

CITY FEATURES¹



Cuenca is an intermediate-sized, third-largest, city in Ecuador. Surrounded by mountains, Cuenca belongs to the Andean region of the country, with four rivers running through the city and providing a vitalic and natural landscape. In addition, Cuenca was recognized as an Intangible Cultural Heritage of Humanity by UNESCO because of its preserved historic center. Cuenca is, in turn, the capital of Cuenca Cantón, composed of 21 rural parishes and 15 urban parishes. Despite the fact that most of the administrative and economic activities are located in the city center, the urban footprint has undergone an uncontrolled sprawl towards the periphery. Just between 2001 and 2010, peripheral parishes of Manchángara and Yanucay grew by 70% and 51%, respectively, whereas the city center lost about 24% of its population.



Population
636,996
 (2022)



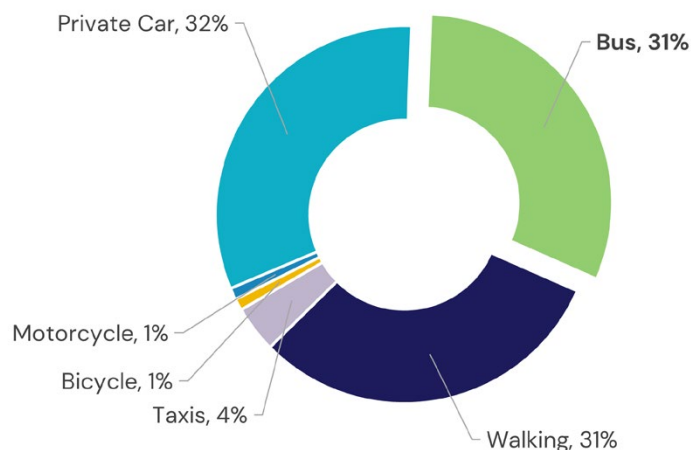
Land area
70.59 km²



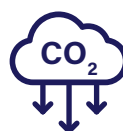
Average temperature
14°C

TRANSPORT FEATURES

Modal Split¹



GHG Emission Levels



Total GHG emissions
1,500,133 tCO_{2eq}
 From road transport
825,073 tCO_{2eq}

Air Pollutant Levels²



PM 2.5	10.8 µg/m³	NO ₂	22.5 µg/m³
PM 10	38.5 µg/m³	SO ₂	11.3 µg/m³

About 1.3 million trips are undertaken in Cuenca Cantón daily, with private cars, public transport and walking accounting for a third of the total, each. Approximately, a quarter of trips have their origin in peripheral parishes with the City of Cuenca as the main destination. Average occupation was of 1.3 passengers per car and 65% of total bus passenger capacity. Since 2017, a tram system of, about 20 km in length (round trip), started operation and has further reinforced the public transport system, carrying around 65,000 passenger per day from east to west.

The number of cars in Cuenca has skyrocketed: in less than a decade, the number of cars increased from 52,674 in 2006 to 105,178 in 2015. By 2015, there were 136 vehicles per 100 inhabitants, namely 544 cars per 1000 households. The steady increase of private car use in Cuenca Cantón has mostly been associated with a rise in the congestion levels, especially in the city center, and car accidents in which drivers remain mostly responsible.

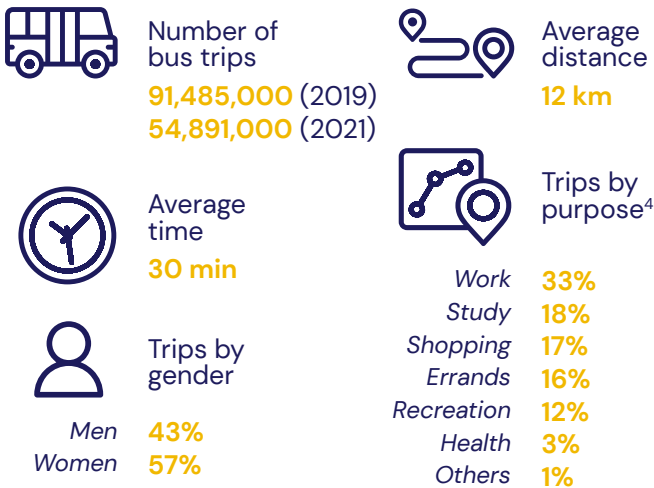
¹ Cuenca Mobility and Public Space Plan 2015–2025, 2015 (Note: Latest modal split data does not take into account trips currently undertaken by tram, which started operation in 2020.)

