



GUANGZHOU, PEOPLE'S REPUBLIC OF CHINA

URBAN TRANSPORT PROFILE

December 2024

Summary

Guangzhou, a mega urban center in southern China with a population of 41.3 million in 2020, boasts a rapidly growing economy and a dense urban form. Between 2000 and 2020, the center's population density increased from 5,000 to 6,000 persons per sq km, with a rise in GDP per capita from \$7,000 to \$10,000. Despite its size, Guangzhou maintains a relatively low built-up area per capita compared to the East Asia average, with 33 sq km per capita in 2020. The city has invested heavily in public transportation, developing an extensive rapid transit network that will reach 578 kilometers in length by 2023 and is primarily composed of metro and BRT lines. This robust public transport infrastructure has contributed to a high level of access, with 64% of the population having convenient access to public transport services, exceeding the East Asia average of 45%.

While data from Oke et al. (2017) suggests a high prevalence of walking and cycling (70% of trips), more recent data is needed to assess current modal split trends. Furthermore, access to crucial services and spaces remains limited, with only 10% of the population having access to both healthcare and schools, and a mere 11% having access to car-free areas. Addressing these disparities and promoting sustainable transport options will be crucial for enhancing the quality of life in Guangzhou as it continues to grow and evolve.

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.

Disclaimer

The Asian Transport Observatory (ATO) project collects, collates, and organizes data from publicly available official, as well as reputable and peer-reviewed secondary sources, which may contain incomplete or inconsistent data. It is important to note that the ATO does not generate data. Moreover, while the ATO carries out quality control and assurance of whether the data are truthfully reflected in the ATO, the ATO does not make any warranties or representations as to the appropriateness, quality, accuracy, or completeness of the data in the ATO databases, and in the knowledge products that are produced from such. Users are encouraged to scrutinize, verify, interpret, and judge the data before utilizing them.

General

Population 41.3 million
(2020) (GHS)

Population density

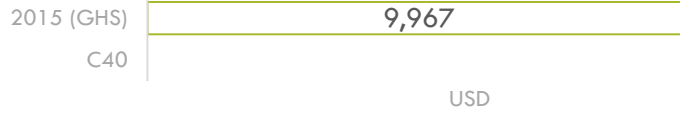
Land area 6,622 sqkm
(2015) (GHS)



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

GDP per capita

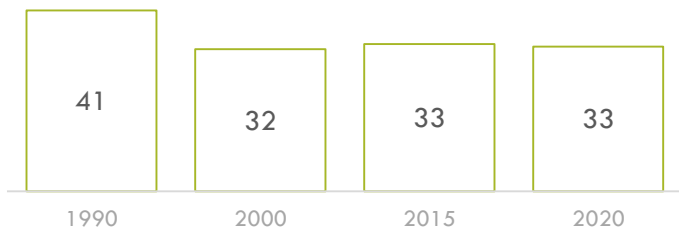
GDP per capita 10 thousand USD
(2015) (GHS)



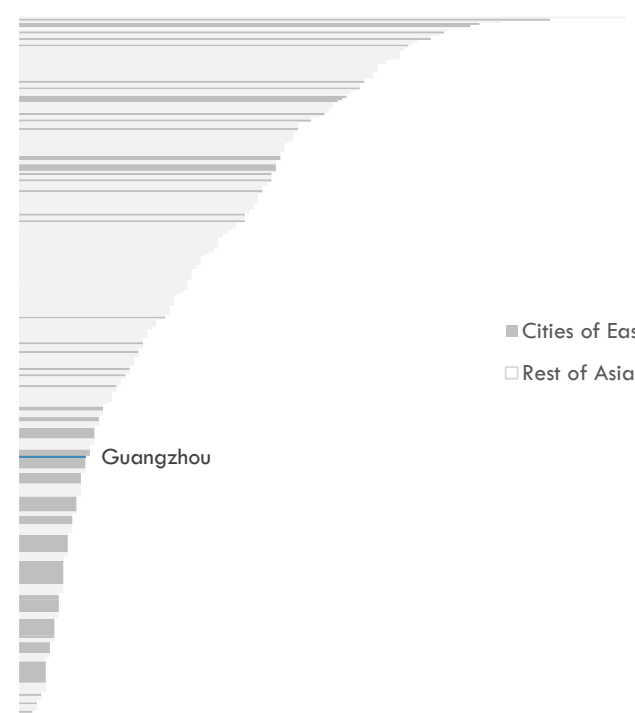
Urban Form and Structure

Builtup area per capita
sqm per capita (GHS)

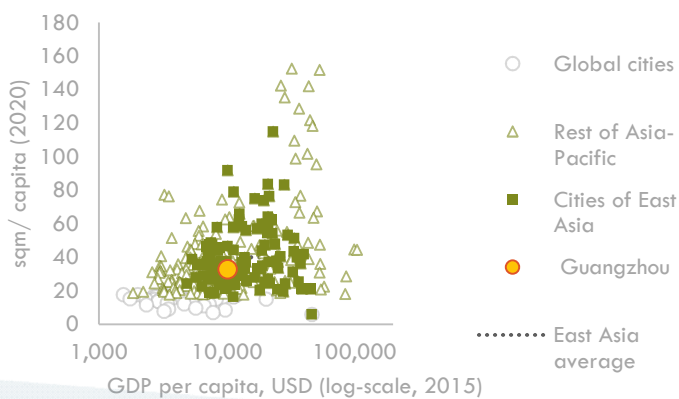
Mean block density
blocks per sqkm (2020) (ITDP)



