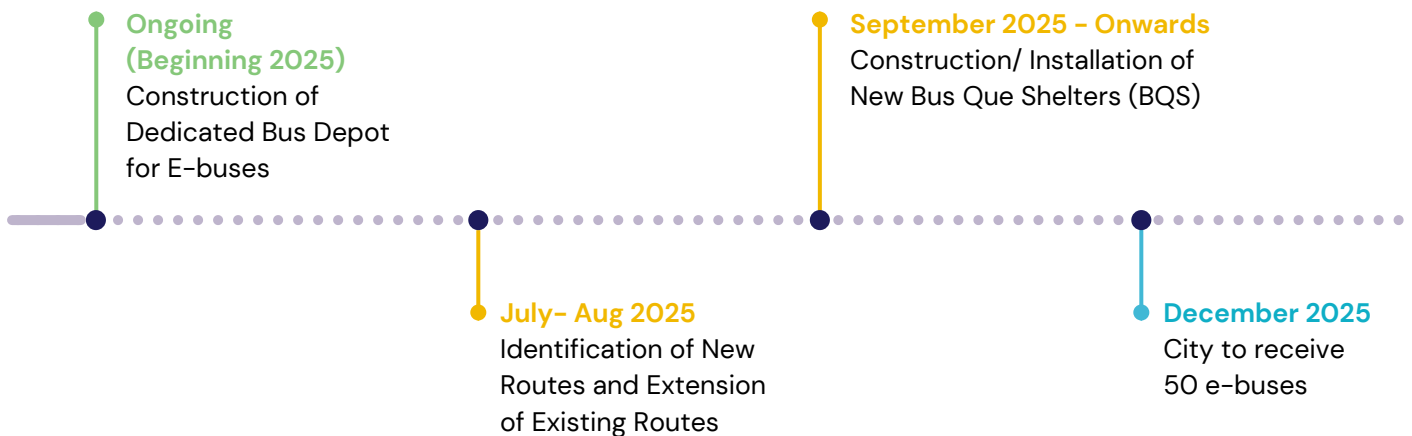
A

Udaipur's current public transport is managed by Udaipur City Transport Service Ltd. (UCTSL). It is funded and operated through a Viability Gap Funding model. The operation and maintenance are carried out by a third-party contractor for seven years (July 2021 – June 2028), with the possibility of extension by three additional years depending on performance. For operations, the operator receives ₹39.50 per km for non-A/C buses and ₹45.00 per km for A/C buses from the city or state government.



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

## E-BUS ADOPTION APPROACH<sup>9</sup>



### Opportunities and Challenges to Scaling E-Bus Fleets



#### Opportunities

- As public transport usage rises and cities strive to meet the PM's Net Zero vision, significant opportunities emerge for introducing and adapting e-buses within city planning.
- To serve peripheral villages and nearby regions, the city is currently identifying new routes and extending some existing ones, which will facilitate the deployment of e-buses in Udaipur.
- With rapid urbanisation, there will always be a need to serve these areas, presenting a substantial opportunity to scale e-bus fleets throughout the city.



#### Challenges

- Currently, with no e-bus in operation, the city lacks experience and technical know-how in operating and maintaining e-buses and charging stations, which may deter their adoption.
- With undulating topography, the city might face challenges managing the average running kilometres. This can lead to frequent charging and faster battery wear and tear, resulting in higher maintenance and operational costs.

<sup>9</sup> Udaipur City Transport Service Ltd (UCTSL)



## OVERALL FRAMEWORK

### Policy

The adoption of e-buses in Rajasthan is guided by the Rajasthan Electric Vehicle Policy (REVP) 2022. It aims for a phased transition to e-buses in eight priority cities, including Udaipur. Udaipur Municipal Corporation, Urban Development Authority, Udaipur City Transport Service Ltd, Regional Transport Office, Law & Order, Traffic Police and Ajmer Vidyut Vitran Nigam Ltd. are responsible for procuring and operating e-buses in the city. These agencies are tasked with identifying and allocating space for the bus depot and BQS, enforcing traffic laws, and taking action against theft and vandalism of e-buses and their supporting infrastructure.

### Financing

The National Government (Ministry of Power) will finance the procurement of 50 e-buses and the installation of charging stations through its subsidiary, Energy Efficiency Services Limited (EESL). The state and city governments will fund the civil infrastructure for the construction and/or retrofitting of bus depots and Bus Queue Shelters (BQS).

### Impact

With the plan of introducing e-buses in December 2025, the city aims to improve and progress towards promoting sustainable urban mobility. Moreover, in transitioning to sustainable and clean fuel-based urban mobility, the city plans to replace conventional fuel-based auto-rickshaws with electric autos, particularly within the walled city. Additionally, the ambitious 'Green Mobility Zone' has already been finalized and approved by the city's Traffic Management Committee and is awaiting implementation.



# TUMI E-bus Mission City Network – Profile

## UDAIPUR, INDIA



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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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