² Latin America Development Bank, CAF, and the French Development Agency (2016)

³ Cuenca Air Quality Report, 2017

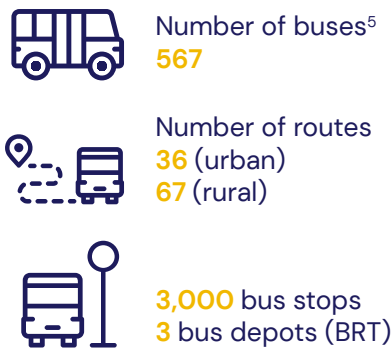
BUS SYSTEMS OUTLOOK

Bus Trips Features

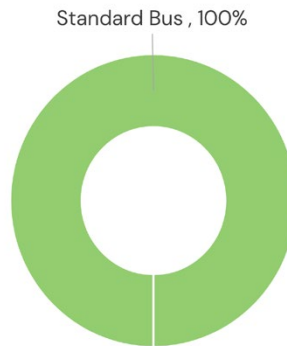


In the year 2012, roughly 382,000 daily bus trips were taken in Cuenca, an average of 1.08 trips per passenger a day. Buses are mostly used by low and medium income people for work and study purposes. Most of the bus trips are originated in peripheral areas and 88.7% have the city center as their final destination. Cuenca has reasonably good coverage of bus routes and stops in 77% of the territory. However, when taking into account population density, it has been identified that approximately 8% of the inhabitants are poorly served with public transport, mostly in the north-east and north-west peripheral areas of the urban functional area.

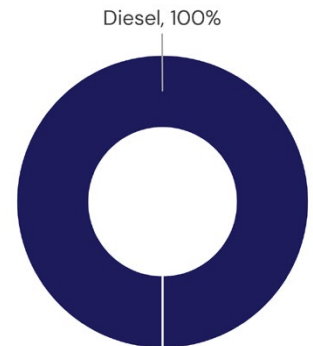
Fleet and Infrastructure



Buses by fleet type



Buses by fuel type



Quality of Service⁶

The current bus network presents inefficiencies due to the way the bus routes are laid out. Roughly 80% of bus routes run and overlap in the city center, generating high levels of traffic congestion, hence, impacting travel times, and noise and air pollution. In contrast, most peripheral areas remain underserved.

In principle, accesibility levels seem to be fairly adequate as approximately 92% of dwellers have a bus stop at a radius no greater than 300 m – a distance reachable by foot. Nonetheless, accessibility in practice is highly constrained by topography (slopes over 9%) and by the lack of a wide, continuous sidewalk networks, especially in peripheral areas. With regards to frequency, average time in Cuenca is 7 min, having 76% of routes within the normal range indicated for mid-sized cities, that is 6–9 min.

Existing deficiencies in service quality seem to negatively impact present and future ridership. According to the Mobility Perception Survey, 36% of bus riders indicated that the main reason to use buses was the lack of access to a private car and roughly 50% of the bus riders claimed that given the opportunity, they would switch to private cars.



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4 Note: Percentage breakdown Includes all trips undertaken by any means of public transport
 5 Mobility Management Department. NOTE: 475 buses in urban service and 92 buses in rural service.
 6 Cuenca Mobility and Public Space Plan 2015–2025, 2015

Existing Business Model^{7,8}

Currently, 36 lines, operated by seven private transport operators, comprise the bus public system in Cuenca. Four out of this 36 lines are trunk lines: the 100 and 200 line run in the north to side direction across the city, whereas the feeder lines 102 and 201, run in the east–west direction. The remaining, non-trunked lines had more confusing patterns which resembles more radial routes.



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

Bus public system in Cuenca is operated by CONCUENCA Consortium, which comprises seven private operator companies, which in turn, became associated with the Chamber of Urban Transportation of Cuenca (CTC) in 2000, soon after the municipality decided to create the Municipal Transport Unit. All seven transport operators are in charge of acquiring, operating and maintaining the bus fleet. The municipal transport unit was created in 1999 and since then, it has been taking care of defining and regulating fares, redefining routes, and spearheading the electronic payment system.



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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

8 Cuenca Mobility and Public Space Plan 2015–2025, 2015

OPPORTUNITIES AND CHALLENGES FOR ADOPTION OF E-BUS FLEETS



Opportunities

- Political will, citizen support, access to financing from the German government, and operation contract to be renewed with 3 companies, are advantageous for acquiring 50% of the electric bus fleet.
- As a national goal, from 2025, public transport units must be electric, which offers an ambitious outlook for cities like Cuenca. This should, undoubtedly, help achieve the goal.
- The municipality is in the process of hiring a consultancy on a contractual basis, for the feasibility study of electrifying the transportation network, which will allow for defining the characteristics of the units, business model, and infrastructure designs.



Challenges

- The transition process towards an electric bus fleet faces some challenges due to the change of the local government in 2023. This may delay the public procurement process and the arrival for electric buses in the city. It may also hamper the duration of the bidding process.
- The involvement of different actors, approval by banking entities to develop pre-feasibility studies and defining routes by the administration.



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Acknowledgements

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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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