KUALA LUMPUR, MALAYSIA

URBAN TRANSPORT PROFILE

December 2024

Asian Transport Observatory

Summary

Kuala Lumpur, a thriving metropolis with a population of 7.8 million, faces the universal urban challenge of balancing economic growth with sustainable transport solutions. While the city boasts a high GDP per capita and a well-developed road network, it grapples with high vehicle ownership rates, with nearly 900 vehicles per thousand residents. This has led to a significant reliance on private transport, accounting for 83% of trips, despite the existence of an extensive rapid transit system comprising 157 kilometers of metro lines. This over-reliance on private vehicles contributes to congestion and carbon emissions, hindering the city's efforts to become a climate-smart and sustainable urban center.

Recognizing the need for change, Kuala Lumpur has embarked on ambitious initiatives to transform its urban transport landscape. The Mass Rapid Transit (MRT) project, launched in 2010, aims to alleviate traffic congestion and enhance connectivity by expanding the city's metro network. This commitment to public transport is further underscored by ongoing Klang Valley Mass Rapid Transit and Light Rail Transit systems expansions. These initiatives are aligned with national targets to increase the modal share of public transport to 40% by 2030, reflecting a concerted effort to reduce car dependency and promote sustainable mobility.

Kuala Lumpur's vision extends beyond simply expanding public transport infrastructure. The city's Low Carbon Society Blueprint sets a clear target of becoming a climate-smart city by 2030, with a 70% reduction in carbon emissions. This ambitious goal is supported by the Kuala Lumpur Structure Plan 2040, which provides a strategic framework for sustainable urban development. Kuala Lumpur is taking concrete steps towards achieving its sustainability targets by actively promoting electric vehicles, investing in smart technologies, and optimizing resource management. The city's commitment to the UN Sustainable Development Goals and its real-time progress monitoring further demonstrate its dedication to creating a more livable and environmentally responsible urban environment.

About the Urban Transport Profiles

The Asian Transport Observatory (ATO) Urban Transport Profiles provide a comprehensive snapshot of urban transport dynamics for 40 cities in the Asia-Pacific region. These profiles compile data from official city reports, relevant sources from reputable research organizations, multilateral development institutions, international experts' reports, secondary studies, and all other research endorsed or guided by city governments. Featured cities are benchmarked against other cities, where data is available, in the region, subregional averages — and in some cases, global cities — offering valuable comparative insights. In cases where data is not available, placeholders for the graphs are retained. Each profile also includes a curated list of relevant urban transport policies and documents, presenting a concise overview of the city's policy framework. By covering a wide range of transport-related indicators, these profiles serve as a critical resource for understanding and improving urban transport systems.

General

Population 7.8 million
(2020) (GHS)
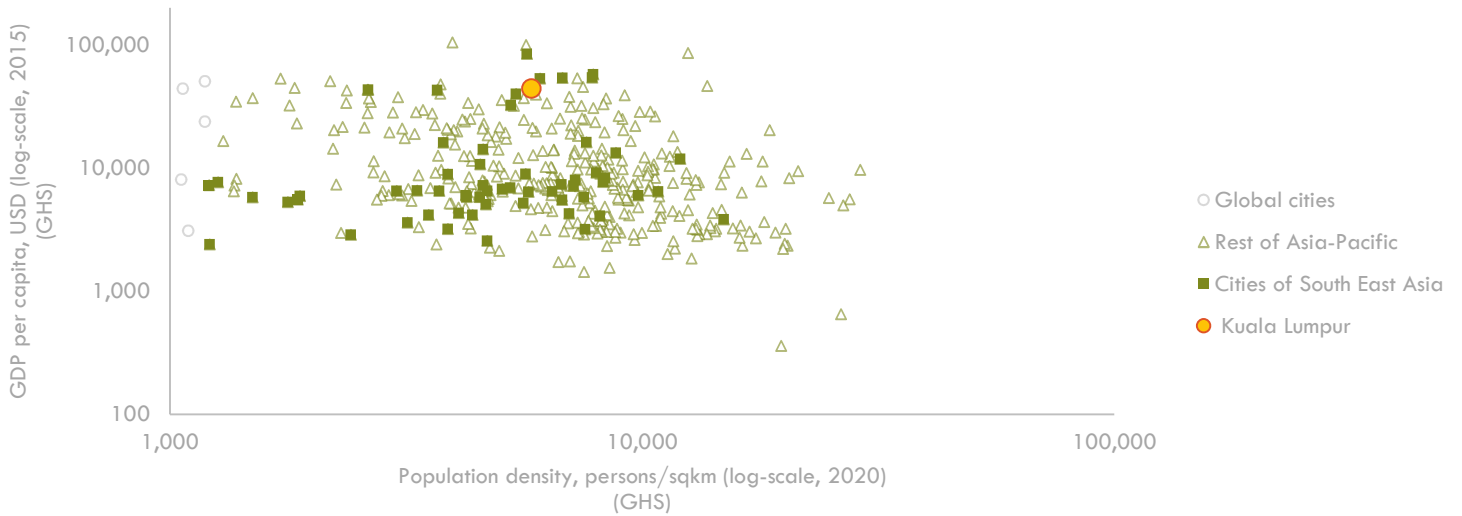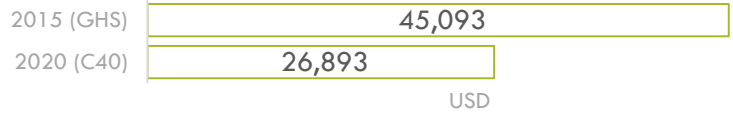
Land area 243 sqkm
(2017) (C40)

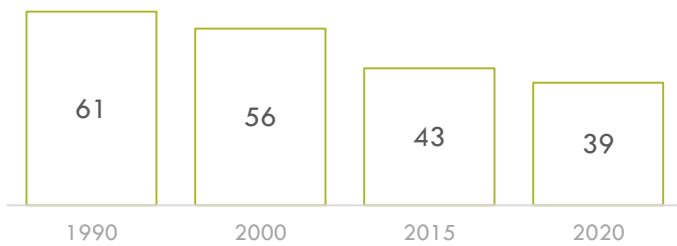**Population density** 6 thousand per sqkm
(2020) (GHS)

GDP per capita 27 thousand USD
(2020) (C40)

Population density

2020 (C40)	7,284
2020 (GHS)	5,836

thousand people per sqkm

GDP per capita

2015 (GHS)	45,093
2020 (C40)	26,893

USD

GDP per capita, USD (log-scale, 2015) (GHS) vs Population density, persons/sqkm (log-scale, 2020) (GHS)

