Asian Transport Observatory

Bengaluru

Urban Transport - State of Play

Insights from the Asian Transport Observatory (ATO)

Uploaded Jan 2025

ADB ASIAN DEVELOPMENT BANK
AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

Section 1: Bengaluru city – state of play

Asian Transport Observatory

Urban form, space and structure

ADB ASIAN DEVELOPMENT BANK

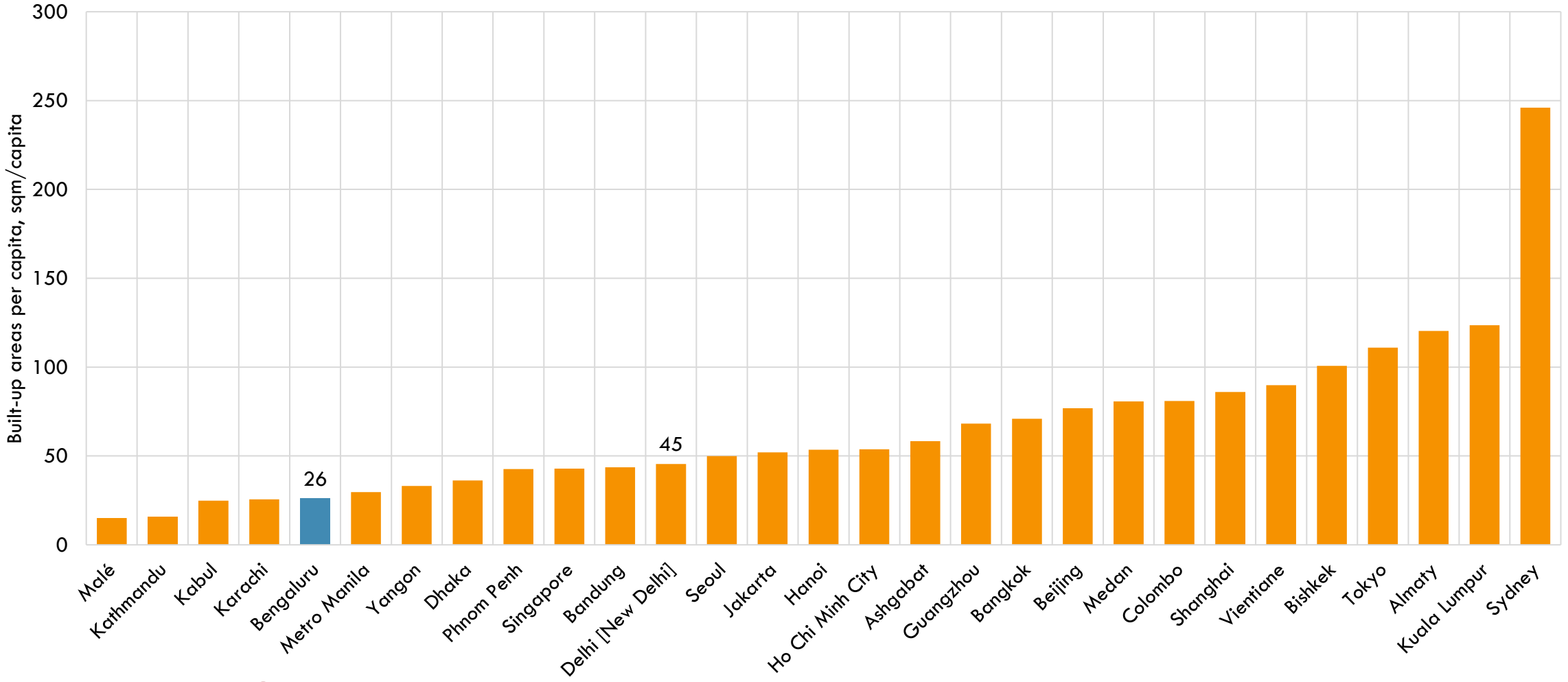
AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

Bengaluru has 83 blocks per sqkm, standing significantly higher compared to majority of the Indian cities.

ADB ASIAN DEVELOPMENT BANK

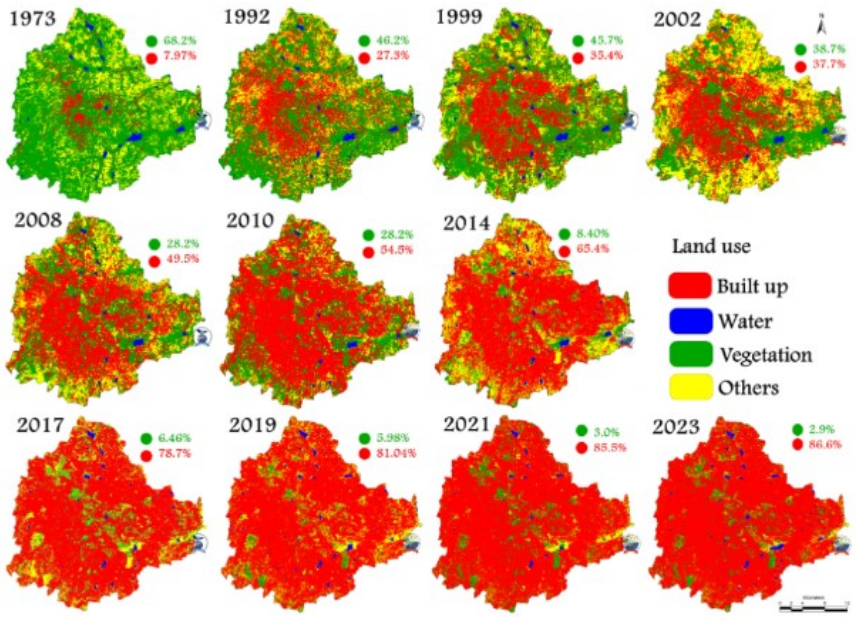
AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

Bengaluru stands at 25 sqm of built up area per capita, which is significantly less compared to major Asian and non Asian cities.

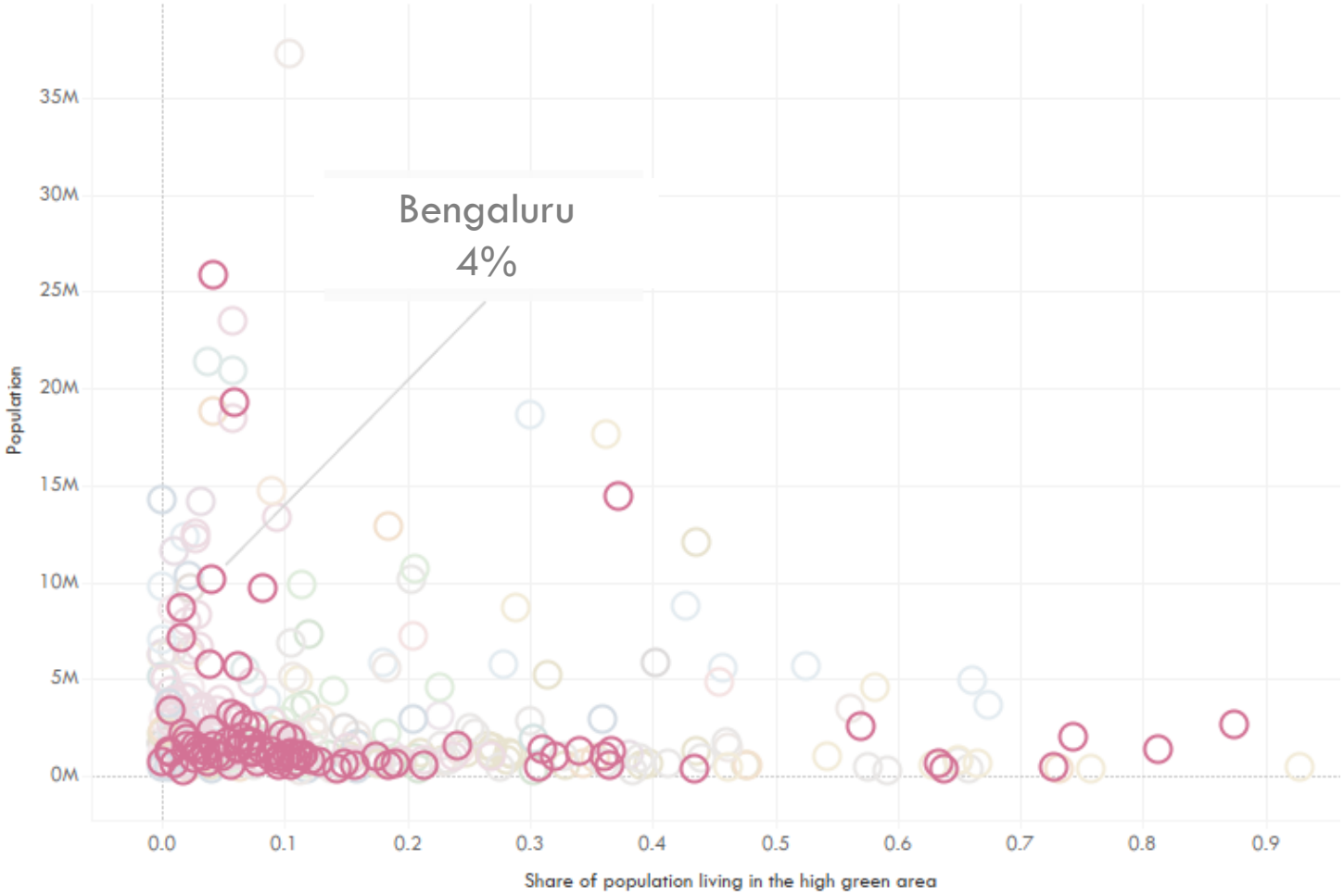


Only 4% of the Bengaluru population are estimated to be living within green areas. The average for all the cities in India is 2%.

- Share of population living in the high green area in 2015 in the Urban Centre of 2015
- High green for 0.6 <Greenness < 0.9: corresponding to dense vegetation (e.g. forest, gardens, etc.).
- Geospatial operations applied to derive attributes of Urban Centres.

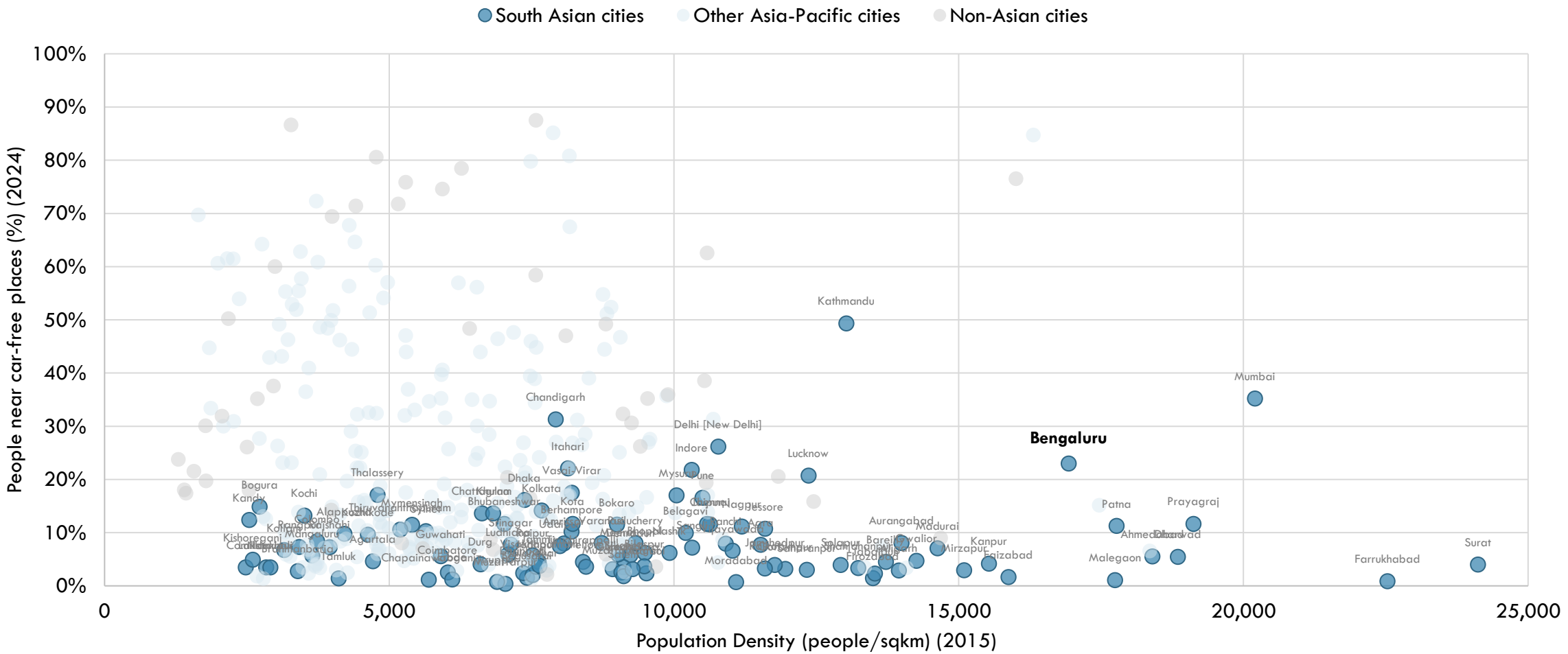


Source : wgbis.ces.iisc.ac.in



ADB ASIAN DEVELOPMENT BANK AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

Only 23% of the population live near car-free places in Bengaluru.



- Footpaths are available along about 47% of the road length
- About 32% of the transit corridor length is covered with mixed use development (815/2537) km.

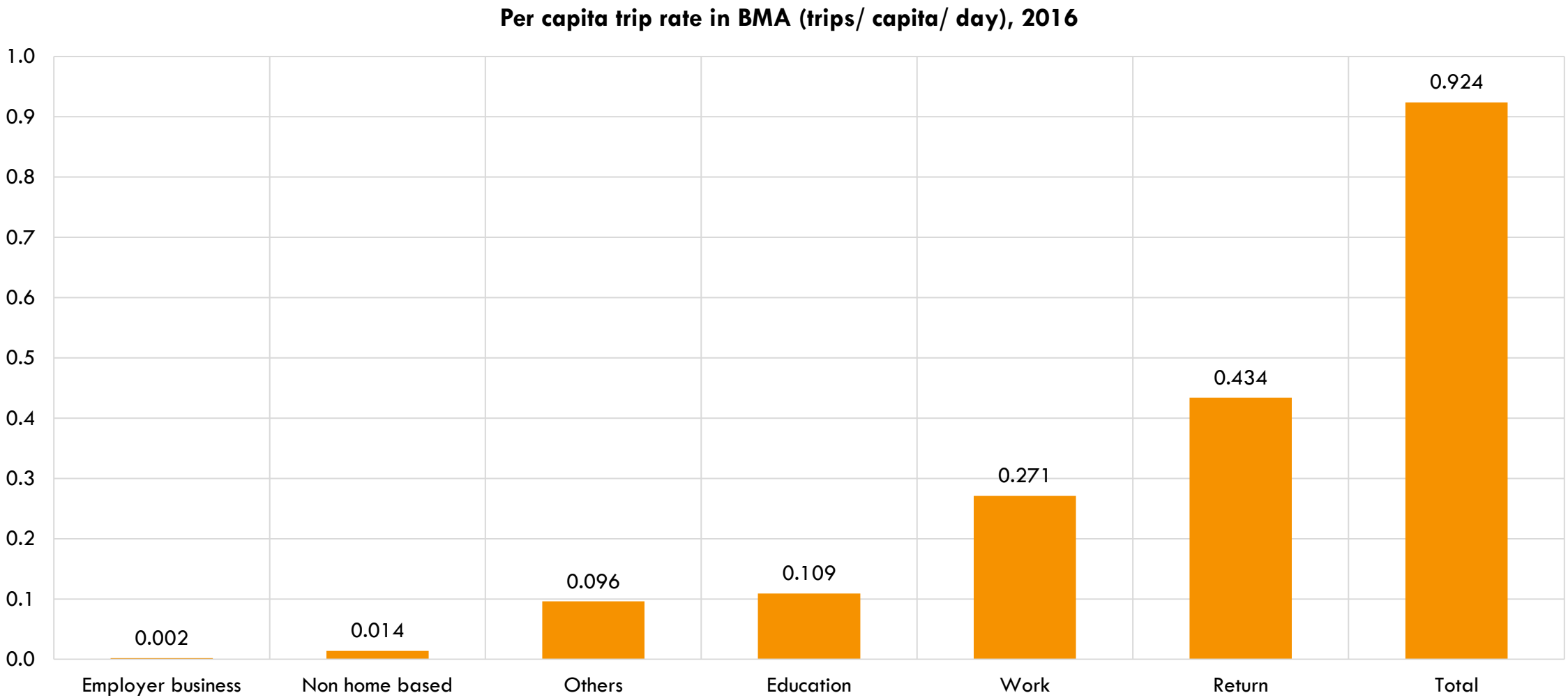
Based on CMP

Bengaluru demonstrates a compact structure of population distribution also indicating a dense economic activity

In terms of landuse share, the Area allocated for transportation and communications falls very short of the requirements. The general norm is 20% but most cities achieve at least 15% and what Bengaluru is bestowed with is only 7.3%. (CMP)

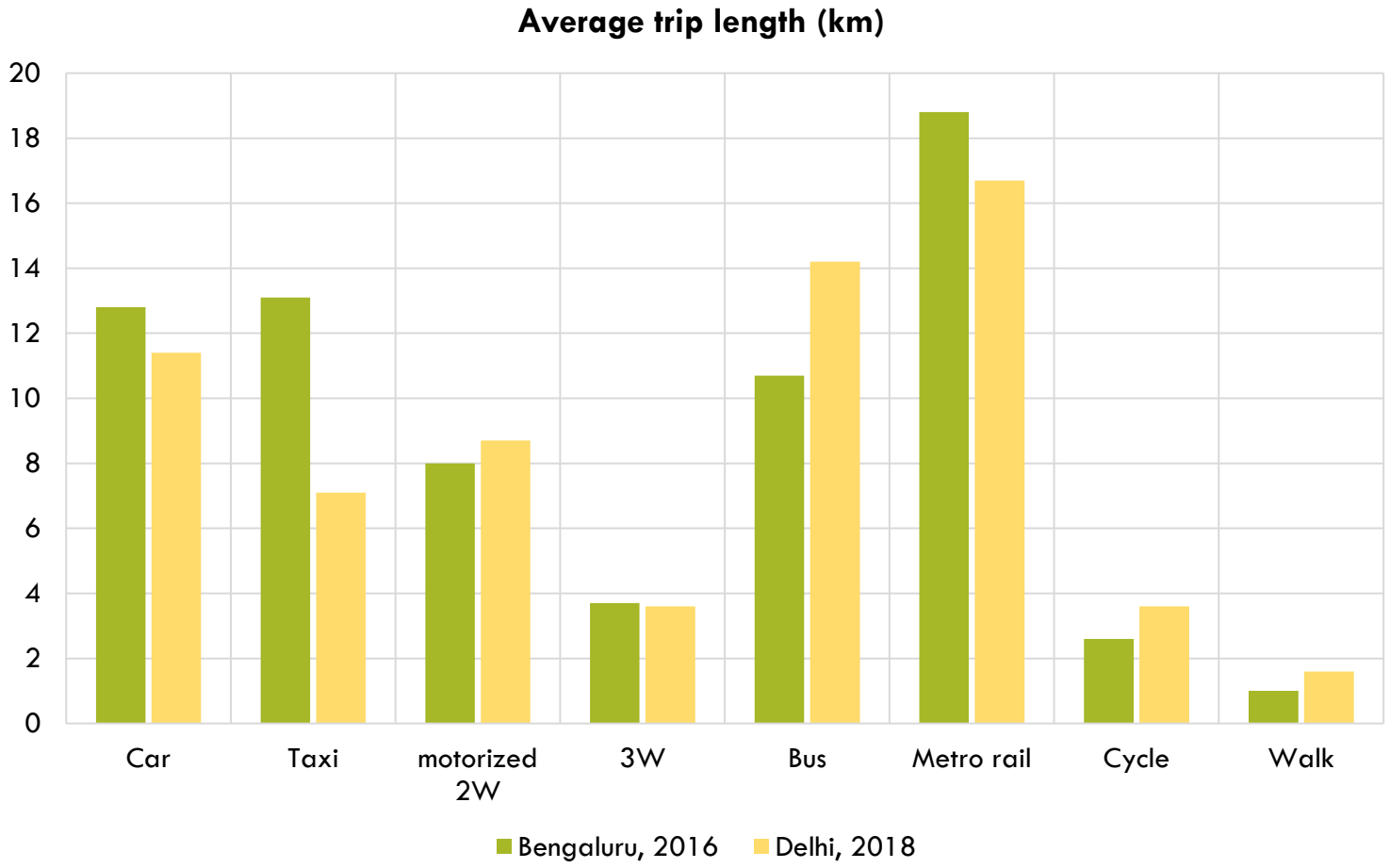
Transport activity and characteristics

Work trips dominate the trip types in Bengaluru

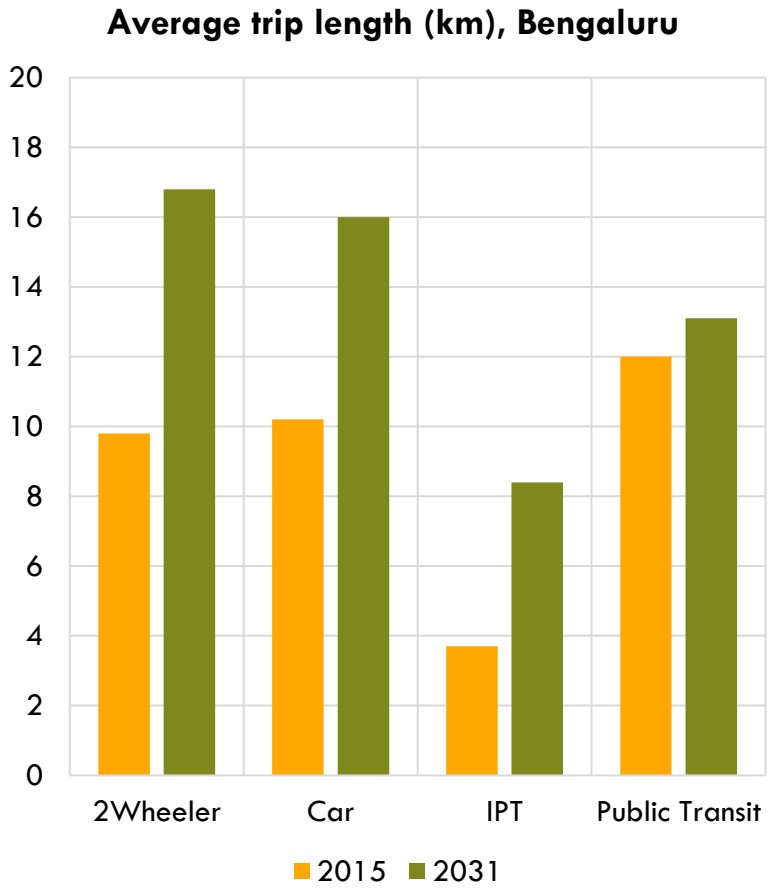


Source: https://data.opencity.in/dataset/comprehensive-traffic-and-transportation-plan-for-bengaluru/resource/bengaluru-comprehensive-traffic-and-transportation-plan---chap-3-existing-traffic-and-travel-charac

Car, Taxi, 3W and metro rail average trips lengths in Bengaluru are higher than that of Delhi.



