

CITY FEATURES



Manizales is the capital of the Department of Caldas in the central-western part of Colombia. Geographically, the city is located at an altitude of 2,153 m.a.s.l. within the Andean coffee region. Manizales contributes to roughly 68% of the region’s GDP, with industrial, commercial and coffee cultivation being the most outstanding economic activities. Until the mid 90s, urban growth was somewhat correlated with population growth. From mid 90s onwards, however, the city experienced an accelerated expansion towards the periphery, almost duplicating the urban footprint in only 15 years. This phenomena is associated with a relocation of residential units, which in turn has stimulated car use and dependency for commuting and other trip purposes.¹



Population
434,403
 (2018)



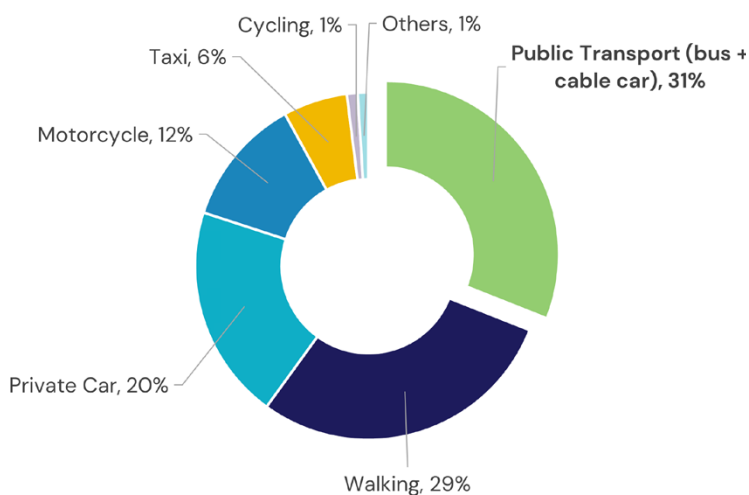
Land area
571.8 km²



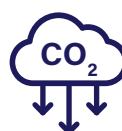
Average temperature
21°C

TRANSPORT FEATURES

Modal Split²



GHG Emission Levels³



Total GHG emissions
452,045 tCO_{2eq}
 From road transport
203,788 tCO_{2eq}

Air Pollutant Levels



PM 2.5	NO ₂
14 µg/m³	—
PM 10	SO ₂
21 µg/m³	4.6 µg/m³

Comprising over a third of daily trips, public transport, in the majority of its buses, represents the main means of transport in Manizales. In recent years, nevertheless, this mode has been losing ground in favour of private motorized modes. Compared to 2010 figures, modal share of public transport decreased about 20% by 2018. In contrast, share of trips made by cars and motorcycles doubled and tripled, respectively, within the same period of time. This trend seems to hold in correlation with the motorization rate, which between 2011 and 2021, increased from 254 to 487 cars per 1000 inhabitants.⁴

¹ Information provided by the city and Cifuentes, P and Londono, J.;

Analysis of urban growth: an approach to the study of growth factors in the city of Manizales as a contribution to planning, 2010

² Retrieved from Ecologistics City Profiles, 2018

³ GHG 2018, developed under UrbanLEDS II project, ICLEI – Local Governments for Sustainability

⁴ Manizales life quality report, 2011 and 2021

BUS SYSTEMS OUTLOOK

Bus Trips Features



Number of trips⁵
187,564 (2018)



Average distance
7.3 km



Average time
47 min



Trips by purpose

Return home **45%**
Work **22%**
Errands **19%**
Study **11%**
Shopping **3%**



Trips by gender

Men **45%**
Women **55%**

The current offer of public buses in Manizales is made up of 71 routes, operated by 6 transport companies. Overall, it is possible to note that during the peak period, a bus takes around 88 minutes to complete the whole route, at an average speed of 17.7 km/h. It is estimated that over 180,000 trips are made daily by public transport (including TPC⁶, aerial cable, jeeps and inter-municipal transport modes), of which about 18,000 (10%) take place in the morning peak period.

Fleet and Infrastructure



Number of buses
976

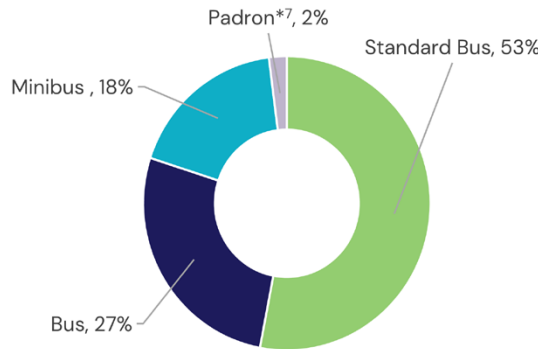


Number of routes
71

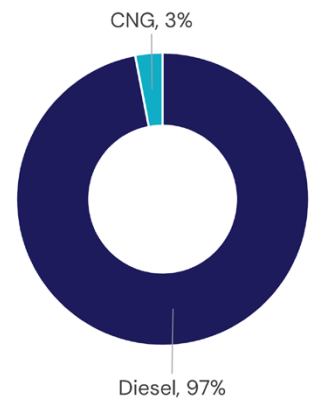


1,530 bus stops
8 bus depots (BRT)

Buses by fleet type



Buses by fuel type



Quality of Service

According to information reported by city officials, there are enough routes for different travel purposes and reaching peripheral areas of the city throughout the day. Nevertheless, the offer is significantly reduced at night. Aspects to improve were mostly related to trips efficiency due to the time lost in traffic and physical barriers to get on and off the vehicles.

Moreover, and according to 2021 residents perception survey, a significant majority of bus riders (75%) reported to be fairly satisfied with the bus service in the city. Despite this good trend, buses were, in turn, the means of transport with the highest level of dissatisfaction, that is of 9%, compared to the average 1-2% reported for taxi, private car, motorcycle and bicycle. With regards to travel times, bus riders reported to have experienced longer trips compared to in 2020.



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5 Note: the number includes all trips done by bus, midibus, minibus taxis and aerial cable

6 TPC - Privately-run public transport system

7 Padrón - non-articulated bus with capacity for 90-100 persons; 12 meters length

Existing Business Model⁸

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

6 transportation companies are duly authorized by the Municipalities of Manizales and Villamaría. The service providers own, operate, maintain, and scrap the buses whereas the infrastructure is managed by the municipal administration. Fares are charged in cash by the driver of each vehicle. The municipal government establishes and assigns routes, fares, defines schedules and fleet specifications, and monitors operation. Currently, there is no fare subsidy in place.



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⁸ 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 overdue renovation of the public bus fleet, with vehicles with an average age of 20 years, opens a unique window of opportunity to make the definite switch to zero-emissions vehicles, which in turn will have lower operational costs in the long-term.
- Commitment of the National Government to co-finance the Integrated Public Transport System (SITP) of Manizales, which it considers a model of sustainable mobility because it includes aerial cables and bicycle sharing. Moreover, the national legislation promotes the purchase of sustainable vehicles through VAT tariff exemptions for the purchase of electric vehicles.
- At the local level, the Master Mobility Plan of Manizales, with 6 pillars and its actions, a management model, and strategic projects, paves the road for further developing specific goals and strategies for e-bus adoption.



Challenges

- One of the main challenges envisioned is the possibility of articulating actors at the national level – transport companies, operators and other stakeholders – to co-finance and manage e-bus projects, technology and infrastructure.
- Other challenges that need to be taken into account are the topographical conditions and narrow streets in some parts of the urban area, which may affect operational performance and limit the type of bus fleets that will be able to operate under such circumstances.



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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/>