○ Global cities
△ Rest of Asia-Pacific
■ Cities of South East Asia
● Kuala Lumpur

Urban Form and Structure

Builtup area per capita
sqm per capita (GHS)

1990	2000	2015	2020
61	56	43	39

Mean block density
blocks per sqkm (2020) (ITDP)

■ Cities of South East Asia
☐ Rest of Asia-Pacific

Builtup area per capita
(GHS)

sqm/ capita (2020) vs GDP per capita, USD (log-scale, 2015)

○ Global cities
△ Rest of Asia-Pacific
■ Cities of South East Asia
● Kuala Lumpur
⋯⋯ South East Asia average
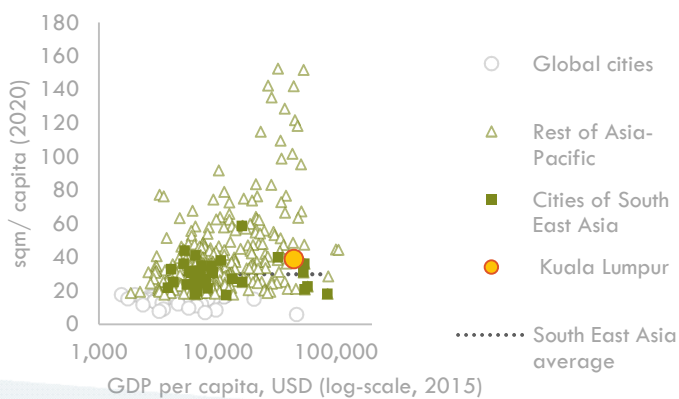
Intersection density   (Oke et.al. (2019) (OSM))

Night time light intensity (a)
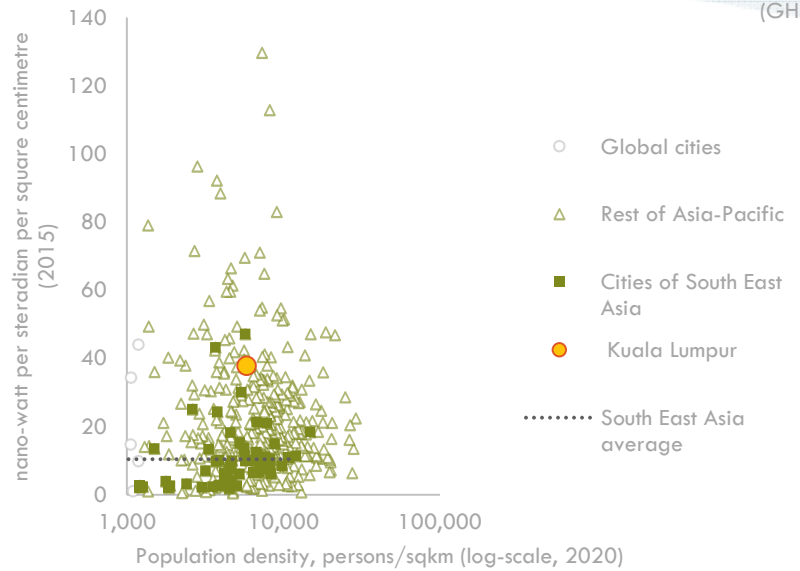
(GHS)
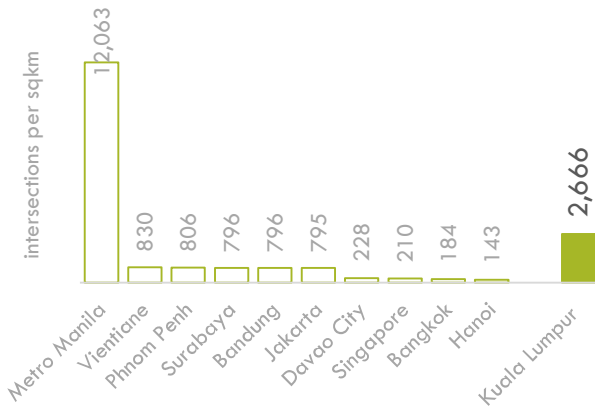
(a) Night time light intensity studies illustrate urban forms and patterns by mapping human activity, infrastructure, and connectivity, offering insights into urban sprawl, density variations, and transport network
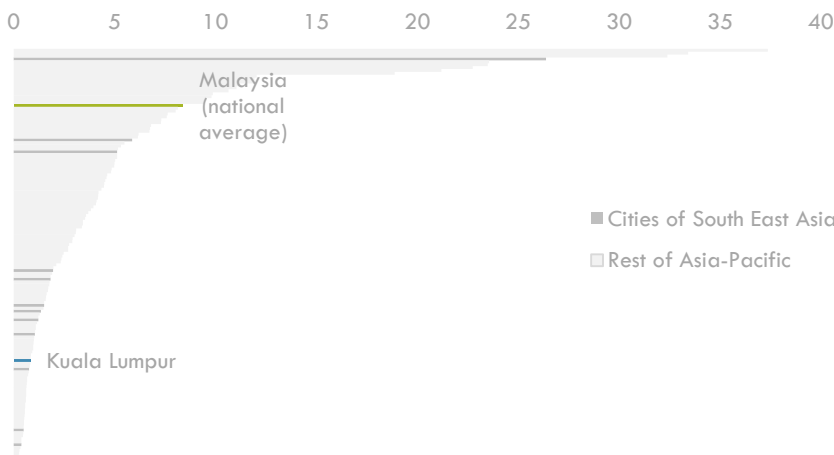
Urban Transport Infrastructure

Road availability

kilometers per thousand population (2019) (Oke et.al. (OSM) and GHS)

Road kilometers 1,544 kilometers

(2018) (Primary data)

Rapid transit infrastructure

(2024) (TE)

