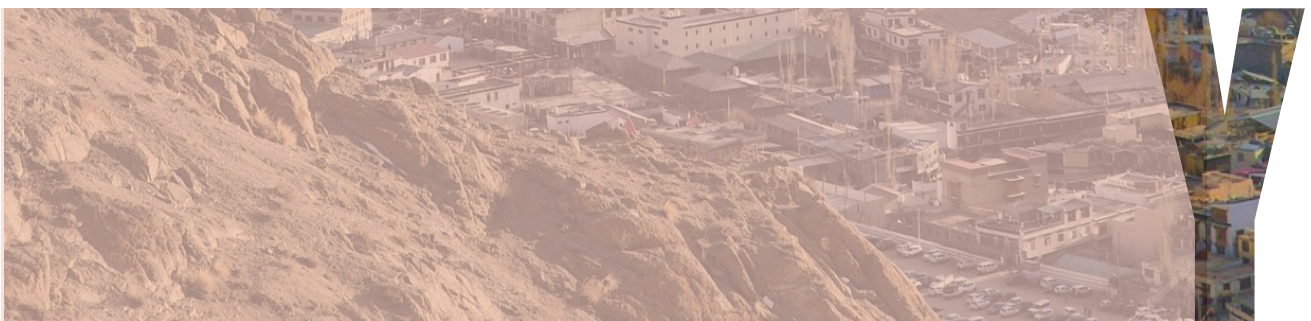


LEH, INDIA



CITY FEATURES



The city of Leh is located in the Leh district of the Union Territory (UT) of Ladakh, India. The Leh district is the country's second-largest district, spanning 45,110 km². The city is located in a cold mountain desert region of the Trans-Himalayas, with altitudes of 3,915 m to the north and 3,310 m to the south. The city's economy is primarily focused on tourism and is experiencing rapid growth. In recent decades, the town has experienced 18.95% population growth from 2011 to 2024, resulting in spatial expansion and the development of townships on former agricultural and barren lands, alongside the densification of built-up areas. With the influx of tourists and the high floating population, the city is making an effort to provide them with a quality experience while also maintaining the local ecology.



Population
30,870
(2011)



Land area
9.15 km²



Average temperature
-2.2°C (winter)
18.7°C (summer)

TRANSPORT FEATURES

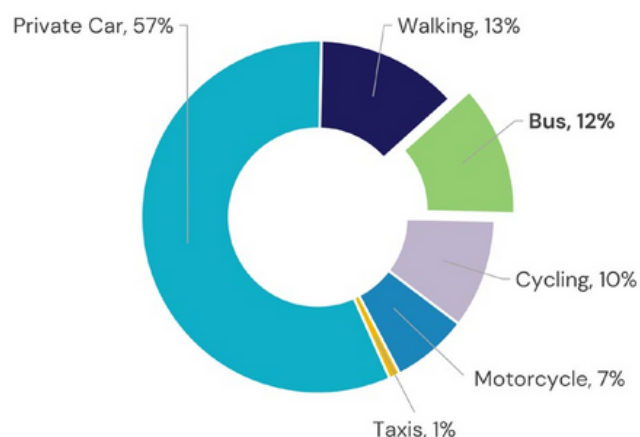
Status quo and urban mobility trends

According to the Leh Vision Plan 2030, the number of car registrations has steadily increased over time, rising from an annual total of 218 cars in 2010 to 1,439 cars in 2018. In 2019, a total of 26,200 vehicles were registered in Leh. The travel pattern indicates that most trips occur in zones such as major commercial and market areas, as well as government offices. Urban expansion and tourism have increased transportation demand, affecting both private vehicle ownership and the development of public transport services. The rise in private vehicle usage contributes to traffic congestion and air pollution, which negatively impact both environmental quality and the health of residents. As of April 2023, Leh introduced 10 electric buses under the Sindhu Infrastructure Development Corporation (SIDCO), enhancing eco-friendly public transportation options. The challenges and opportunities for transitioning to the city's climate-neutral and equitable mobility systems include harsh climate conditions that impact vehicle performance and limited infrastructure for EV charging. Opportunities include harnessing solar energy for EV charging, given Leh's high solar irradiance, and promoting sustainable tourism through eco-friendly transportation options.

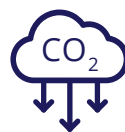


TRANSPORT FEATURES

Modal Split¹



GHG Emission Levels²



Total GHG emissions

9,153 tCO_{2eq}

From road transport

—

Air Pollutant Levels³



PM 2.5

8.4 µg/m³

NO₂

—

PM 10

—

SO₂

—

Approximately 57% of respondents currently use a private car for travel, highlighting the significant reliance on personal vehicles. 7% percent of respondents utilize motorized bikes, particularly in the summer months; 12% rely on public transport, 13% walk, and only 10% cycle to their destinations. Public transport services were revived in Leh in 2018 following the deployment of additional public buses to address the existing traffic issues created by private vehicles. Additionally, cycling as a mode of transportation increased in Leh from 0.9% in 2018 to nearly 10% in 2020. This growth reflects a transition to public and sustainable transportation methods.

