

CITY FEATURES



The town of Leh is part of the Leh district in the Union Territory (UT) of Ladakh, India. The Leh district is the second largest district (45,110 km²) in the country. The town is a cold mountain desert located in the trans Himalayas with an altitude of 3,915 m in the north and 3,310 m in the south. The economy of the town is growing and is mainly dependent on the tourism sector. In recent decades, the town has seen population growth that has also resulted in spatial growth and townships that have developed on the periphery. The town centre has major commercial developments with diverse land use and high density neighbourhoods. With tourist influx and high floating population, the town is putting its efforts into providing them quality experience and maintaining local ecology.



Population
30,870
 (2011)



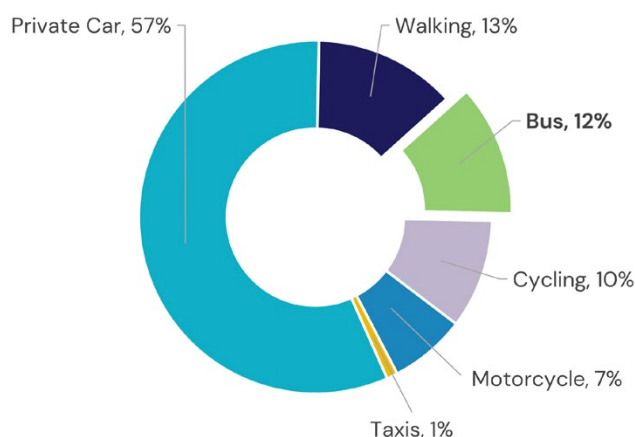
Land area
11.6 km²



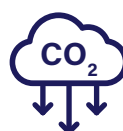
Average temperature
-2.2°C (winter)
18.7°C (summer)

TRANSPORT FEATURES

Modal Split¹



GHG Emission Levels²



Total GHG emissions
9,153 tCO_{2eq}
 From road transport
 —

Air Pollutant Levels³



PM 2.5	NO ₂
66.54 µg/m³	—
PM 10	SO ₂
101 µg/m³	—

The prevalent mode of commuting in the city is by a private car, with a share of 57%, followed by walking and bus accounting for 13% and 12% respectively. Based on the Leh Vision Plan 2031, the registration count for cars has increased steadily over time, from annual registration of 218 cars in 2010 to 1,439 cars in 2018. Overall, 26,200 vehicles were registered in Leh until 2019. The travel pattern shows that maximum trips are performed in zones like the main market, major commercial areas and government offices. To make Leh carbon neutral, the authority has introduced electric buses in Leh and are planning to induct more electric buses in the town. The problem is associated with road space as the terrain is quite steep and there is less available space in the city.

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

² [Data Portal for Cities](#)

³ [The World Air Quality project](#)

BUS SYSTEMS OUTLOOK

Bus Trips Features



Number of bus trips
5,720 per day (2021)



Average time
20 min



Average distance
26 km

Passengers use the bus service to travel to activity areas of the town and reach surrounding villages. The trip by bus takes an average of twenty minutes to complete one route. The bus service has been used by tourists, students, women, senior citizens, and working class people, because it is well connected to all institutional areas, important nodes and tourist attraction points in the city. The majority of bus passengers are regular users and tourists. The captive users belonging to the weaker economic section also benefited from bus services to commute at an affordable price, for work and social purposes in the city.

Fleet and Infrastructure



Number of buses
126

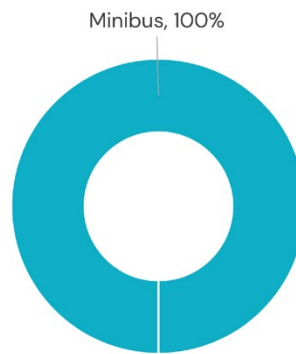


Number of bus routes
3

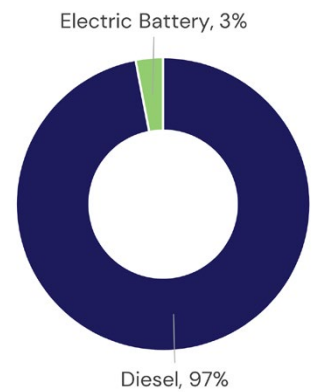


29 Bus stops
1 Bus depot

Buses by fleet type



Buses by fuel type



Quality of Service

The network of bus transport covers only south eastern part of Leh, from tourist spots to the fringe areas of the town. The existing service and frequency of bus transport are not satisfactory as the public transport system has not completely evolved yet. The bus service is only available during the daytime and most of the buses are only operated by private operators. The buses usually run on the scheduled timetable, although, there are delays due to traffic. During peak time, the buses are overcrowded, while during non peak hours, traveling by bus is comfortable. The fares for bus transport are minimal and affordable for all the city residents. Travelling by bus is considered safe for all passengers, including women, children and elderly people.



