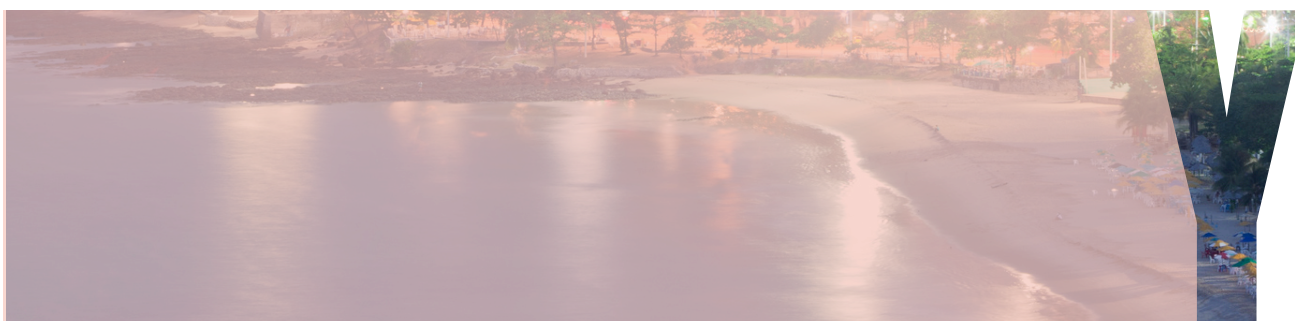
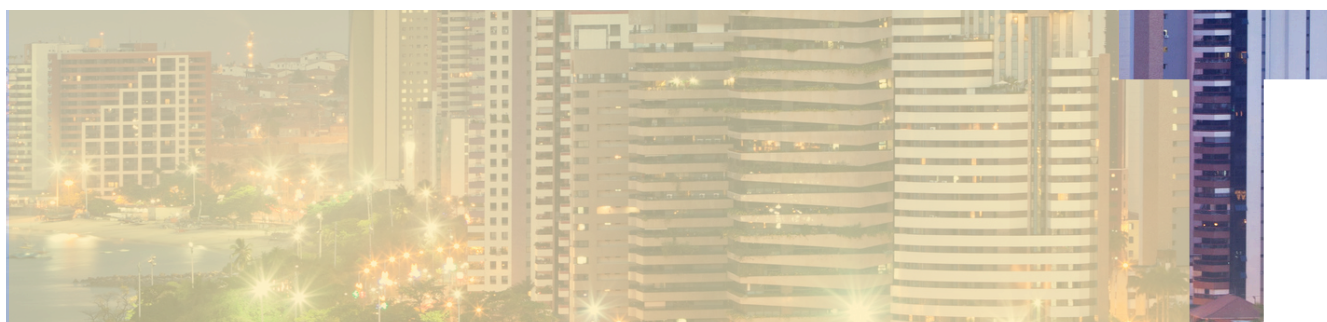


FORTALEZA, BRAZIL

C



CITY FEATURES¹



Fortaleza is a coastal city in Brazil and the capital of the state of Ceará, located in the Northeast region of the country. The city covers an area of 312,353 km² and has an estimated population of approximately 2.5 million inhabitants (2022). It also has the highest population density among the country's state capitals, with 7,775 inhabitants per km² (2022). Fortaleza is the largest city in Ceará and the fourth largest in Brazil in terms of population. It is also the main city of the Fortaleza Metropolitan Region. The primary economic driver of Fortaleza, which boasts the highest GDP in the Northeast region, is the tertiary sector, encompassing a diverse range of industries, including commerce, services, and tourism, all of which play crucial roles in wealth generation. Additionally, the secondary sector is also prominent, featuring an industrial district that hosts over 100 companies in the textile, metallurgical, mechanical, electrical materials, chemical, civil construction, and food industries, reflecting the region's economic diversity.