0 50 100 150

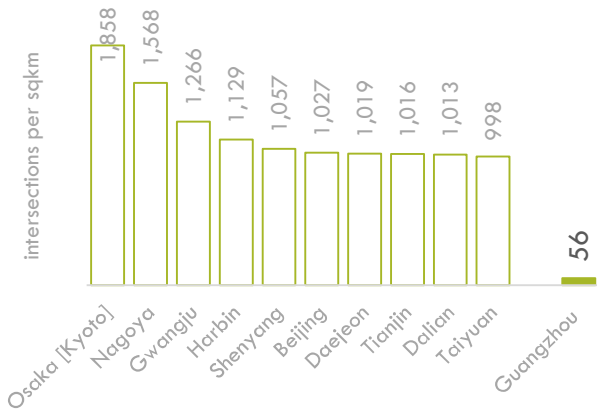


Builtup area per capita
(GHS)



Intersection density

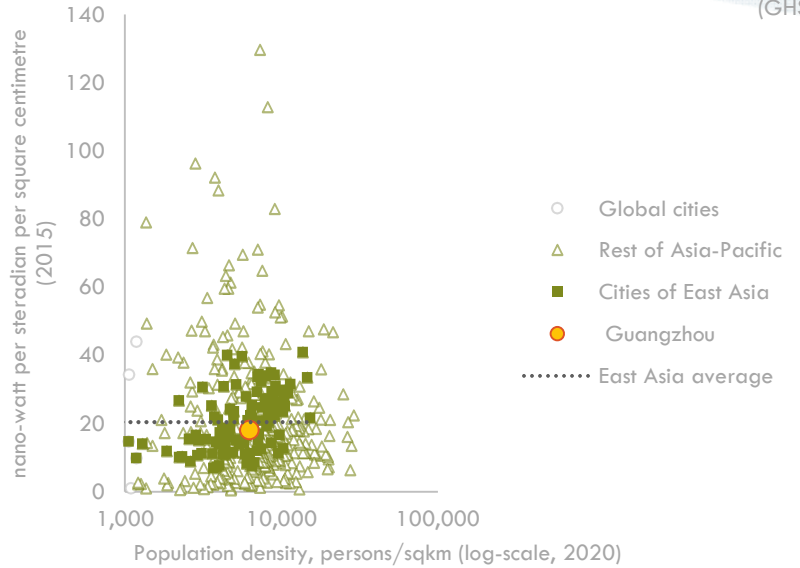
(Oke et.al. (2019) (OSM))



(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

Night time light intensity (a)

(GHS)



Urban Transport Infrastructure

Road availability

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



Road kilometers n.d.

Rapid transit infrastructure

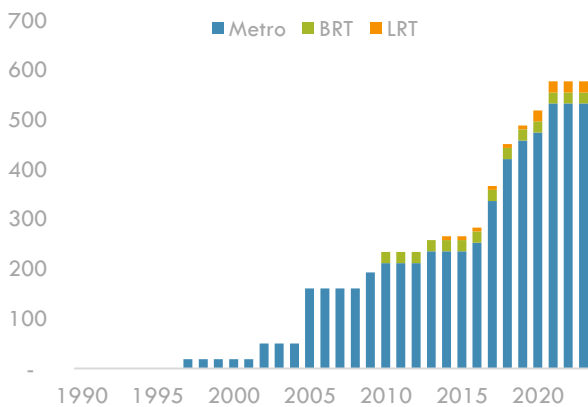
(2024) (TE)

■ Under construction ■ Planned



Rapid transit infrastructure

kilometers (ITDP, Primary data)

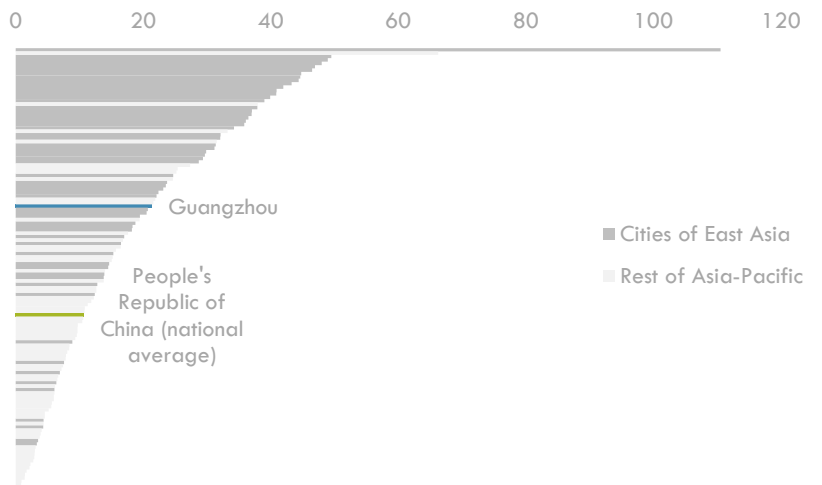


BRT 23 kilometers
LRT 22 kilometers
Metro 533 kilometers
Total 578 kilometers

(2023) (ITDP)