Rapid transit infrastructure

kilometers (ITDP, Primary data)
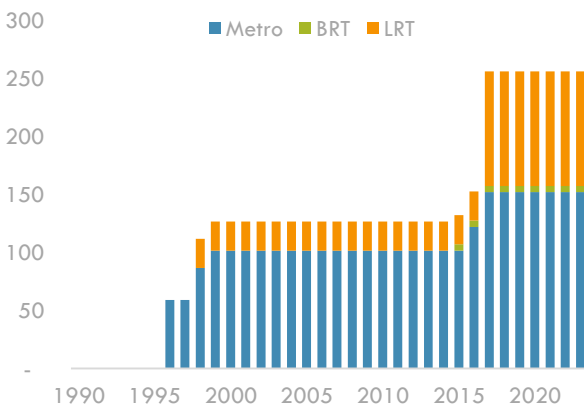
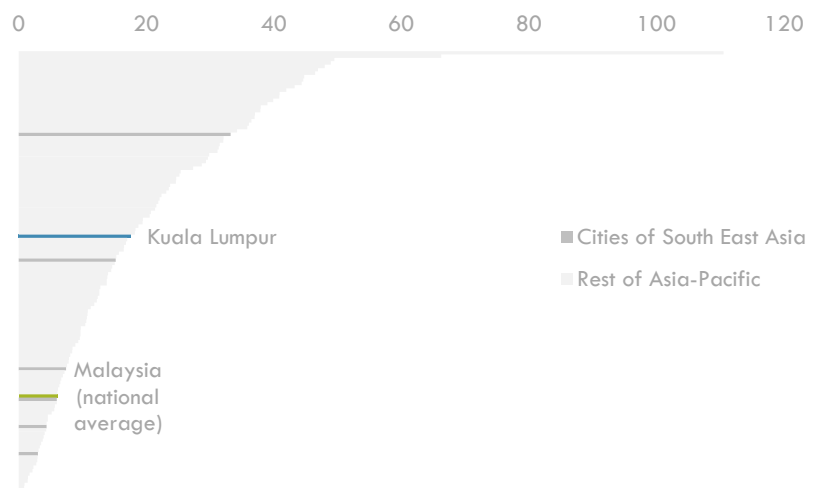|	
BRT	5 kilometers
LRT	99 kilometers
Metro	152 kilometers
Total	256 kilometers

(2023) (ITDP)

Rapid transit availability

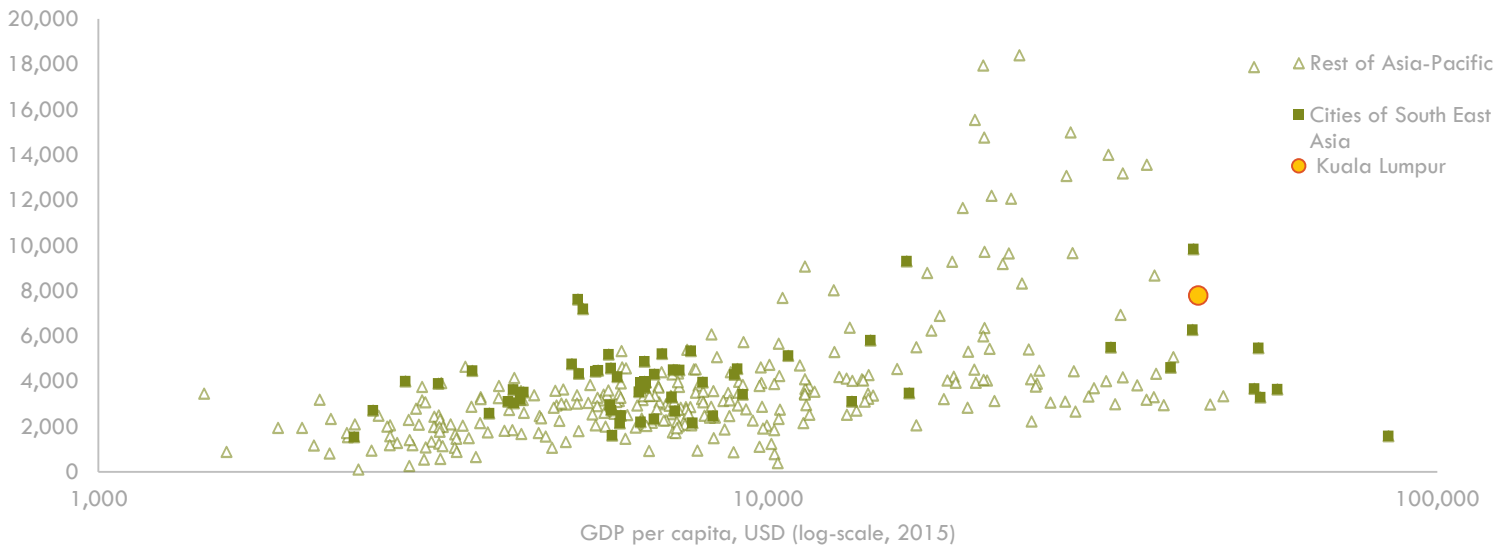kilometers per million urban population (2021) (ITDP, Primary data)

Approximate transit coverage 16% of land area

(2015) (ITDP and GHS)

Transport Activity and Services

VKT per capita

Vehicle-kilometer per capita (2022) (ClimateTrace)

- △ Rest of Asia-Pacific
- ■ Cities of South East Asia
- ○ Kuala Lumpur

GDP per capita, USD (log-scale, 2015)

Trips Mode share (b)

Share, %

- ■ Walking and cycling
- ■ Private
- ■ Public transport (bus, ferry, informal public transit, etc)

Google Evironmental Insights Explorer (2023)	13%	83%	4%
Primary data		
Oke, et al. (2017)		
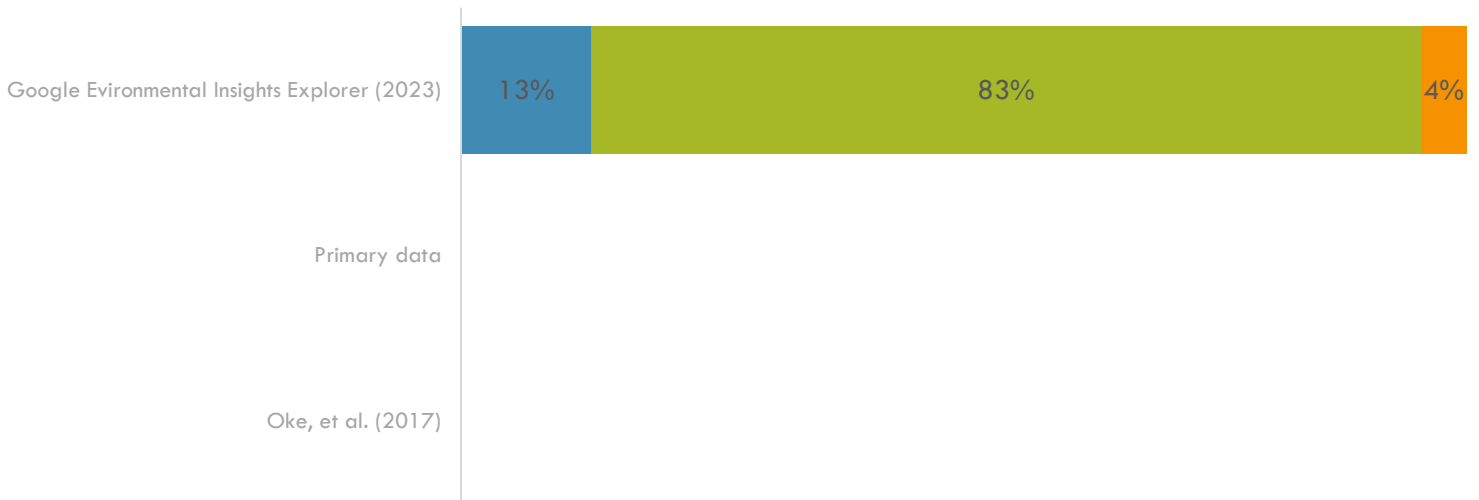
(b) The methodologies used for mode share assessments vary across different studies, making direct comparison of results inadvisable. Specifically, the Google Environmental Insights Explorer derives its assessments from mobile data analysis, while primary data studies typically rely on survey-based approaches. In contrast, the study by Oke et al. utilizes a combination of secondary data sources.

