

## CITY FEATURES



Semarang City is the capital of Central Java Province. Located on the economic traffic lane of Java Island makes Semarang not only act as the center of the government, but also one of the economic centers in Central Java. It developed into a city of trade and services which became the backbone of the economic development in Semarang. Semarang City is better known as a coastal city, although there are 3 different landscapes, namely coastal and lowland areas that dominate the northern part while hills dominate in the southern part. The center of government and trade, the old city center and various important and vital city infrastructure facilities such as stations and airports are located in north Semarang. Currently, the city development is increasingly shifting towards south Semarang.



Population  
**1,687,222**  
 (2022)



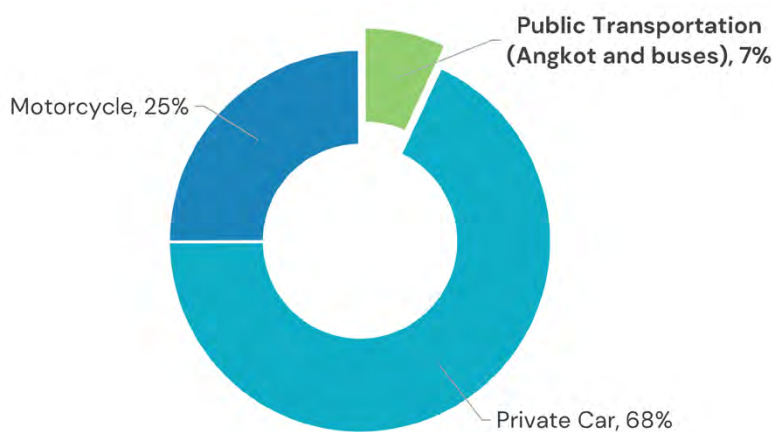
Land area  
**373.7 km<sup>2</sup>**



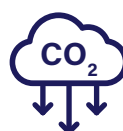
Average temperature  
**29°C**

## TRANSPORT FEATURES

### Modal Split<sup>1</sup>



### GHG Emission Levels<sup>2</sup>



Total GHG emissions (direct)  
**6,099,129.44 tCO<sub>2eq</sub> (2020)**

From road transport  
**1,217,863.41 tCO<sub>2eq</sub> (2020)**

### Air Pollutant Levels<sup>3</sup>



PM 2.5	NO <sub>2</sub>
<b>16.02</b>	<b>28.69</b>
PM 10	SO <sub>2</sub>
<b>19.68</b>	<b>45.62</b>

Semarang has public transportation modes such as Angkot, BRT, and feeder buses that ensure the mobility of its citizens. However, private vehicles still dominate the mode of transport, accounting for 93% in 2020. This can be caused by the growth of private motorized vehicles up to 12% per year, while public transportation share is only 7%. The transportation sector also contributed 20% of total direct GHG emissions in 2020. To tackle these issues, the government showed its commitment to a sustainable mobility system. In Semarang's mid term development plan, sustainable infrastructure became one of its key development missions. The environmentally Friendly Fueled Transportation Development program is one of the priorities under that mission as well.

1 Low Emission Integrated Mass Transit Plan (Urban Mobility Plan) Kota Semarang, 2020

2 Local Mid-Term Development Plan of Semarang 2021 – 2026

3 Environment agency of Semarang City, 2022

# BUS SYSTEMS OUTLOOK

## Bus Trips Features



Number of bus trips<sup>4</sup>  
**356,707 (2019)**  
**300,938 (2020)**



Average time (per round trip)  
**90 min**



Trips by purpose<sup>5</sup>



Passengers by category<sup>6</sup>

Return home **42.3%**  
 Commuter **17%**  
 Recreation **14%**  
 Study **10.3%**  
 Business **6%**  
 Shopping **5%**  
 Others **5%**

General **74.38%**  
 Elderly **12.59%**  
 Students **8.04%**  
 Children (below 17 y.o.) **3.10%**  
 Graduate students **1.84%**  
 Veterans **0.04%**

The citizens of Semarang City and the surrounding city, use Trans Semarang for work, study, shopping and recreation. The passengers include vulnerable groups such as elderly people, pregnant woman, people with disability, and so on. The most common origins and destinations are from home to schools and offices. Based on 2021 data, more than half of passengers are categorized under the general group (74.4%), while 12.6% are under the elderly group, 8 % school students, 1.8% college students, 3.1% children and less than 1% veterans. The average BRT (Bus Rapid Transit) trip is 30 – 45 minutes.