Rapid transit availability

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



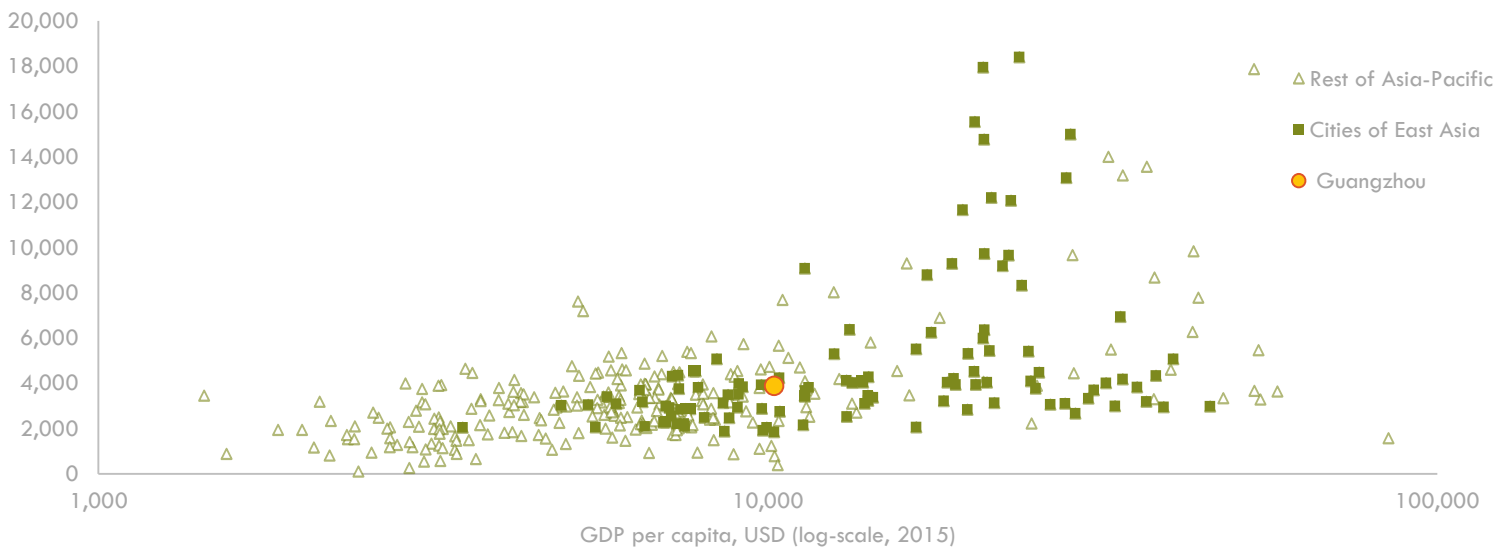
Approximate transit coverage 8% of land area

(2015) (ITDP and GHS)

Transport Activity and Services

VKT per capita

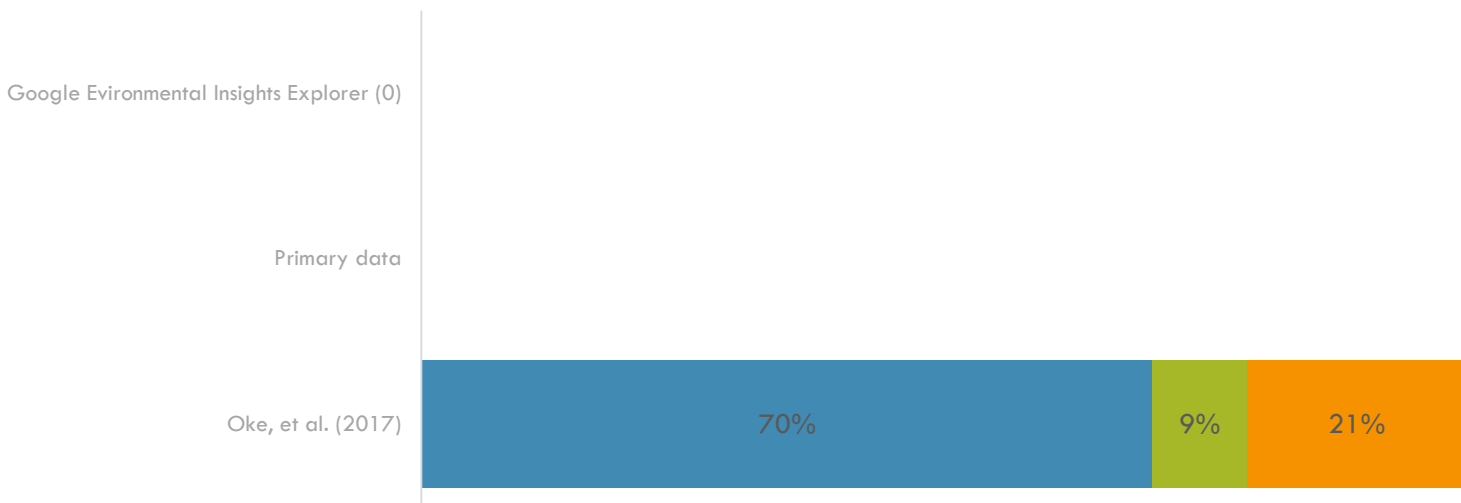
Vehicle-kilometer per capita (2022) (ClimateTrace)



Trips Mode share (b)

