

CITY FEATURES



Fortaleza is a Brazilian coastal city, capital of the state of Ceará, located in the Northeast region of the country. Fortaleza has an area of 313.140 km² and approximately 2.7 million inhabitants (2021), besides having the highest demographic density among the country's capitals, with 8,390.76 inhabitants/km². It is the largest city in Ceará in terms of population and the fifth largest in Brazil. It is also the main city of the Metropolitan Region of Fortaleza. The municipality's main economic source is centred on the tertiary sector, with its diversified segments of commerce and service provision. Moreover, the secondary sector stands out, with an industrial district with over a 100 companies in the textile, metallurgy, mechanical, electrical material, chemical and civil construction sectors.



Population
2,703,391



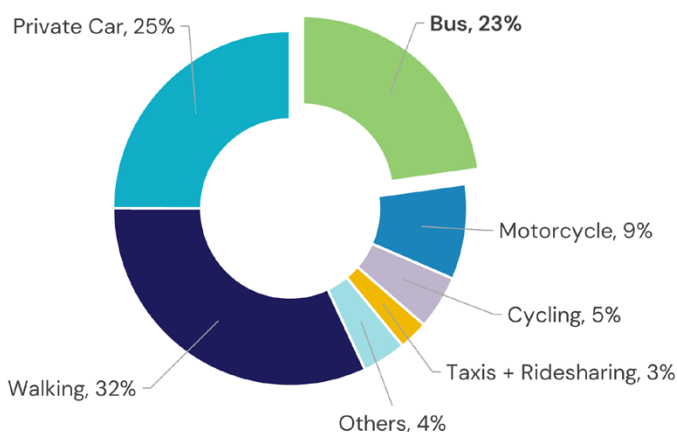
Land area
312.441 km²



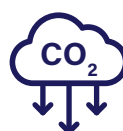
Average temperature
26°C

TRANSPORT FEATURES

Modal Split¹



GHG Emission Levels²



Total GHG emissions
4,523,015 tCO_{2eq}
 From road transport
2,687,561 tCO_{2eq}

Air Pollutant Levels³



PM 2.5	16.3 µg/m³	NO ₂	6.5 µg/m³
PM 10	24.7 µg/m³	SO ₂	17.9 µg/m³

Fortaleza's public transport system has evolved in the last 10 years, with priority given to the implementation of exclusive lanes, BRT corridors and the implementation of transport time integration. The goal of this prioritization is to make the population think about leaving their private vehicles and use public transport more. However, despite all these efforts, the private vehicle fleet (cars and motorbikes), has been on a growth trend, mainly due to tax incentives, which hinders sustainable urban development in view of the large use of fossil fuels.

As a result, today the transport sector represents the largest source of GHG emissions in the city, with land transport responsible for 79% of the emissions of the transport sector.

¹ PASFOR. Public Hearing of Diagnosis. Feb./2021

² Fortaleza's 4th GHG Emissions Inventory

³ Fortaleza's Air Monitoring Report

BUS SYSTEMS OUTLOOK

Bus Trips Features



Number of daily bus trips
18,767 (2019)
14,499 (2022)



Average distance⁴
6 km



Average time⁴
55 min



Trips by purpose

- Return home **46%**
- Work **21%**
- Study **18%**
- Errands **4%**
- Shopping **4%**
- Recreation **3%**
- Others **4%**



Trips by gender

- Men **58%**
- Women **42%**

Trips are mostly made by women (58%) and mostly for work and study reasons. The average time of bus trips is 55 minutes. The Central Area is the biggest attraction of trips in the city, mostly because of the high number of jobs there, followed by the Northwest Area, next to the seashore; and a Southeast axis, following the Subway Southern Line.

Although in very similar values, the number of trips by individual transport is higher than the number of trips by public transport. The Mobility Index is higher in the higher income areas, which shows that it is easier for this population to move around the city, in relation to the population with lower income, which faces more difficulties.

Fleet and Infrastructure



Number of buses
1,848

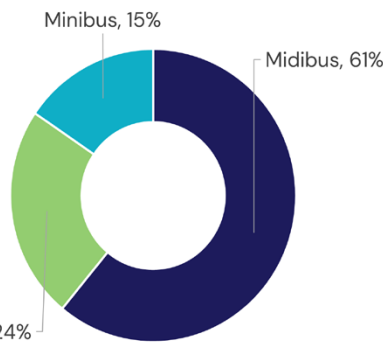


Number of routes
338

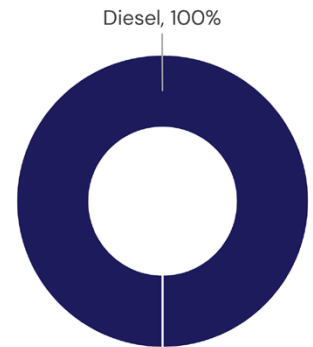


5,289 bus stops
9 bus depots (BRT)

Buses by fleet type



Buses by fuel type



Quality of Service

The municipal public transport network covers 97% of the territory, covering an area of 500 meters across the transport lines. 7 bus terminals are physically integrated, while 2 are temporally integrated. Also, once the ticket is validated, physical integration at any bus stop for up to 2 hours is allowed. Since there is no fare integration with the metro network, the passenger has to pay twice. The public fare is accessible, at the current value of R\$3.90 (full) and R\$1.80 (students). Currently, the system is being subsidised with a contribution of R\$6 million/month.

Most users of public transport are women (58%) and young people between 20 and 29 years old (36%). The percentage drops to 23% for users over 60 years old. There are 116 km of exclusive lanes, but in the rest of the network, users still suffer with traffic at peak hours.



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Existing Business Model⁵

The Urban Transport Company of Fortaleza (ETUFOR) is the managing organization of Fortaleza's transportation system. Currently, the system has a subsidy of up to R\$ 72 million.

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 The regular transport system is operated by O5 consortia, composed of 10 private companies. The municipality has a contract with a private company for the operation of bus stops, which provides shelters and maintenance; and to provide labor services for the administration of terminals and BRT's terminals and stations.

D Model D corresponds to a complementary transport system, which is operated by a cooperative, using only midi and mini buses. This model operates the terminal-neighbourhoods routes, and has a 2 hour fare integration with the large bus and BRT system.



⁵ 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 city has adopted the Local Climate Action Plan goal that declared that the city will achieve 100% of the bus fleet electrified by 2050. This is expected to enable decision making and the set up of financial and political mechanism to achieve this vision.
- The electrification of the city transport is also an opportunity to review the operational system's business model. It is expected that the modernization of the system, along with lower fares can revert this trend.



Challenges

- The biggest challenge identified is the current financial difficulties that bus transport operators are experiencing, specially during and after the pandemic where ridership significantly decreased. This situation makes operators reluctant to invest in the renewal of the conventional diesel fleet in favor of e-buses, which required a more costly initial investment.
- Difficulties in the current operational system create a barrier between the operators and the municipality to even discuss a change in the operational model or the implementation of electric buses.
- Given the city's warm weather, it is expected that the demand for air conditioning inside e-buses will demand more energy consumption, impacting operational costs.



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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/>