Population

22,428,708
(2022)



Land area

312,353
km²



Average temperature

27°C

TRANSPORT FEATURES

Status quo and urban mobility trends²

Fortaleza's public transportation system has significantly evolved in recent years with the implementation of exclusive bus lanes, BRT corridors, and an integrated transport system featuring electronic ticketing and timed transfers. These measures aim to encourage public transport use and reduce dependence on private vehicles. Additionally, the city introduced the cycling policy, investing in infrastructure expansion, cyclist safety, and innovative projects to integrate bicycles into urban mobility, promoting sustainable alternatives.

Despite these advancements, the number of private motorized vehicles, particularly motorcycles, continues to grow due to tax incentives and a reliance on private transport. This trend hinders sustainable urban development by increasing fossil fuel consumption and greenhouse gas (GHG) emissions. Currently, the transport sector accounts for approximately 59% of Fortaleza's total emissions. Furthermore, unregulated urbanization exacerbates air pollution and GHG emissions by expanding road infrastructure needs, which can lead to the destruction of green areas and increased pollutant emissions.

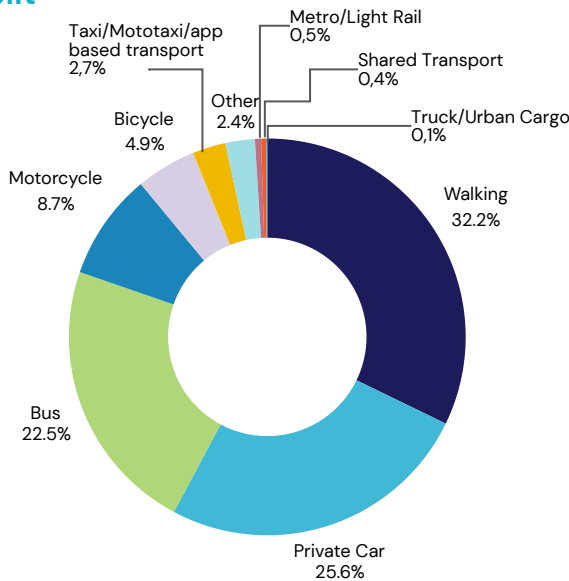


¹ IBGE – Instituto Brasileiro de Geografia e Estatística, 2022

² Fortaleza's 4th GHG Emissions Inventory

TRANSPORT FEATURES

Modal Split ³



GHG Emission Levels²



Total GHG emissions
4,523,015 tCO_{2eq}

From road transport
2,687,561 tCO_{2eq}

Air Pollutant Levels⁴



PM 2.5	NO ₂
12.6 µg/m3	11.6 µg/m3
PM 10	SO ₂
33.3 µg/m3	9.3 µg/m3

Fortaleza has expanded BRT corridors, dedicated bus lanes, and transport time integration to encourage public transit use. However, private vehicle ownership keeps rising, driven by tax incentives, hindering sustainable development. As a result, the transport sector is the city’s largest GHG emitter, with land transport responsible for 79% of its emissions. In 2018, total emissions hit 4.52 million tCO_{2eq}, with road transport at 2.69 million. Walking (32.2%) remains the top mode, followed by cars (25.6%) and buses (22.5%). Air pollution, including PM2.5 (12.6 µg/m³) and PM10 (33.3 µg/m³), reflects growing environmental concerns.

Bus Trips Features ^{5, 6}



Number of bus trips
12,652 (2024)



Average distance
6 km



Average time
55 min



Trips by purpose



Trips by gender

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

Return home **45.8%**
Work **20.4%**
Study **18.4%**
Shopping **3.6%**
Health **2.6%**
Recreation **1.6%**
Others **7.6%**



