TUMI E-bus Mission City Network - Profile

SÃO JOSÉ DOS CAMPOS, BRAZIL

CITY FEATURES

São José dos Campos is a Brazilian municipality in the interior of the state of São Paulo. It is the headquarters of the Metropolitan Region of the Paraíba Valley and Northern Coast. It occupies an area of 1,099.61 km², of which 353.9 km² is in the urban perimeter. The municipality is integrated in the Expanded Metropolitan Complex, a megalopolis with over thirty million inhabitants, the first urban agglomeration of its kind in the southern hemisphere. The city is known for being an important technological and industrial center, with an emphasis on the metallurgical and aerospace sectors. The Technological Park of São José dos Campos, the largest of its kind in the country, hosts research units of large companies and is the only city in the world with research centers of the three largest aircraft manufacturers in the world.

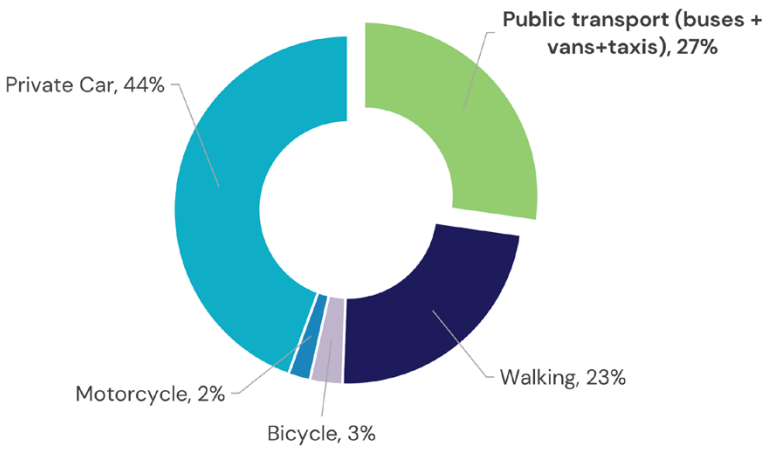
Population
737,310
(2021)

Land area
1,099.61 km²

Average temperature
20°C

TRANSPORT FEATURES

Modal Split[1]



GHG Emission Levels[2]

Total GHG emissions
2,973,932 tCO_{2eq}

From road transport
622,305 tCO_{2eq}

Air Pollutant Levels[3]

PM 2.5 **11 µg/m³**	NO_2 **18 µg/m³**
PM 10 **24 µg/m³**	SO_2 **2 µg/m³**

The land use planning policies are in line with the Urban Mobility Plan, especially in terms of the development of a compact city and encouragement of displacement by active modes and public transport. To increase the attractiveness of public transport and reduce the environmental impacts caused by its energy matrix, the City Hall is investing in the electrification of the fleet, linked to the operation model to be tendered. Twelve articulated buses - VLP - have been acquired. With the systems in financial difficulties, due to the fall in demand aggravated by the pandemic, elaborating a model that contemplates electric buses and is economically sound is a great challenge.

1 Origin-Destination survey Sao José dos Campos, 2011
2 SEEG Municipios, 2022
3 Report on air emissions and air quality. Urbanism and sustainability Secretary Sao Jose dos Campos, 2022

BUS SYSTEMS OUTLOOK

Bus Trips Features

Number of bus trips (total)
83,839,450 (2019)
51,903,346 (2021)

Average distance
—

Average time
45 min

Trips by gender

Men	62%
Women	38%

Trips by purpose[4]

Work	44%
Study	16%
Errands	14%
Recreation	10%
Shopping	7%
Return home	5%
Others	5%

The current public transportation system is radiocentric, i.e., the lines depart from the various neighborhoods and macro-areas and go to the city center, where it is possible to make the integration with other lines. This justifies the high incidence of lines that pass through this macro-zone - 86% of the total (Origin Destination Survey - 2011).

There is a predominance of the "passenger transportation" mode among those with incomes up to two minimum wages, with 28.5% of women as heads of households. Most of the population declares the reason for their commute as work (37.9%) and study (16.83%).

