

CITY FEATURES



The Metropolitan Area of Puebla is an urban region where several municipalities located in the centre of the state of Puebla are concentrated, being the fourth most populated city in Mexico. Puebla is located in the southern part of central Mexico, between Mexico City and Veracruz. There is an economic and social relationship between the municipalities of the conurbation. The urban area is in continuous growth. Both in terms of population and industry, Puebla is becoming one of the main centres of the country. There are active commercial industries in the region, mainly, the automotive industry, which makes it a city in constant growth.



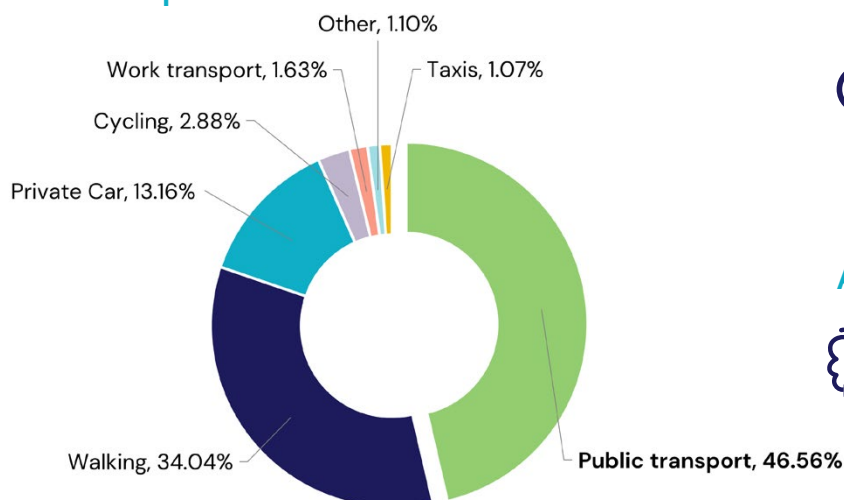
Population
1,692,181



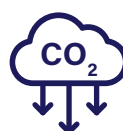
Land area
544.65 km²

TRANSPORT FEATURES

Modal Split



GHG Emission Levels¹



Total GHG emissions
3,287,488 tCO_{2eq}
 From road transport
1,744.267 tCO_{2eq}

Air Pollutant Levels²



PM 2.5	NO ₂
3 µg/m³	—
PM 10	SO ₂
59 µg/m³	—

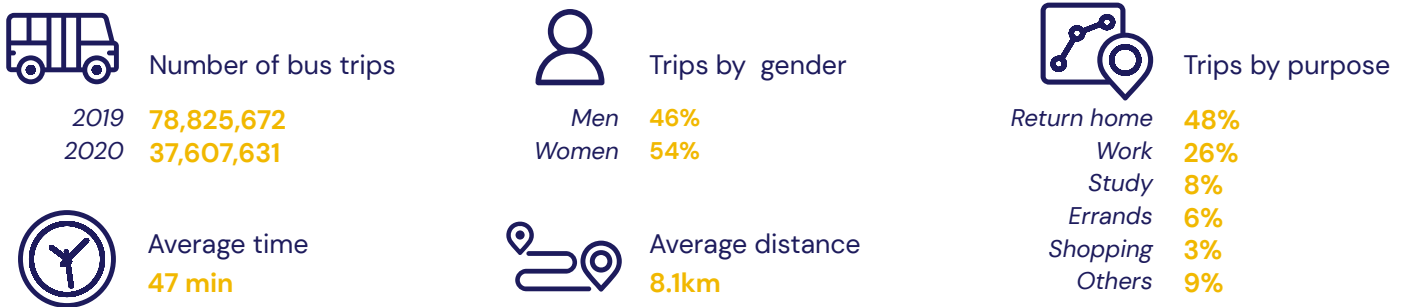
The Secretariat of Mobility and Transportation reports that, in the metropolitan area, there are 1.3 inhabitants per vehicle, while for each of the 241 public transportation routes that circulate daily, there are 9,91 thousand people. These figures reflect the disparity between the two modes of mobility and the intense demand for public transport concessionaires' services. The vehicle fleet has exceeded its useful life and thus, endangers the integrity of citizens, in addition, to being an active source of pollution. Moreover, the urban model, focused on motorized mobility, has triggered significant emissions of pollutants into the atmosphere that deteriorate air quality and have effects on public health.