Share, %

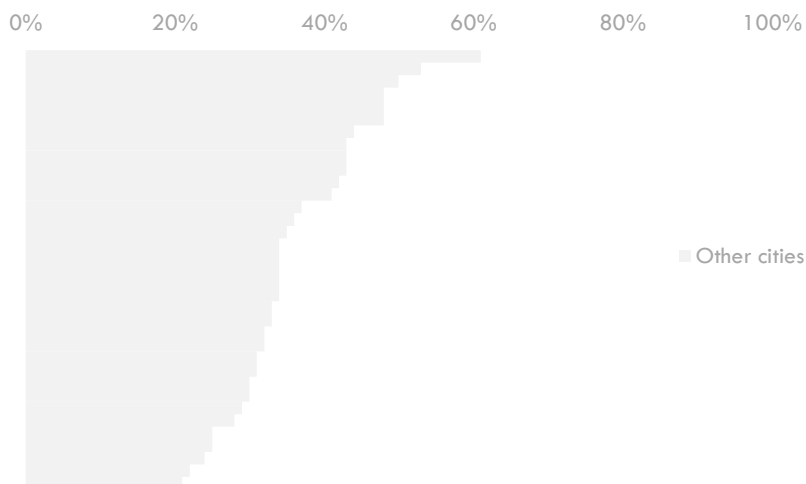
■ Walking and cycling ■ Private ■ Public transport (bus, ferry, informal public transit, etc)



(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.

Congestion level

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

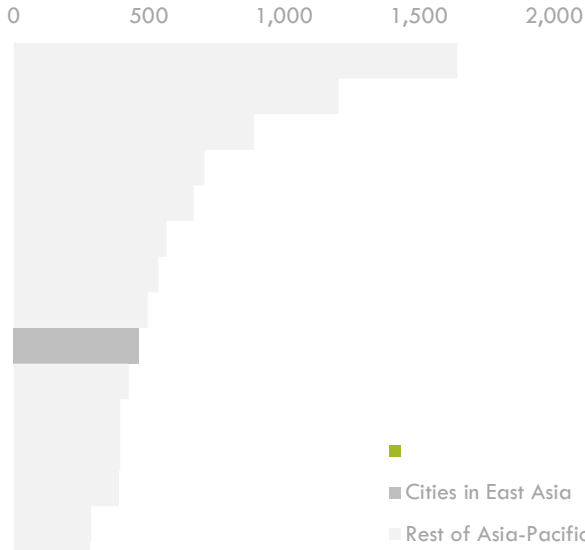


Metro ridership n.d.

Congestion ranking n.d.

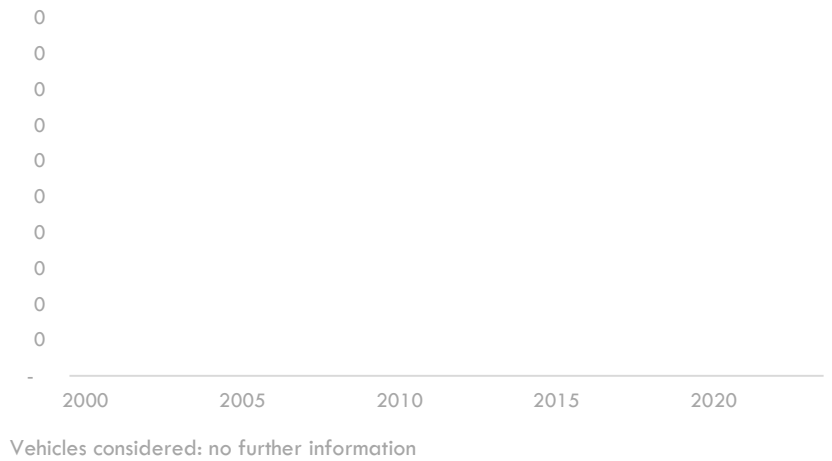
Vehicle motorization

Vehicles per thousand population (Primary data)



Vehicles registered (c)

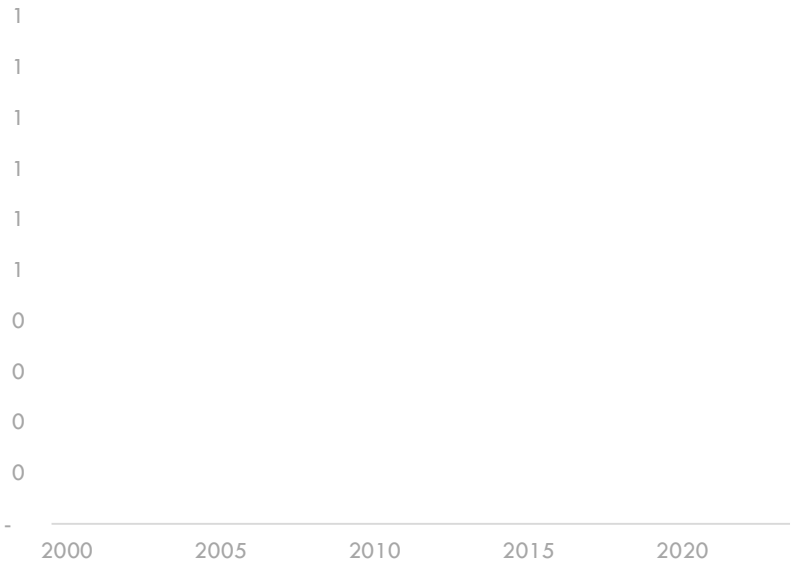
Thousand vehicles (Primary data)