Bus Trips Features⁴



Number of bus trips

5326 bus trips/day



Average time

40.08 min



Average distance

17.12 km



Average cost per travel by bus

INR 10

Leh's public transport consists of standard and electric buses serving urban and peri-urban areas. The primary users are residents, mainly students and workers from diverse socio-economic backgrounds, predominantly the working class. Buses are used for commuting to work, educational institutions, and markets, with peak hours in the morning (8:30–10:30 AM) and afternoon (3:30–5:30 PM). Common destinations include the Leh market area, which is both economically and touristically significant, and residential areas such as Agling, Spituk, and Choglamsar. Bus trips lack dedicated stops, allowing passengers to board and alight as convenient, with the New Bus Terminal and Leh Gate as the only fixed points. Some residents rely entirely on buses due to affordability and lack of private vehicles.

¹ Walkable Leh – A sustainable public transport plan for Leh town

² Data Portal for Cities

³ IQAir, 2025

⁴ Calculated based on data available on Leh Vision 2030

BUS SYSTEMS OUTLOOK

Fleet and Infrastructure⁵



Number of buses
140 buses
(10 E-buses, 130 Mini buses)

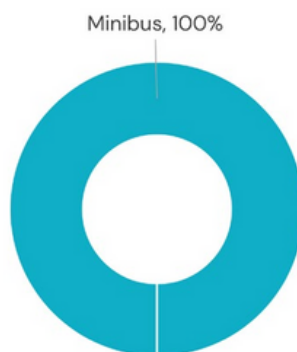


Number of bus routes
2

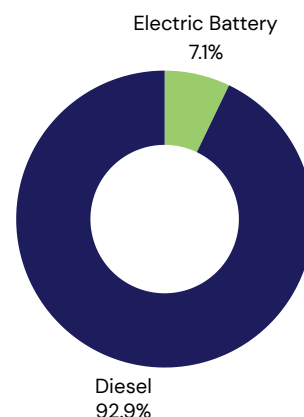


1 Bus depot

Buses by fleet type



Buses by fuel type



Leh's public transport system primarily consists of 130 diesel mini-buses and 10 electric buses. These mini-buses, typically 5–7 meters long, accommodate 30 passengers and are well-suited for the city's mountainous terrain and narrow roads. The fleet operates predominantly on diesel (92.86%), with a small but growing electric bus segment (7.14%) aimed at promoting sustainable transport. Leh currently has one combined bus terminal and depot, which houses all city and intercity buses along with taxis. Electric buses are maintained at the terminal, with charging facilities managed by the Leh Garages Department at a nearby location. A new dedicated depot is under development on the city's outskirts to improve fleet management. The city has no designated bus stops, and the transport network remains compact, catering mainly to local commuters and visitors navigating Leh's challenging geography.

Quality of Service

Leh's bus network connects major urban and peri-urban areas covering 250 km, providing a cost-effective mode of transport; however, coverage in remote regions remains limited. While the southern part of the Leh Municipal Corporation area has access to public transportation, the northern and western areas lack connectivity, making travel challenging for residents in these regions. Leh currently has no exclusive or preferential bus lanes. Public transport ticket fare ranges from INR 10 to INR 20, making it an affordable option for most people. However, bus crowding levels fluctuate, with peak hours in the morning and evening experiencing the highest congestion. Although buses are accessible to the general public, they often lack specific accommodations for women, children, the elderly, and individuals with disabilities, which affects overall inclusivity and safety. Despite these challenges, buses continue to be a vital transportation option for daily commuters.



⁵ Sindhu Infrastructure Development Corporation Limited (SIDCO)

Existing Business Model⁶



D

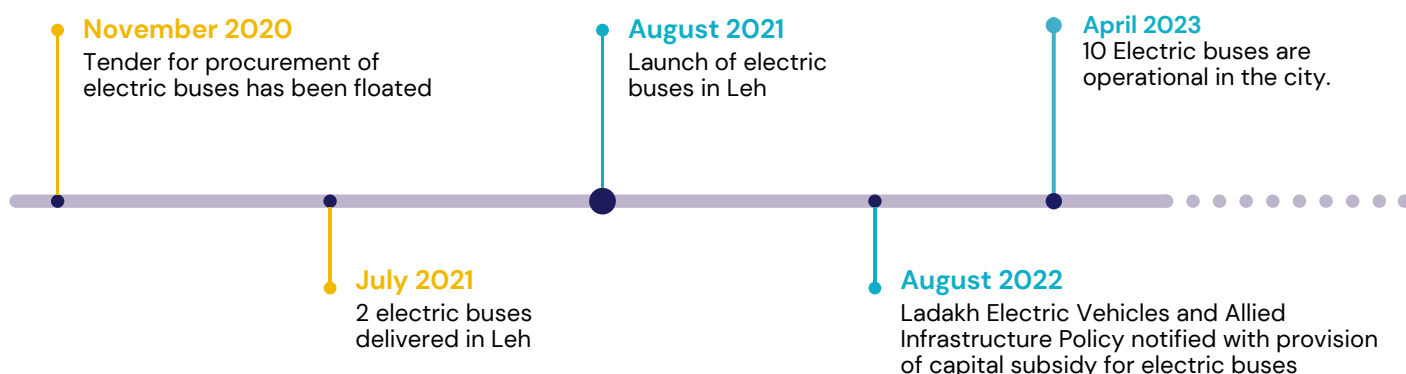
Mini-buses in Leh are operated privately by the Mazda Union, which comprises small, informal private operators holding five-year permits from the Regional Transport Office (RTO) to provide their services. These operators play a vital role in offering public transportation. The mini-bus operators solely depend on fare box revenue as their primary source of income.

