TUMI E-bus Mission City Network - Profile

MANAUS, BRAZIL

CITY FEATURES

Manaus is the capital of the Brazilian state of Amazonas. It is the 7th largest city in Brazil, with an estimated population of 2.25 million (2021) with land area of about 11,401 km^2. Located at the east center part of the state, the city is the center of the Manaus Metropolitan Region. The city is situated near the confluence of the Negro and Solimões rivers. The main city in the Amazon Rainforest and home to the National Institute of Amazonian Research.

Currently, its main economic engine is the Industrial Park of Manaus, a Free Economic Zone. The city has a free port and an international airport. Its manufactured products include electronics, chemical products, and soap; there are distilling and ship construction industries. Manaus also exports Brazil nuts, rubber, jute, and rosewood oil.

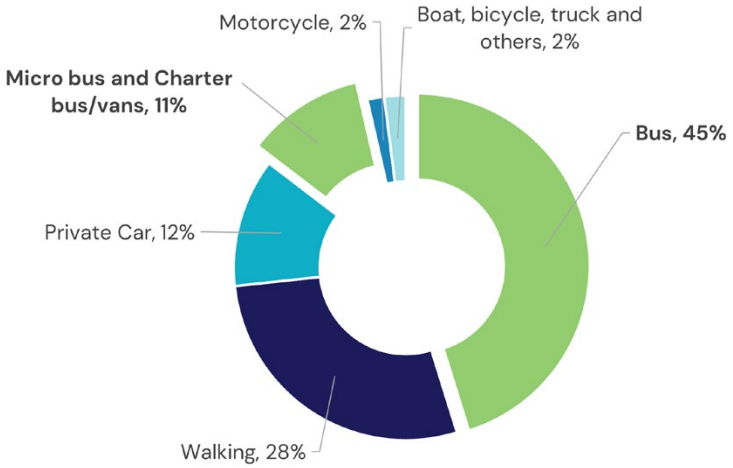
Population
2,255,903
(2021)

Land area
11,401 km^2

Average temperature
27.4°C

TRANSPORT FEATURES

Modal Split[1]



GHG Emission Levels[2]

Total GHG emissions
9,332,738 tCO_{2eq}

From road transport
2,014,728 tCO_{2eq}

Air Pollutant Levels

PM 2.5 —	NO_2 —
PM 10 —	SO_2 —

The collective transport of Manaus is constituted by a feeder-bus system and by radial and diametrical intraurban lines. The system has a main service, called conventional (operated by regular buses, padron and articulated vehicles) and alternative and executive services (operated by micro-buses). In general, the public transportation service has been growing in accordance with urban expansion. The areas closer to the central area constitute the greatest urban consolidation and the use of public transportation. The transport sector is the second largest emitter of GHG in the city, only behind the energy sector. This year, the mayor signed an agreement for the acquisition of the first 12 electric buses, which will be introduced in the city's fleet.

1 Instituto Municipal de Mobilidade Urbana (IMMU), Manaus
2 SEEG Municípios 2022 - Base year 2019

BUS SYSTEMS OUTLOOK

Bus Trips Features

Number of bus trips
206,977 (2019)
185,834 (2020)

Average time[3]
54 min

Average distance[3]
18 km

Trips by gender[4]

Men	47%
Women	53%

Trips by purpose[4]

Work	63%
Study	11%
Shopping	8%
Recreation	3%
Others	15%

In general, the public transportation service has been growing in accordance with urban expansion. The areas closest to the central area, as well as the south, east, center-south and center-west zones are already practically consolidated, with the latter showing strong vertical growth. The urbanization of Manaus has been extending to the extreme north of the city, in the direction of the AM-010 and BR-174 highways. This growth model, however, greatly affects the public transportation system and the road infrastructure, which is increasingly congested.

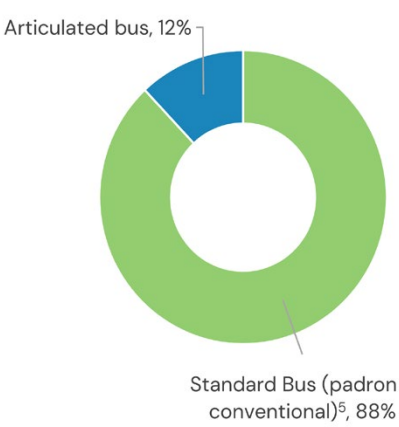
Fleet and Infrastructure

Number of buses
1,504 Registered
1,143 In operation

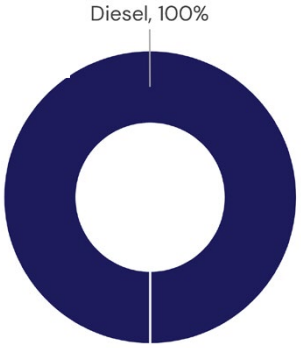
Number of routes
217

2,176 Bus stops
5 Integration terminals
4 Connecting stations

Buses by fleet type



Buses by fuel type



Quality of Service

Public transportation in Manaus still needs a lot of improvement. Safety, waiting time, and crowded vehicles are the main reasons for users' complaints.[6] All lines have scheduled time tables, although delays occur mainly due to traffic. The time lost in traffic jams can cause a 15 to 20% increase in travel time, depending on the road corridor. The spatial distribution of the system reaches a large part of the city, including a large portion of the communities along highways AM-010 and BR-174, reaching practically the entire peripheral area. Most lines of the system have a high frequency of users, with a drop in frequency of users during non-peak hours.

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3 National Urban Mobility Survey (PEMOB), 2019
4 Manaus Origin-Destination Survey, 2005
5 Padrón - non-articulated bus with capacity for 90-100 persons; 12 meters length
6 The quality of public transportation as a sustainable means of urban mobility in Manaus. MAXIMILLIAN NASCIMENTO DA COSTA. Federal Institute of Education, Science and Technology of Amazonas

Existing Business Model[7]

A	B	C	D	E
Model A: *Vertically integrated, private operator in BRT/integrated system*	***Model B:*** *Divided responsibilities in BRT/ integrated system*	***Model C:*** *Large, more formal, private operator in traditional service*	***Model D:*** *Small, informal, private operator in traditional service*	***Model E:*** *Government-run system*

C

The transport of Manaus has 7 private operators and 320 individual permission holders. The operators are responsible for the maintenance and disposal of the buses. Instituto Municipal de Mobilidade Urbana (IMMU) is responsible for the infrastructure, planning and supervision of the public transport service.

The transport fare is subsidised by the Municipal and State governments, guaranteeing free transport for primary and secondary school students from public schools, as well as the cost of one of the taxes (ICMS) on fuel.

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7 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

- There is an opportunity to renew the city fleet that has an average age of 7 years, considering an electric fleet. In addition, the implementation of an electric fleet could support in reviewing the current system and the reactivation of exclusive bus lanes. These are beneficial initiatives that would bring quality to the public transport.
- In May 2022, the city mayor signed an agreement with the governor of the state of Amazonas for R$36.4 million, for the acquisition of the first 12 electric buses. This is an opportunity to carry out a pilot and in the future, scale up the project for the electric transition of the city's fleet.

Challenges

- Currently, the public transport system of Manaus is subsidized by the municipal and state governments, due to the financial difficulties that the system faces post-pandemic. The implementation of electric buses from the financial point of view, would only be possible in a partnership between these two spheres of government, increasing the complexity of the initiative.
- The city's road system presents integration difficulties, added to an increase in the use of individual vehicles and a consequent increase in traffic. The deployment of electric buses would have to accompany infrastructure improvement and prioritization of public transport.

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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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