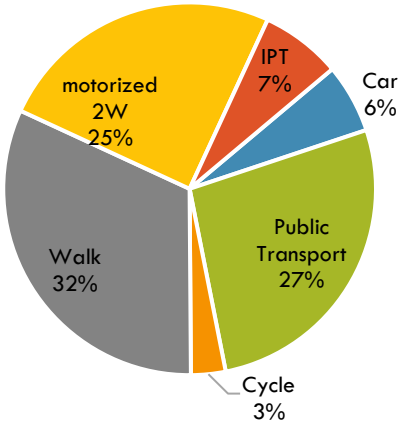
Source: ATO urban database, city official reports



Source: CMP

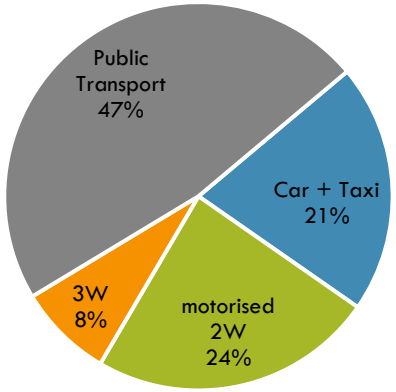
Mode share of public transport and motorized 2W stands strong throughout *All the studies follow a different analytical methodology

Mode share (2011)



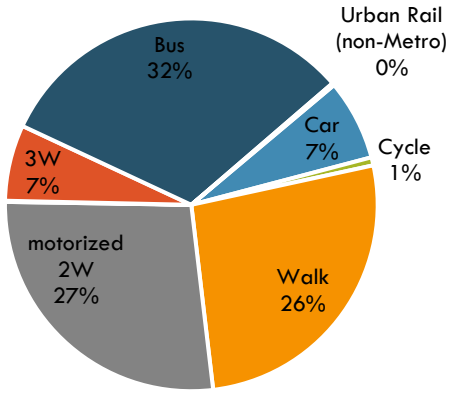
Source: Bengaluru Mobility Indicators 2010-11

Mode share (2015)



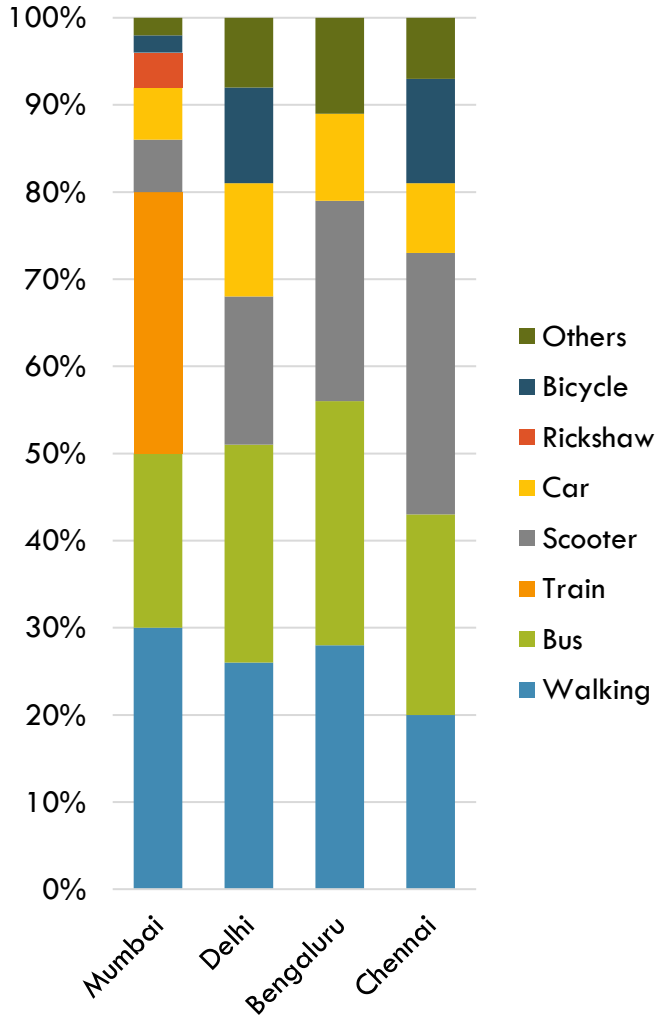
Source: CMP

Mode share (2016)



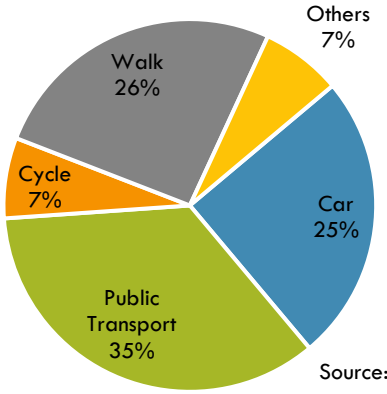
Source: CMP

Mode share (2011)



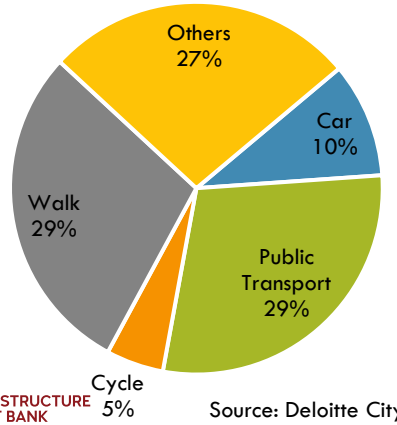
Source: Census of India, 2011

Mode share (2017)



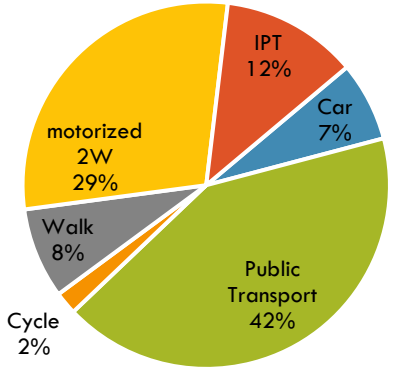
Source: Oke et al.

Mode share (2018)



Source: Deloitte City Mobility Index

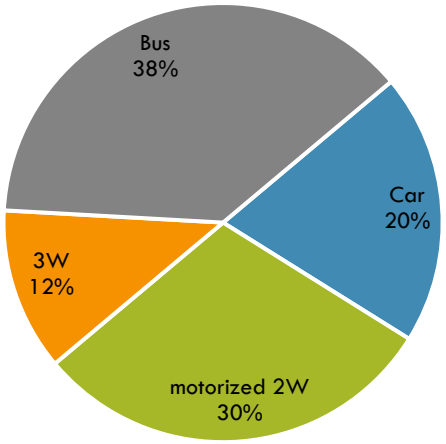
Mode share (2022)



Source: Tumi E-bus mission

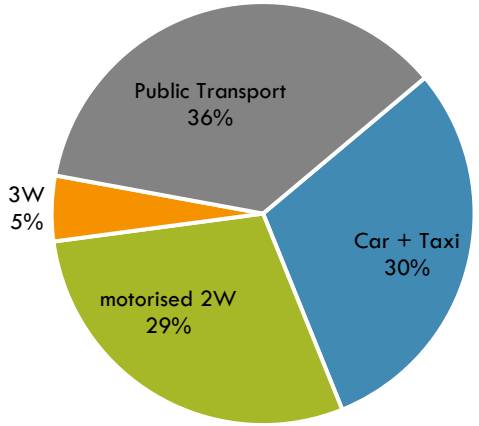
Estimated mode shares in the Future (2031) BAU scenario indicate a similar trend dominated by public transport and 2W.

Mode share estimated (2031)



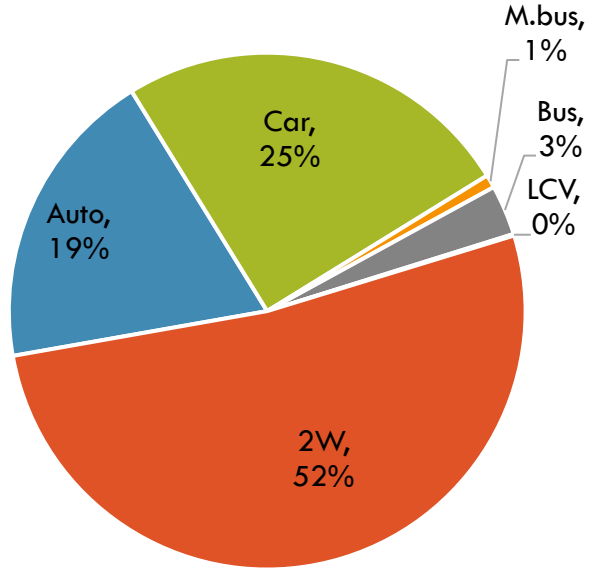
Source: CTTS, JICA; Base year 2011

Mode share estimated (2031)



Source: CMP; Base year 2015

Traffic Composition at Typical Mid Block/Screenline Locations



Source: Bengaluru Comprehensive Traffic and Transport Plan

- Indicative variation with the surveyed numbers. Survey, 2016

Asian Transport Observatory

Transport infrastructure and access

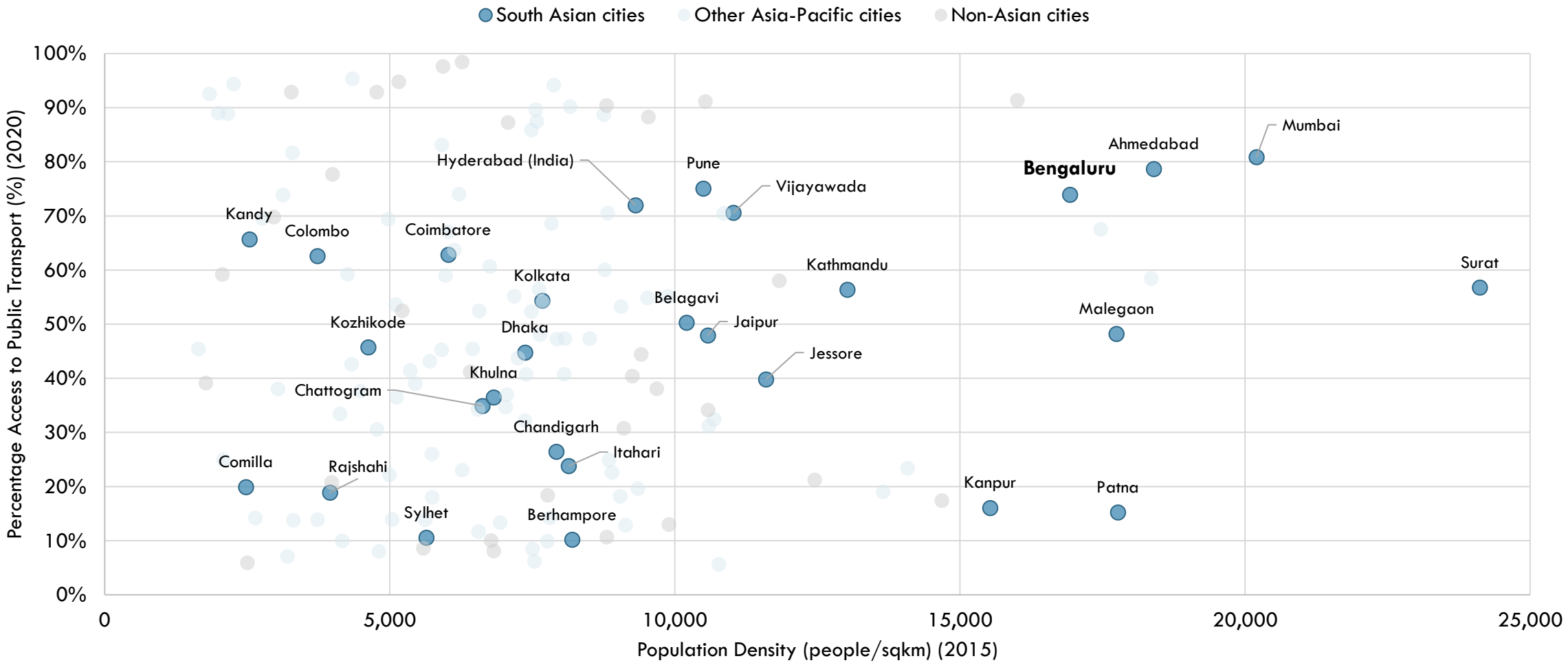
ADB ASIAN DEVELOPMENT BANK

AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

Bengaluru has a significantly low road length availability at just about 1m per capita, but still higher compared to Delhi and Chennai.

Source: Oke et al.

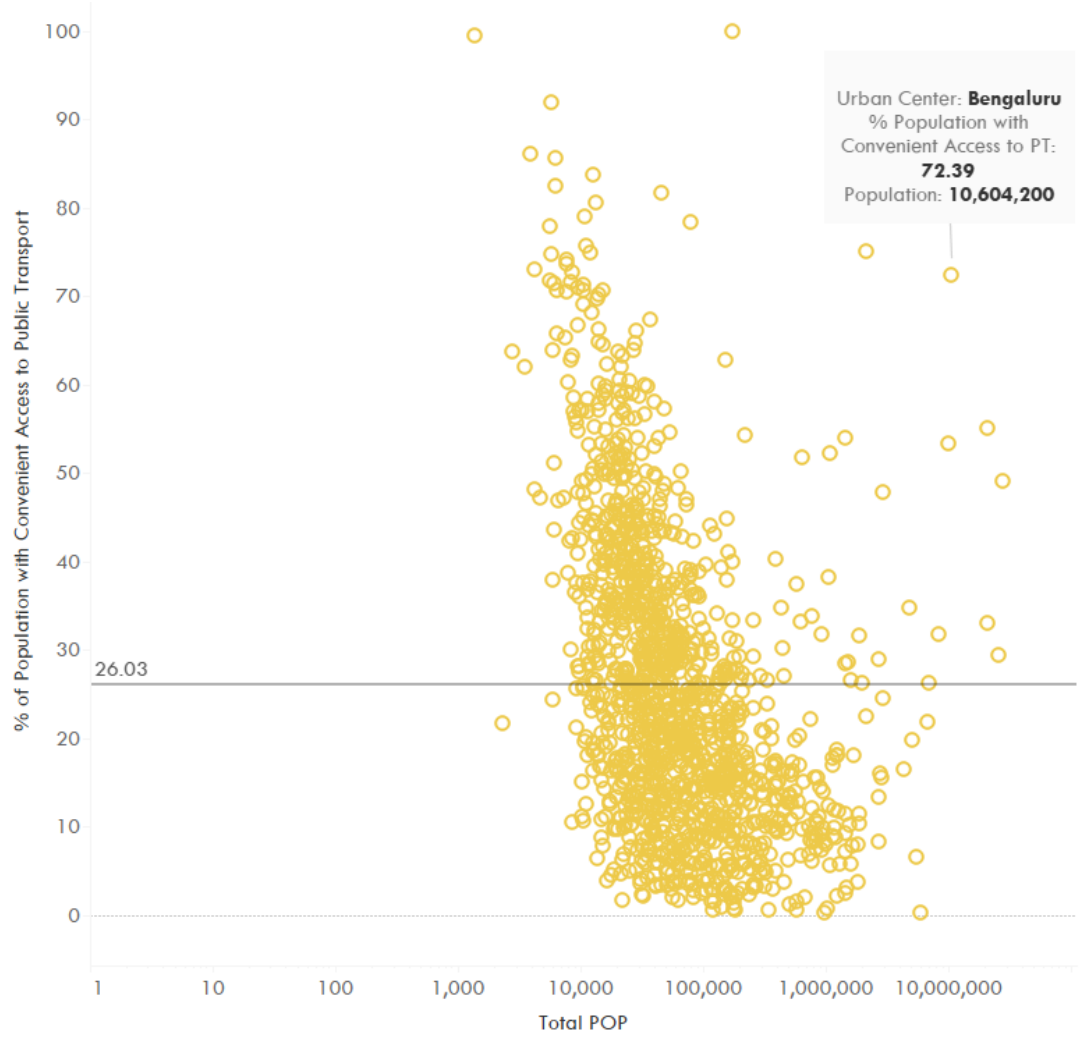
Based on the UN-Habitat data, Bengaluru has a decent public transport access at 74%.



ADB ASIAN DEVELOPMENT BANK AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

Source: UN-Habitat

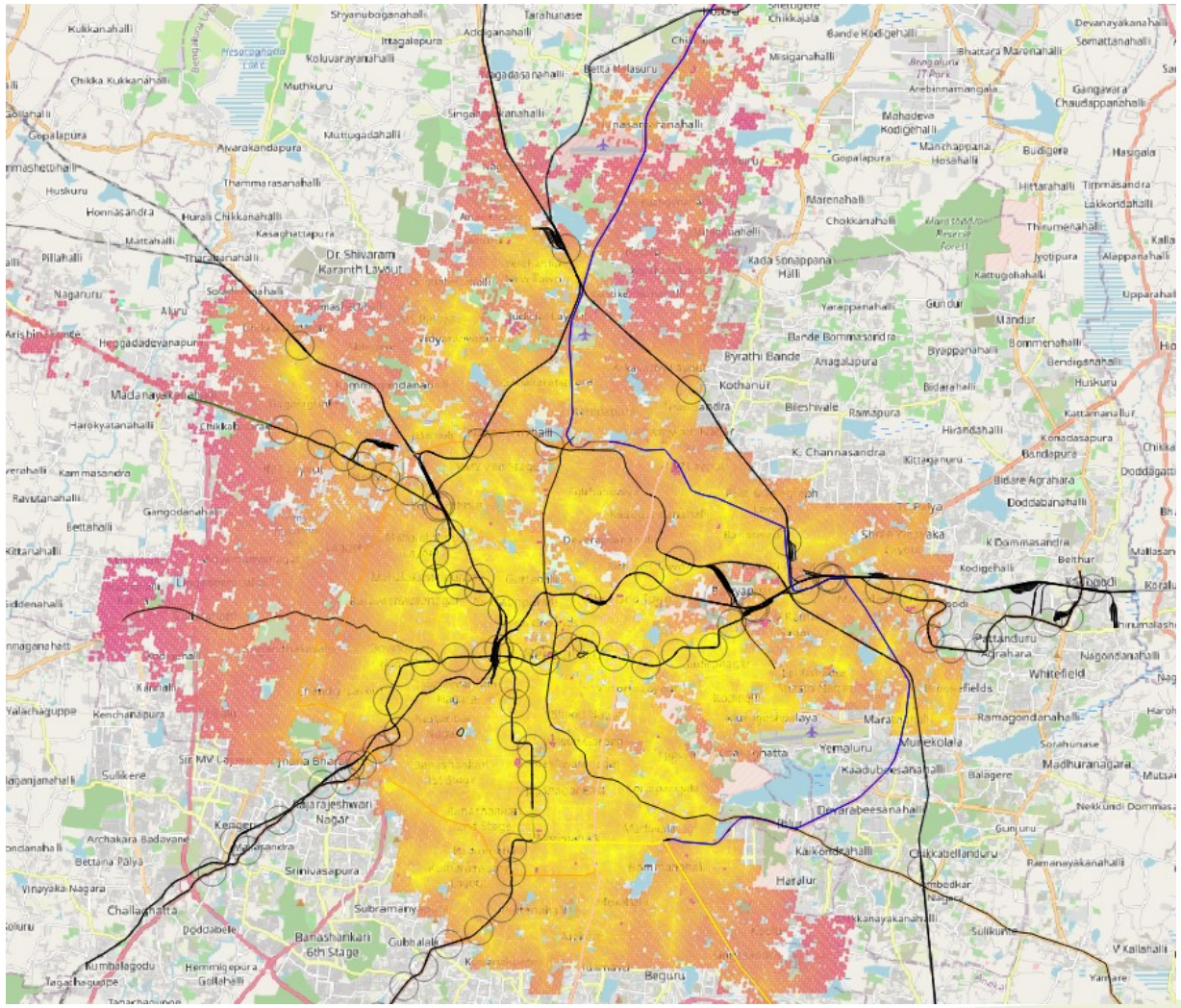
Based on CIESIN data, the estimated % of the population with convenient access to public transport is 72%, significantly higher than the 26% national average.



Source: Visualization by the Asian Transport Outlook (ATO) using data from CIESIN Columbia University (2023)

Around 73% of the urban population in Bengaluru has access to services* within a 15 minute walk.

- It is estimated that around 73% of the urban population in Bengaluru has access to services* within a 15 minute walk. The estimated average for urban areas in India is 20%.



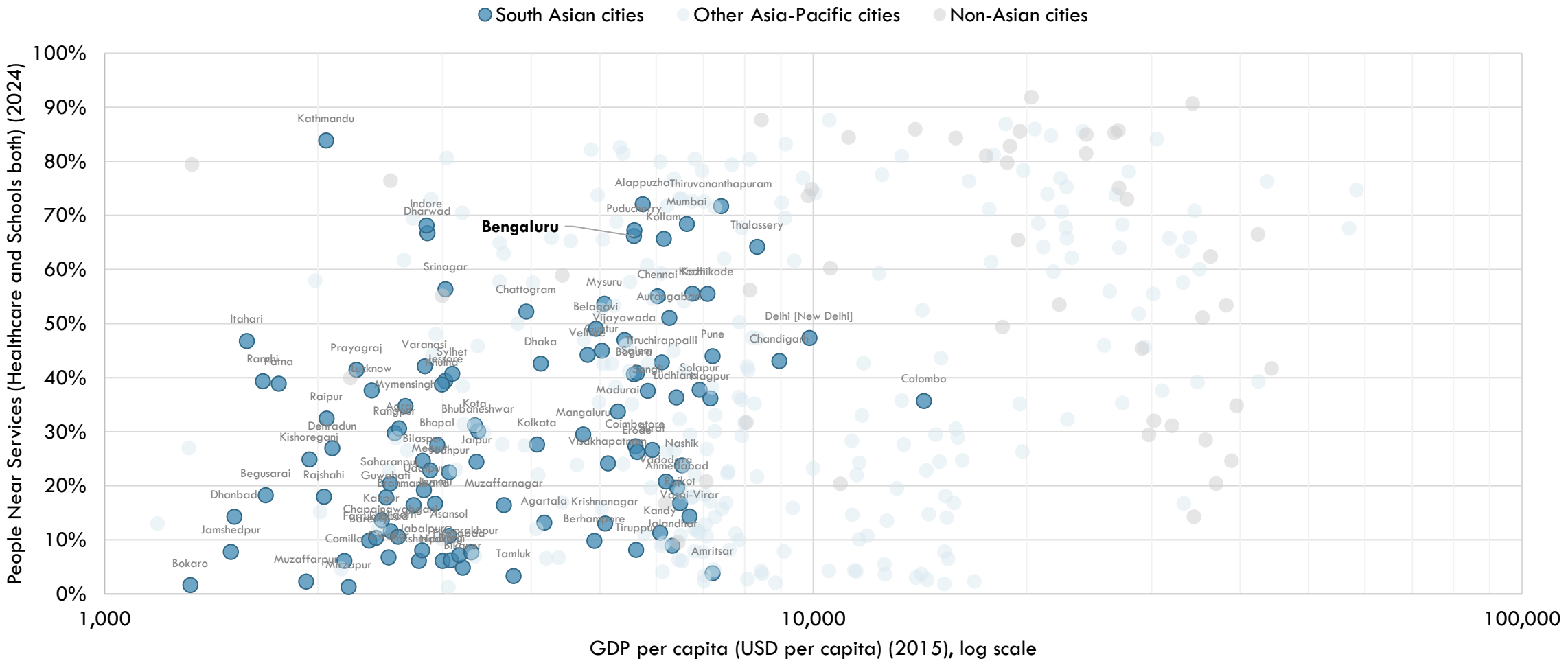
* Public transit stations; parks, recreation, educational; medical; food.
Source: https://www.cityaccessmap.com/

ADB ASIAN DEVELOPMENT BANK

AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

Asian Transport Observatory

Based on the ITDP data, 66% of Bengaluru population lives within 1km walk of both healthcare and educational services