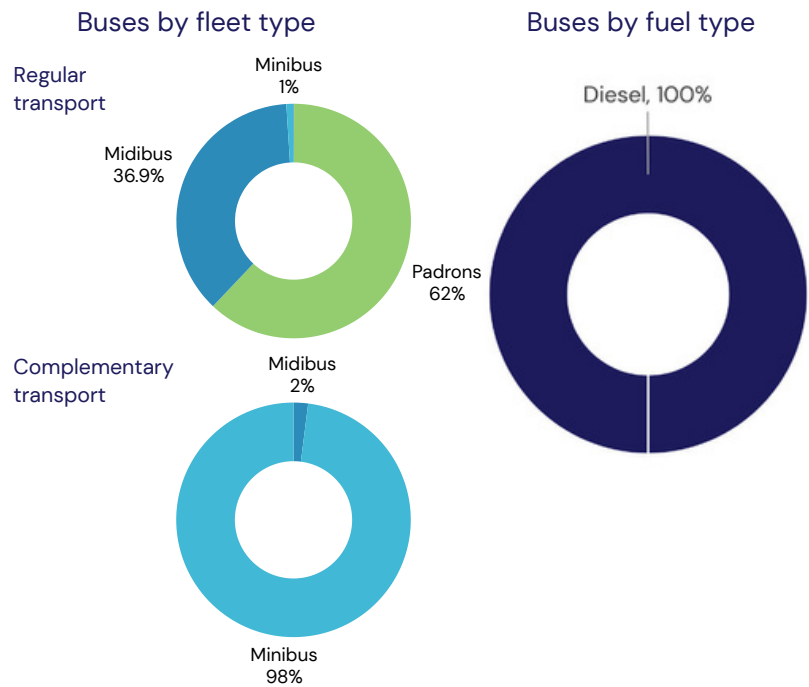
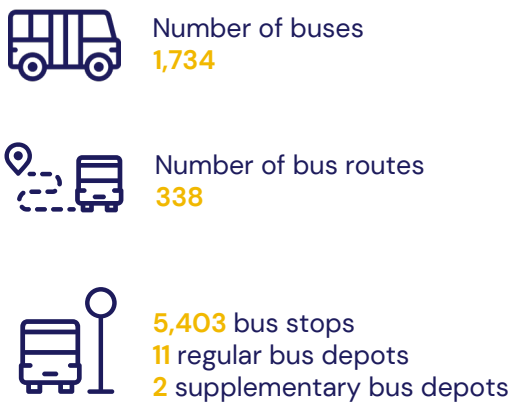
Average cost per travel by bus
R\$ 6.53

Trips are primarily made by women (58%) and mainly for work and study purposes. The average bus travel time is 55 minutes. The central area attracts the highest number of trips in the city, mainly due to the high concentration of jobs, followed by the northwestern area near the coastline and the southeastern corridor along the metro’s southern line.

Although the numbers are very similar, individual transport trips exceed public transport trips. The Mobility Index is higher in high-income areas, indicating that this population has greater ease in moving around the city compared to lower-income residents, who face more challenges in mobility.

2 Fortaleza’s 4th GHG Emissions Inventory 2018
3 Plano de Acessibilidade Sustentável de Fortaleza (PASFOR) 2023
4 Prefeitura Municipal de Fortaleza. 2023. Canal Urbanismo e Meio Ambiente
5 Estatísticas de transporte público em Fortaleza e região – Moovit Insights
6 Etufor, 2024.

Fleet and Infrastructure ⁶



In 2024, bus garages in Fortaleza serve as logistical hubs for the maintenance and operation of the public transport fleet. They provide facilities for refueling, cleaning, minor repairs, and vehicle parking. Additionally, they offer rest areas for drivers and fare collectors. Fortaleza's BRT system includes two express corridors: Avenida Bezerra de Menezes, featuring 11 stations, and Avenida Aguanambi, with two dual stations and four single stations. The integration system allows passengers to access various parts of the city with a single fare and a unified ticketing system. Full integration covers 100% of the transit network, with a transfer time window of up to two hours.