## Fleet and Infrastructure



Number of buses  
**259 (2022)**

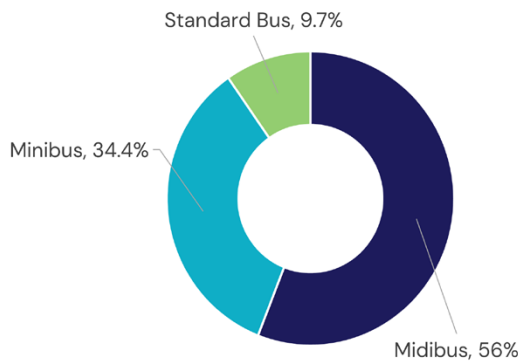


Number of routes  
**8 bus routes**  
**4 feeder routes**  
**1 night route**

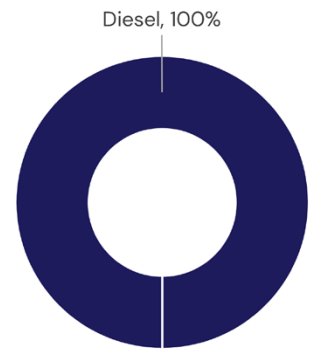


**890 bus stops**  
**13 bus depots**

Buses by fleet type



Buses by fuel type



## Quality of Service

As a mode of mass public transportation in the Semarang City, Trans Semarang is equipped with several facilities for the convenience of users such as AC, CCTV, and GPS. Trans Semarang fares are also quite affordable, namely Rp. 3500 (cashless) and Rp. 4000 (cash) for general groups and Rp. 1000 for special groups. Users can get information about routes, bus stops and bus positions in real time through the Trans Semarang mobile application. The current coverage of Trans Semarang is 45%. However, additional corridors are also being carried out, especially feeder corridors to reach areas with narrow roads. In 2021, the load factor is 37.4%. A problem with Trans Semarang is that there is not yet a dedicated line for the bus, so it operates on the same line as other vehicles, which could affect the interval time between BRT fleets. The city government plans to provide a dedicated line for Trans Semarang, in order to improve its services.



4 Trans Semarang

5 Demand Survey IGES, 2016 in Low Emission Integrated Mass Transit Plan (Urban Mobility Plan), 2019

6 Trans Semarang

## Existing Business Model<sup>7</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

E

BLU Trans Semarang manages the operation of the BRT, including overseeing the bus operation which is run by 12 different bus companies. BLU Trans Semarang is a public authority under the Transportation Agency of Semarang City. It owns and manages infrastructure as well as a few buses. A large number of buses are mostly purchased and owned by the bus operators. The cooperation between BLU and operators is through contract, MoU, and concession. The contract is renewed per 1-year. Operators are paid per bus kilometer traveled.



<sup>7</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

- The Mayor of Semarang has a commitment related to the implementation of electric buses. This can be seen through the efforts of the City of Semarang to provide 1 electric bus which will be used for tourism activities.
- Currently, there are 3 charging stations in Semarang City which can be the starting point to support the implementation of electric buses later.
- Moreover, Trans Semarang users have increased over the last 10 years – from 369,326 in 2009 to 11,306,893 in 2019.



## Challenges

- The main challenge for the adoption of the electric bus fleet is the limited fiscal capacity of the city, given the high cost of electric buses. Therefore, there is a need for stages of mass implementation of electric buses as well as financial support.
- The varied geographical characteristics of Semarang City (there are lowlands and highlands), are a challenge for the adoption of electric buses. In some parts of the city of Semarang, flooding often occurs when it rains.
- Further technical studies are needed regarding the types of buses that are suitable for use in different geographical characteristics and in areas prone to inundation.



## 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-ebus-mission-2/>