Metro ridership n.d.

Congestion ranking 159th out of 387 cities

Congestion level

Percent increased travel time vs. uncongested conditions (2021) (TomTom)

■ Other cities

Vehicle motorization

Vehicles per thousand population (Primary data)

Kuala Lumpur, 2020

- Kuala Lumpur
- Cities in South East Asia
- Rest of Asia-Pacific

(c) It should be noted that, in most cases, scrapped vehicles are not de-registered, which may result in slightly inflated numbers.
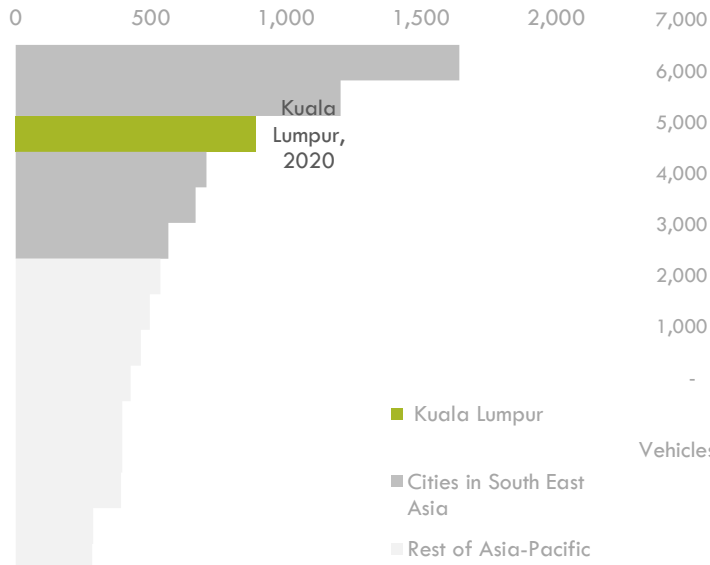
Vehicles registered (c)

Thousand vehicles (Primary data)

Vehicles considered: Car, 2W, Bus, Freight vehicles, Others
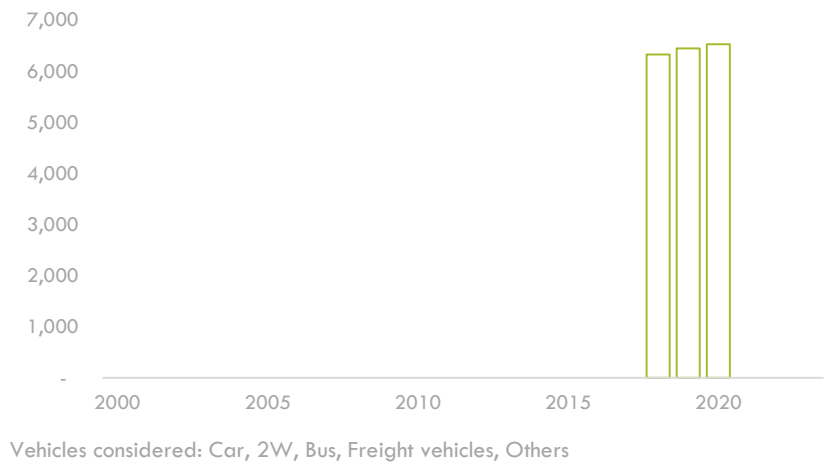
Bus fleet (operational)

Bus (and other public transport) fleet (Primary data)

Urban Access

Access to urban public transport

Share of population with convenient access to public transport (2023) (CIESIN)

GDP per capita, USD (log-scale, 2015)

- ○ Global cities
- △ Rest of Asia-Pacific
- ■ Cities of South East Asia
- ⋯ South East Asia average
- ● Kuala Lumpur
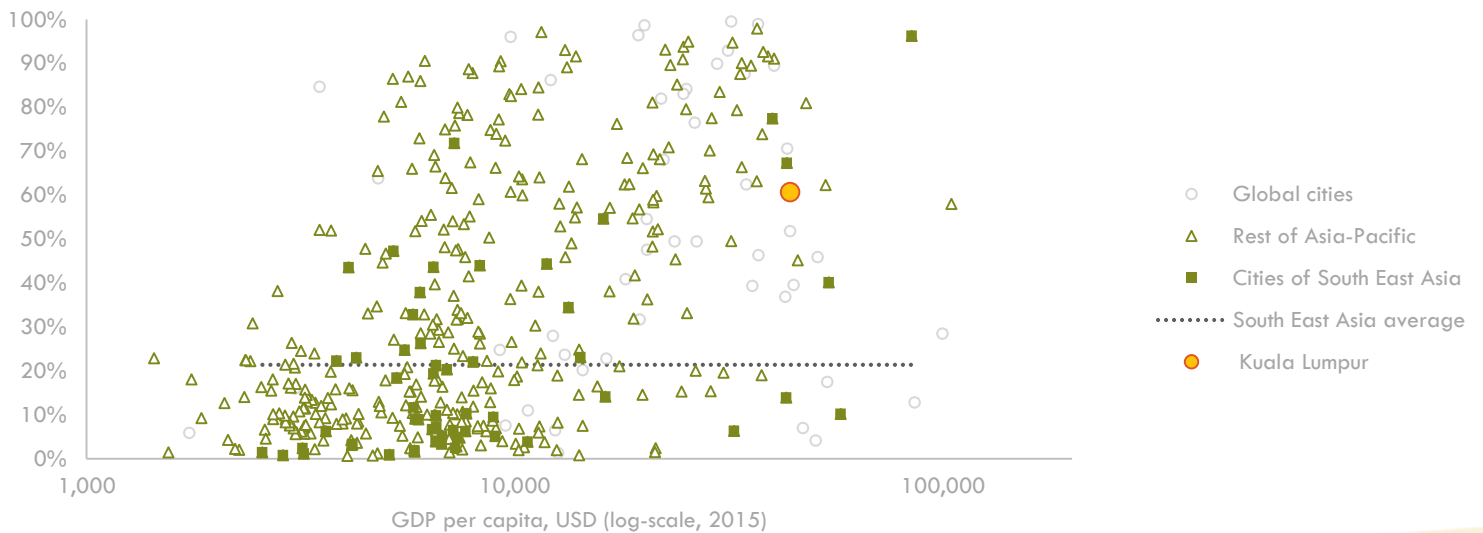
Access to urban public transport (d) - by source