Vehicles considered: no further information

Bus fleet (operational)

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

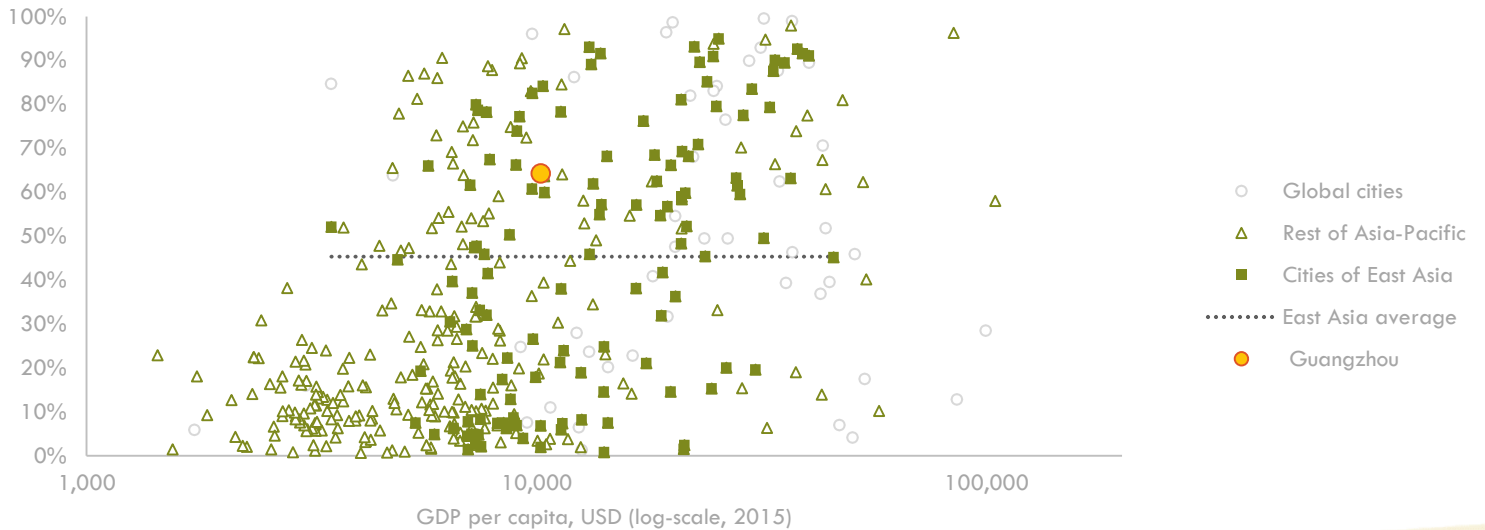


(c) It should be noted that, in most cases, scrapped vehicles are not de-registered, which may result in slightly inflated numbers.

Urban Access

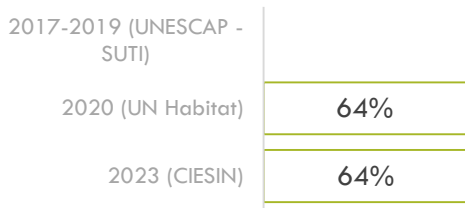
Access to urban public transport

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



Access to urban public transport (d) - by source

Share of population with convenient access to public transport



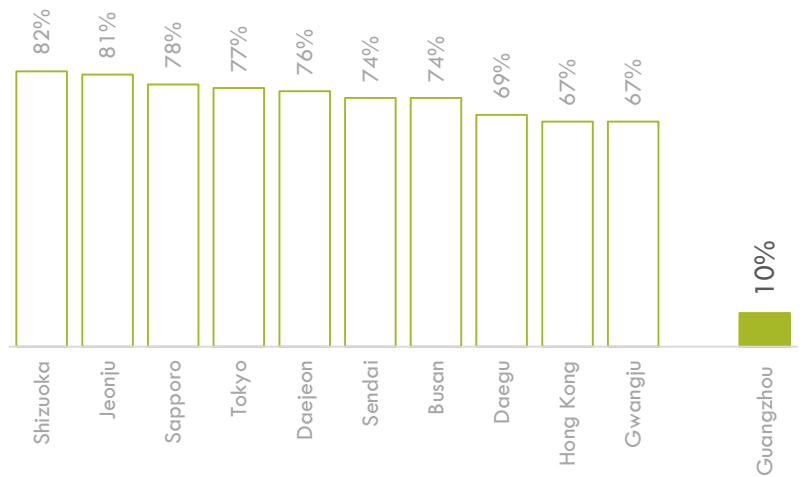
(d) "Access to urban public transport" is computed as share of population who live within a walking distance (along a street network) of 500m to a low capacity public transport system (eg bus, tram) and 1000m to a high capacity public transport system (eg trains, ferries, etc). Only public transport 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).

