

## CITY FEATURES



León is located at 101° 41' 00" arc, equivalent to 6 hours 46 minutes 44 seconds west of the Greenwich meridian and 21°07'22" north latitude. The surface of the municipal territory is equivalent to 4.8% of the state surface. The municipality is divided into 639 localities. The climate situation is temperate and mild throughout the year. Land use is divided into agriculture (39.4%), urban area (14.1%), vegetation grassland (19.3%), jungle (16.1%), forest (9.3%), scrub (0.9%) and mesquite (0.1%).



Population  
**1,721,215**



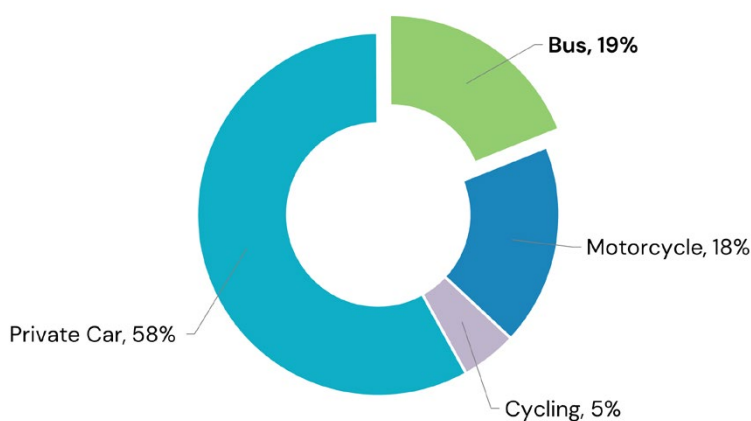
Land area  
**1,219.67 km<sup>2</sup>**



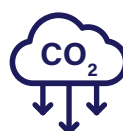
Average temperature  
**19.2°C**

## TRANSPORT FEATURES

### Modal Split



### GHG Emission Levels<sup>1</sup>



Total GHG emissions  
**2,673,085 tCO<sub>2eq</sub>**  
 From road transport  
**1,969,676 tCO<sub>2eq</sub>**

### Air Pollutant Levels



PM 2.5	<b>50.86 µg/m<sup>3</sup></b>	NO <sub>2</sub>	<b>11.13 µg/m<sup>3</sup></b>
PM 10	<b>101.84 µg/m<sup>3</sup></b>	SO <sub>2</sub>	<b>3.35 µg/m<sup>3</sup></b>

León's transport system has professionalised by adopting an "Integrated Transport System", which is responsible for providing 3 types of services: trunk, feeder and auxiliary, with greater coverage from the periphery and/or outlying neighbourhoods of the city. In a single payment, it is possible to utilize all three forms of services i.e. trunk, feeder and auxiliary. The Optibús manages through a control centre which allows each service to be programmed based on demand. It provides users real time information with respect to the travel times vis-a-vis an introduction to Express Routes, which helps in reducing travel times in many format. The trunk system consists of bus units with Euro V certified technology; and it serves 85% of the trips generated in the municipality.

<sup>1</sup> Inventario de Gases y compuestos de efecto invernadero del municipio de León, Guanajuato y su zona metropolitana 2017

# BUS SYSTEMS OUTLOOK

## Bus Trips Features



Number of bus trips

2019 **800,455**  
2022 **620,000**



Trips by gender

Men **46%**  
Women **54%**



Trips by purpose

Work **56%**  
Study **22%**  
Return home **8%**  
Recreation **5%**  
Shopping **4%**  
Others **5%**



Average time  
**1 h 42 min**



Average distance  
**20.97 km/day**

## Fleet and Infrastructure



Number of buses  
**1,506**

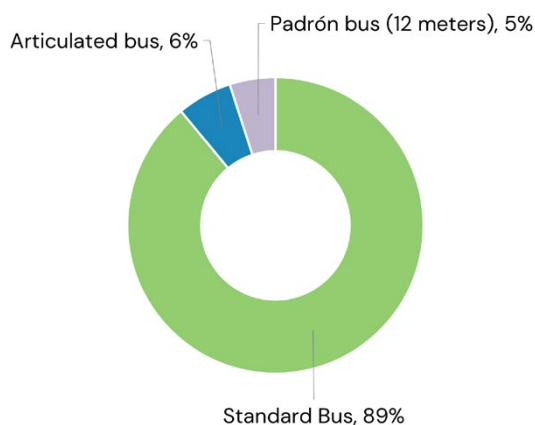


Number of routes  
**15** (BRT)  
**148** (non-BRT)

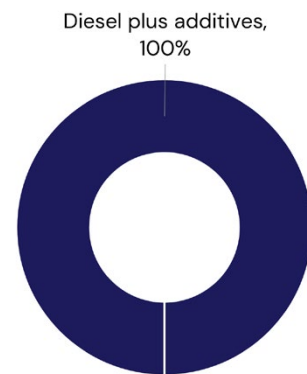


**3,340** bus stops  
**36** bus depots

Buses by fleet type



Buses by fuel type



## Quality of Service

The municipal government is authorized to grant concessions, define routes, schedule plans and monitor compliance by the concessionaires. The concessionaires are responsible for investments in the fleet, operations and maintenance of buses, infrastructure preservation, confinement and dispatching.

The current fare of public buses is \$13 Mexican pesos; whereas, the general prepaid Pagobus card fare is \$12. The preferential Pagobus card fare (applies to students, disabled and ederly) is \$5.20, while the services are free of cost for seniors at the poverty line. The authority is responsible for the development and maintenance of the infrastructure for bus stops, terminals, micro-stations and traditional bus stops on public roads. Moreover, the government does not subsidise the bus operations.



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## Existing Business Model<sup>2</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

C

A single concessionaire is responsible for the services of the entire urban public transport system, in a pay-per-kilometre model, through automated fare collection system which is directly deposited into an operating trust. On the other hand, kilometer reconciliation and payments to the operator are made weekly. The concessionaire can also define the size of the vehicle fleet, the business plan, evaluation mechanisms, among other factors from time to time.



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<sup>2</sup> Based on Accelerating a market transition in Latin America: New business models for electric bus deployment, P4G, Zebra and Dalberg, 2020

# OPPORTUNITIES AND CHALLENGES FOR ADOPTION OF E-BUS FLEETS



## Opportunities

- An efficiency of bus circulation in the exclusive lanes of the BRT trunk routes, which can serve as a prelude to the implementation of electric buses in the city.
- Some concessionaires have conducted tests on electric buses, which drive a mega opportunity for the city to adopt electric fleet.



## Challenges

- The city shall face several challenges in the implementation of electric buses, including the first major investment in infrastructure and renewal of an old fleet.
- The second challenge includes the willingness of concessionaires to make a huge investment in the electric buses.
- The third challenge is the deep-rooted behavior and customs of the population to accept this new modality.



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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](mailto:tumi-network@iclei.org) or visit <https://sustainablemobility.iclei.org/tumi/>