

## CITY FEATURES



Cape Town, in the City of Cape Town metropolitan municipality, is South Africa’s oldest city and the legislative capital. The City is mostly situated on low-lying plains connecting the peninsula to the mainland with the Table Mountain’s steep slope in the south-west. The City is the second-largest economic centre and about 80% of the economic activity is generated by finance, retail, real-estate, food and beverage industries. The city is characterised by urban sprawl. There are large differences in densities in formal areas and informal township areas. For instance, low density, formal neighbourhoods are well located and predominantly depend on the use of private vehicles to access the city. Compared to high density informal neighbourhoods, predominantly black townships continue to be built on the outskirts of the city, far removed from immediate employment opportunities and reliant on an expensive disjointed public transport service.



Population  
**4,423,834**  
(2018)



Land area  
**2,445 km<sup>2</sup>**

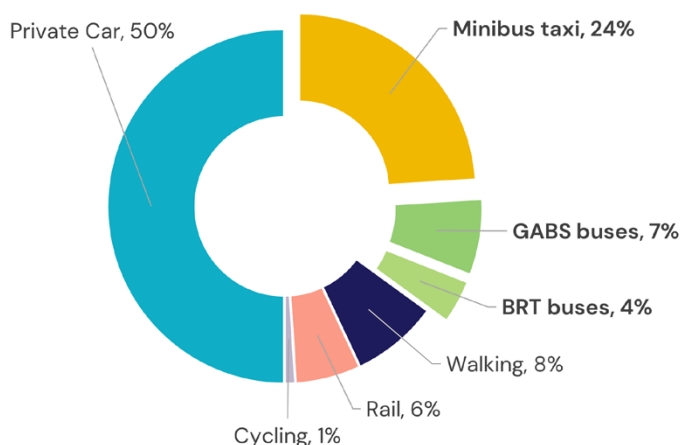


Average temperature  
**20°C** (summer)  
**13°C** (winter)

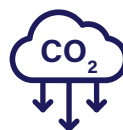
## TRANSPORT FEATURES

$\mu\text{g}/\text{m}^3$

### Modal Split



### GHG Emission Levels



Total GHG emissions  
**19,932,984 tCO<sub>2eq</sub>**  
From road transport  
**6,256,872 tCO<sub>2eq</sub>**

### Air Pollutant Levels<sup>1</sup>



PM 2.5	NO <sub>2</sub>
<b>8 <math>\mu\text{g}/\text{m}^3</math></b>	<b>13 <math>\mu\text{g}/\text{m}^3</math></b>
PM 10	SO <sub>2</sub>
<b>19 <math>\mu\text{g}/\text{m}^3</math></b>	<b>5 <math>\mu\text{g}/\text{m}^3</math></b>

About 3.2 million trips are undertaken on a work day in the City of Cape Town (hereafter CCT). Roughly half the trips are done using private vehicles, whereas about a quarter are undertaken using public transport, namely, minibus taxis, buses (BRT – Bus Rapid Transit – and non BRT), and rail. Going to work and to study were the two most important reasons for travelling, comprising 37% and 32% of all trips, respectively, in the whole Western Cape area. With regards to transport trends, the City of Cape Town’s road-based public transport has increased over the past five years. There has been a decline from 29.4% to 7.5 % in household use of rail, and private vehicle ownership of households has increased from 45.8% in 2011 to 51.9% in 2018.

Congestion (14.5%) and crime (11.9%) were the two main perceived factors associated to problems with the transport system in the city.<sup>2</sup>

1 State of Cape Town Report, 2020

2 Western Cape National House Travel Survey, 2022

# BUS SYSTEMS OUTLOOK

## Bus Trips Features



Number of bus trips  
(% of yearly transport trips)  
**8.3% (2018)**  
**11% (2022)**



Average time  
**79 min** (non-BRT)  
**38 min** (BRT)



Average distance  
**19 km** (non-BRT)  
**9 km** (BRT)

Some of the BRT routes service lower socio-economical neighbourhoods in the city's peripheral, namely Khayelitsha and Mitchells Plain on the cape flats and Atlantis, situated 30 km east and 55 km north, respectively, of Cape Town City Centre. The most common and top three origins of destination zones for Phase 1 are: Central Business District (CBD) – CBD, Table View – CBD, and Khayelitsha – CBD.

Furthermore, Golden Arrow Bus Services operate GABS (160 years of service) and serves more than 3100 routes, traveling roughly 60 km and carrying about 230,000 passengers per week day. Sibanye company, for its part, operates 50 buses with services from Atlantis to Cape Metropole.