ADB ASIAN DEVELOPMENT BANK

AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

Source: ITDP

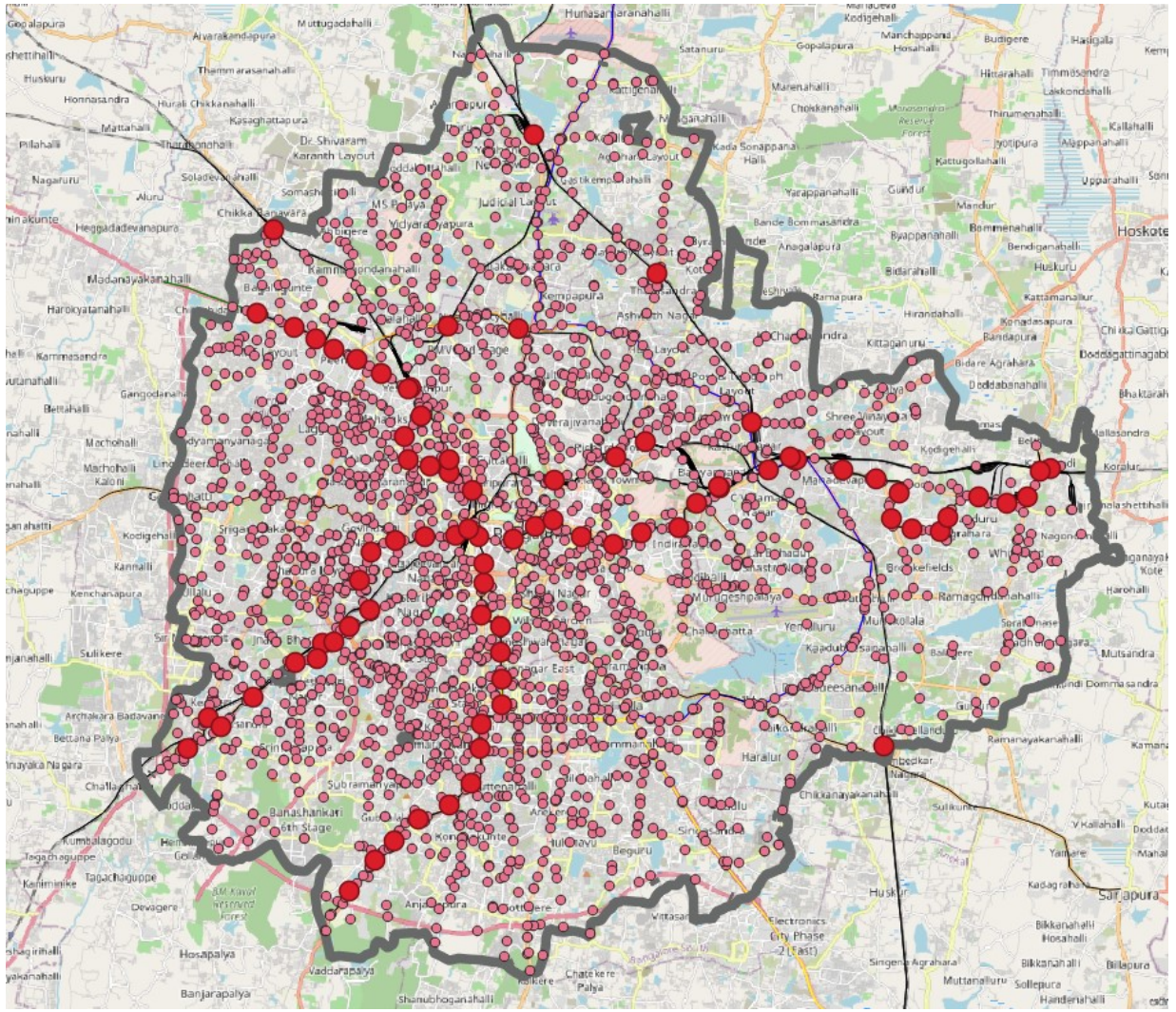
Asian Transport Observatory

Bus transport system

ADB ASIAN DEVELOPMENT BANK

AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

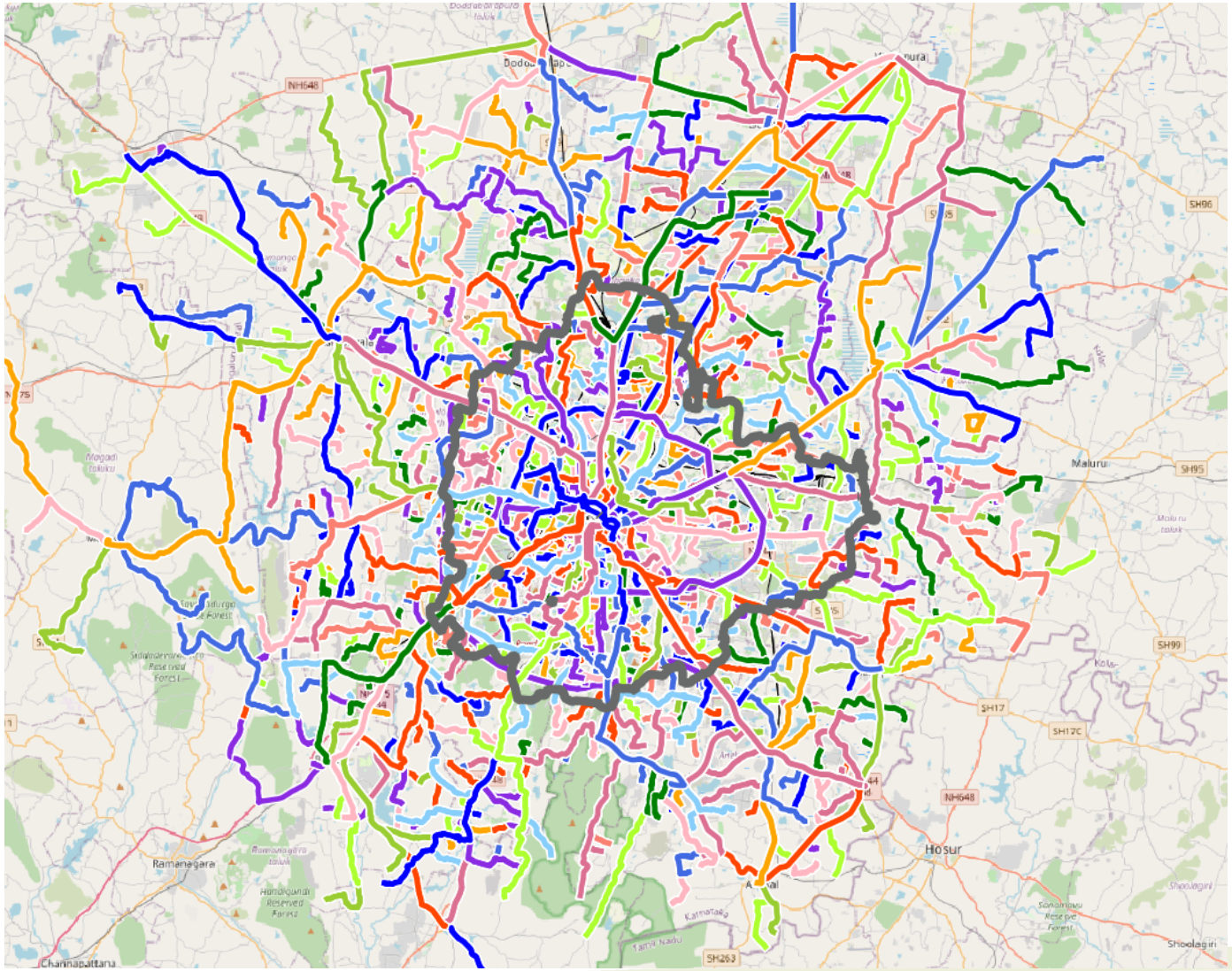
More than 4,400 public transport stops (within the Bruhat Bengaluru Mahanagara Palike – BBMP) boundaries



Source: ATO analysis using data from opensource GTFS file

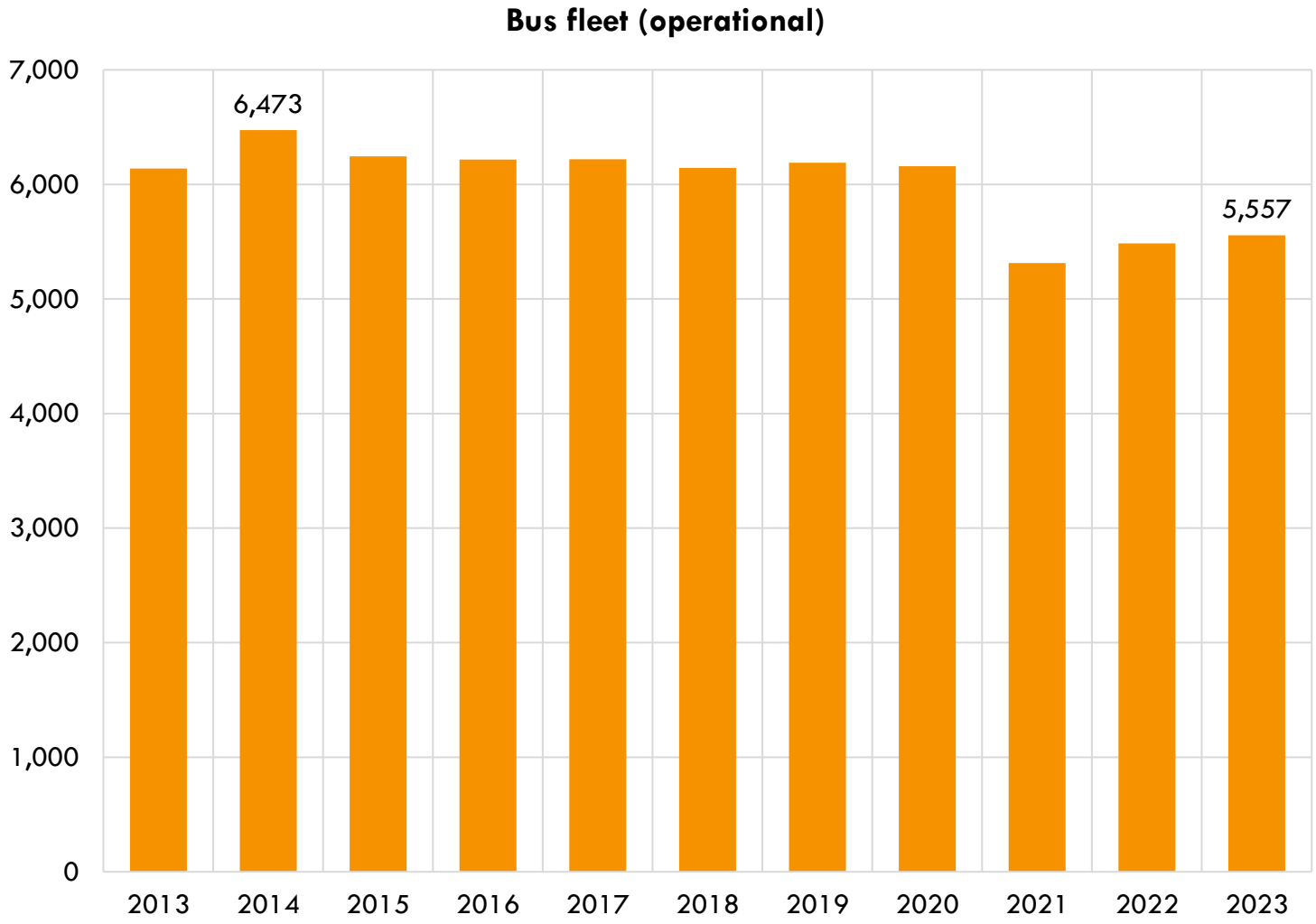
2,870 public transport routes identified for the greater Bengaluru Metropolitan Region (1,684 in the BBMP area).

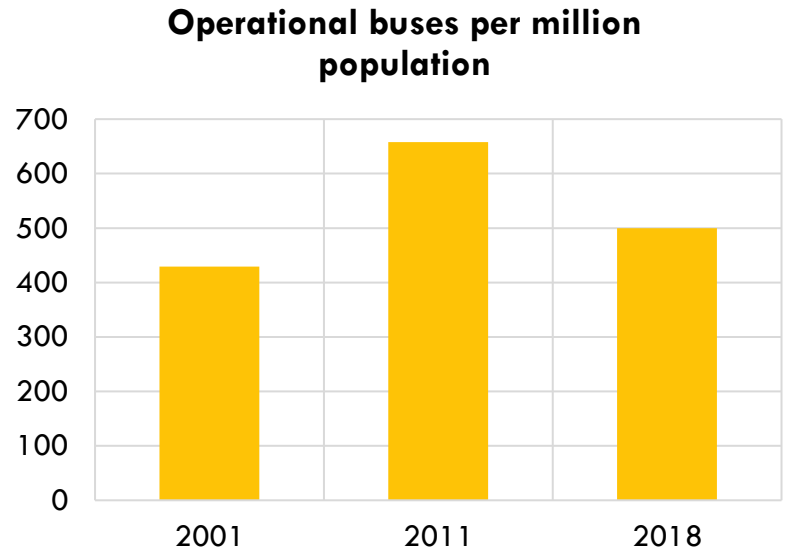
- The total route length in the metropolitan region is >103 thousand km.
- Within BBMP, it is 24 thousand km.

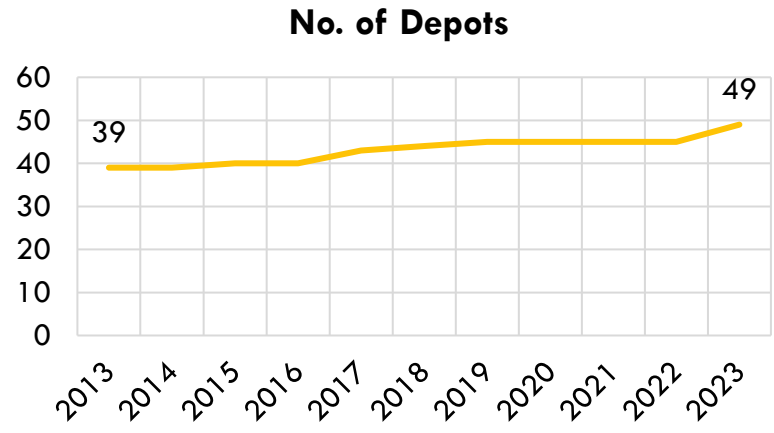


Source: ATO analysis using data from opensource GTFS file

Operational bus fleet is decreasing



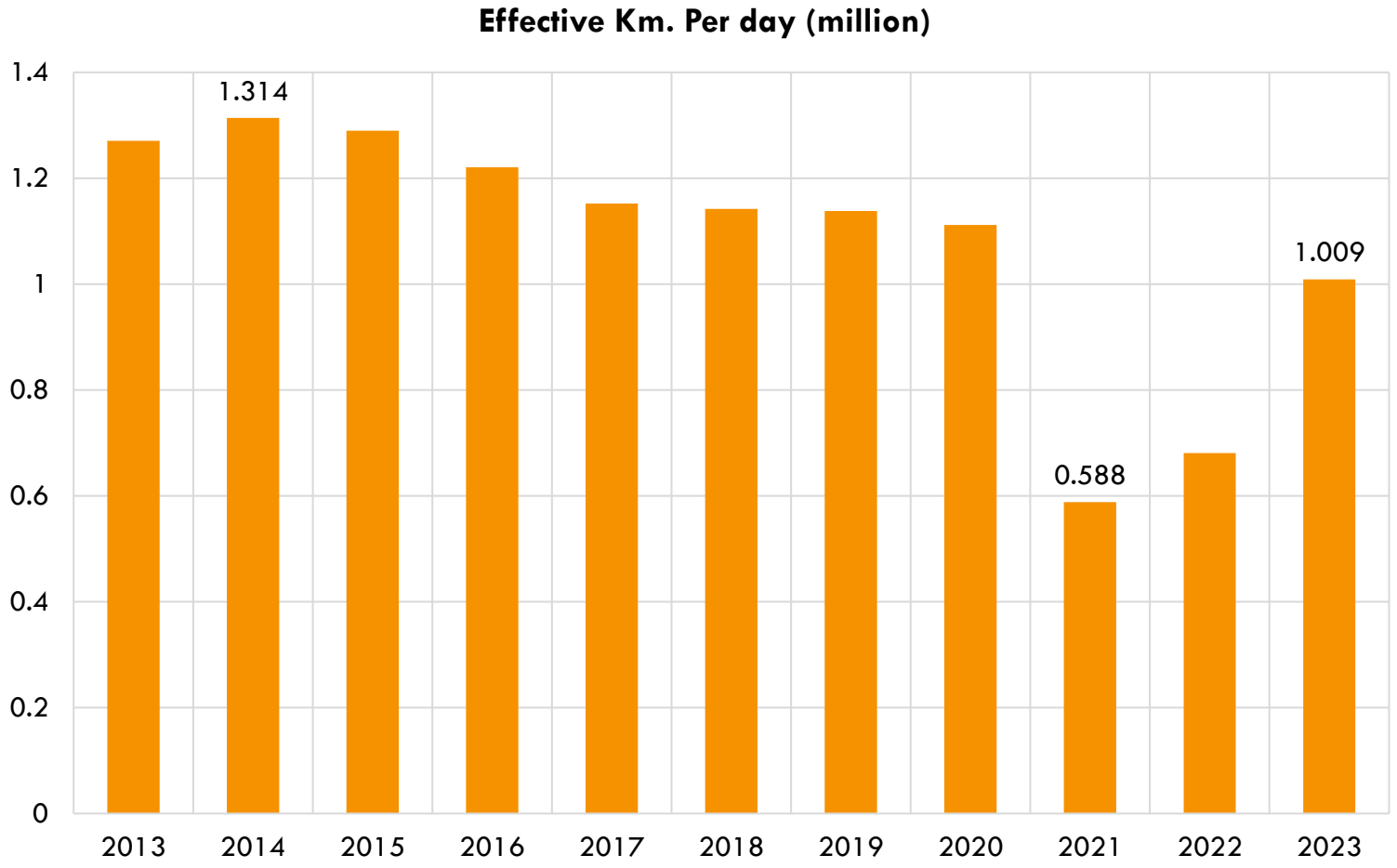


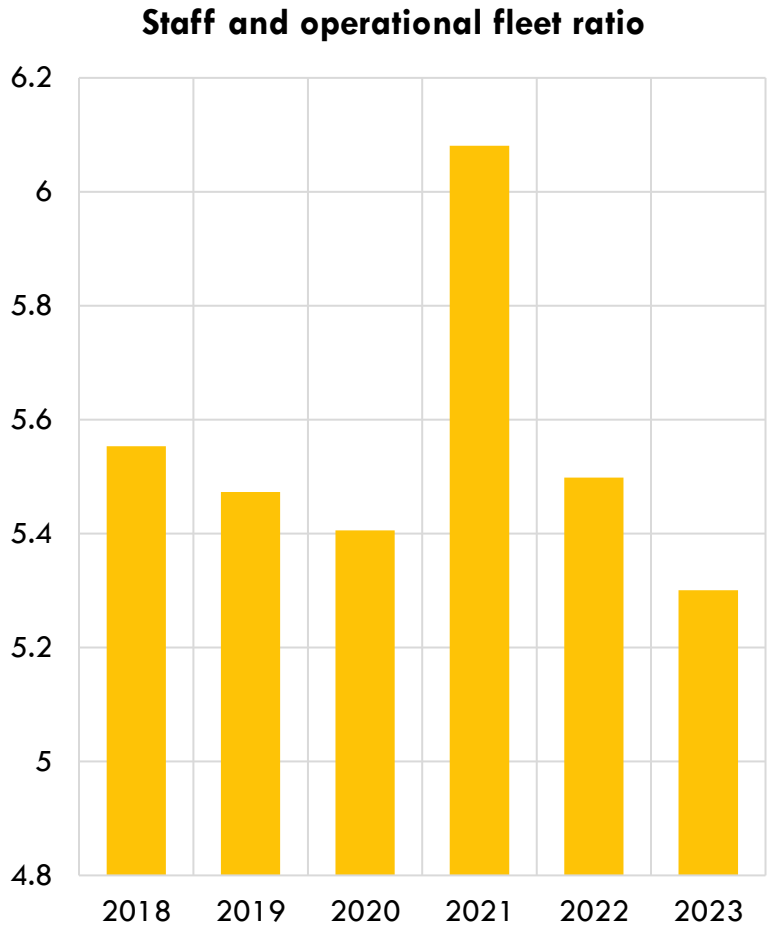


ADB ASIAN DEVELOPMENT BANK AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

Source: Open city, CMP

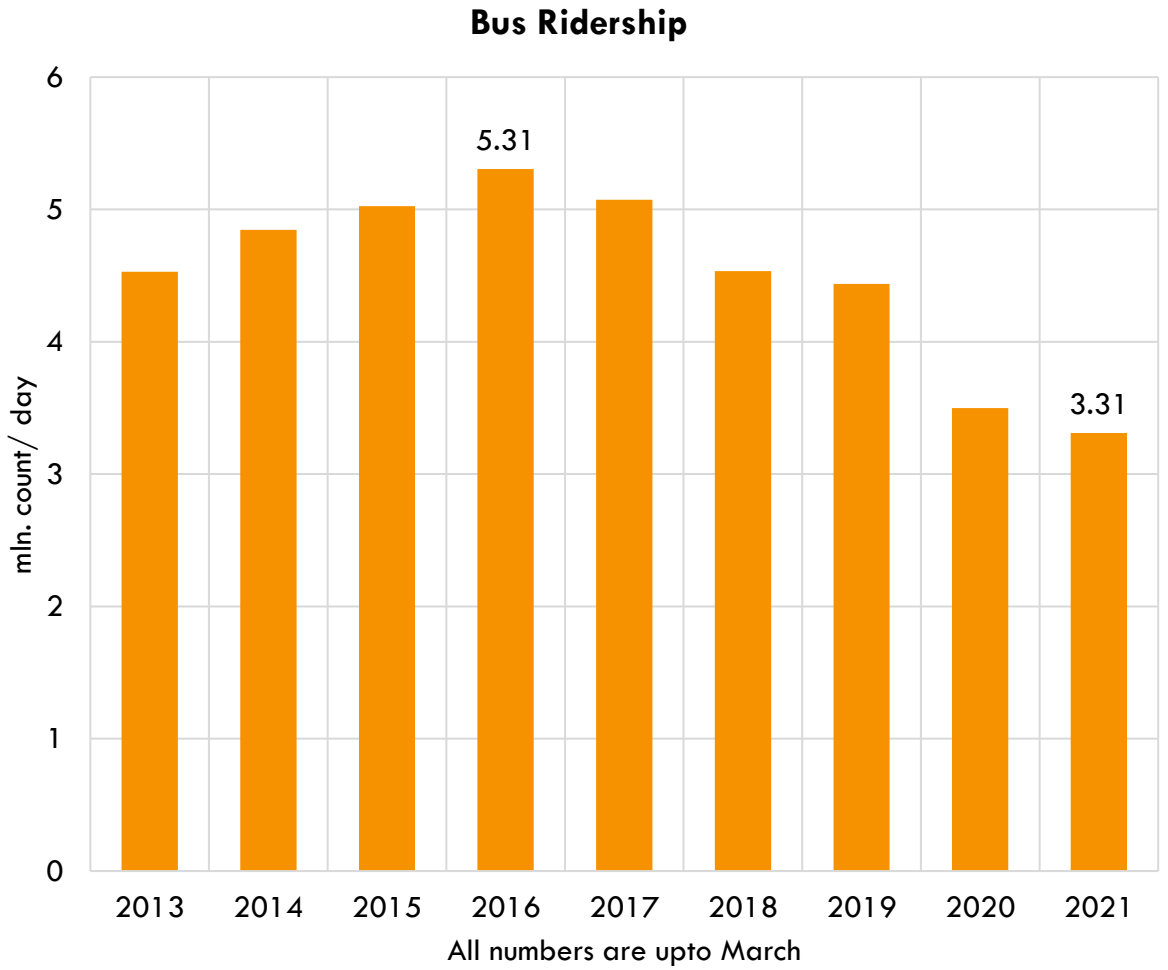
Effective km per day performed by the BMTC bus fleet is decreasing. Staff and operational fleet ratio has dropped in 2023 against recent years.

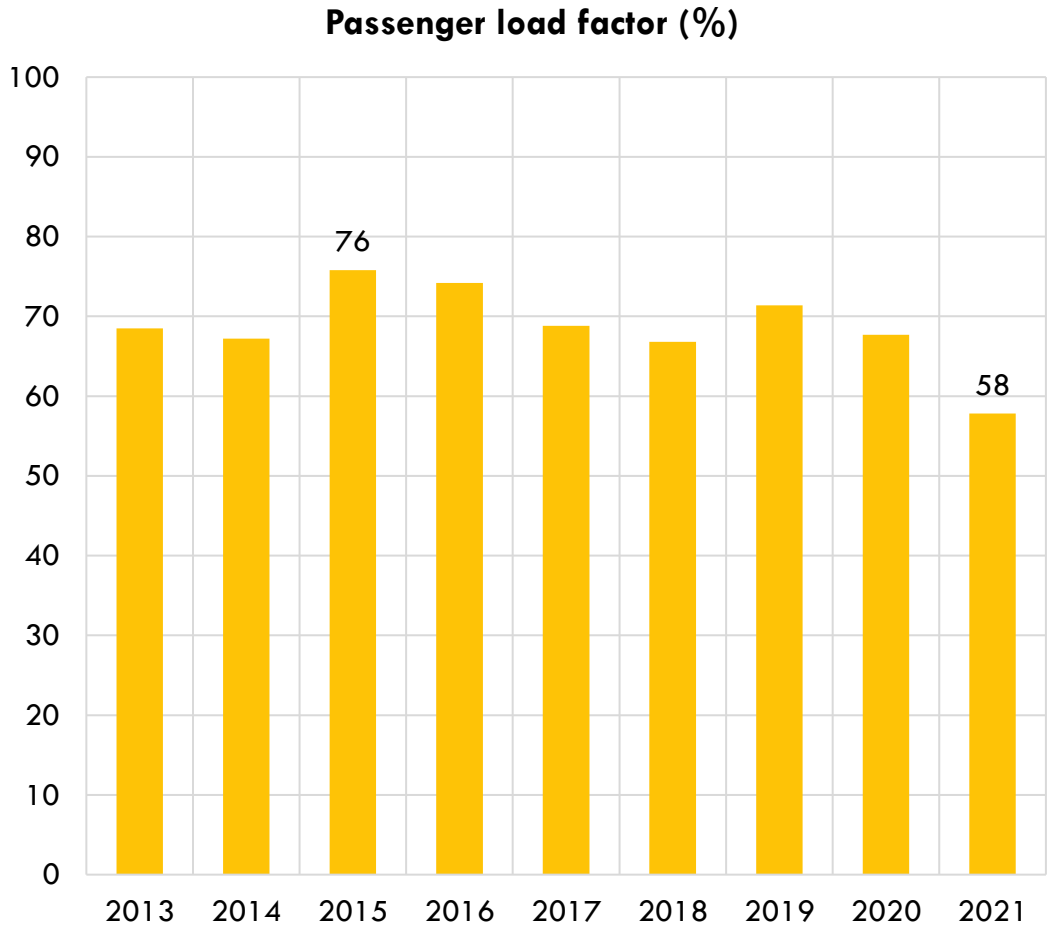




Source: Open city, CMP

Bus ridership and load factor trends are decreasing





Source: Open city, CMP

Public and Private Transport Analysis: Passenger Behavior, Load Factors, and Journey Speeds

- About 53% of total passengers take less than 20 minutes and about 47% passengers take more than 20 minute to reach bus terminals from their initial origins.
- About 56% of total passengers at bus terminals are daily and about 23% are occasional travelers.
- The average headway for each bus route is about 25.26 minutes. Therefore, the average waiting time is half the headway i.e. 12.63 minutes.
- Load factor was calculated for different routes (Peak and Off peak hours). From the calculated load factor distribution table was prepared. The average value obtained from the distribution is about 0.72
- From the speed and delay survey for private vehicles, the average journey speed for major corridors for the private vehicles = 11 Kmph.
- From the speed and delay survey for public transport, the average journey speed for major corridors for the public transport = 8 Kmph.