E

Sindhu Infrastructure Development Corporation Limited (SIDCO) operates electric buses in Leh as part of a government-run public transportation system, providing a sustainable and environmentally friendly alternative to conventional fuel-based transportation. The E-bus system currently relies solely on fare box revenue as its primary source of income.



E-BUS ADOPTION APPROACH



⁶ 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



Model/Brand

Type A
PMI



Number of buses with this Technology

10 buses Type A



Passenger capacity

Type A
30



Number of chargers available per bus

Type A
0.1



Battery features

Type A

Capacity
Range

–
330 km/charge



Price

Type A
INR 0.8–1 Crore
EUR 85k–106k

E-Bus Business Model

Sindhu Infrastructure Development Corporation Limited (SIDCO) owns, operates, and maintains Leh's electric buses as part of a government-run public transportation system, providing a sustainable and environmentally friendly alternative to conventional fuel-based transportation. The buses are maintained at the terminal, with charging facilities managed by the Leh Garages Department at a nearby location. The government collects the fare, and its revenue is used to meet the operational expenses of the buses.

Opportunities and Challenges to Scaling E-Bus Fleets



Opportunities

- **Environmental Benefits:** Adopting electric buses can substantially reduce greenhouse gas emissions and improve air quality in Leh, thereby supporting global sustainability initiatives.
- **Operational Cost Savings:** E-buses typically incur lower fuel and maintenance expenses than diesel buses, offering long-term financial benefits for transit agencies.
- **Enhanced Tourism Appeal:** As a renowned tourist destination, Leh's investment in sustainable transportation can attract environmentally conscious travelers, contributing to economic growth.



Challenges

- **High Initial Investment:** The upfront cost of acquiring e-buses and developing essential infrastructure, such as charging stations, is very high.
- **Geographical and Climatic Constraints:** Leh's high-altitude terrain and extreme climatic conditions impact battery performance and the overall efficiency of e-buses.
- **Infrastructure Development:** Establishing a reliable charging network in remote areas, such as Leh, requires strategic planning and substantial investment.

OVERALL FRAMEWORK

Policy

In Leh, the push for transport electrification is driven by national and state schemes, including the PM E-Drive, the Ladakh Electric Vehicles and Allied Infrastructure Policy 2022, and Leh Vision 2030, which outlines a roadmap with a focus on clean mobility. The UT Ladakh administration has deployed 19 electric buses in Ladakh, aiming to increase the use of sustainable modes of public transport. Mobility planning is integrated into master plans, which include provisions for electric vehicle infrastructure, such as charging stations. Ladakh Autonomous Hill Development Council (LAHDC), the Municipal Committee Leh, and the Traffic Police coordinate transport planning and regulation. Additional efforts, such as EV subsidies and public awareness initiatives, support the transition to sustainable mobility and reduction of GHG emissions.

Financing

The Union Territory (UT) Administration of Ladakh provided 19 buses to the State Industrial Development Corporation (SIDCO) to operate public transportation services within Ladakh, out of which 10 buses operate in Leh. These buses were fully funded by the UT administration, covering the costs of procurement, registration, and deployment. This initiative aimed to strengthen the public transport infrastructure and address the growing transportation needs of the local population across Leh and its surrounding villages.

Impact

Under the Leh Vision 2030, the region aims to promote sustainable and equitable mobility through public transportation, non-motorized options, and the widespread electrification of commercial vehicles. A key milestone is the deployment of 19 electric buses in Leh and Kargil, which cover over 1 million km and serve 1,500 passengers daily, resulting in an estimated 2.52 million kg reduction in CO₂ emissions, as per an article by The Economic Times released in December 2023. These initiatives are part of a broader project pipeline supported by financial incentives and EV infrastructure. The administration ensures inclusive planning by engaging government bodies, private operators, and marginalized groups, prioritizing affordability, accessibility, and gender-responsive mobility solutions.



TUMI E-bus Mission City Network – Profile

LEH, INDIA



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About the TUMI E-Bus Mission

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