Quality of Service

The municipal transit network in Fortaleza covers 92% of the city's territory within a 500-meter walking radius. Peripheral areas remain underserved due to the lack of sufficiently wide roads for vehicle access. Bus travel can sometimes be faster, especially in areas with 118.9 km of exclusive lanes, but may be slower depending on the route and time of day. Various fare policies promote inclusivity, such as Social Fare, offering reduced fares on Sundays and specific dates; Off-Peak Fare, with lower fares from 9 AM to 11 AM and 2 PM to 4 PM, and Unified Ticketing, allowing unlimited transfers within two hours. Currently, 61% of buses have air conditioning, 100% provide Wi-Fi, and the entire fleet is accessible. Public transport insecurity remains a challenge, particularly for vulnerable groups. To combat sexual harassment, Fortaleza launched Nina 2.0, an in-app reporting tool integrated into the city's Meu Ônibus app.



6 Etufor, 2024.

Existing Business Model⁷

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 Integrated Transport System of Fortaleza consists of bus transportation with physical, temporal, and fare integration. It is currently operated by five consortia, comprising ten private companies. Additionally, the municipality has a concession contract** with a private company for the implementation and maintenance of 5,400 bus stops. The company Socicam is responsible for the management, security, and maintenance of bus terminals and BRT stations.

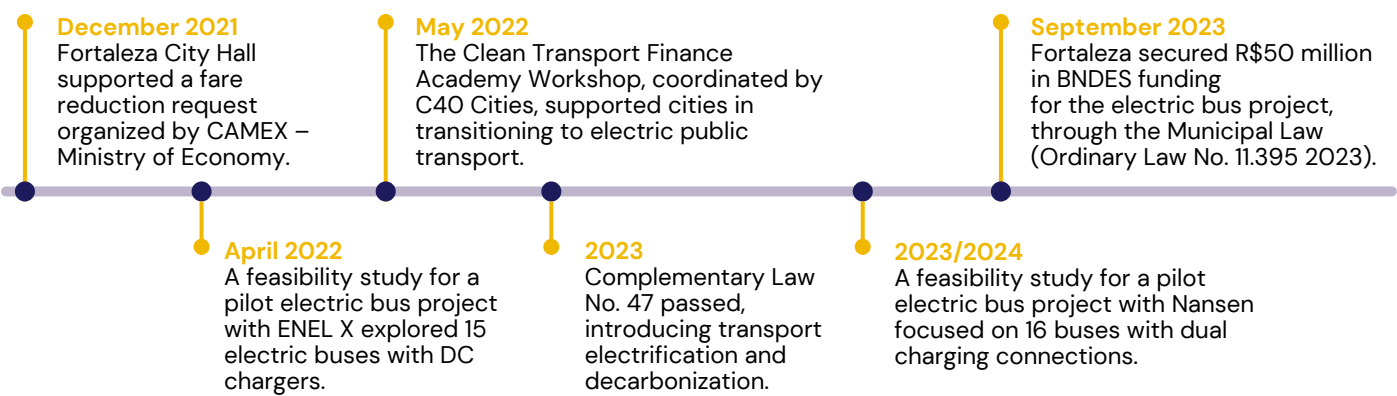
D

The model D is characterized by a complementary transport system operated by vans and serves as a supplement to the regular bus-based public transportation system. This means that the complementary system should fill gaps in the regular service, where it is found to be inadequate or insufficient to meet the population’s needs. The fare applied must be at least equal to the single fare of SITFor.



7 Based on Accelerating a market transition in Latin America: New business models for electric bus deployment, P4G, Zebra and Dalberg, 2020

E-BUS ADOPTION APPROACH⁸



Opportunities and Challenges to Scaling E-Bus Fleets



Opportunities

- **Air and noise pollution:** Diesel buses significantly contribute to air pollution in Fortaleza, affecting vulnerable groups like children, the elderly, and those with respiratory conditions. Transitioning to electric buses offers a chance to reduce emissions, particularly in sensitive areas like schools and hospitals. With our low-cost monitoring system, we can track air quality improvements. Additionally, electrifying the fleet will reduce noise, creating a calmer, healthier urban environment.
- **GHG emissions:** The transportation sector is the largest source of greenhouse gas emissions in Fortaleza. Electrifying public transport is a key measure for reducing emissions and meeting the city's climate goals.
- **Comfort for users:** Enhancing on-board comfort can make public transport more appealing, encouraging people to choose it over other alternatives.