Source: The Master Plan Study on the Introduction of Intelligent Transport System (ITS) in Bengaluru and Mysore in India

Declining Public Transport Use in Bengaluru Amidst Rapid Growth in Private Vehicle Registration

Based on B.PAC report, 2019

- Private vehicle registration has increased by 280 % between 2007 – 2020 (2.1 million to 8 million).
- On average, the city witnesses approximately 100 – 110 lakh trips every day, out of which 35 – 42 lakh trips are on BMTC buses, 4 – 4.5 lakh trips are on Metro and about 1.5- 2 lakhs trips on Suburban Rail.
- Over the years the number of trips by suburban rail has increased. A large portion of daily trips in the city are through privately owned vehicles, auto-rickshaws, cabs and shared mobility services.
- Bengaluru has one of the lowest share of public transport at 48 %, much lower than Mumbai, Kolkata which are at 80% public transport.
- Between 2011 and 2019, the fleet strength of BMTC has increased only by 7.89%, whereas the population in Bengaluru has increased by 32% (BMTC; Voters list 2019; Census report 2011).
- As of January 2020, the number of buses in BMTC was 6483 which reveals a 3% dip compared to 2019.
- Earlier, BMTC buses used to cover 230 kms per day which has fallen to 180 kms per day.
- The fall in ridership of BMTC from 51.3 lakh in 2014-15 to 35.8 lakh in 2018-19.
- This highlights a significant drop in the level of service and inability to match the schedule due to congestion in city roads and is a vicious downward spiral unless immediate steps are taken to stem the decline.

Source: B.PAC

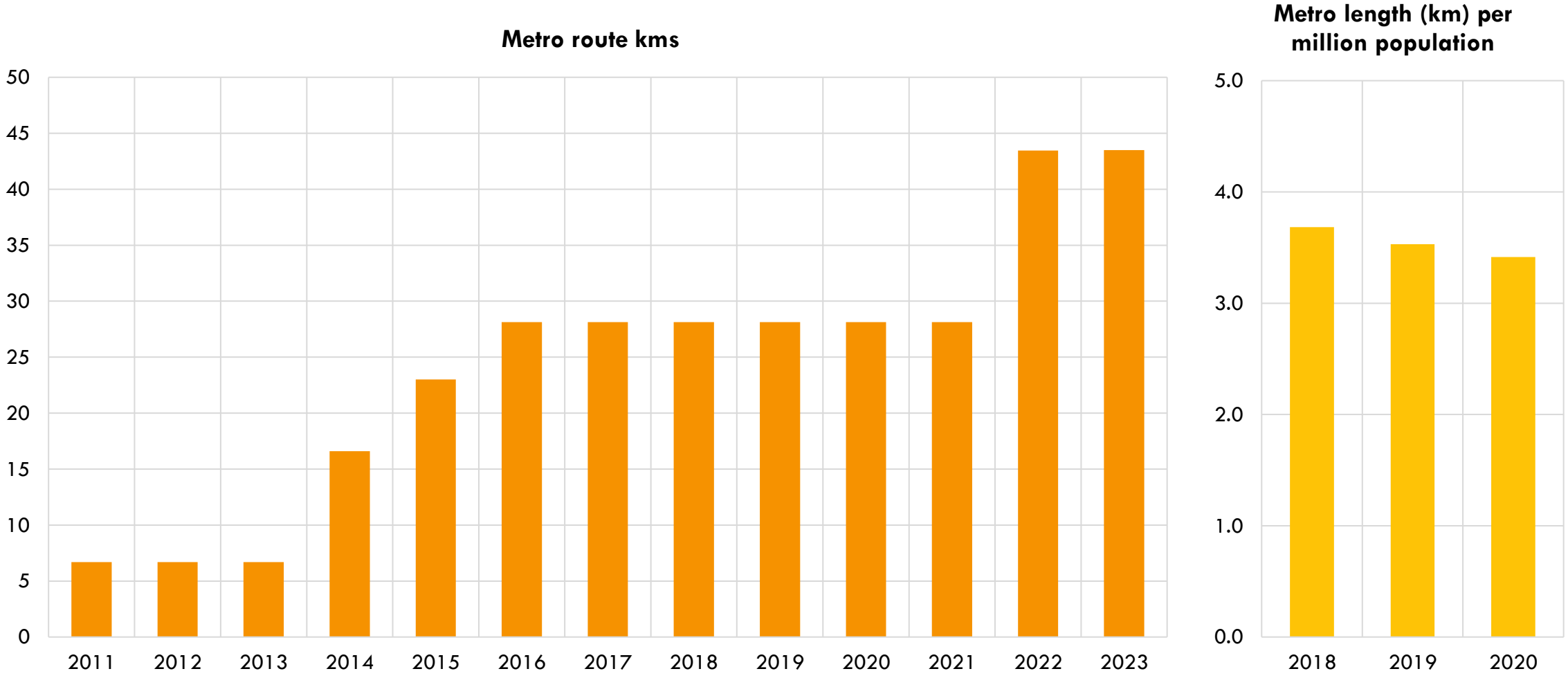
Asian Transport Observatory

Metro rail system

ADB ASIAN DEVELOPMENT BANK

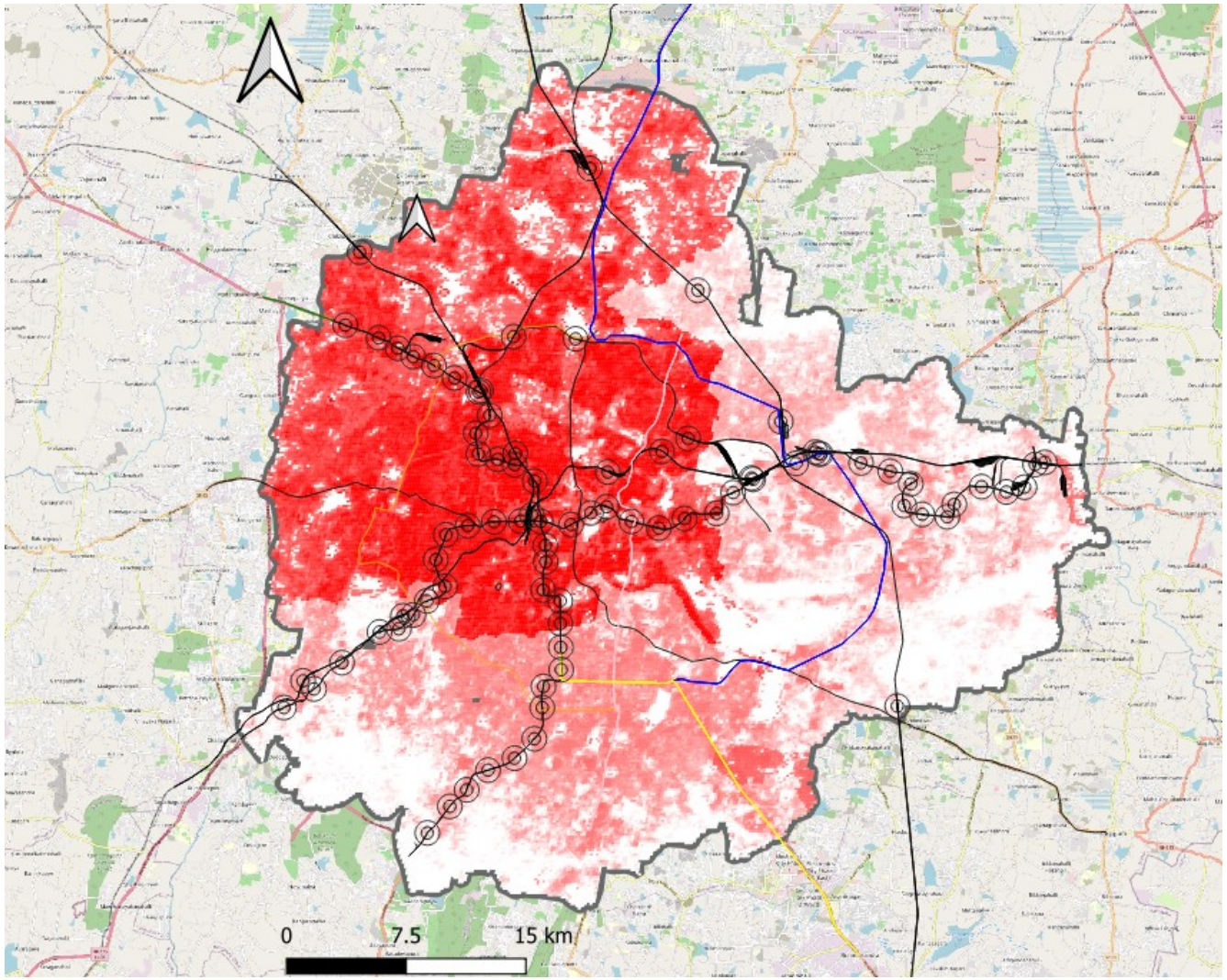
AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

Metro length in Bengaluru expanded at about 30% annually between 2011 and 2021. The metro length per capita has decreased in the recent past.



Source: ITDP *2022, 2023 data is from Wikipedia

Based on GHSL data, 15% of the population in Bengaluru is living within 500m of railway stations. Only 5% are within 250m.

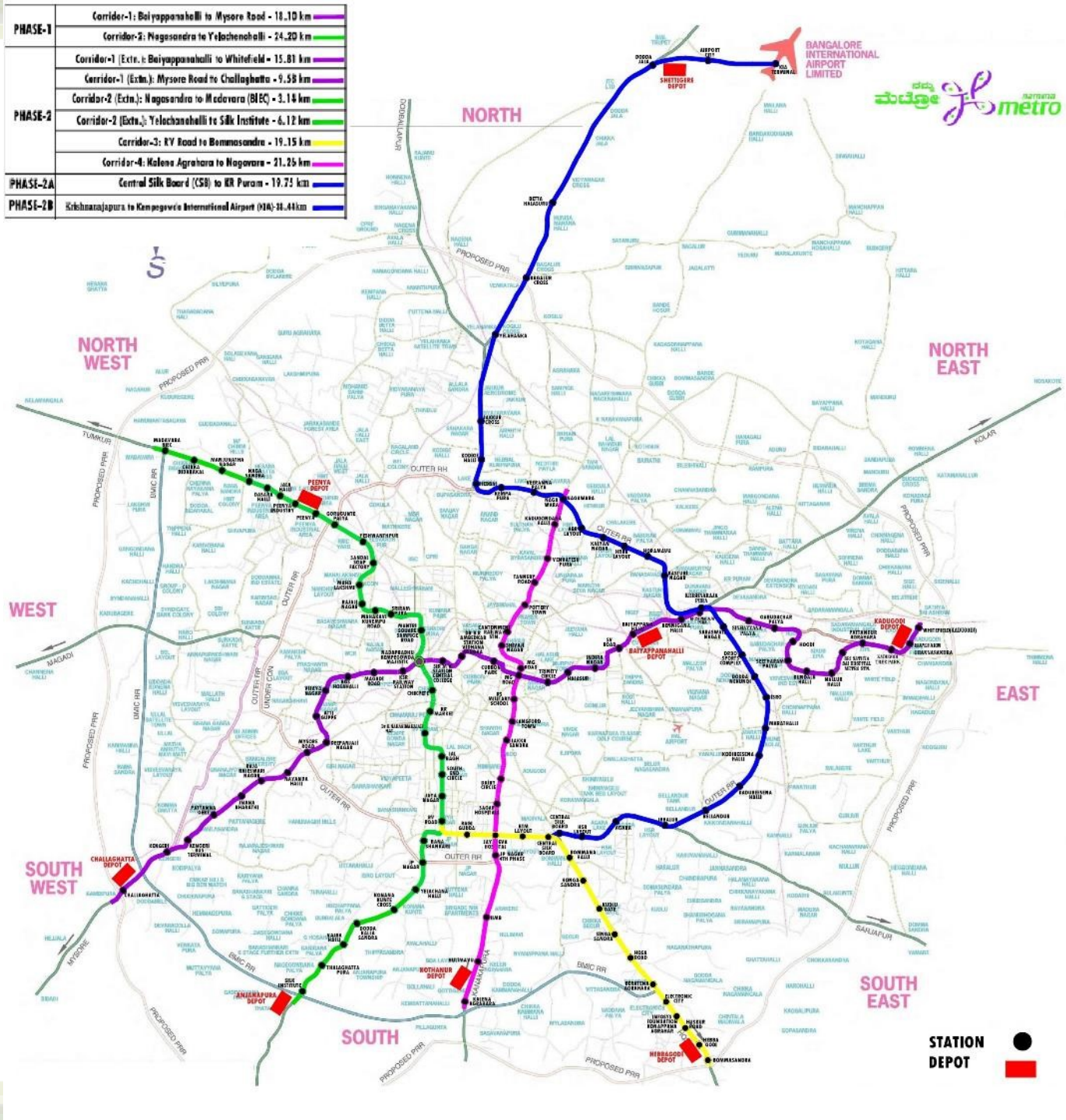


Source: ATO analysis using data from GHSL - Global Human Settlement Layer and OSM

Existing metro route map based on the Nammametro official website

Phase totals (approx.)

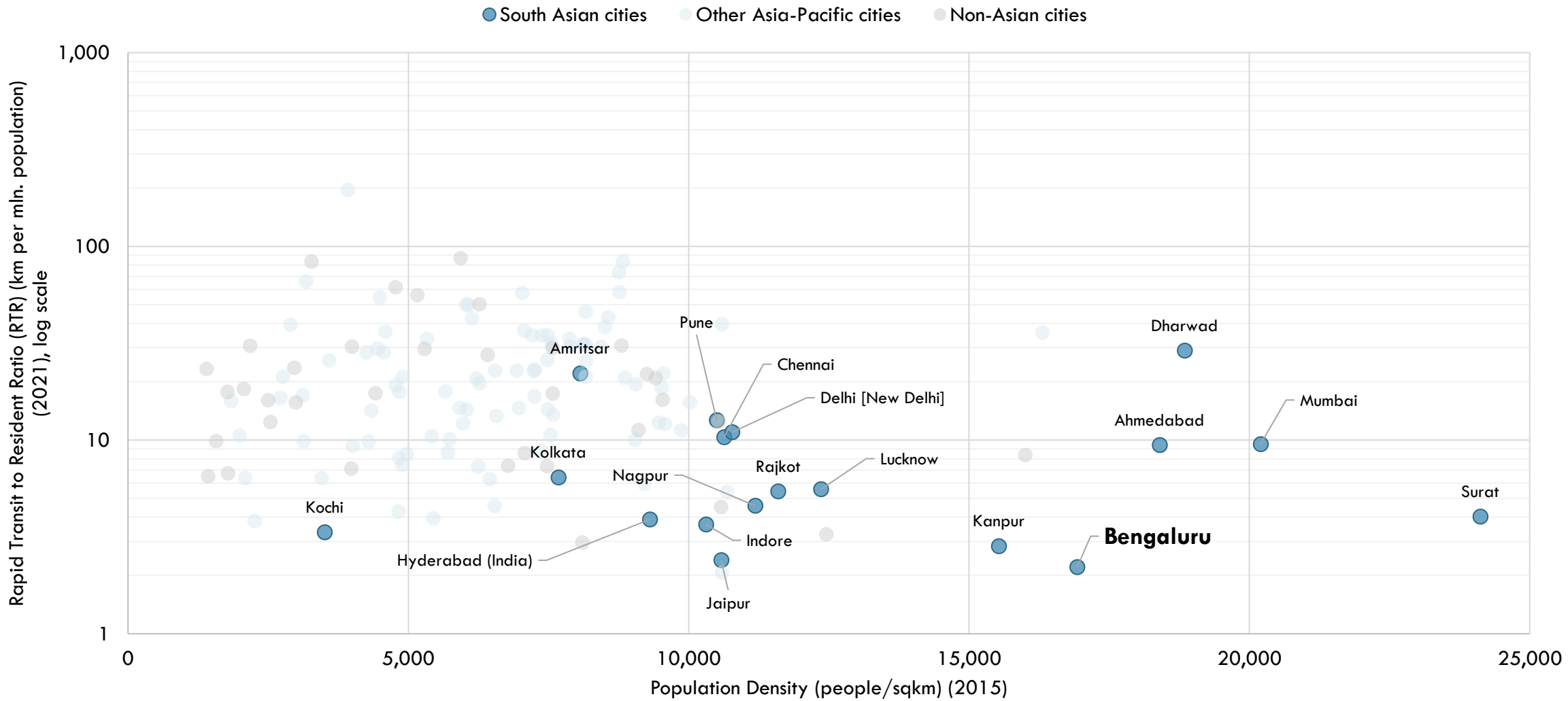
- 1 – 42 kms
- 2 – 75 kms
- 2A – 20 kms
- 2B – 38 kms



ADB ASIAN DEVELOPMENT BANK

AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

Bengaluru a low rapid transit to resident ratio at about 2km per million population compared to majority of the Indian cities.



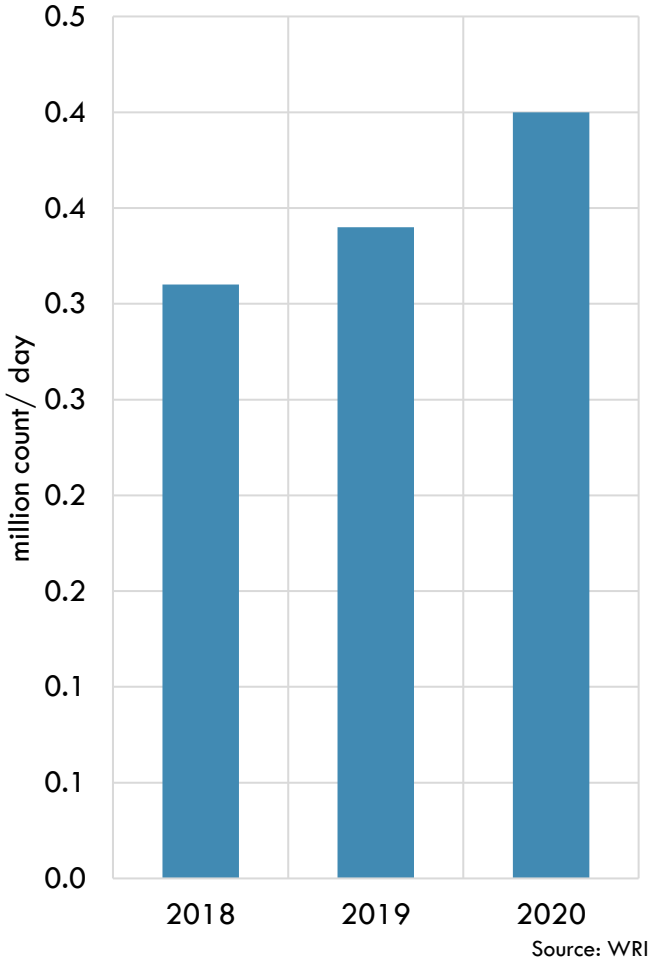
ADB ASIAN DEVELOPMENT BANK AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

Source: ITDP

Bengaluru metro ridership is increasing but ridership rate per day per km is significantly low compared to Delhi, Mumbai and select global cities.

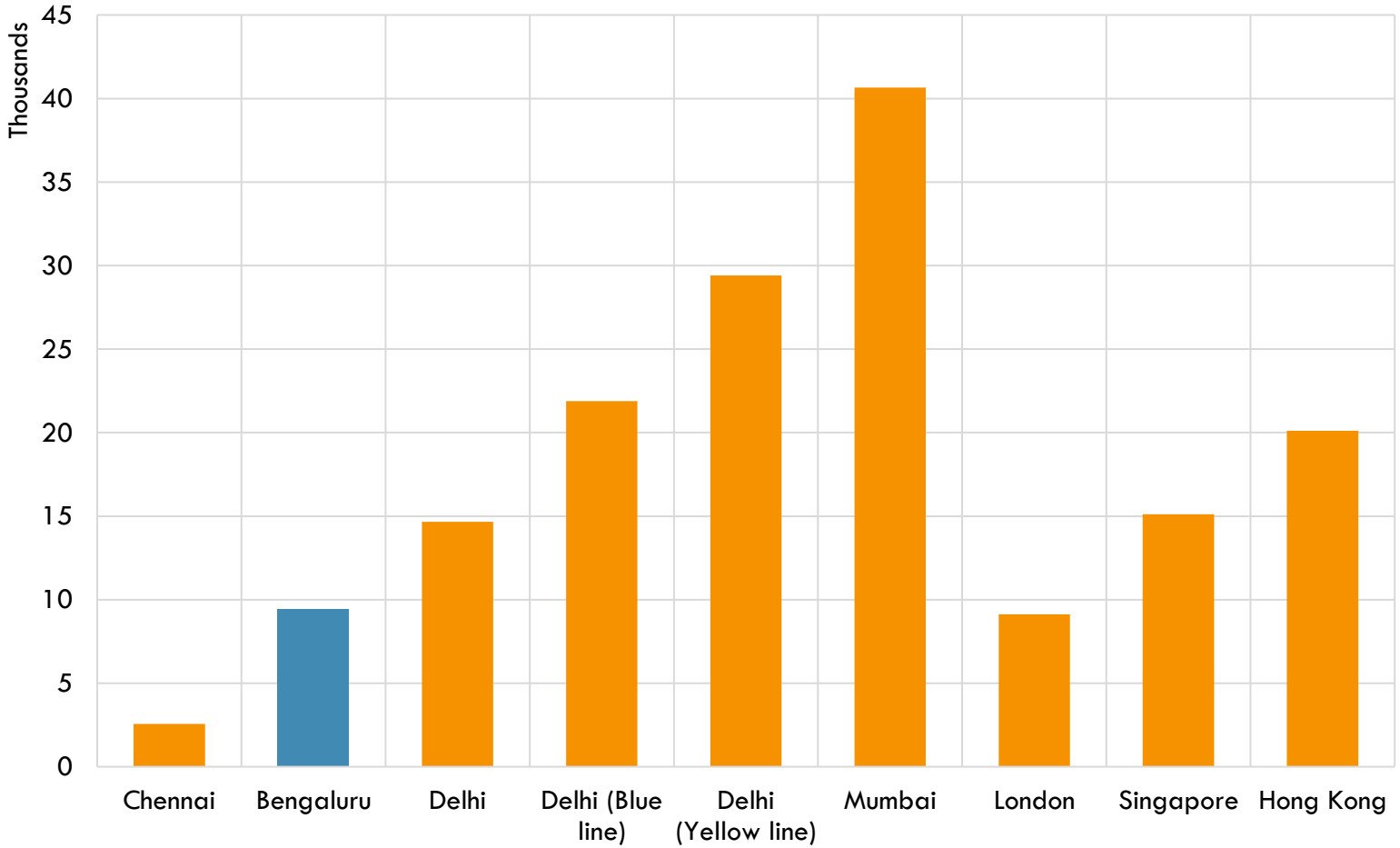
Asian Transport Observatory

Ridership (Metro) - Bengaluru



Source: WRI

Ridership per day per km (2019-20)