¹ Plan de Acción Climática del Municipio de Puebla

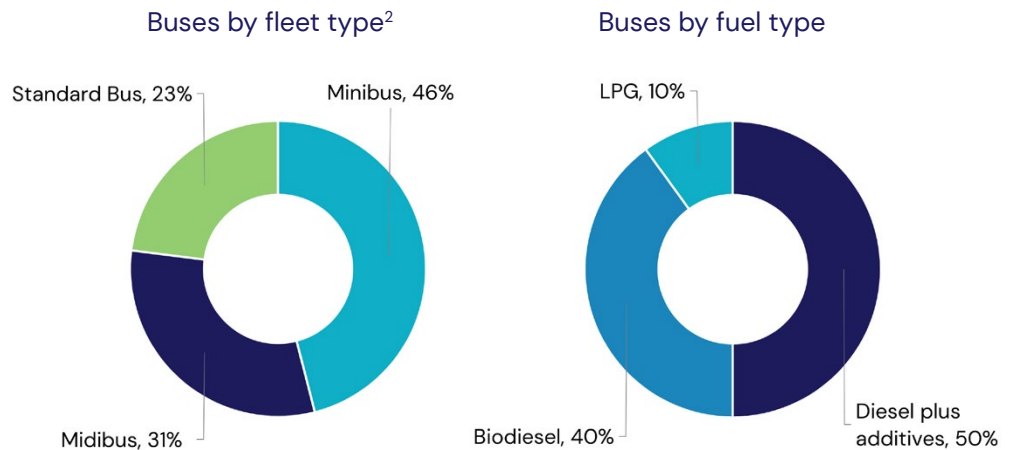
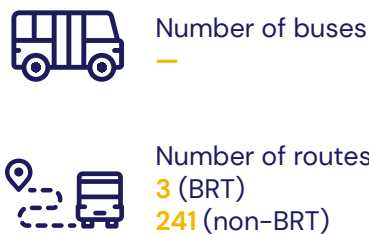
BUS SYSTEMS OUTLOOK

Bus Trips Features

In the city, there are currently three types of public transport: trucks, vans and the Urban Articulated Transport Network (RUTA). Transportation is mainly used by students, followed by the labour force. In both cases, women are the predominant users, for purposes of visiting relatives, picking up their children from school and shopping. People in Puebla spend 49 minutes traveling by public transport from their origin to the final destination on a regular day, the most common destinations being downtown, markets, shopping malls. The most vulnerable urban city dwellers rely heavily on buses for daily utility trips. Compared to men, women use the buses more frequently and for a wider variety of trips. Women's trips are also more evenly distributed at different times of the day, with less pronounced increases at peak times. Buses are reported to be the main source of transportation for people who are 51 years old and older. Similarly, buses represent the second most frequent mode of transportation for low- and lower-middle-income residents and those with less than a tertiary education. Data from the National Institute of Statistics and Geography (Inegi) showed that 31.6 percent of Puebla households are classified as middle class, receiving an average daily income of 10 to 20 dollars.



Fleet and Infrastructure



Quality of Service

The waiting time for people at a bus stop or station for their bus line is approximately 10 minutes, to travel around 12 kilometers. The demand for public transportation reaches the saturation of units and long journeys. The most vulnerable sectors of the population, women, children, adults and senior citizens, have access to deficient and unsafe mobility systems. That is why mobility planning allows equal access to opportunities, since this sector of the population is the one that invests more in travel time and travel expenses.



Existing Business Model³

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

RUTA oversees the operation of the metrobus and 3 bus lines. A prepaid card is required to use the services. The cost per trip is 7.50 Mexican pesos. There is also a subsidized card for the elderly, and for people with disabilities, who pay 4.50 Mexican pesos. ADO Movilidad is responsible for lines 2 and 3; line 1 is operated by the Asociación Mexicana de Transporte y Movilidad. Infrastructure is the responsibility of the state government. In addition, Alimentadoras belongs to RUTA, on the same schedule as the prepaid card; it has 1,028 stops, covering from the north of San Pedro Cholula to the south of Valsequillo.

D

Concessions are granted by the state for urban and suburban transport routes that interconnect at different points in the city with varied vehicle sizes, that are organised in groups without any business concept. Other permits are granted by the State Secretariat of Communications and Transport, which include suburban routes with urban function, along with an authorization of terminals in the city. The schedule of service varies for each concession, but on average, operates between 05:00 a.m. and 10:00 p.m. The cost of each trip is \$8 Mexican pesos in combis and \$8.50 in buses; elderly citizen pays \$4; students \$5.50 in combis and \$6 in buses.



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³ 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

- The government is trying to change the use of fossil fuels. A first step is to use natural gas, which, due to its composition, is more environmentally friendly. Thus, fuel switching is being promoted to combat emissions in the transport sector. The trial can be applied to public transport and private vehicles.
- A next step could be the implementation of the use of electric vehicles to mitigate pollutant emissions in higher volumes in the city.



Challenges

- The transition in the region implies new challenges, since not only economic and financing issues must be considered, but also the existence of an ideal ecosystem for its operation. This ideal system would need public policies that promote the acquisition of this type of vehicles, the creation of an electric infrastructure network for battery recharging, an infrastructure in the city that allows proper operation and, a robust supply chain for this industry.



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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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