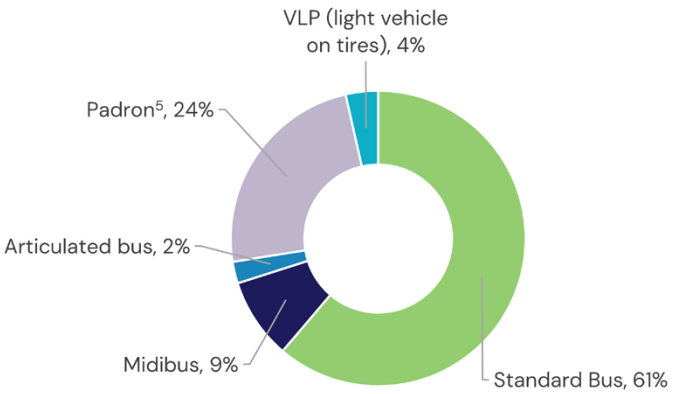
Fleet and Infrastructure

Number of buses
339

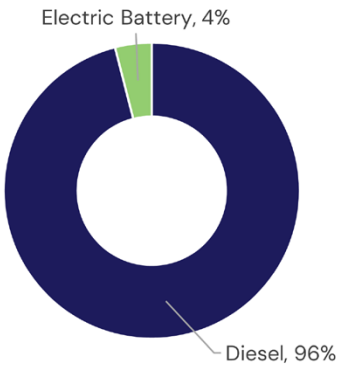
Number of bus routes
101

2,515 Bus stops
3 Bus depots

Buses by fleet type



Buses by fuel type



Quality of Service

Although bus lines are functional and reach most peripherical and disadvantageous areas, many times, users need to transfer up to 2 or 3 times to reach their destinations. Children below 5 and elderly above 60 years are exempt from paying transport fare, and students get a 50% discount. With the same ticket, users can take up to 4 journeys within a 2-hour period. The fleet is fairly safe and accessible, equipped with reserved seats for the elderly, pregnant woman, and with instructions to the staff, in case of harassment of women and vulnerable groups.

Buses ride in both non and dedicated lanes, depending on the region. There is a built infrastructure of 12.5 km of exclusive lanes, 3.6 km of preferential lanes and 6.1 km of an exclusive corridor (in a pilot project). Oftentimes, buses get stuck in traffic jams, especially during peak times, when they can also be at their full passenger capacity or overloaded. In general terms, taking the bus is slower than riding a private car.

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4 Origin-Destination survey Sao José dos Campos, 2011

5 Padrón - non-articulated bus with capacity for 90-100 persons; more than 13 meters length

Existing Business Model[6]

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 public transportation system in SJC is operated by 3 companies, through a service concession. In the current contract, the companies are responsible for the operation and management of the ticketing, and the City Hall is in charge of the operational planning and inspection of the services. With the pandemic, to maintain the economic-financial balance of the system, the City Hall is financially assisting the companies, since the system does not operate with municipal subsidies.

The current contracts are approaching their end, and the municipality is seeking a new model and distribution of responsibilities among the municipality and the private bus operators. The idea is to separate the operation from the ticketing system for the tendering process and elaboration of new contracts.

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E-BUS ADOPTION APPROACH

2020
Acquisition of 12 articulated VLPs for the Green Line

December 2021
Start of pilot operation with VLPs (without charging and outside the planned route of the Green Line)

July 2022
Start of the Green Line operation, in a partial stretch (South Zone)

2023
Bidding for the lease of the electric buses for new operation

2024
New system operation with electric buses begins

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

E-Bus Fleet Technical Features

Number of e-buses
12 *(BYD/D11B ATTIVI EXPRESS)*

Passenger capacity
168 pax

Battery features

Capacity 553 kWh
Range 250 km/charge

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E-bus Business Model

The current contracts are in the final phase, with the new bidding process underway. A new model of the system to be tendered is being developed, where the city will separate the operation and the ticketing system. In the case of the electric buses, the next step will be to lease the buses for the new operation.

Opportunities and Challenges to Scaling E-Bus Fleets

Opportunities

- A favorable political moment, with a strong political will and commitment of the current mayor in taking the pros and cons of making the city a national pioneer in e-buses fleet.
- The current elaboration of the Urban Mobility Plan, that is setting the perspectives and actions for urban mobility for the next years.
- Spreading knowledge and build technical capacities in the public and private sector to support public acceptance and accelerate the transition.

Challenges

- High upfront prices altogether with the applied importation taxes and lack of incentives of the national government results into a high CAPEX, that make the transition vey costly.
- Need to improve the quality of the service while guaranteeing an affordable tariff for the users, to increase ridership levels.
- Difficulties to find and agree on an adequate business model and distribution of responsibilities between the city hall and private companies.
- Very little knowledge of the operation and maintenance of electric fleets is a difficulty, as well as overcoming the resistance of local bus operators to migrate to this technology.

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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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