Challenges

- **Financial viability:** The public transport system in Fortaleza faces financial challenges due to reduced demand since the pandemic. This impacts the ability to invest in electric vehicles and infrastructure. The priority is to maintain the current system, but a pilot project for electric buses is crucial for future fleet expansion.
- **Raising funds:** A detailed, scalable pilot project for electric buses must be developed with local stakeholders. It should be legally and institutionally viable to attract funding and private partners.

⁸ Prefeitura de Fortaleza (2022/2023)

Policy

The Novo PAC Seleções program plans to acquire 2,296 electric buses, 3,015 Euro 6 buses, and 39 rail vehicles to renew Brazil's urban transport fleet and equipment.

A new automotive hub has been announced in Horizonte, near Fortaleza, featuring an electric bus factory and federal government incentives.

The Ordinary Bill 328/2023 in Fortaleza's City Council authorizes R\$ 50 million from the BNDES to finance the initiative, but no purchase or operational timelines have been defined.

Fortaleza's Master Plan was revised in 2023–2024, aligning with the city's Mobility Plan, with further revisions expected in 2025. The Local Climate Action Plan includes goals to electrify 10% of the public transport fleet by 2030, 35% by 2040, and 100% by 2050.

The city also operates the Bicicletar bike-sharing system, expanded in 2024 with 100 electric bikes. Additionally, Re-ciclo, a platform for collecting recyclables using electric tricycles, has reduced 4.2 tons of CO₂ emissions since September 2022.

Financing

In September 2023, Ordinary Bill 328/2023 was fast-tracked and analyzed by the Joint Committees on Constitution and Justice (CCJ), Budget, Oversight and Public Administration (Cofap), and Urban Policy and Environment (CPUMA). However, there are no set deadlines for the vehicle purchase or operation start date. The bill authorizes a R\$ 50 million contract with the BNDES to finance the acquisition of 19 electric vehicles.

After the new administration begins on January 1, 2025, the goal is to identify the municipal actors responsible for public transport to present ongoing initiatives related to electric mobility in Fortaleza's public transport system.

The city also aims to seek new funding sources and open calls for projects, such as the Climate Finance Facility (CFF), to support electric mobility initiatives.

Impact

The Local Climate Action Plan includes a goal to promote electric mobility, ensuring that the public transport fleet consists of 10% electric vehicles by 2030, 35% by 2040, and 100% by 2050. GHG emissions are analyzed based on the 2012 inventory, which recorded 3,827,521 tons of CO₂eq. The target is a 20% reduction in GHG emissions by 2030.

Fortaleza's cycling infrastructure is constantly expanding, with 427.9 km of bike lanes, cycleways, bike routes, and shared sidewalks, representing a 529% increase from 2012. By the end of 2024, the city will have 500 km of cycling infrastructure. Electric tricycles used in the Re-Cycle program operate efficiently on this infrastructure, which also serves the city's growing cycling network.

The Re-Cycle platform aims to expand, covering 40 neighborhoods with 31 tricycles and targeting 121 neighborhoods with 150 electric tricycles. Various organizations, including ETUFOR, SINDIÔNIBUS, CERF, ENEL X, and CITINOVA, are involved in advancing sustainable mobility projects in the city. Additionally, the BICI program promotes active mobility and bicycle use. A new partnership between Fortaleza, WRI, and the Toyota Mobility Foundation aims to implement innovative solutions for sustainable public transport.

TUMI E-bus Mission City Network – Profile

FORTALEZA, BRAZIL



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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.

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