Source: UITP

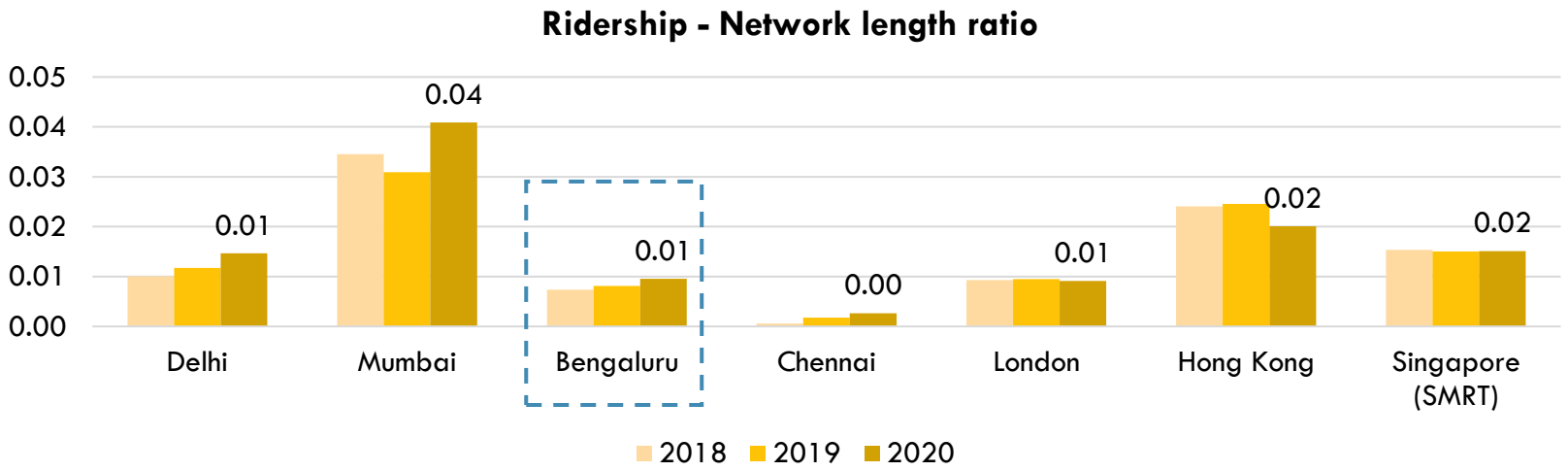
ADB ASIAN DEVELOPMENT BANK

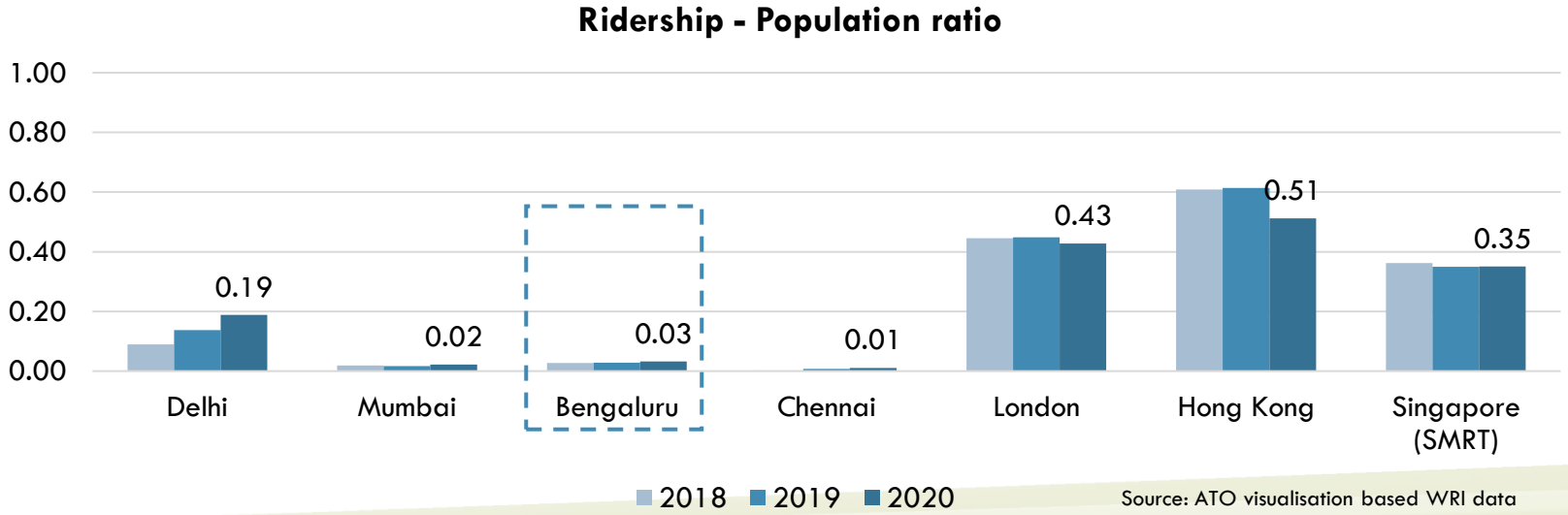
AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

Bengaluru metro ridership is increasing but the ratios with network length and population are low compared to select Indian and global cities.

Based on the WRI India–TMF survey data

- Average trip length in 2022 is 9 km for Bengaluru compared to 13km for Delhi.
- Mean trip cost for metro travel was INR 13 for Bengaluru compared to INR 6 for Delhi.
- 10% of the metro commuters in Bengaluru have a monthly Household income of INR >60k, compared to 4% in Delhi.





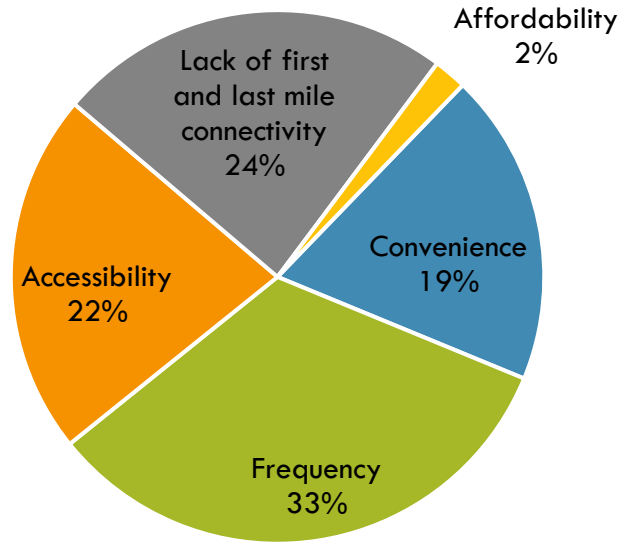
Source: ATO visualisation based WRI data

Gender Differences and Connectivity Gaps in Public Transport: Insights from a B.PAC Survey on First and Last Mile Travel Choices

Based on the B.PAC survey, 2019

- In a recent survey conducted by B.PAC, 24% of the non-users of public transport stated a lack of good first and last mile connectivity as the reason to use private modes of transport
- There is a difference in the travel patterns of public transport between men and women. This difference is also observed in the way women and men travel their first and last mile. In the B.PAC survey, there were gender differences observed in travel patterns for men and women in choosing the modes for first mile connectivity.
- 65% of the women said that they prefer shared mobility – auto, cabs, shared cab as their first mile connectivity option to access public transport whereas, 50 % of the men preferred personal owned vehicles to cover first mile to access public transport.
- 44% of public transport commuters their own vehicles to cover the first mile.
- In Bengaluru, 53% of people who travel on public transport walk both their first and last mile, while 18 % of them do not walk even one leg of the journey.
- 51% and 68% of the commuters on public transport use shared mobility (shared cabs, single ride cabs) as their first mile and last mile respectively.

Reasons for non-usage of public transport



Source: B.PAC

Inadequate Last-Mile Connectivity Limits Metro Usage in Bengaluru, Highlighting the Need for Improved Access Solutions

- WRI India's research in Bengaluru indicated that about 70 percent of potential metro users surveyed avoid the metro due to inconvenient access (Kanuri et al. 2019), and other surveys reported similar percentages (Chidambara 2012; Kumar 2015). Other academic papers, briefs, and media articles have also highlighted the importance of last-mile connectivity in metro rail usage (CSE 2017; Singh 2020; Irani 2022). - WRI White paper.
- Bengaluru lacks a share auto-rickshaw network, and buses do not provide frequent or reliable last-mile connectivity from several metro stations. As a result, some higher-income users accessing the metro choose on-demand modes such as regular auto-rickshaws, taxis, or new mobility modes such as rental scooters. This indicates that there is certainly some demand for higher-fare, on-demand services for metro last-mile connectivity. However, it is also likely that the lack of a proper share auto-rickshaw network prevents the metro in Bengaluru from achieving higher levels of ridership.

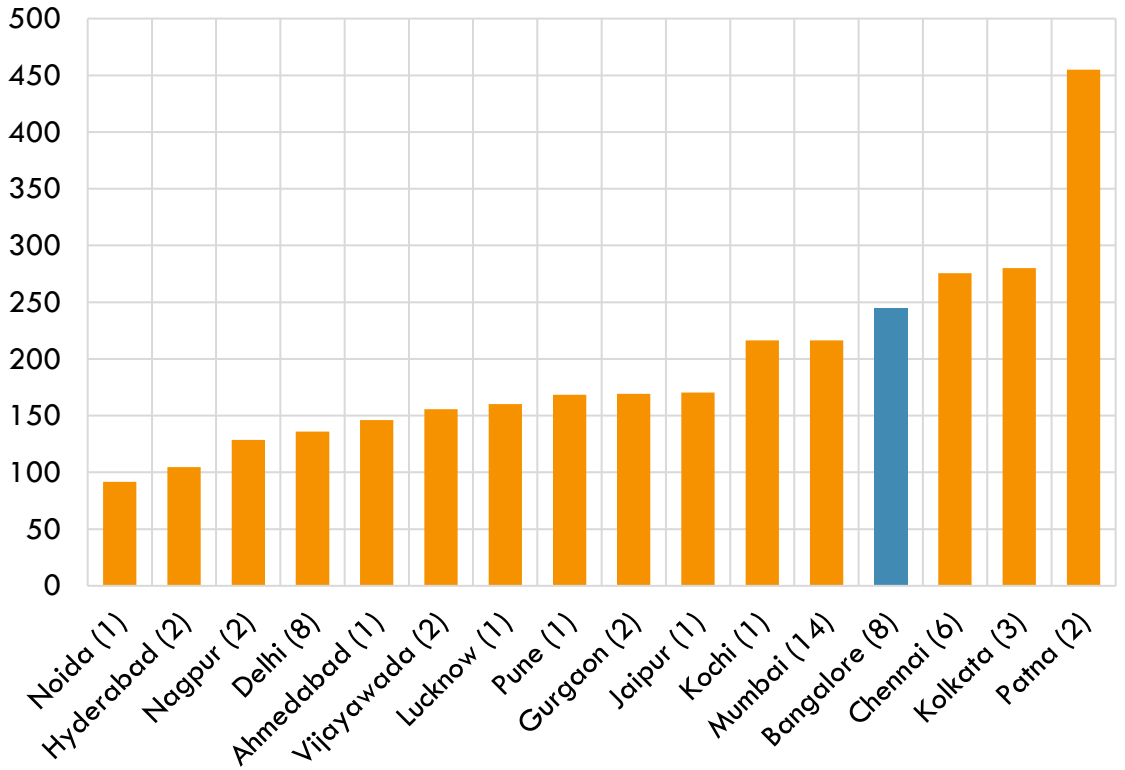
Bengaluru's cost of building metro rail system per km is higher than second highest in India.

Asian Transport Observatory

Cost of building metro rail system in India

CITY	UNDERGROUND NETWORK LENGTH (KM)	UNDERGROUND NETWORK SHARE	ELEVATED NETWORK LENGTH (KM)	ELEVATED NETWORK SHARE	PROJECT COST (INR CRORE)	COST PER KM (INR CRORE)
Delhi (Total)	89.1	25%	263.4	75%	70,433	181
Delhi Phase 1	13.2	20%	51.9	80%	10,571	162
Delhi Phase 2	34.9	28%	90.0	72%	18,783	150
Delhi Phase 3	41.0	25%	121.5	75%	41,079	253
Mumbai	-	-	11.1	100%	4,321	389
Bangalore	8.8	21%	33.5	79%	13,845	327
Chennai	24.8	55%	20.3	45%	11,667	259

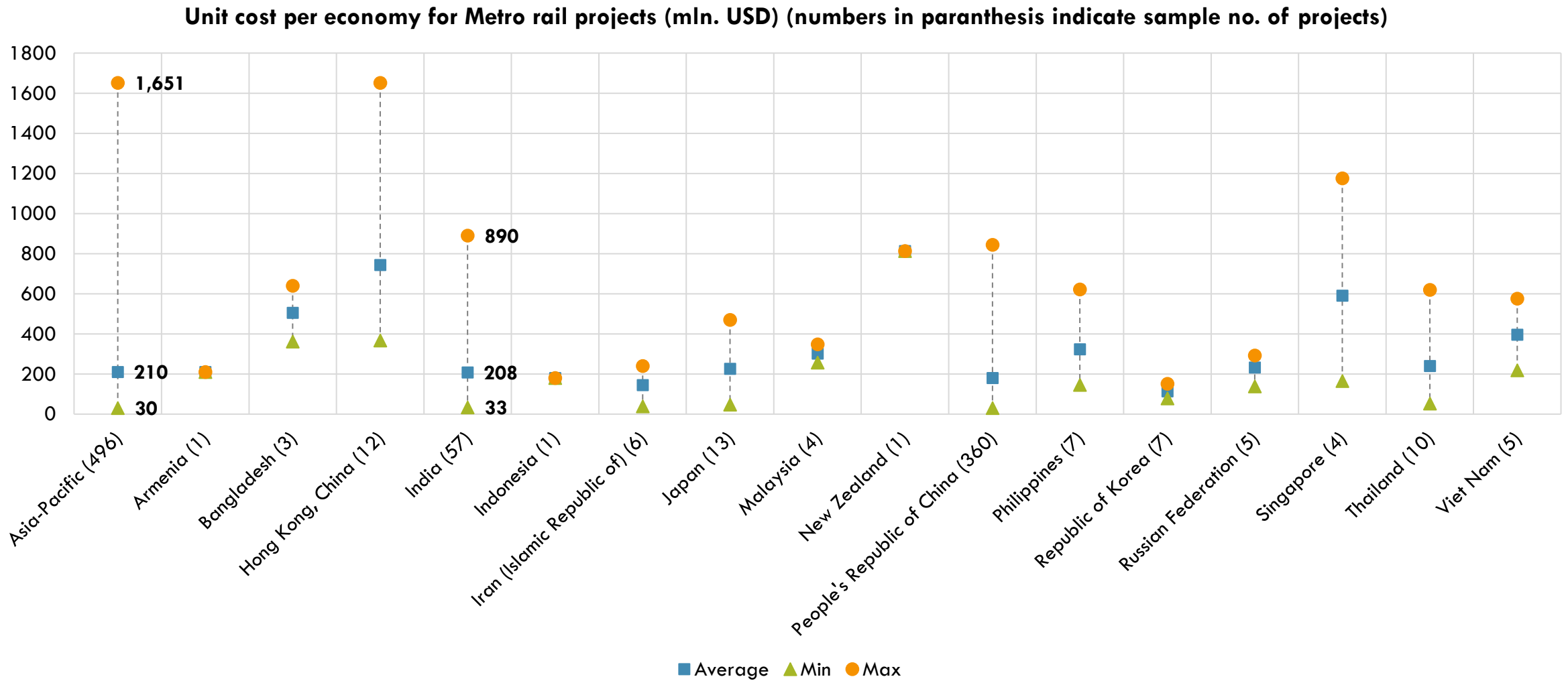
Average Mln. $/km (PPP) for Metro rail projects (numbers in paranthesis indicate sample no. of projects)



ADB ASIAN DEVELOPMENT BANK AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

Source: UITP, ATO Cost Database

Unit cost in Mln. USD, PPP



Source: ATO cost Database

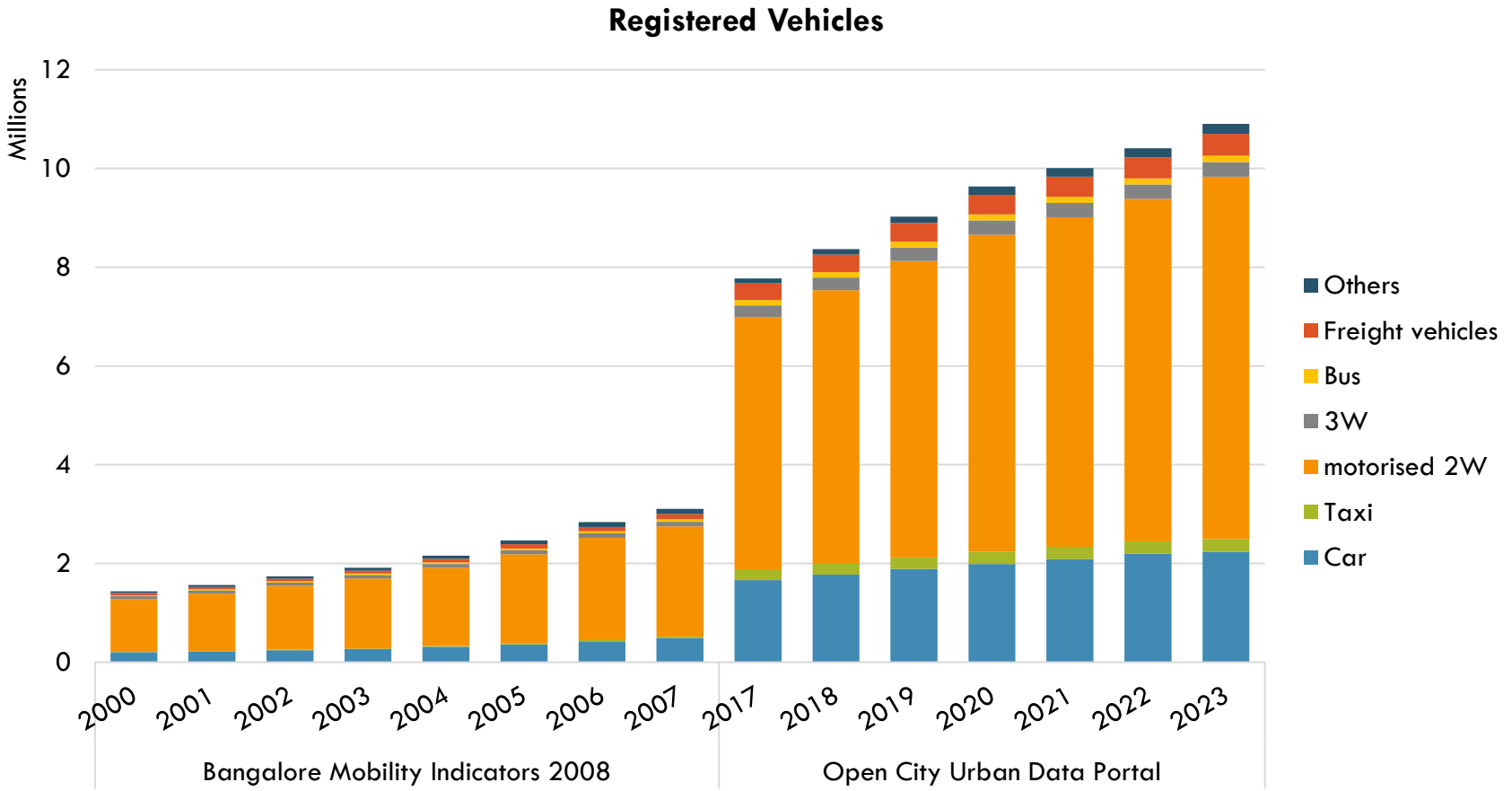
Asian Transport Observatory

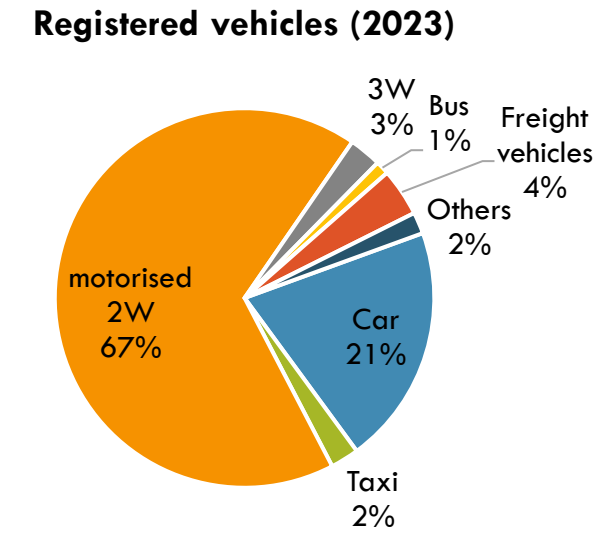
Vehicular population and traffic dynamics

ADB ASIAN DEVELOPMENT BANK

AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

Registered vehicle in Bengaluru has annually grown at 9% between 2000 and 2023. Motorised 2W shares about 60% consistently.

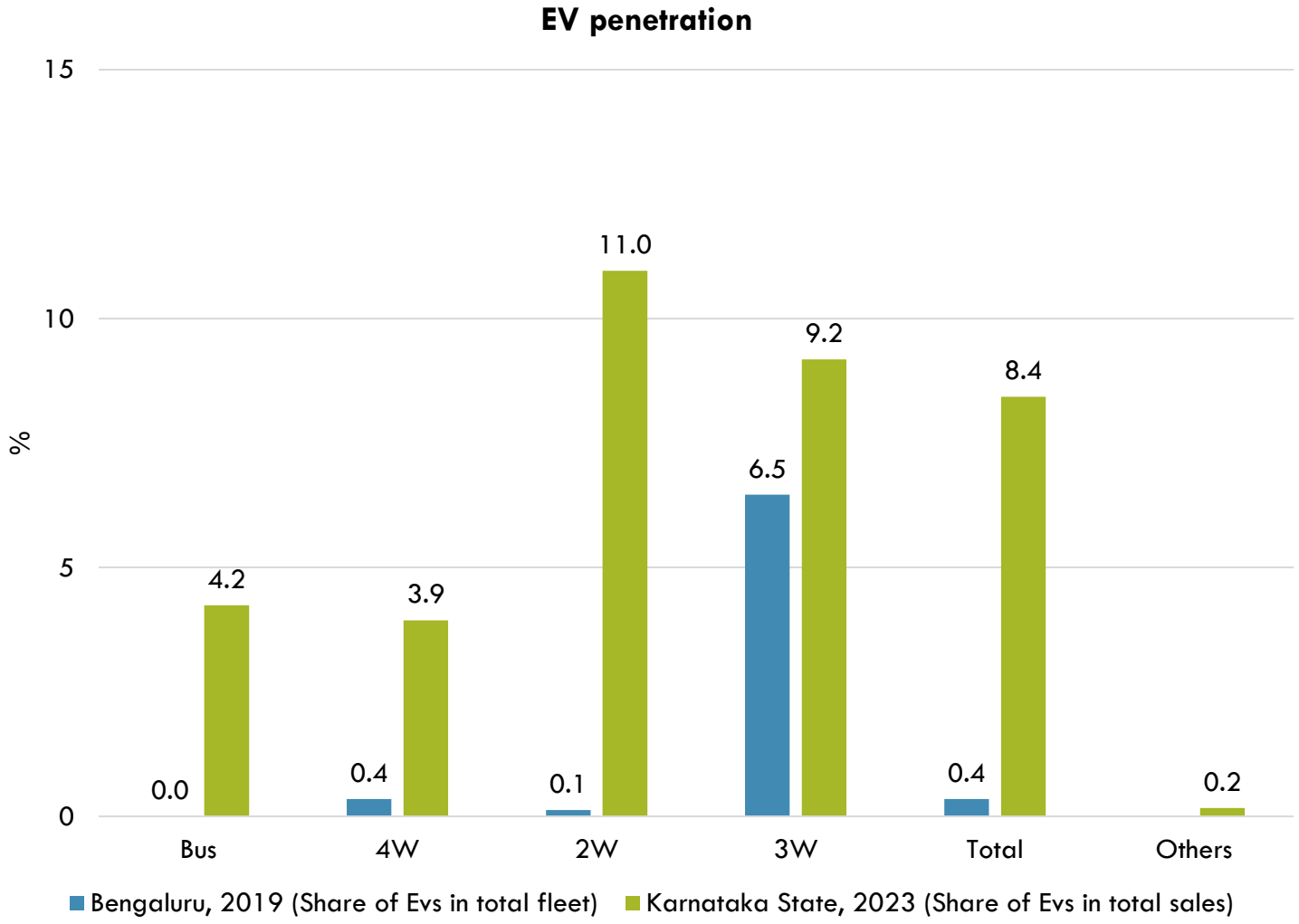




- The vehicle ownership has increased from 284 vehicles per thousand persons in 2001 to 419 vehicles per thousand persons in 2011 and further to an estimated 640 in 2018. This means the vehicle population is increasing at a much higher rate compared to the rate of growth in population.