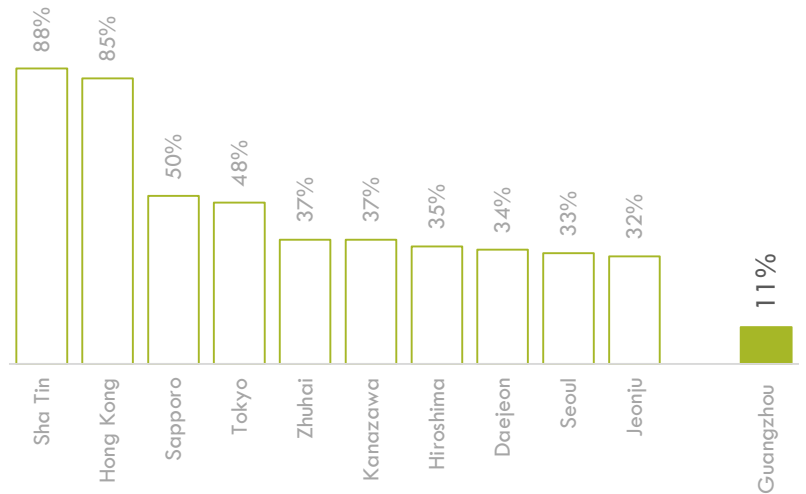
People near services (both healthcare and schools) (e)

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



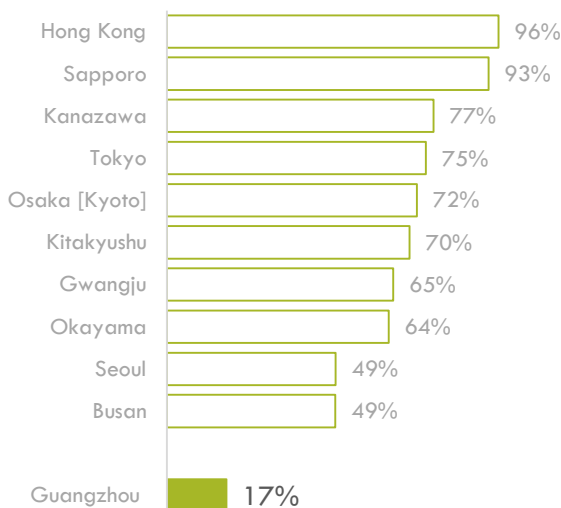
People near car-free places (f)

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



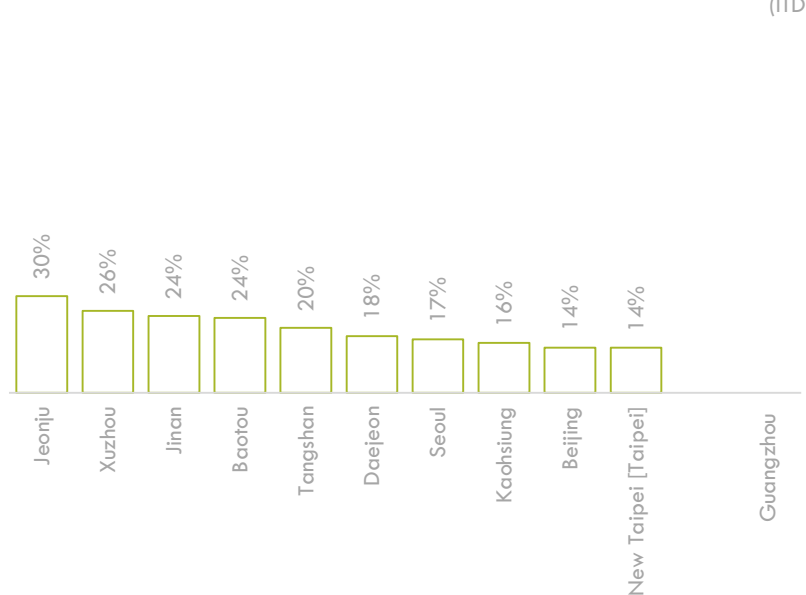
People near open public space

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



People near protected bikelanes

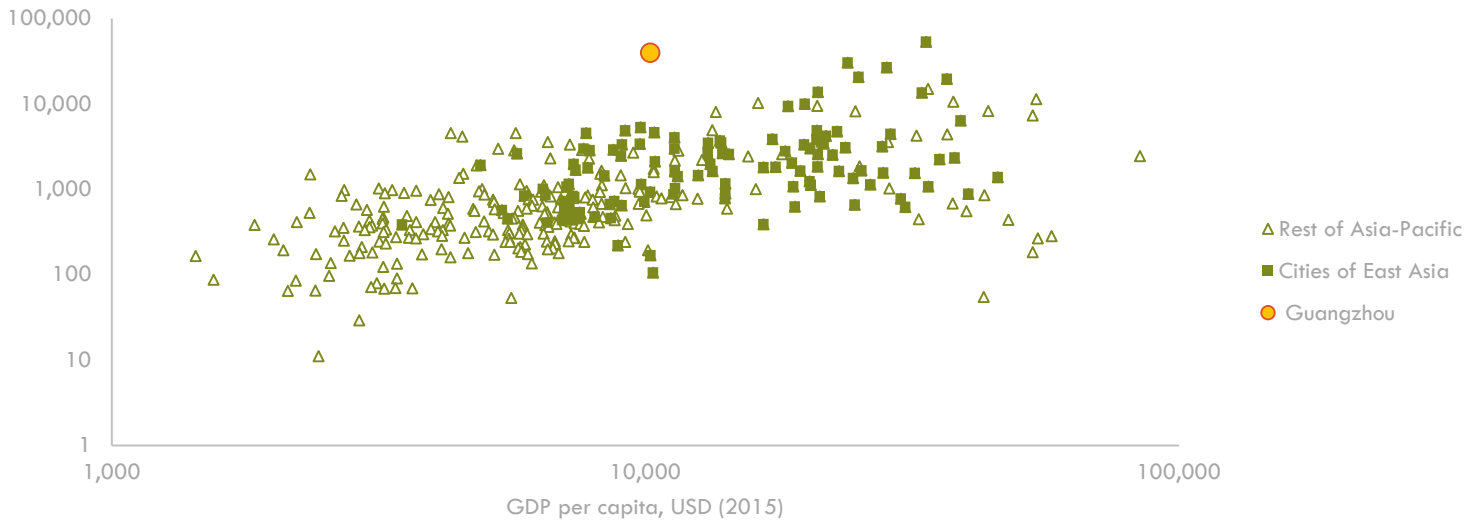
(Share of population) vs. highest 10 cities in East Asia (2020) (ITDP)