## Fleet and Infrastructure



Number of buses  
**1,531**

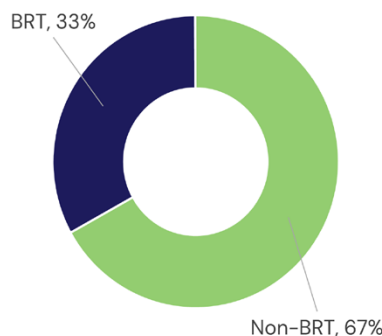


Number of routes  
**40 BRT**  
**4,469 non-BRT**

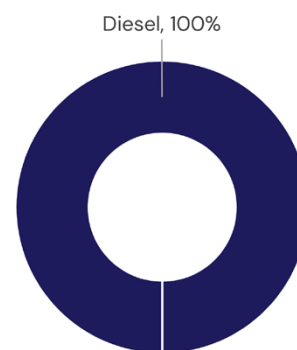


**>700** bus stops (BRT)  
**4** bus depots (BRT)  
**6** bus depots (non-BRT)

Buses by fleet type



Buses by fuel type



## Quality of Service<sup>3</sup>

The BRT has dedicated roadways and bus priority measures, allowing buses to move faster during peak traffic. Vehicles are, overall, safe and comfortable. However, BRT buses fail to reach a significant part of the city area and are poorly integrated to minibus taxis and other paratransit systems.

29.4% of households attributed travel cost as the biggest determinant of modal choice, followed by comfort, reliability and travel time at 18.4%, 15.9%, 15.7% respectively. With regard to buses, 76.8% households attributed inaccessibility to be a concern since it would take up to 15 minutes to walk to the nearest bus stop. In 2020, the reasons provided by household respondents for not using the bus services are service attributes (44.9%), preference for private transport (22.5%) and lack of availability of services (13.5%). Dissatisfaction with both buses and minibus taxis was majorly linked to security at the bus stops, on route, or getting on and off. Other factors were associated to crowding levels, limited frequency during non peak hours, punctuality, and travel time.



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## Existing Business Model<sup>4</sup>

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

B

There is one public BRT MyCiTi system which is operated by 4 Vehicle Operating Companies namely, Kidrogen, Transpeninsula Investments (TPI), N2 Express Joint Venture and Table Bay Area Rapid Transit (TBRT). The City owns and leases the buses to vehicle operating companies, who in turn operate the buses on routes identified by the City of Cape Town. Vehicle Operating Companies are responsible for operation and maintenance.

C

Frontier Transport Holdings owns both GABS and Sibanye non-BRT bus services in CCT. GABS & Sibanye are privately operated bus companies that are contracted by the Province to service specific routes in the City. These companies own the buses assets while the CCT owns the road and bus infrastructure. The companies operate and maintain the buses. Private owners scrap their own buses.

D

Mini-bus taxis are privately owned 15 seat passenger vehicles, that form collectives of multiple taxi operators as Taxi associations. Taxi associations are permitted to operate along certain registered routes and collectively self-regulate by managing their own routes and schedules. Taxi operators either hire drivers or drive the vehicles themselves. Taxi operators require a licence to operate. Mini-bus taxis operate on public roads making use of public transport facilities like taxi ranks at major transport interchange nodes. The owners are responsible for operation, maintenance and scrapping, in accordance with the City's road traffic regulations.



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<sup>4</sup> 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

- A case study done by a local private operator in Cape Town on two battery electric buses has demonstrated the possibility of successfully running electric buses in Cape Town.
- This pilot conducted in Cape Town powered the electric buses predominantly with renewable solar power which contributes to reducing well-to-wheel emissions even further.
- Potentially lower long-term costs and risk price volatility for passengers by cutting reliance on international fuel prices.



## Challenges

- Lack of knowledge and experience using e-bus technology in differing operating environments, especially on high slopes.
- Lack of educated and trained personnel for: procurement; safety issues; operations; driver training; maintenance, repair; monitor, control; disposal of battery.
- High capital of vehicles and import duties alongside lack of access to finance and innovation of financing models.
- Lack of data on life-cost analysis between e-bus and ICE to make the case of long term savings for adoption.
- Existing procurement and contracting practice favour the technology option with the lowest purchase price, oftentimes with disregard to technology quality and suitability.



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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](mailto:tumi-network@iclei.org) or visit <https://sustainablemobility.iclei.org/tumi/>