Share of population with convenient access to public transport

2017-2019 (UNESCAP - SUTI)	
2020 (UN Habitat)	**67%**
2023 (CIESIN)	**61%**

(d) "Access to urban public transport" is computed as share of population who live within a walking distance (along a street networ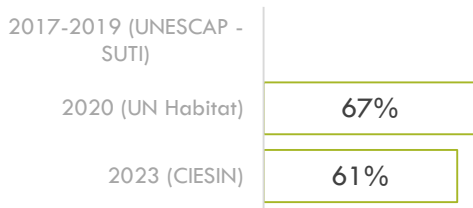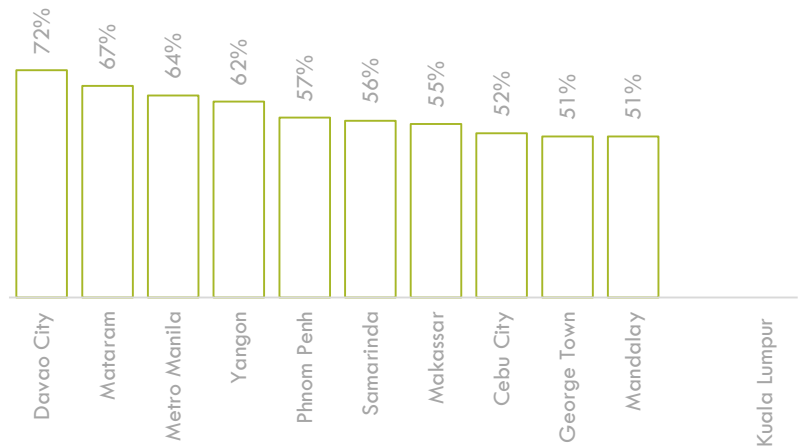k) of 500m to a low capacity public transport system (eg bus, tram) and 1000m to a high capacity public transport system (eg trains, ferries, etc). Only public transport stops which are mapped are included in the analysis which may include both formal and informal stops. Many cities (mostly in the developing countries) have informal public transport systems which are not fully mapped - meaning that they may record higher levels of access to public transport than reported in this dataset.

(e) People Near Services measures the percentage of the city's population living within a 1km walk of both healthcare and education. These services are especially vital for babies, toddlers, and their caregivers, who should be able to reach them on foot.

(f) Percentage of the city's population that lives within 100m of a car-free place. These car-free places include pedestrian-only alleyways, nature trails, playgrounds, pedestrianized squares, and anywhere else that is not used by cars and trucks (except, in some cases, emergency vehicles).
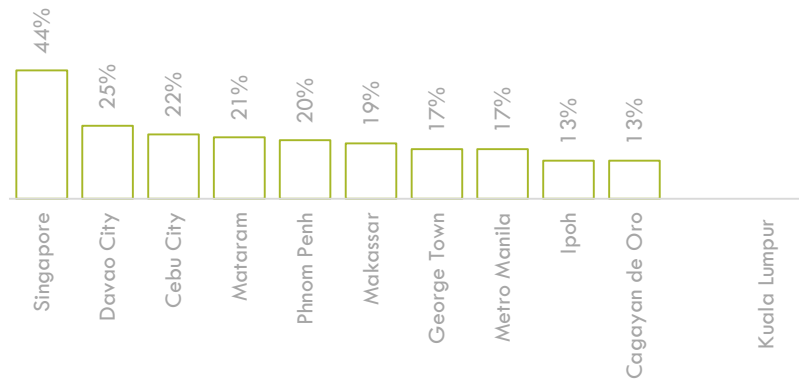
People near services (both healthcare and schools) (e)

(Share of population) vs. highest 10 cities in South East Asia (2020) (ITDP)

City	Share
Davao City	72%
Mataram	67%
Metro Manila	64%
Yangon	62%
Phnom Penh	57%
Samarinda	56%
Makassar	55%
Cebu City	52%
George Town	51%
Mandalay	51%
Kuala Lumpur	

People near car-free places (f)

(Share of population) vs. highest 10 cities in South East Asia (2020) (ITDP)

City	Share
Singapore	44%
Davao City	25%
Cebu City	22%
Mataram	21%
Phnom Penh	20%
Makassar	19%
George Town	17%
Metro Manila	17%
Ipoh	13%
Cagayan de Oro	13%
Kuala Lumpur	

People near open public space

(Share of population) vs. highest 10 cities in South East Asia (2020) (UN Habitat)

City	Share
Singapore	70%
George Town	70%
Bukit Mertajam	53%
Ipoh	51%
Pekalongan	41%
Cebu City	40%
Semarang	39%
Davao City	34%
Samarinda	32%
Makassar	32%
Kuala Lumpur	46%
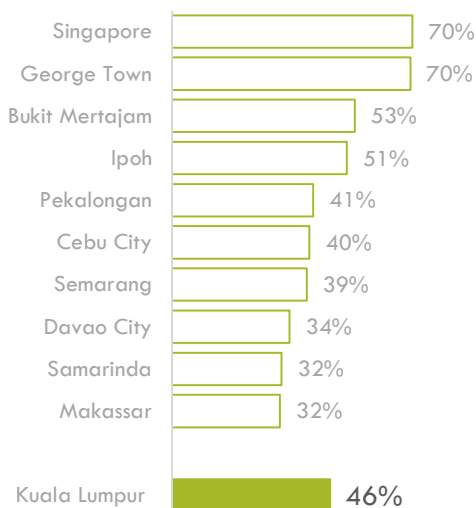
People near protected bikelanes

(Share of population) vs. highest 10 cities in South East Asia (2020) (ITDP)