Transport externalities

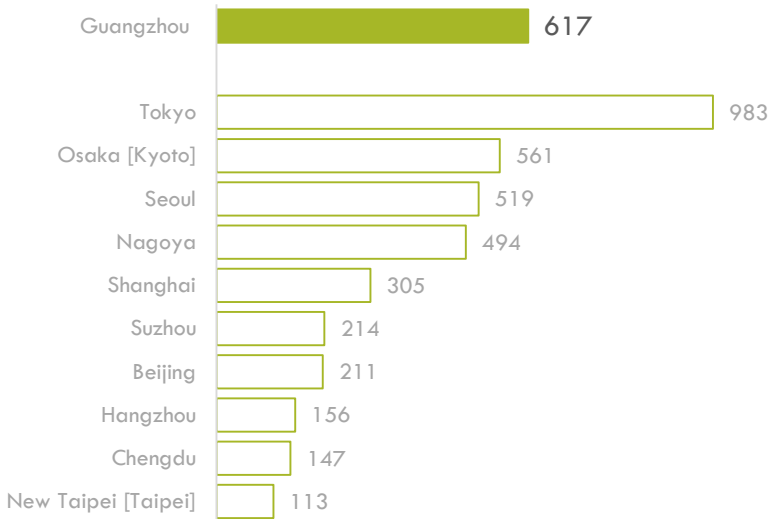
Road transport - CO2 emissions

Thousand tonnes (2022) (ClimateTrace)



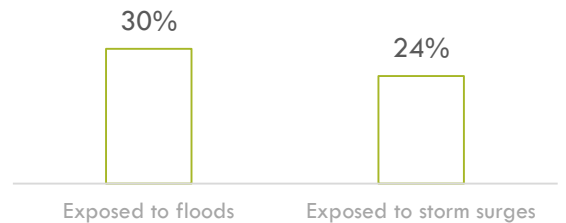
Road transport - N2O emissions

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



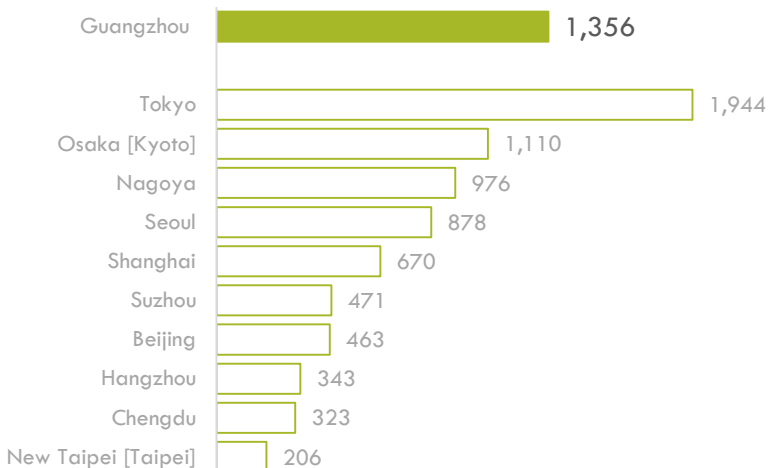
Population exposure to disasters

Share of population (2015) (GHS)



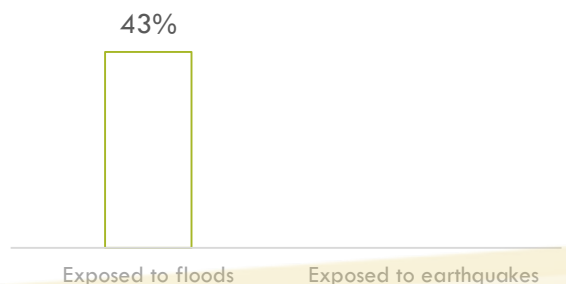
Road transport - CH4 emissions

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



Urban built-up area exposure to disasters

Share of urban area (2020) (GHS)