Source: CMP

Only 0.35% of the total vehicle share is Electric in Bengaluru.

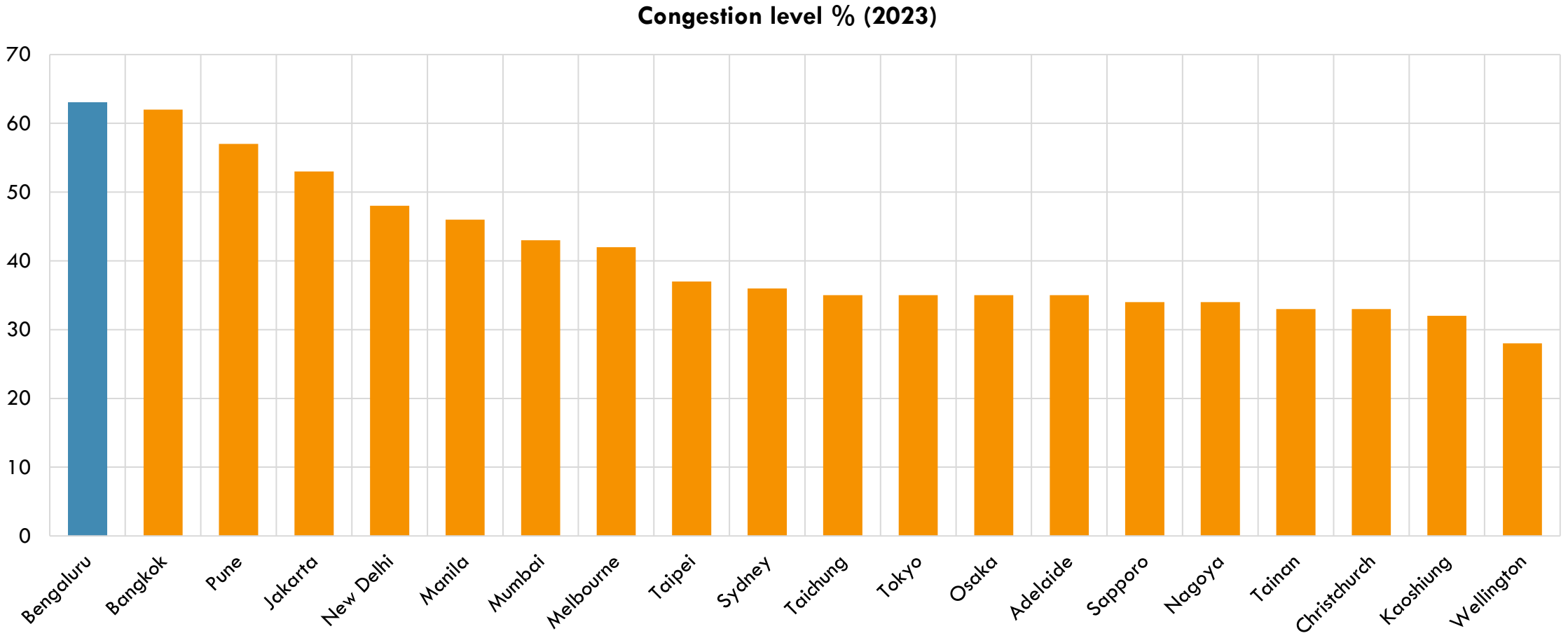


- By 2030, electric two-wheelers and three-wheelers will lead EV adoption in Bengaluru, with sales penetration projected to reach 30 per cent for private cars, 70 per cent for commercial vehicles, 40 per cent for buses, and 80 per cent for two and three-wheelers. The penetration of electric buses and private vehicles is expected to increase at a slower rate compared to other segments.
- With the rise in EVs, the demand for charging infrastructure is also set to grow. The report projects that Bengaluru will need at least 58,416 charging points by 2030, driving the city's energy demand to 11.73 gigawatt hours. Bengaluru's conducive EV and energy storage policies, along with its thriving tech industry and extensive logistics network, are key factors supporting its transformation into a global EV lighthouse city.
- Karnataka leads the nation in the number of publicly available charging stations, with over 5,500 stations as of February 2024. EVs account for 6-7 per cent of the total energy consumption in Karnataka, with Bengaluru alone accounting for over 5 per cent. According to Bescom data, EV chargers approved by the company have consumed 14.8 lakh kWh of power over the past two years, generating significant revenue.

(Source: https://www.firstpost.com/tech/bengaluru-leads-indias-new-ev-registrations-beating-new-delhi-mumbai-karnataka-has-most-charging-stations-13781333.html)

Source: B.PAC, 2019, Clean Mobility Shift, 2024

Bengaluru has the highest global ranking in Asia-Pacific in terms of Congestion and has level of 63%.



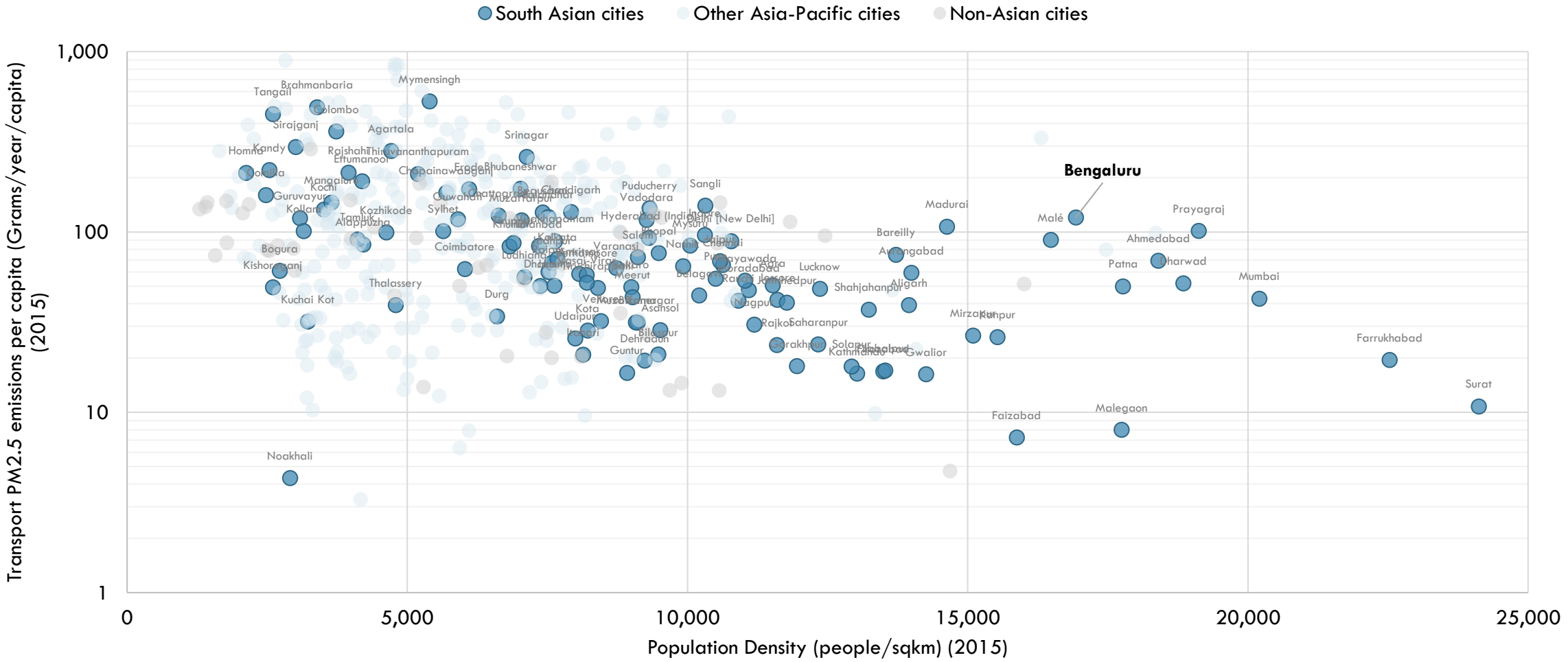
Source: TomTom

Parking scenario

- In all the total capacity of off-street parking spaces available in the city for general public is about 1300 cars and 4000 two wheelers.
- However, the numbers do not include parking spaces provided in shopping malls.
- Bengaluru has a Parking policy 2.0 illustrating strategies for a comprehensive parking plan

Transport air pollution and GHGs

Bengaluru' is estimated to emit 120 grams of transport PM2.5 per year per capita



ADB ASIAN DEVELOPMENT BANK

AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

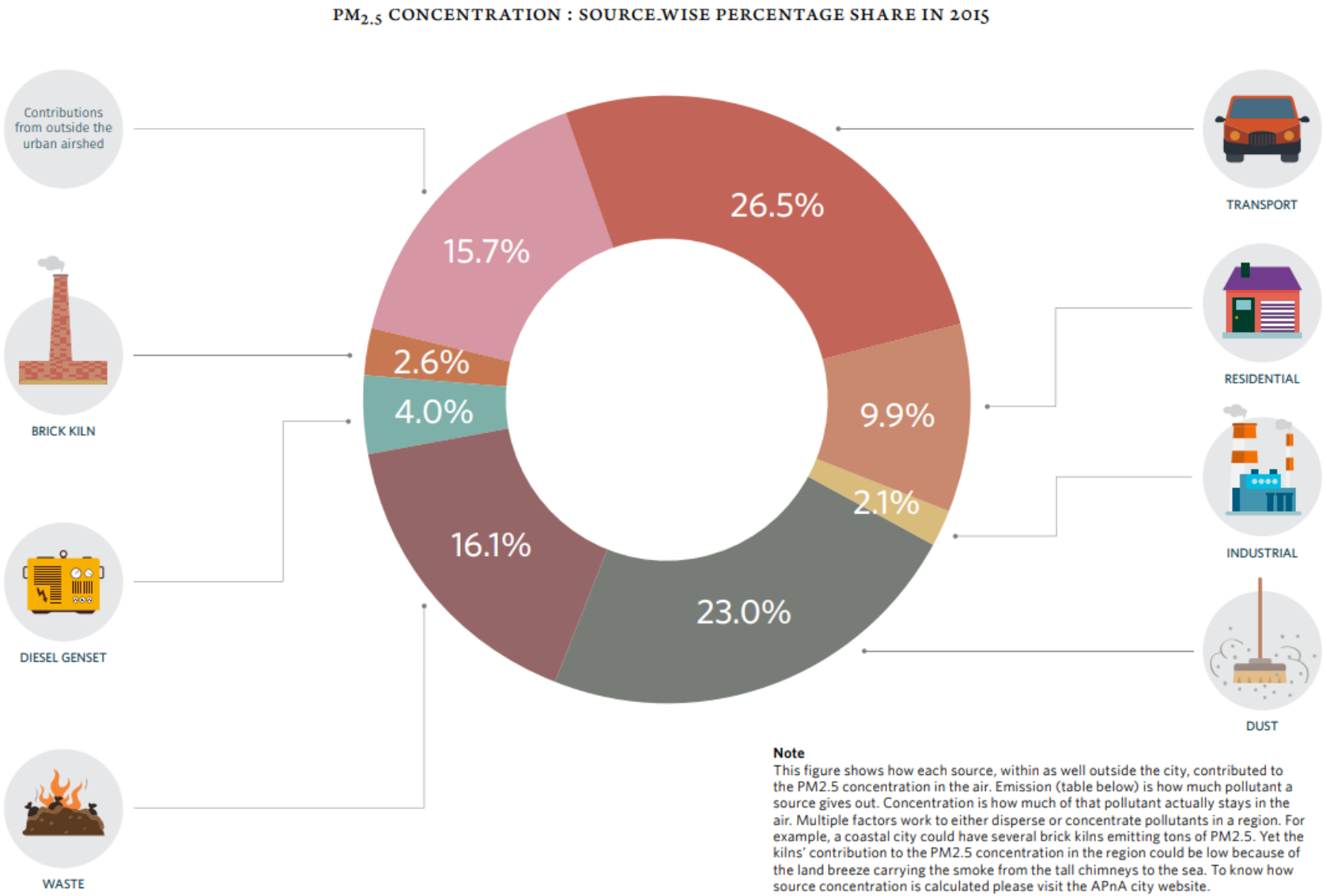
Source: GHS

Transport sector accounts for highest share in terms of PM2.5 emissions

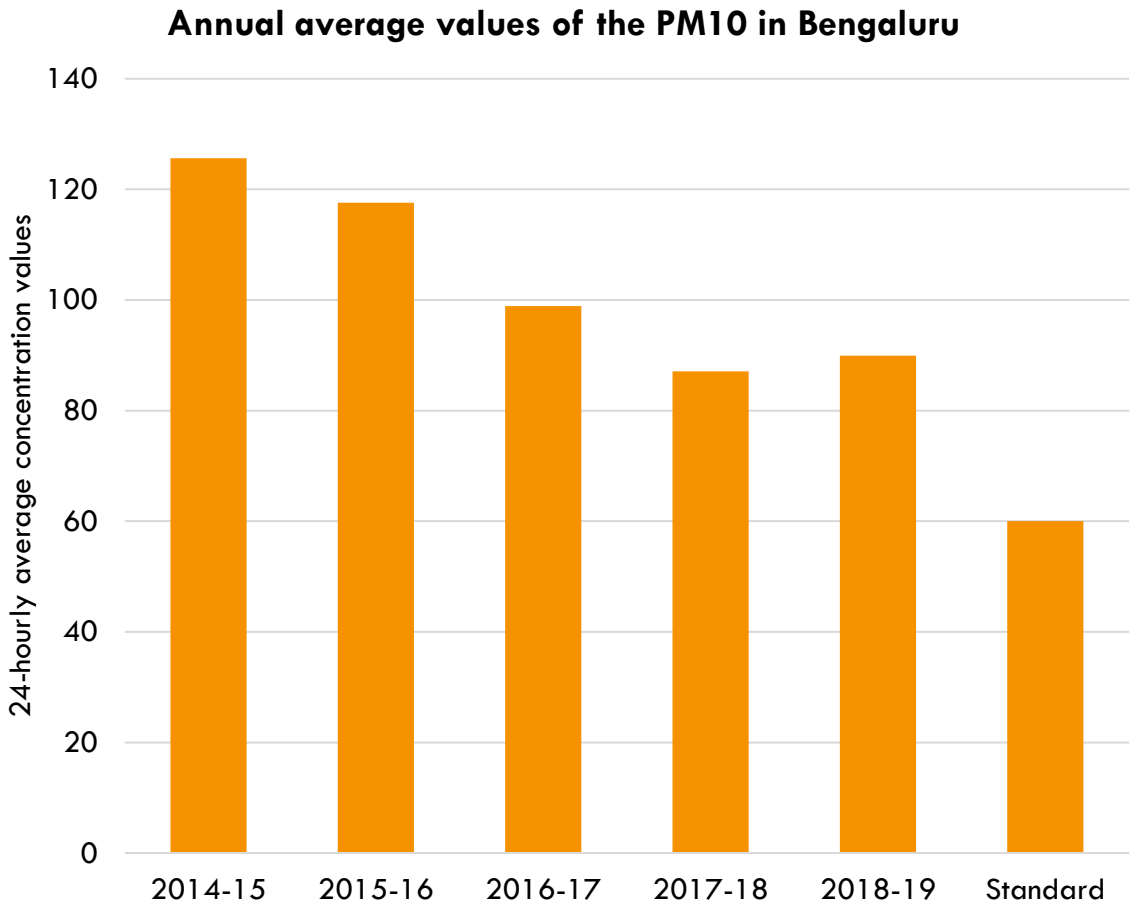
- As per paper on " Air quality, emissions and source contributions analysis for Greater Bengaluru region of India" (By Sarath K Guttikunda et. al., 2019) vehicle exhaust and on-road dust resuspension account for 56 % and 70 % of total PM2.5 and PM10 emissions respectively - CMP

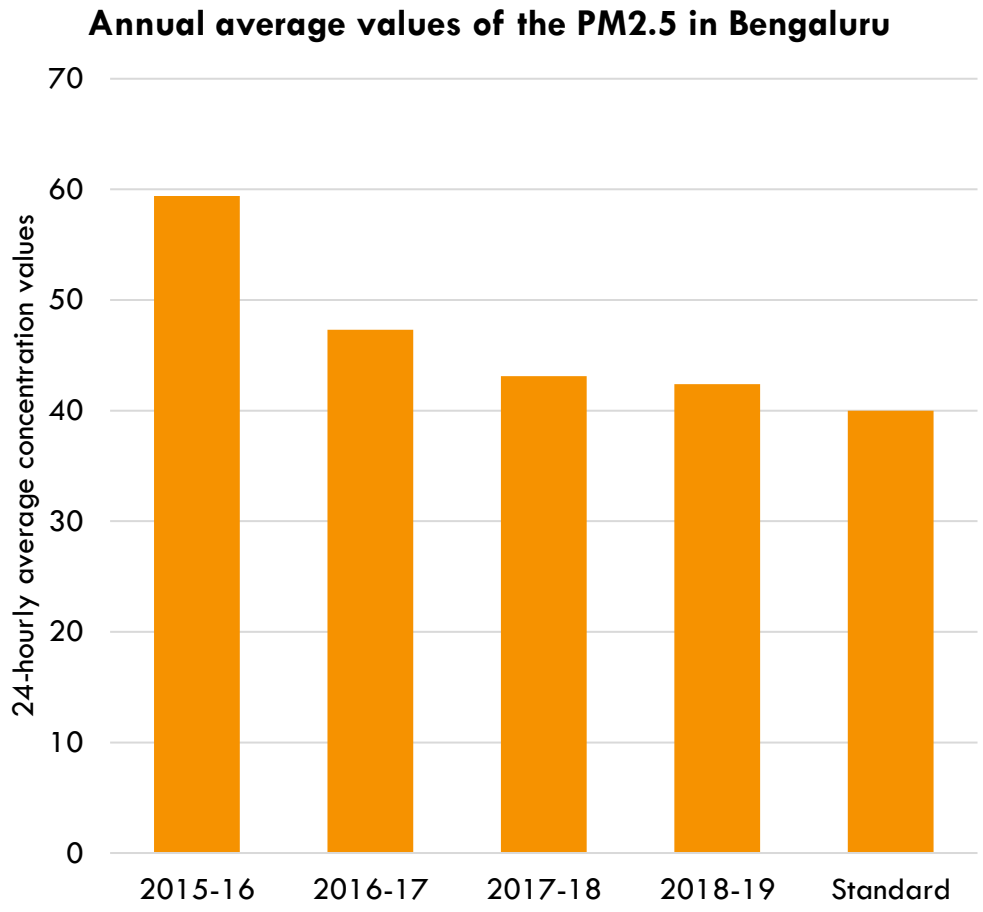
Bengaluru Traffic Police is booking cases against vehicles emitting black smoke. The No. of cases booked are as follows.

year	No. of emitting black smoke cases	Fine collected in (Rs)
2016	727	72700
2017	671	67100
2018	1810	181000



Economy-wide: Annual average values for PM emission



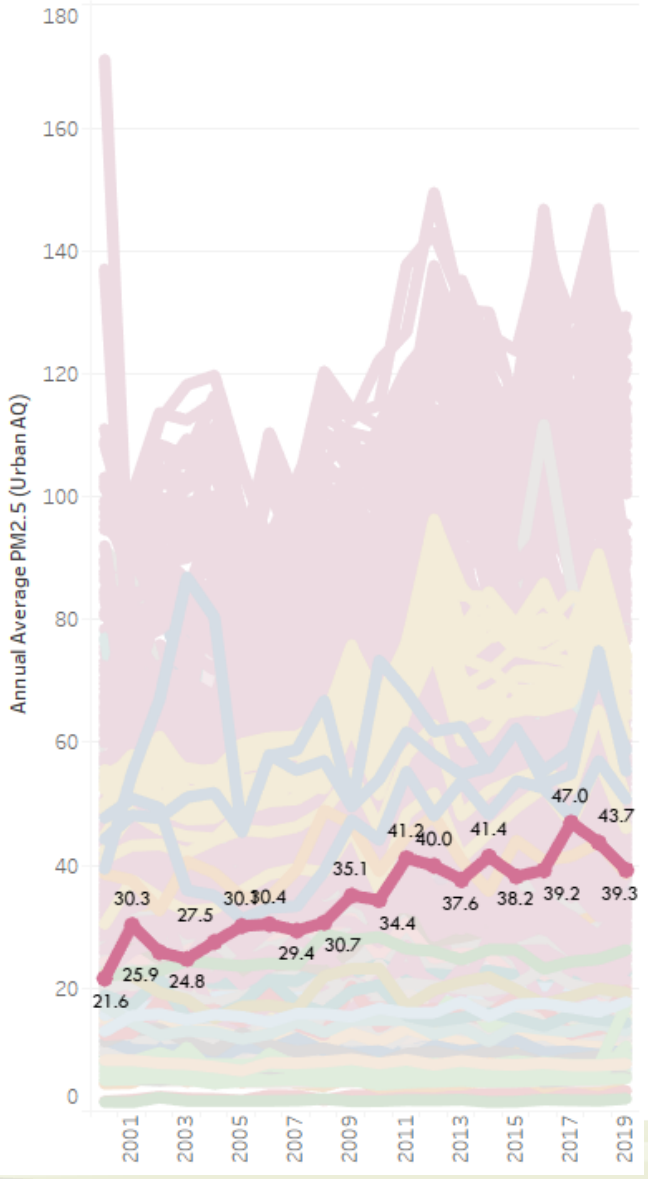


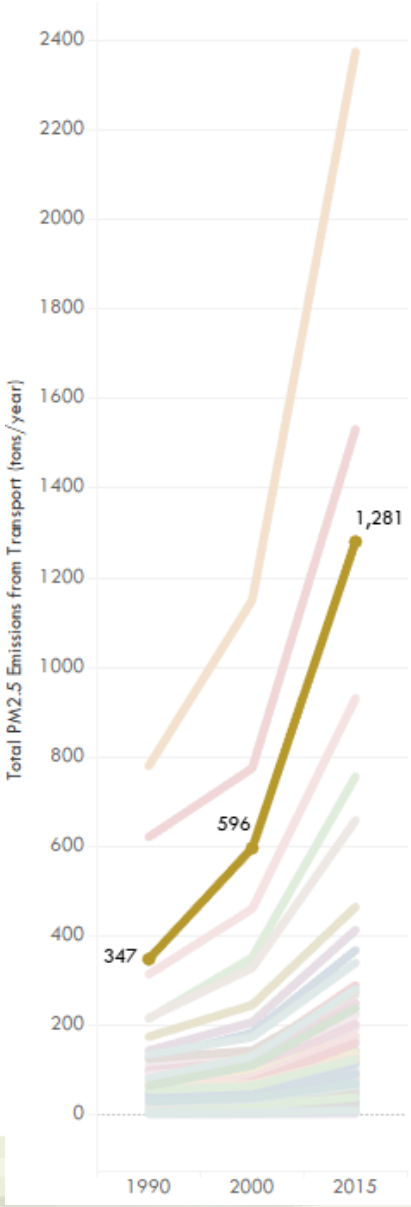
Source: Revised Action plan for Control of Air Pollution in Bengaluru City

Air Pollution (Particulate Matter 2.5)

- The average concentration levels of PM2.5 (micrograms/cubic meter in Bengaluru (39) is lower than the national average (71). However, the average concentration has almost doubled between 2000-2019.

- The total PM2.5 emissions (tons) from transport (within Bengaluru) is estimated to have grown at an annual average of 5% per annum between 2000 and 2015. The 2015 tonnage of 1,281 for Bengaluru is 7 times the national average (by urban center) of 177 tons/year.