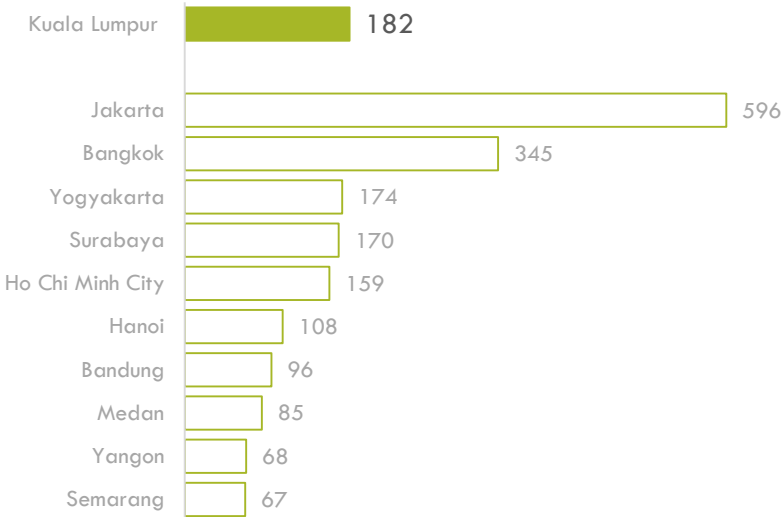| City	Share
Singapore	40%
George Town	9%
Bangkok	2%
Hanoi	1%
Kota Kinabalu	1%
Angeles (San Fernando)	1%
Metro Manila	1%
Phnom Penh	1%
Davao City	1%
Jakarta	0%
Kuala Lumpur	1%
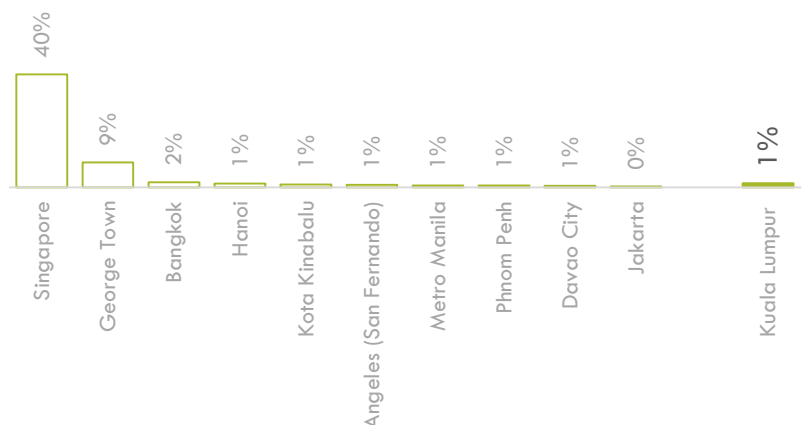
Transport externalities

Road transport - CO2 emissions

Thousand tonnes (2022) (ClimateTrace)

- △ Rest of Asia-Pacific
- ■ Cities of South East Asia
- ● Kuala Lumpur
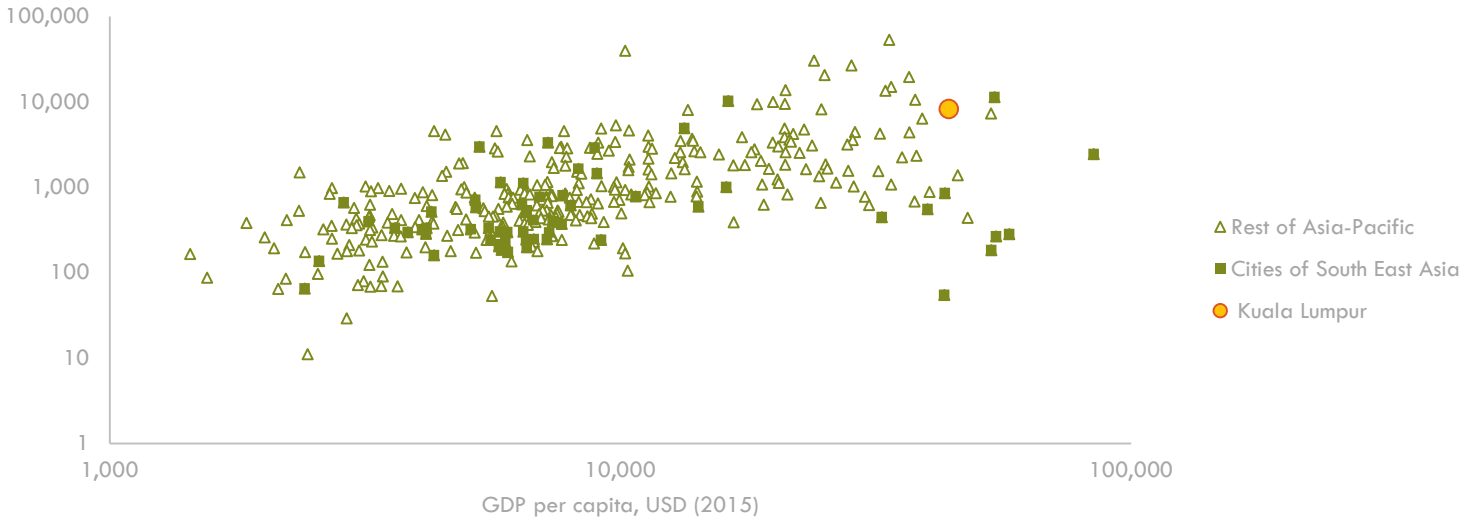
Road transport - N2O emissions

Tonnes (2022) vs. highest 10 cities in South East Asia (ClimateTrace)

City	Value
Kuala Lumpur	182
Jakarta	596
Bangkok	345
Yogyakarta	174
Surabaya	170
Ho Chi Minh City	159
Hanoi	108
Bandung	96
Medan	85
Yangon	68
Semarang	67

Population exposure to disasters

Share of population (2015) (GHS)

5% Exposed to floods — Exposed to storm surges

Road transport - CH4 emissions

Tonnes (2022) vs. highest 10 cities in South East Asia (ClimateTrace)