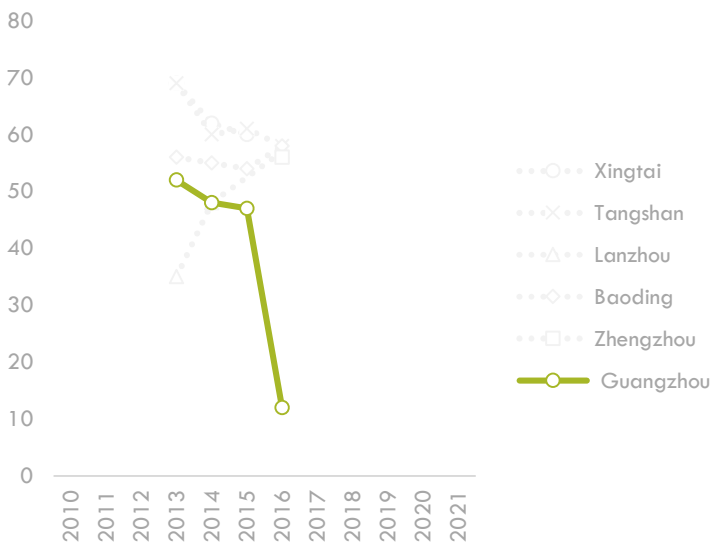
Transport PM 2.5 emissions

(GHS)



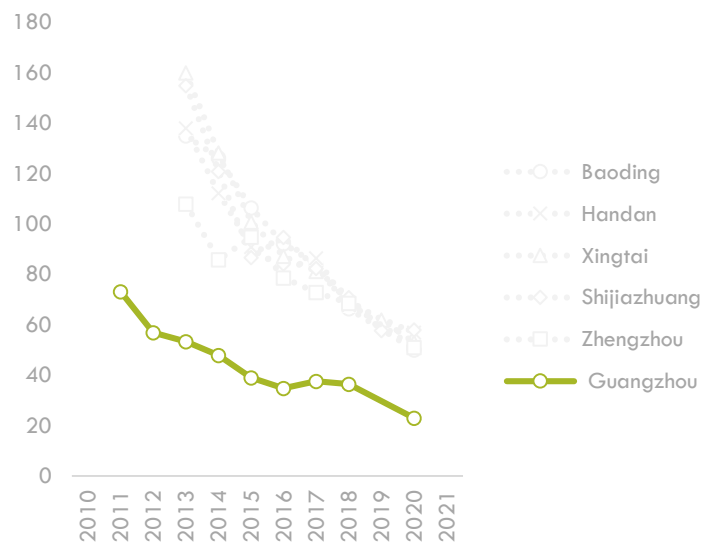
NO2 concentration

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



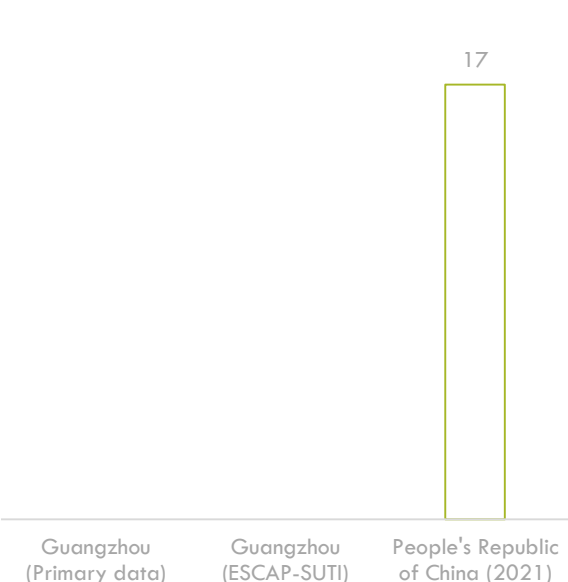
PM 2.5 concentration

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



Road crash fatality rate

Deaths per 100,000 population



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)

Guangzhou 8th out of 370 cities

(2023) (WB)

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

Guangzhou 0.08/1.00

(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

Guangzhou n.d.

Cities in Motion index ranking

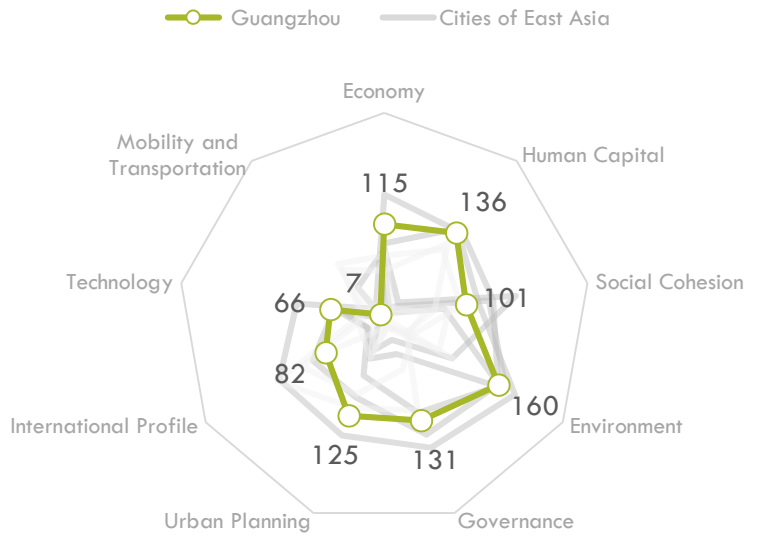
The Cities in Motion Index (CIMI) is a composite indicator evaluating cities across nine dimensions—governance, urban planning, technology, environment, international profile, social cohesion, human capital, mobility, and economy—focusing on sustainability and quality of life. It uses a weighted aggregation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

Guangzhou 131st out of 183 cities

(2024) (IESE)

Cities in Motion index ranking by subcomponent

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



Transport relevant policy documents

Year published	Document name
2016	Guangzhou City Master Plan

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