Existing Business Model⁴

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

D

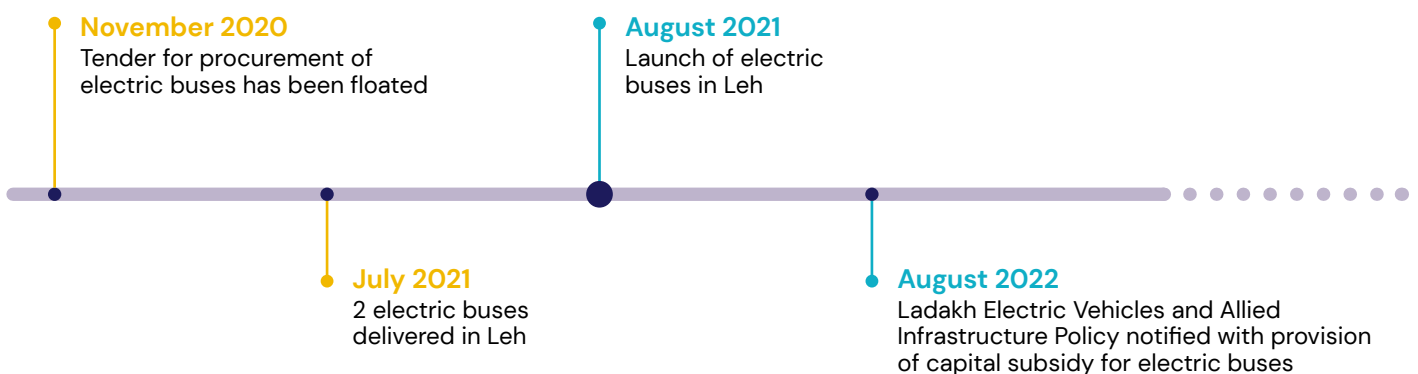
The buses are owned, operated and maintained by private operators under the supervision and jurisdiction of the transport department, UT of Ladakh. The route permits have been given to the operators for the operation of buses in the town. The associated infrastructure, like bus stops and depots, has been constructed by the Municipal Committee of Leh, with the support of the Urban Development Department through the National Highways and Infrastructure Development Corporation (NHIDCL). The bus fare has been decided by the Transport Department, Ladakh, in consultation with, private operators and collected by private operators. For city bus operations, there are no subsidies available for operators. The fare revenue collected have been used to meet the operational expenses of the buses.

E

The Model E is in operation for operating electric buses in the city. These buses have just started their operation with a small fleet size in the second half of 2021. The government department is responsible for executing all the functions required to run the system with electric buses.



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
4 operational (PMI Foton)



Passenger capacity
30 pax



Battery features
Capacity **168 kWh**
Range **150 km/charge**



© Municipal Committee, Leh

E-bus Business Model

The electric buses in the public transport service of Leh town are operated by the transport department, UT of Ladakh administration. The buses are owned, operated and maintained by the Transport Department, Ladakh. The associated infrastructure like bus stops and depots is constructed by the Municipal Committee, Leh with the support of the Urban Development Department through NHIDCL. The decision regarding the fixation of fares has been taken by the Transport Department, UT of Ladakh. For electric bus operations, the fare is collected by the conductor and its revenue is used to meet the operational expenses of the buses.

Opportunities and Challenges to Scaling E-Bus Fleets



Opportunities

- Ladakh is planning to achieve carbon-neutrality under Ladakh Vision 2050. This is a substantial push for the adoption of electric vehicles, such as electric buses, for strengthening electric public transport.
- The push from the central government through the provision of a special financial package and the strong will of the Ladakh administration towards transitioning to electric buses is supporting the city to adopt electric buses at a faster pace.
- The Ladakh Electric Vehicles and Allied Infrastructure Policy which was notified in August 2022 has set up a target for buses by providing capital subsidy till 2027. This initiative will boost the uptake of electric buses.



Challenges

- Due to sub-zero temperatures and steep gradients, the operators are concerned about taking up electric buses, particularly, with regard to the battery range of the electric buses.
- The less established public transport system in the city and lack of associated infrastructure for bus transport is creating an obstruction in the uptake of electric buses.
- Due to a lack of skilled manpower and Original Equipment Manufacturer (OEM), the uptake of electric buses is slowing down and hindering the process of faster adoption of electric buses.

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Authors: Sumit Kumar Agrawal (ICLEI South Asia), Shivam Arora (ICLEI World Secretariat)

Contributors: Dr. Ishey Namgyal, Stanzin Rabgais (Municipal Committee, Leh), Vijay Saini (ICLEI South Asia)

Editors: Sajili Oberoi, Alyssa Chenault (ICLEI World Secretariat)

Design: Olga Tokareva, Laura López (ICLEI World Secretariat)

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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/>



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