City	Value
Kuala Lumpur	1,023
Jakarta	4,565
Bangkok	2,090
Yogyakarta	1,329
Surabaya	1,299
Ho Chi Minh City	965
Bandung	733
Hanoi	653
Medan	652
Semarang	511
Yangon	451
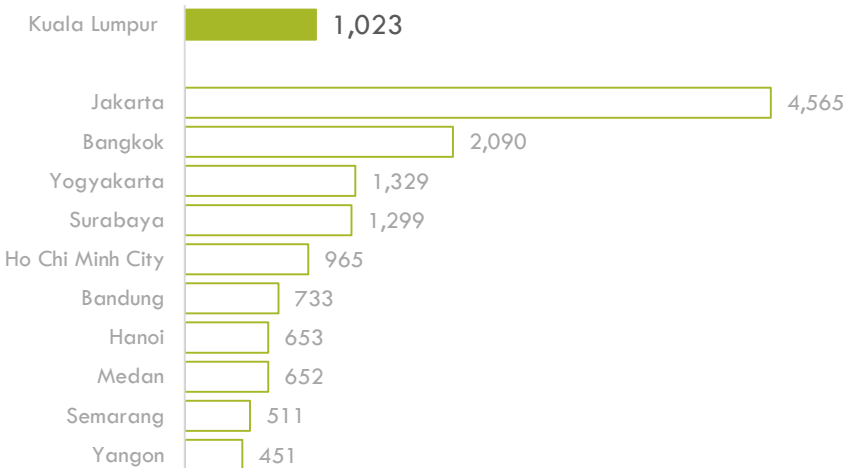
Urban built-up area exposure to disasters

Share of urban area (2020) (GHS)

8% Exposed to floods — Exposed to earthquakes

Transport PM 2.5 emissions

(GHS)

Grams per capita (log-scale, 2015)

GDP per capita, USD (log-scale, 2015)

- ○ Global cities
- △ Rest of Asia-Pacific
- ■ Cities of South East Asia
- ● Kuala Lumpur

NO2 concentration

ug/m3 (vs. highest 5 cities in South East Asia) (WHO)

- ○ Jakarta
- ✕ Bangkok
- △ Singapore
- ◇ Phnom Penh
- □ Yangon
- ○ Kuala Lumpur

PM 2.5 concentration

ug/m3 (vs. highest 5 cities in South East Asia) (WHO)

- ○ Hanoi
- ✕ Jakarta
- △ Ho Chi Minh City
- ◇ Kuala Lumpur
- □ Haiphong
- ○ Kuala Lumpur

Road crash fatality rate

Deaths per 100,000 population

Kuala Lumpur (Primary data) | Kuala Lumpur (ESCAP-SUTI) | Malaysia (2021)

14
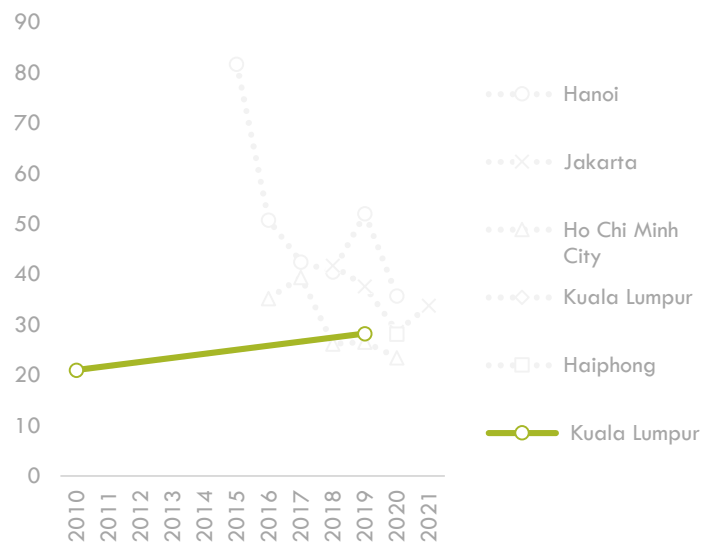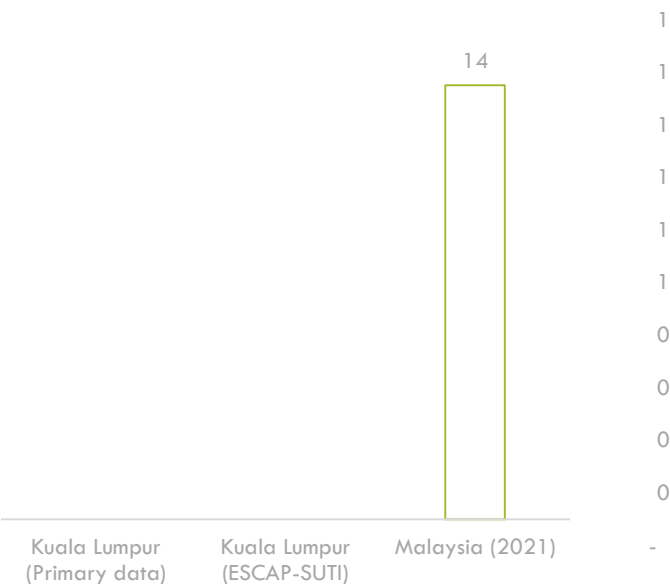
Road crash fatality rate

Deaths per 100,000 population (Primary data)
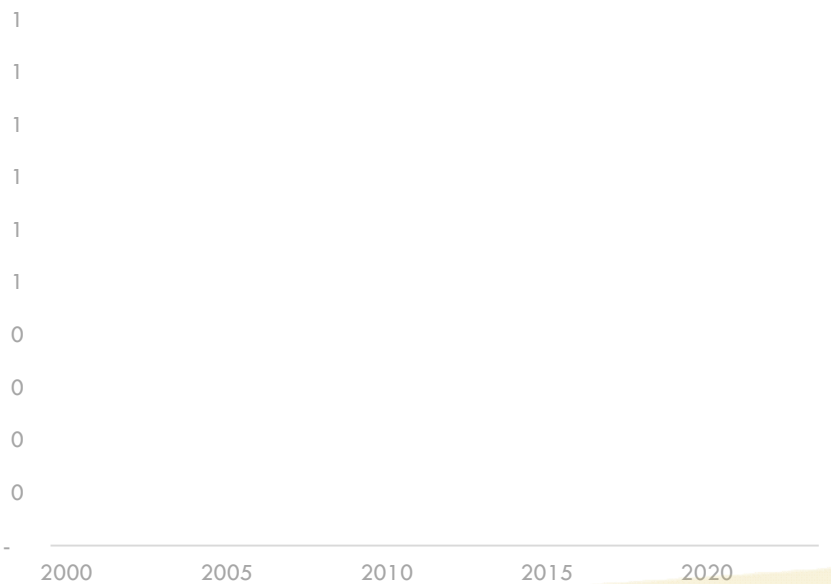
Transport related Indices

Container port performance index

Index is resultant of the sum of a weighted average of indices for each of the five vessel sizes: feeders (<1,500 TEUs), intra-regional (1,500–5,000 TEUs), intermediate (5,000–8,500 TEUs), neo-Panamax (8,500–13,500 TEUs), and ultra-large container carriers (>13,500 TEU)

Kuala Lumpur n.d.