ADB ASIAN DEVELOPMENT BANK

AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

Challenges and Trends in Bengaluru's Urban Transport: Increasing Emissions and Road-Centric Planning

- Overall, transport is the key emission source for Bengaluru – vehicle exhaust and on-road dust resuspension account for 56% and 70% of total PM2.5 and PM10 emissions
- Unless there is an aggressive strategy to improve urban planning and public transport options, total emissions under the business as usual scenario are expected to increase at least 50% in 2030 and doubling the urban area with PM2.5 annual averages above the national ambient standard of 40 µg/m3
- With increase in population and the expansion of the city, the demand for travel connectivity has risen. Personalized mode of transportation is preferred over the public mode. With growing number of personal vehicles, the urban transport planning approach remained road infrastructure centric. Te city development plans for 2015 (released in 2007) and 2031 (released in 2017), both evaluated and considered road widening as a significant challenge to reduce traffic congestion and prioritized connectivity of the underdeveloped areas in the outskirts (BDA, 2007; BDA, 2017). Between 2003 and 2017, Bengaluru added more than 10,000 km of road
- Number of vehicles registered per 1,000 population, increased from 150 in 1990 to 300 in 2001 and 600 in 2016 (Figure 6a). Between 1980 and 2016, Bengaluru's vehicle registration increased at an annual growth rate of 10.6 %, which is double the annual growth rate observed in New Delhi over the same period (DES-Delhi, 2016). Personal vehicles comprise of 90% of the total registered vehicles of 6.7 million in 2016 – with two-wheelers (73%), four-wheelers (15%), auto 3-wheeler auto-rickshaws (4%) and buses, LDVs, HDVs forming the remaining 8% (MoRTH, 2017). Total registered vehicles in 2006 was 2.8 million. Te 2011 national census revealed that 44% and 17% of households in Bengaluru own at least one 2-wheeler and one car respectively (Census-India, 2012). In the city, most of the traffic growth is concentrated along the outer suburban areas. BDA (2012) reported annual traffic growth rates of 2–4% in the central zone, 5–7% in the intermediate zone, and 8–9% in the outer peripheries along the regional roads. Te per capita passenger trip rate has increased from 0.82 in 2001 to 1.0 in 2007 and 1.4 in 2011 (DULT, 2011). Te public transport mode share reduced significantly from 42% in 2007 to 27% in 2011, in spite of an increase in the number of buses (Figure 6b). In 2003, BMTC used to operate 3,000 buses for a population of 5.6 million with one bus for 1,800 people. In 2016, BMTC operated a feet of 6,400 buses for a population of 11.0 million with one bus for 1,700 people (SoE, 2015).

Source: https://www.urbanemissions.info/wp-content/uploads/docs/2018-12-UEinfo-APnA-Bengaluru-Web.pdf

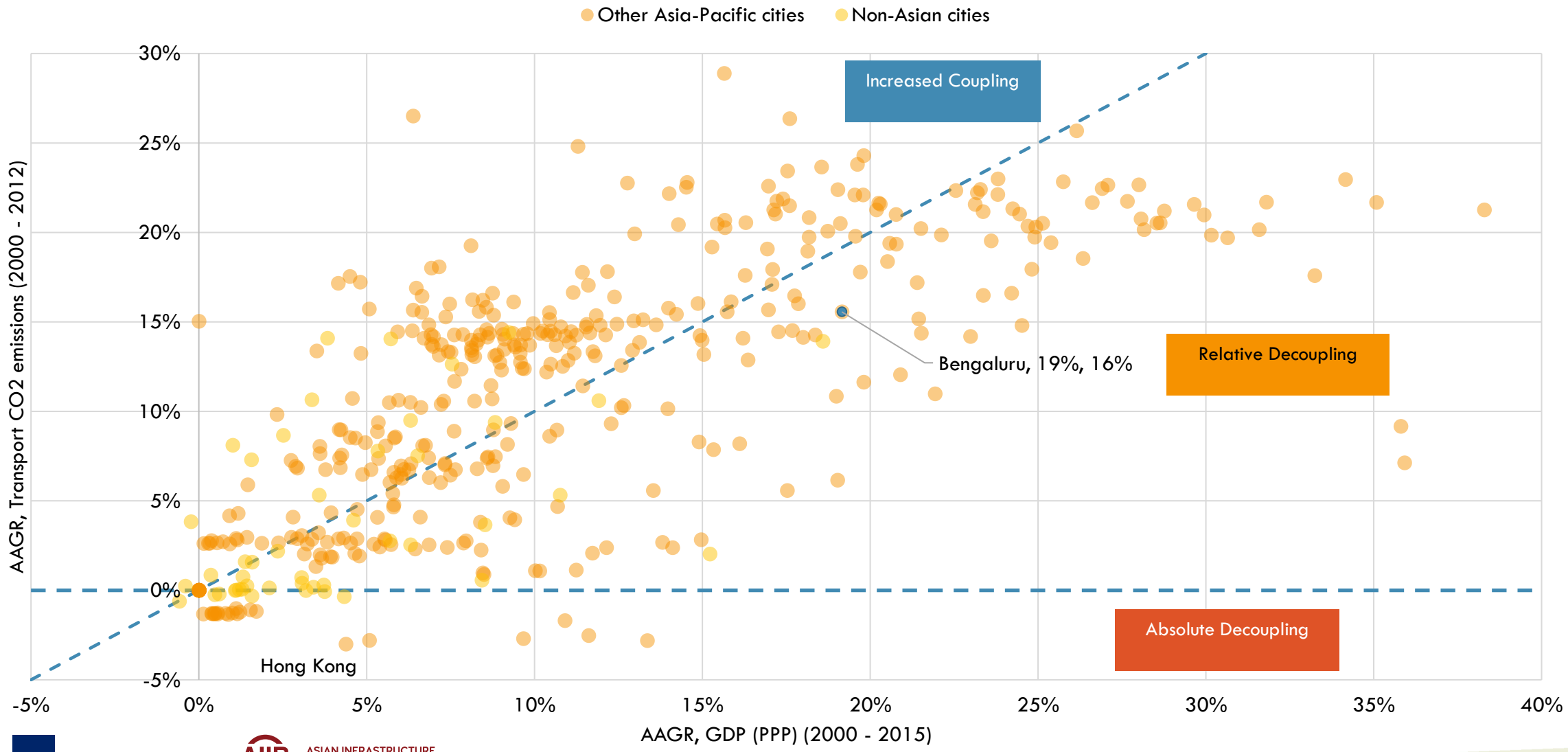
Bengaluru is estimated to emit 139 kilograms of transport CO2 per year per capita

ADB ASIAN DEVELOPMENT BANK

AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

Source: GHS

Bengaluru transport CO2 emissions are relatively decoupling with the GDP growth.



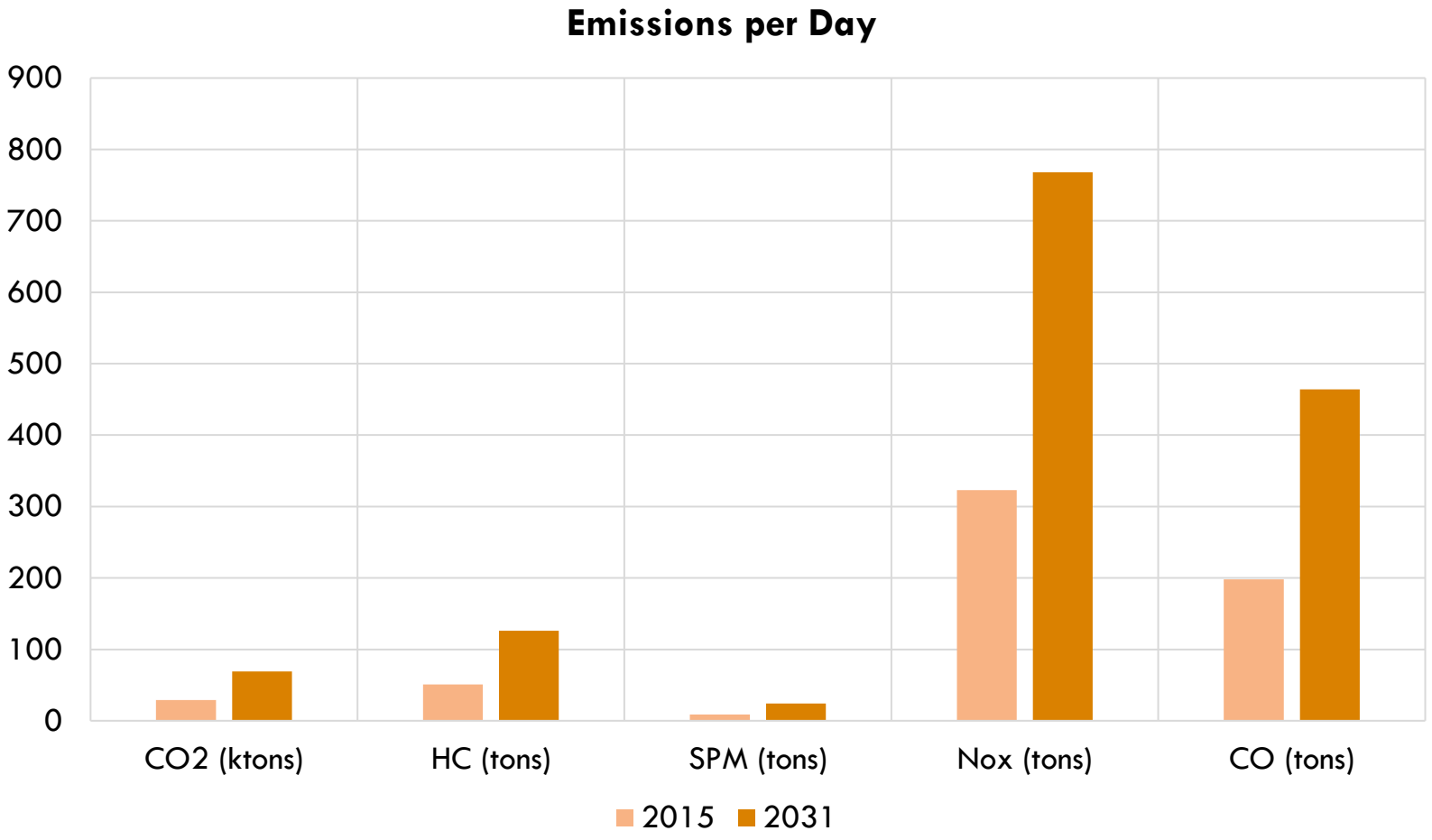
Asian Transport Observatory

ADB ASIAN DEVELOPMENT BANK

AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

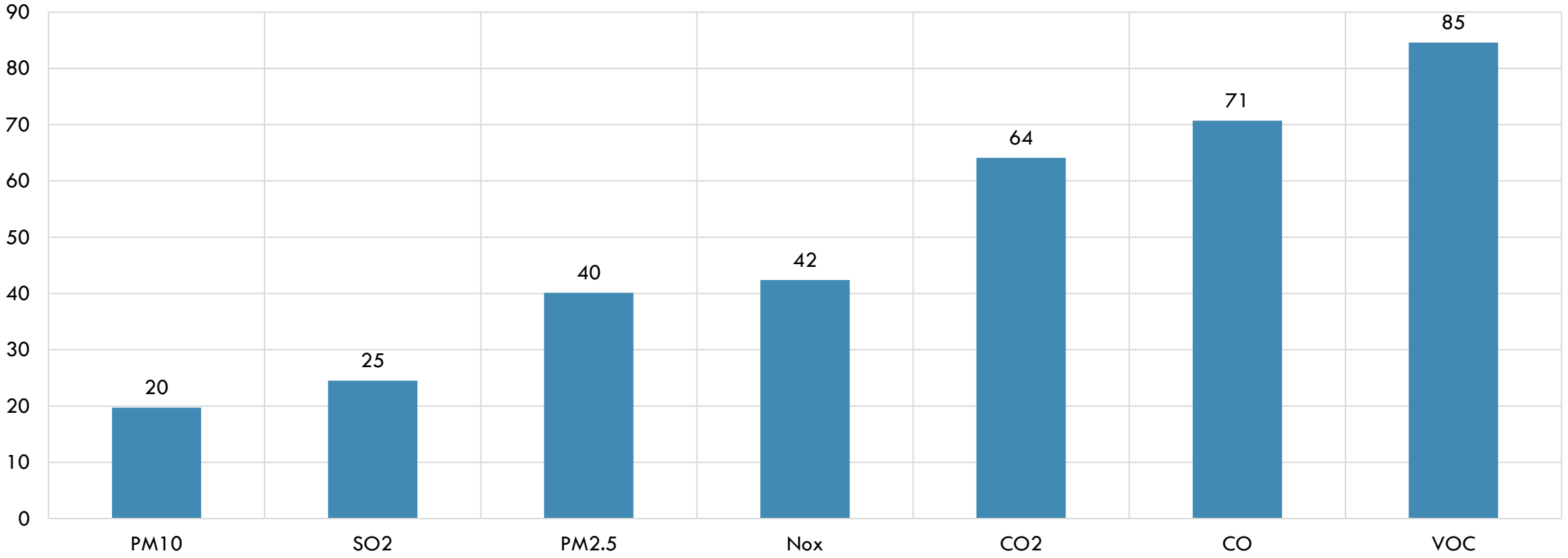
Daily transport emissions (carbon dioxide, hydrocarbons, suspended particulates, NOx, carbon monoxide) will more than double between 2015 and 2031.

- As per the CMP, the daily emissions loading from transportation will grow significantly between 2015-2031. Across the different relevant emission types, an annual average growth rate of >5% are estimated between the periods.
- Daily transport emissions (carbon dioxide, hydrocarbons, suspended particulates, NOx, carbon monoxide) will more than double between 2015 and 2031.
- The total Vehicle Kilometers Travelled (VKT) by the vehicles in the BMR region is about 31 million for the base year and is estimated to increase to about 48 million and 72 million for the years 2030 and 2050 respectively which is about 60% growth rate of VKT in 2050 from base year. The emissions estimated for the base year and future years are shown in Tab l e 2 -1 0.
- Bengaluru stands second in fuel consumption in the country only behind Delhi. According to Indian Oil, on an average, the petrol consumption in Bengaluru is about 70,000 KL a month. - CMP



Vehicle exhaust related air pollution is severe in the case of Bengaluru

Estimated share of vehicle exhaust pollution in economy-wide* emissions for Greater Bengaluru region, for base year 2015



Source: *Other categories include - Domestic, Industries, Dust, Wasteburning, Generator sets, Brick kilns

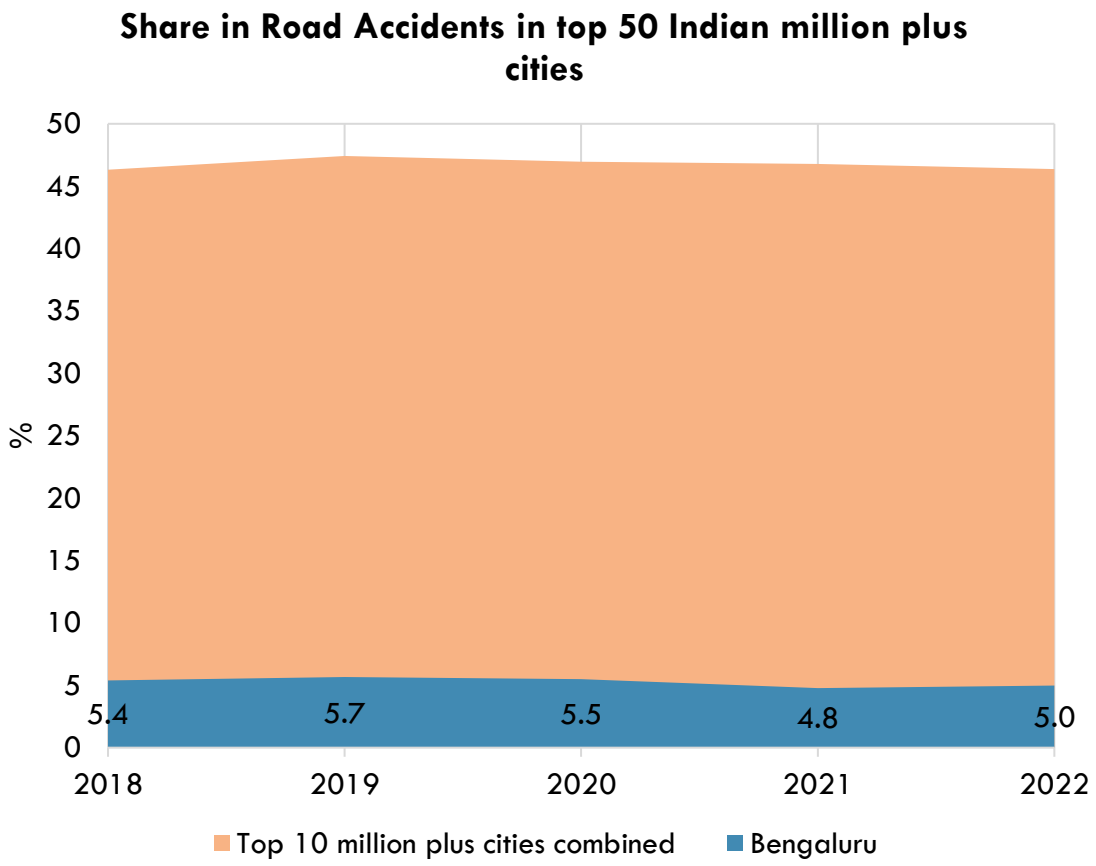
Asian Transport Observatory

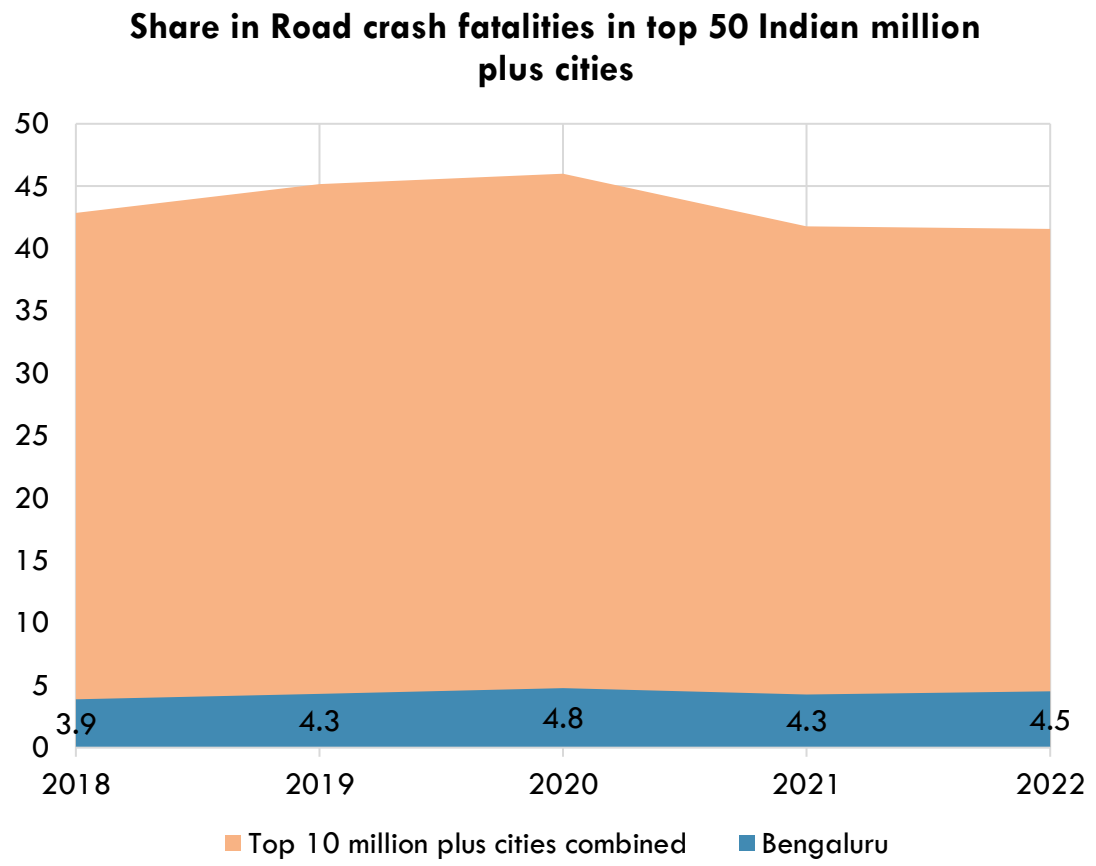
Road safety

ADB ASIAN DEVELOPMENT BANK

AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

Bengaluru shares about 5% of the road crashes and resulting fatalities among the top 50 Indian million plus cities.

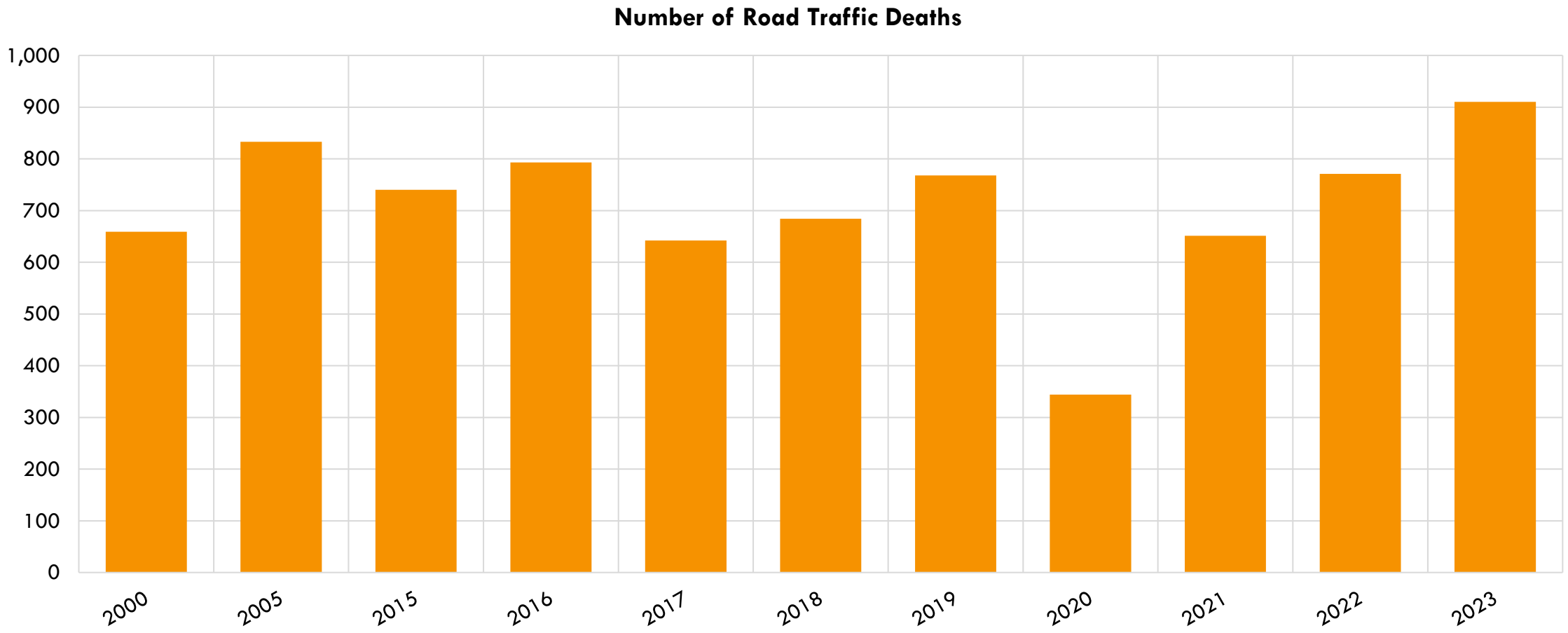




Based on the MORTH Report, the ranking for Bengaluru went up from 5 to 4 in terms of total accidents recorded annually between 2021 and 2022. For the same time period, it also went up in the ranking in terms of number of persons killed from 3 to 2.

Source: https://morth.nic.in/sites/default/files/RA_2022_30_Oct.pdf

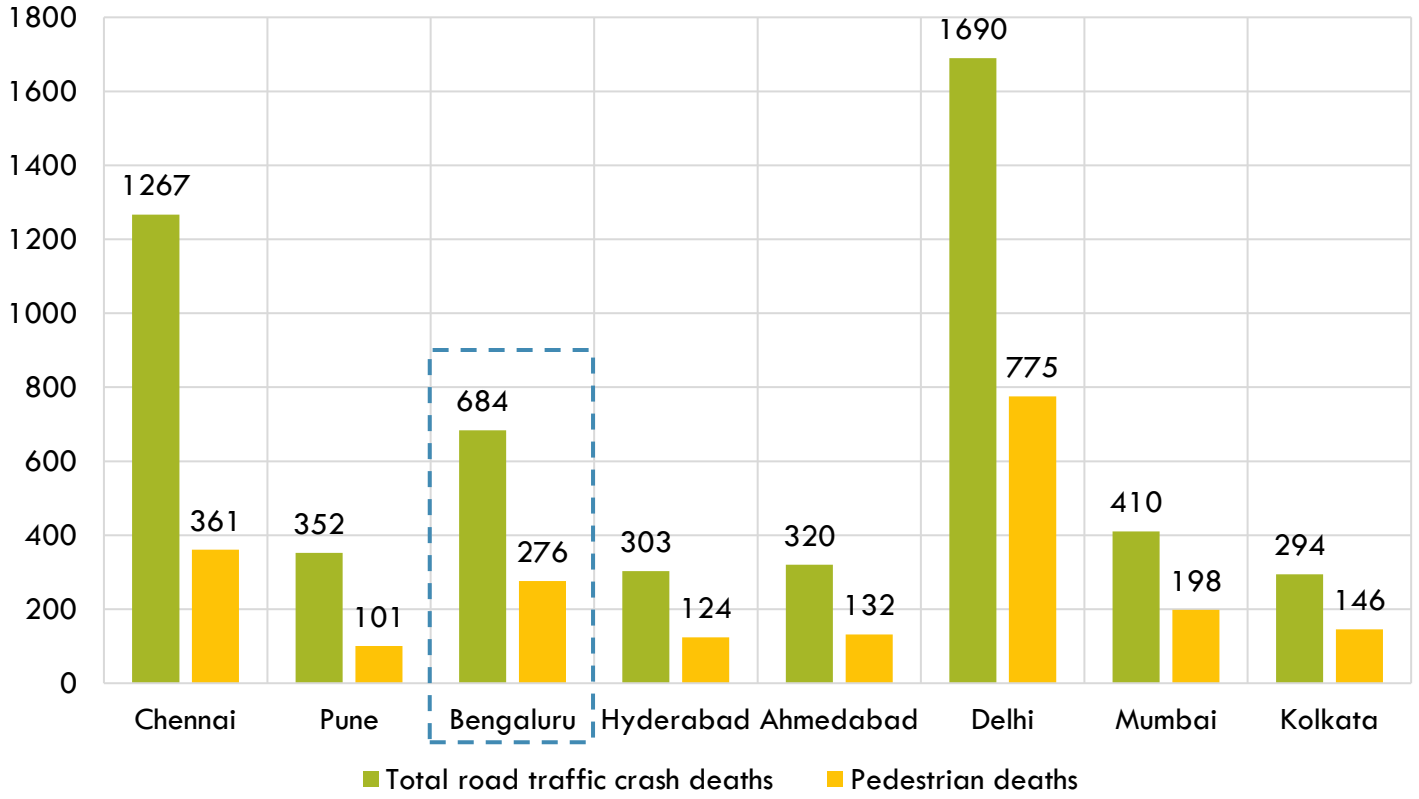
In the recent years the road traffic crash fatalities are showing an increasing trend.