Critical Infrastructures Spatial Index for the transportation sector

CISI is an index that spatially explicit indicates the coverage or lack of transport infrastructure. The CISI is expressed in a dimensionless value ranging between 0 (no CI intensity) and 1 (highest CI intensity). The index aggregates high resolution geospatial information on multiple CI assets per CI system

Kuala Lumpur 0.09/1.00

(2020) (GHS)

SUTI Geometric Mean

The geometric mean in the Sustainable Urban Transport Index (SUTI) by UNESCAP is a mathematical approach to aggregate scores across its 10 sub-indicators, including public transport ridership, safety, affordability, air quality, and access to transport
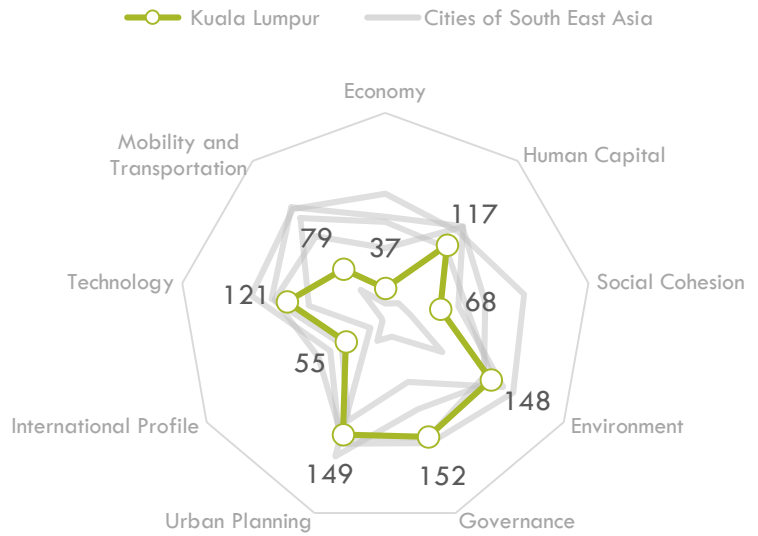
Kuala Lumpur n.d.

Cities in Motion index ranking

The Cities in Motion Index (CIMI) is a composite indicator evaluating cities across nine dimensions—governance, urban planning, technology, environment, international profile, social cohesion, human capital, mobility, and economy—focusing on sustainability and quality of life. It uses a weighted aggregation model to combine sub-indicators for a holistic assessment of urban performance

Kuala Lumpur 152nd out of 183 cities

(2024) (IESE)

Cities in Motion index ranking by subcomponent

Ranking (vs. other Cities of South East Asia) (2024) (IESE)

— Kuala Lumpur   — Cities of South East Asia

Economy 37
Human Capital 117
Social Cohesion 68
Environment 148
Governance 152
Urban Planning 149
International Profile 55
Technology 121
Mobility and Transportation 79

Transport relevant policy documents

Year published	Document name
1972	Kuala Lumpur Urban Transport Project
2013	Greater Kuala Lumpur / Klang Valley Land Public Transport Master Plan
2018	Kuala Lumpur Low Carbon Society Blueprint 2030
2018	Guidelines for Carpark & Internal Traffic Circulation
2019	Kuala Lumpur Pedestrian and Cycling Masterplan 2019-2028
2019	Kuala Lumpur Walkway and Cycle Lane Design Guidelines
2021	Local Mitigation Actions For Carbon Neutral Kuala Lumpur 2050
2021	Kuala Lumpur Structure Plan 2040
2050	Kuala Lumpur Climate Action Plan 2050

References

ATO Urban Policy Tracker	Asian Transport Outlook (ATO). (2024). ATO Urban Policy Tracker. https://asiantransportoutlook.com/
C40	C40. (2024). Greenhouse gas emissions interactive dashboard. https://www.c40knowledgehub.org/s/article/C40-cities-greenhouse-gas-emissions-interactive-dashboard?language=en_US
CIESIN	CIESIN. (2023). SDG Indicator 11.2.1: Urban Access to Public Transport, 2023 Release. https://www.earthdata.nasa.gov/data/catalog/sedac-ciesin-sedac-sdgi-uapt-2023-2023.00
ClimateTrace	Climate Trace. (2024). Data Downloads. https://climatetrace.org/data
GHS	GHS. (2024). GHSL - Global Human Settlement Layer. https://human-settlement.emergency.copernicus.eu/ghs_ucdb_2024.php
Google Evironmental Explorer	Google. (2024). Environmental Insights Explorer. https://insights.sustainability.google/places/ChIJbTgmYNLIlzMR0HiSrNoj7V8?ty=2023&hl=en-US
IESE	IESE. (2024). IESE Cities in Motion Index. https://www.iese.edu/media/research/pdfs/ST-0649-E.pdf
ITDP	ITDP. (2024). The Atlas of Sustainable City Transport. https://itdp.org/publication/the-atlas-of-sustainable-city-transport/
Oke et al.	Oke et al. (2019). A novel global urban typology framework for sustainable mobility futures. https://iopscience.iop.org/article/10.1088/1748-9326/ab22c7#erlab22c7s3
OSM	OSM. (n.d.). Open Stret Map. https://www.openstreetmap.org/#map=4/21.84/82.79
Primary data	This includes city official reports or MDB/ Research organisation/ Third party report endorced/ accepted/ guided by the city government
TE	Transport Politic. (n.d.). Transit Explorer Global Data. https://www.thetransportpolitic.com/transit-explorer/transit-explorer-data-and-sources/
TomTom	Tom Tom. (2023). Traffic index Ranking. https://www.tomtom.com/traffic-index/ranking/
UITP - GUMI	UITP. (2022). Global Urban Mobility Indicators 2022. https://www.uitp.org/publications/global-urban-mobility-indicators-2022
UN Habitat	UN Habitat. (2021). Urban Indicators Database. https://data.unhabitat.org/
UNESCAP - SUTI	UNESCAP. (n.d.). Sustainable Urban Transport Index (SUTI). https://www.unescap.org/our-work/transport/suti
WHO	WHO. (2024). WHO Ambient Air quality database. https://www.who.int/data/gho/data/themes/air-pollution/who-air-quality-database
WB	WB. (2024). The Container Port Performance Index 2023. https://documents1.worldbank.org/curated/en/099060324114539683/pdf/P175833138892300871be641a5ea7b90e0e6.pdf