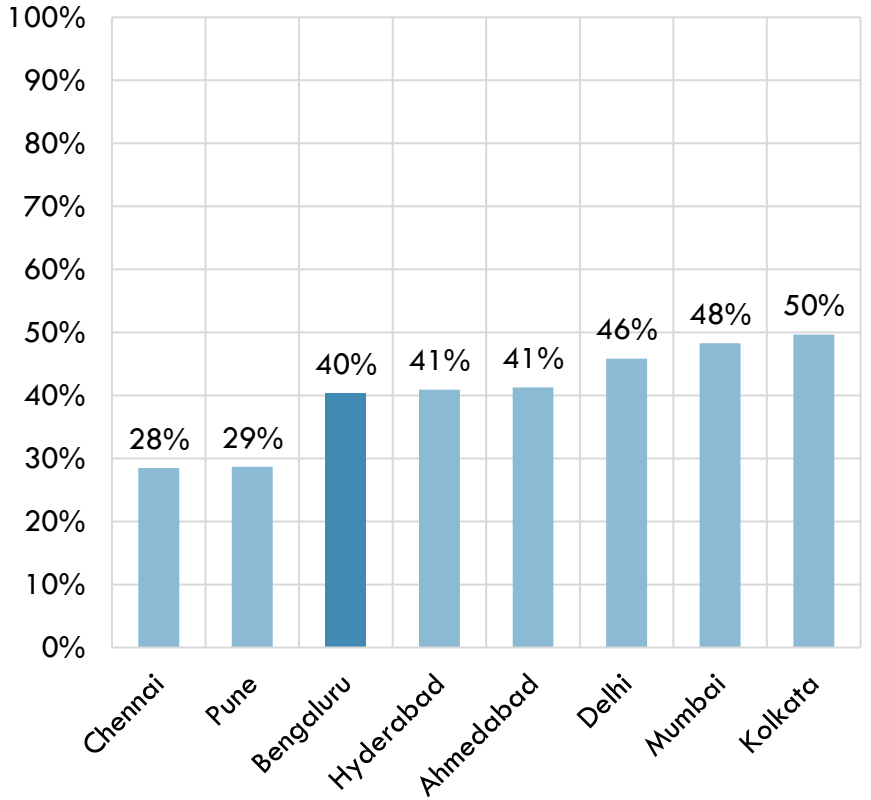
Source: Bengaluru traffic police

40% of the total deaths due to road crashes were pedestrians

Road crash fatalities, 2018



Share of pedestrians in total deaths, 2018



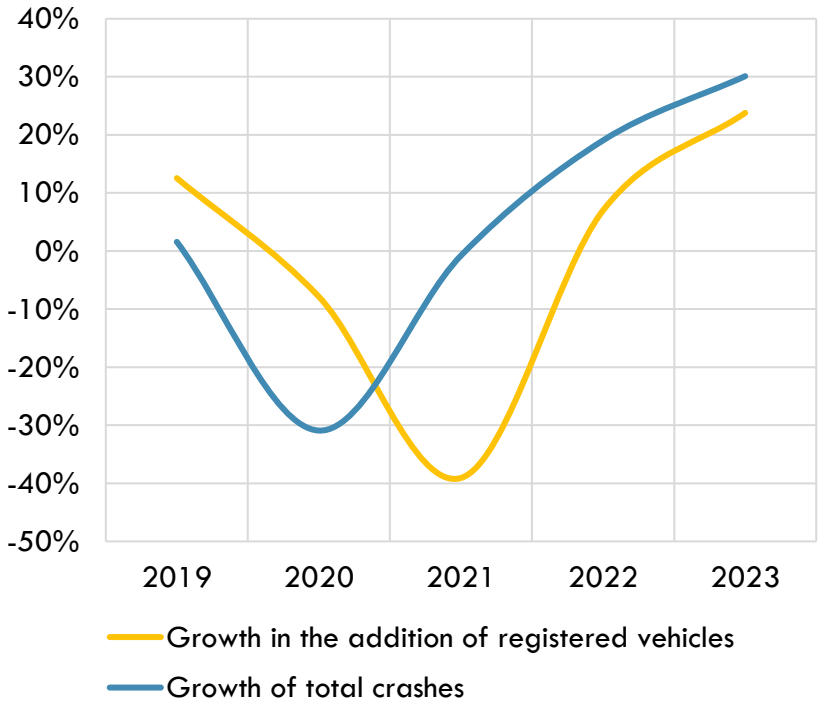
- Two-thirds of deaths in Bengaluru happened on arterial roads, 33% of victims were aged 60 and above, and nearly 60% of victims were crossing roads when the crashes happened.

Source: https://theylacproject.com/wp-content/uploads/2020/10/Promoting-Non-Motorized-Transport-Walking-and-Cycling.pdf

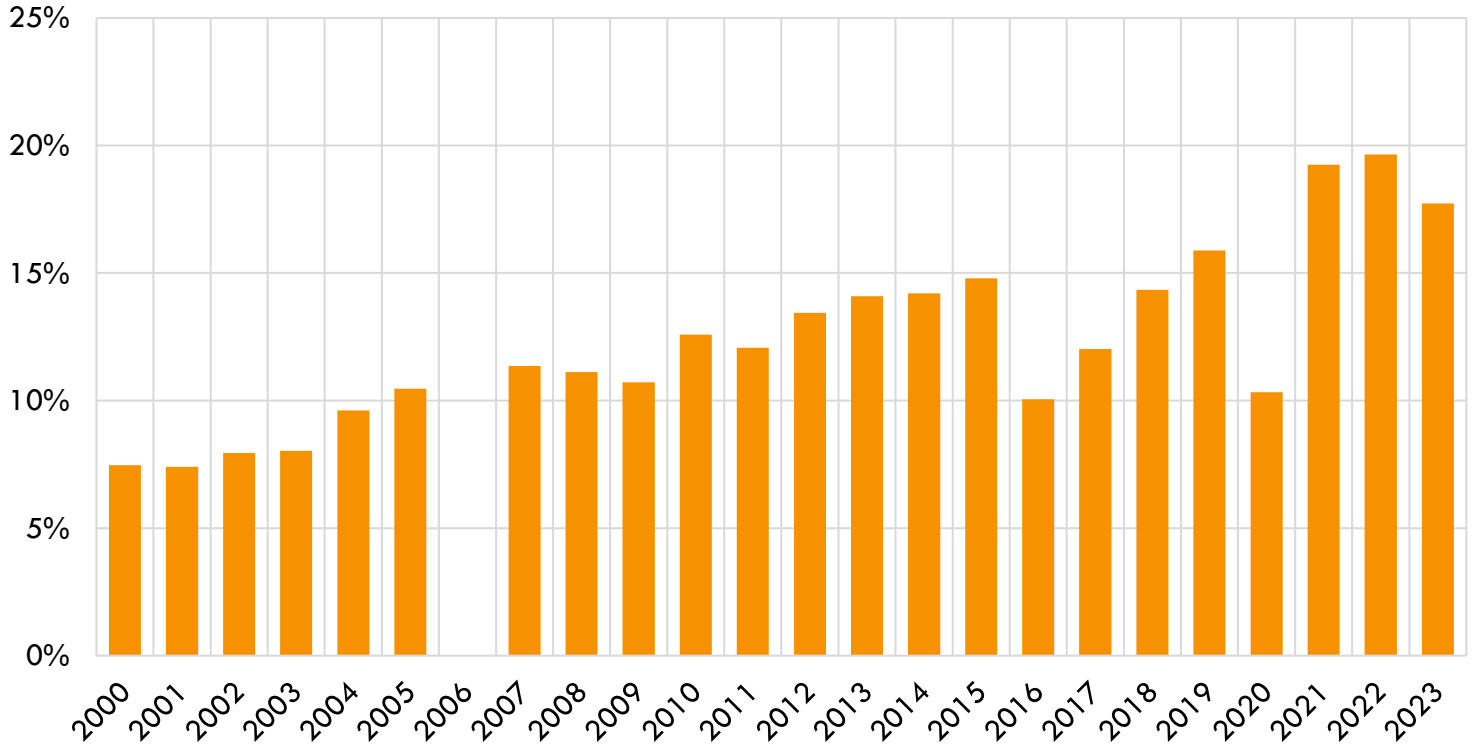
There is an accountable correlation between the growth of road traffic crashes and registered vehicles growth. Share of fatal accidents in total is also increasing.

Asian Transport Observatory

Growth in road crashes vs. addition of registered vehicles



Percentage of fatal accidents in total (2000 – 2023)



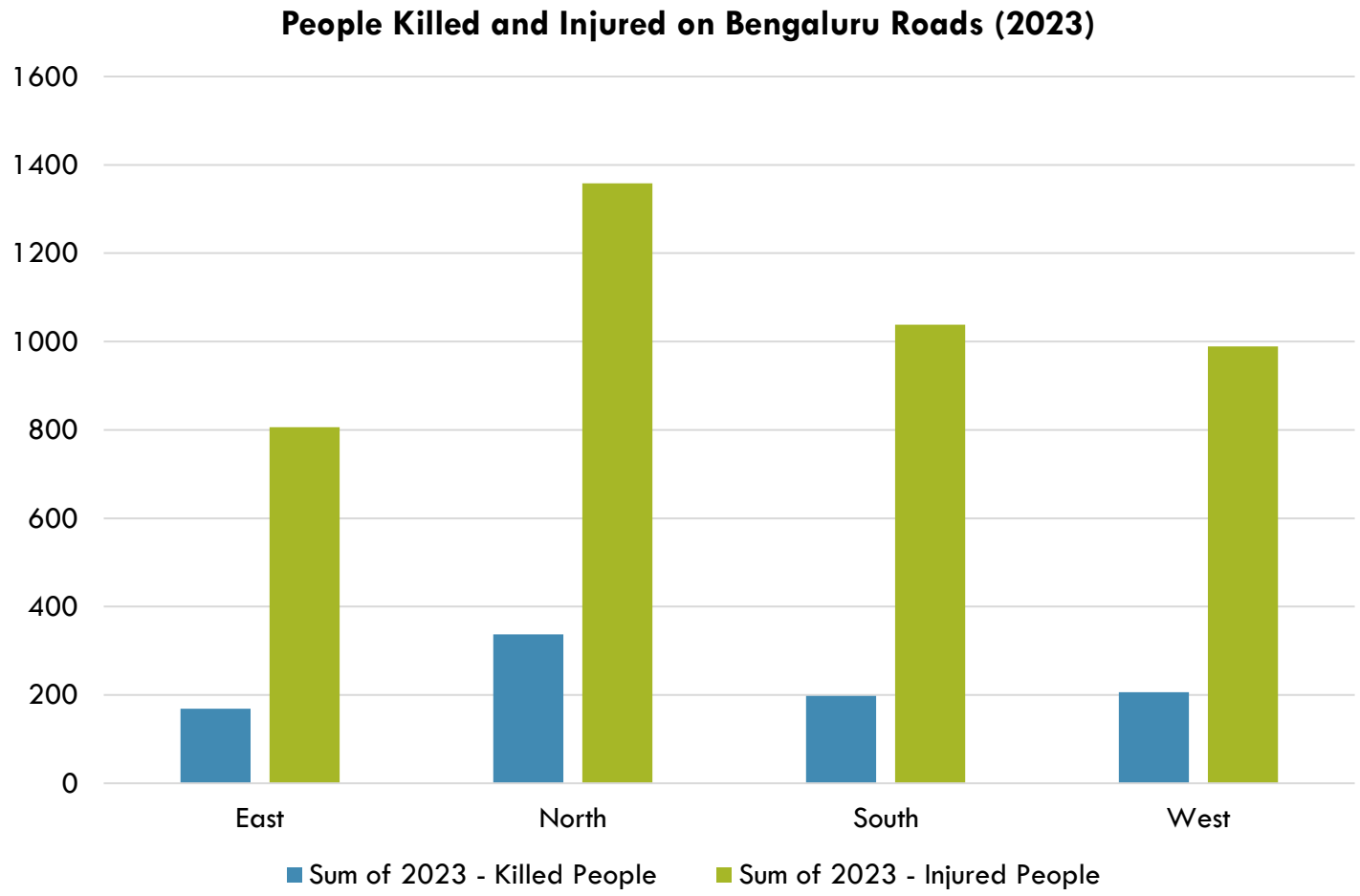
CMP

- Of the total road traffic fatalities in 2018, motorcyclists and pedestrians comprise of 46% and 40% respectively.
- Fatality rate per 100000 Population (ratio) = (A X 100000) / (B) = 5.6

ADB ASIAN DEVELOPMENT BANK AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

Road Safety Zonal Statistics for Bengaluru

- Road safety continuous to be a significant issue in Bengaluru, which has consistently been at the top of the list of cities with highest road crashes.
- In 2023, there were 910 people who were killed, and 4,974 people who were injured in road crashes in Bengaluru.
- No overall improvements have been gained as in 2015, the number of people who died (740) and injured (4,828) were lesser.



https://opencity.in/road-crashes-in-bengaluru-2023/

Section 2: Bengaluru city – policy, plans, projects overview

List of identified policy documents

Document Name	Year Published	Weblink	Document overview
Bangalore Mobility Indicators 2010 - 11	2010	https://dult.karnataka.gov.in/uploads/media_to_upload1632382241.pdf	Provides trend information from which implications for transportation can be drawn or from which transportation policy and investment decisions are made
Comprehensive Mobility Plan for Bengaluru	2019	https://dult.karnataka.gov.in/assets/front/pdf/Comprehensive_Mobility_Plan.pdf	Provides the overall framework for integrating various transport sub-systems and addressing the needs of various segments of population.
Comprehensive traffic and transport study (Draft Final)	2010	https://bmrda.karnataka.gov.in/storage/pdf-files/Blore%20CTTS%20Draft%20Final%20Report.pdf	Aims to develop long-term transportation strategy to identify a practicable and effective investment program up to 2031.
Draft Bengaluru Transit Oriented Development Policy	2019	https://data.opencity.in/dataset/bengaluru-transit-oriented-development-policy/resource/bengaluru-transit-oriented-development-policy---draft-by-bmrcl:-february---2019	The Policy is applicable for Bengaluru Metropolitan Region (BMR), for all the Local bodies, Departments, Agencies, Authorities, Parastatals and Companies that play a role in the planning, funding, implementation, management and monitoring of urban transport and landuse.
Parking Policy 2.0	2020	https://dult.karnataka.gov.in/assets/front/pdf/Parking_Policy_2.0.pdf	Based on the review the existing parking policy to further strengthen its use as an instrument to discourage the use of personal vehicles and to ease road space for seamless movement of people and vehicles.
Revised Action plan for Control of Air Pollution in Bengaluru City	2018	https://kspcb.karnataka.gov.in/sites/default/files/inline-files/AQMC_Revised_actionplan_2682019.pdf	Highlights required action points, time target for implementation and responsible agency, along with the actions in progress.
Revised Master Plan for Bengaluru - 2031 (Draft)	2017	https://data.opencity.in/dataset/bda-revised-master-plan-2031	Includes strategies on the all the urban planning sectors for the city, including Transportation.
The Bengaluru metropolitan land transport authority act, 2022	2022	https://www.indiacode.nic.in/bitstream/123456789/19589/1/06of2023%28e%29metropolitan.pdf	An Act to provide for the constitution of the Bengaluru Metropolitan Land Transport Authority for Urban Mobility Region in the city of Bengaluru and for regulation of the development, operation, maintenance, monitoring, supervision of urban mobility within Urban Mobility Region.
The Master Plan Study on the Introduction of Intelligent Transport System (ITS) in Bengaluru and Mysore in India - Vol. I	2015	https://openjicareport.jica.go.jp/pdf/12235198_01.pdf	The Government of Karnataka requested the Government of Japan to carry out a study to prepare a comprehensive ITS Master Plan for this region
The Master Plan Study on the Introduction of Intelligent Transport System (ITS) in Bengaluru and Mysore in India - Vol. II	2015	https://openjicareport.jica.go.jp/pdf/12235198_02.pdf	

Identified targets from CMP

Target	Target year	Document Name
Setting up 300 km metro network by 2031	2031	Comprehensive Mobility Plan for Bengaluru
The CMP targets to move 70% of people on mass transit rather than privately owned vehicles.	2035	Comprehensive Mobility Plan for Bengaluru

Development of active transport plan/ policy	Active transport infrastructure expansion	Bike Sharing	Road space repurpose to allow access for other modes	General active mobility	Cycling/ Bike Lanes	Walking measures	Traffic calming	Complete Streets design development	Disability access planning/ Barrier free design	Cycling measures
General data & modelling	General data repositories and data collection	Ban of ICE sales	EV charging infrastructure	Fiscal incentives for EVs and components	Renewable energy	General e-mobility	Urban rail electrification	Urban bus Electrification	General freight and logistics	Pricing measures for urban logistics
Change in delivery schedules/night deliveries	General E-commerce delivery	General urban freight consolidation centres	General road safety	General Passenger urban access improvement	Road geometry improvement	Freight Intermodality measures	Passenger Transit hub	Intelligent transport systems	General innovations and digitalization	Technical standards for road infrastructure
Technical standards for general transport infrastructure	Road-side vehicle technical checks	Vehicle Inspection and maintenance	Vehicle labelling	Development density or intensiveness	Mixed use	Transit Oriented Development	General land use	LPG/CNG/LNG	General alternative fuels	Budget/ identification of public transport projects
BRT	Bus fleet renewal	Express lanes / public transport priority	Public transit integration	General public transport	Public transport pricing	Integrated ticketing	Public transit expansion	Public transport information	Enhanced bus networks	Modeshare targets
General IPT/ paratransit measures	General regulations for app-based mobility	General shared mobility	Ridesourcing and Ride Sharing	On-demand transport/ Ride-hailing	General transport asset management	Access restriction by corridor/ road	Fuel tax	Low-emission vehicle zones	Number of vehicle registration limit	Parking Pricing
Vehicle taxes	General commuter trip reduction	General parking measures	General transport demand management	Alternative work schedules (flextime, staggered shifts, compressed work week)	Peak time traffic management	General congestion	Congestion charging	Energy efficient vehicle (non EV) fiscal incentives	Parking Reservations	Traffic flow improvement
Traffic signaling	Vehicle speed	General transport finance	Public Private Partnership (PPP)	General capacity building	Road infrastructure expansion	Coordinate planning across government agencies	Traffic monitoring system	General economic instruments	General Institutional/ governance	General enforcement
Management Authority general	General Parking administration	Stakeholder involvement	Development of other transport-related plan/ policy	General transport planning	Integration of urban and transport planning	General driving permits	General education and behavior change	General Training and workshops	Public awareness campaigns	Gender responsive planning
Vehicle air pollution emission standards	Vehicle efficiency standards	Vehicle safety standards								

Identified policy measures from CMP

Asian Transport Observatory

Ongoing Projects

ADB ASIAN DEVELOPMENT BANK

AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK

TRANSPORT INFRASTRUCTURE PROJECTS

Bengaluru Metro Rail Corporation Limited:
The "Reach One" between Byappanahalli and M.G.Road is completed. Work has been started simultaneously on Reach two, Reach three and Reach four from November 2008 and from March 2009 work has started on the Underground Segment between Minks Square near CTO and Majestic through Dr. Ambedkar Veedhi in front of Vidhana Soudha. All these works will create massive traffic disruption and inconvenience to the public until it is completed.

National Highway Authority of India (NHAI):
Following long term projects have caused total considerable displacement and disruption of traffic:
(a) Elevated road between Peenya and Yeshwanthpur.
(b) Elevate road between Electronic City and Silk Board.

Source: https://btp.gov.in/infrastructure.aspx

Bengaluru Development Authority (BDA)

:1. Grade Separator at the Junction of ORR and Bellary Road near Hebbal
2. Fly over-Bennigana hally
3. Fly over-White Field Road
4. Grade Separator at the Junction of ORR and Bannerghatta Road (Mico lay out Junction)-Jayadeva Grade Separator
5. Fly over at Central Silk Board Junction
6. Grade Separator at Dairy Circle
7. Grade Separator at Ananda Rao Circle
8. Fly over at the Junction of Airport Road and Intermediate Ring Road(IRR)
9. Along ORR at Agara Junction
10. Along ORR at Iblur
11. Along ORR at the junction of ORR & Magdi Road(Sumanahalli)
12. M.C.Layout Junction, Vijayanagar
13. Nayandahalli
14. Chord Road
15. HSR Layout
16. Bellandur
17. Devarabeesanahalli
18. Kadabeesanahalli

Flyovers in progress:

BDA has taken a land mark initiative to ensure seamless connectivity between Silk Board and Hebbal Flyovers. Some of the on going projects are :

1. Kadabeesanahalli
2. Madadevapura
3. Kalyananagar
4. Hennur

Source: https://btp.gov.in/infrastructure.aspx

Transport Infrastructure Projects

- **Bruhat Bengaluru Mahanagara Palike (BBMP)**
- **Junctions**
- (a) Puttanahalli Junction.
  (b) Kadirenahalli Junction
  (c) Yeshwanthapura Grade Separator.
  (d) Prof. C.N. Rao Junction
  (e) Nagavara Junction
  (f) Tagore Circle
  (g) K.R.Road
  (h) Gali Anjaneya Temple Junction
- **Pedestrian Sub-ways:**
- (a) City Market
  (b) Vijayanagar
  (c) Forum Mall
  (d) Garuda Mall
  (e) Ragigudda Temple
  (f) Basaveshwara Circle
  (g) Nagavara Junction

Road widening projects

(a) Bellary Road - 7.6 km
(b) Race course Road - 1.66 km
(c) Hosur Road to Jayanagar "T" block - 2.05 km
(d) Sarjapura Main Road - 2.89 km
(e) Nagarabhavi Main Road - 6.6 km
(f) Madiwala - 1.08 km
(g) Bull Temple Road - 5.49 km
(h) Sevashrama Road - 1.25 km
(i) Shamapura - 3.03 km
(j) Tannery Road - 7.78 km
(k) Palace Road -1.75 km
(l) Hosur Road - 1.60 km
(m) Hosur Lashkar - 4.30 km
(n) Sheshadri Road - 0.5 km
(o) Indiranagara 100 ft Road - 2.60 km
(p) Kasturba Road - 0.77 km
(q) Koramangala 100 ft Road Road - 2.50 km
(r) Kaggadassapura Road - 5.17 km
(s) S.T.Bed Road - 6 km

Source: https://btp.gov.in/infrastructure.aspx

asiantransportobservatory.org

"ATO translates data into insights, policies, and investments"

ATO Team	info@asiantransportobservatory.org
Jamie Leather	jleather@adb.org
Andres Pizarro	andres.pizarro@aiib.org
Manuel Benard	manuel.benard@aiib.org
Alvin Mejia	alvinmejia@asiantransportobservatory.org
Sudhir Gota	sudhirgota@asiantransportobservatory.org
Mel Francis Eden	meleden@asiantransportobservatory.org
Adwait Limaye	adwait@asiantransportobservatory.org
Benjamin Soco	benjaminsoco@asiantransportobservatory.org

X: @transportATO
Linkedin: bit.ly/ATOlinkedin