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Asia Regional Overview

TRANSPORT, CLIMATE AND SUSTAINABILITY GLOBAL STATUS REPORT - 4TH EDITION

SLOCAT Partnership on Sustainable, Low Carbon Transport

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IKI INTERNATIONAL CLIMATE INITIATIVE

DEMOGRAPHICS, TRANSPORT AND SUSTAINABILITY DATA

Indicators	Asia	Global
Population size (2023)	4,732 million	8,000 million
Population growth (2015-2023)	6.8%	8.5%
Urban population share (2023)	52.3%	57%
Urban population growth (2015-2023)	18.1%	16%
GDP per capita (2023)	USD 7,496 (constant 2015 USD)	USD 11,337 (constant 2015 USD)
GDP growth (2015-2023)	36.5%	22.8%
Share of women employed in transport and storage (2023)	13.3%	15.6%
Motorisation rate (2022)	140.4 vehicles per 1,000 people	218.66 vehicles per 1,000 people
Share of urban population with convenient access to public transport (2020)	49.1%	52%
Share of rural population with access to all-weather primary and secondary roads (2020)	40.8%	38%
Transport total GHG emissions (2023)	2,871 million tonnes CO_2eq	7,123 million tonnes CO_2eq
Per capita transport GHG emissions (2023)	0.61 tonnes CO_2eq	0.89 tonnes CO_2eq
Fossil fuel subsidies (explicit and implicit) (2023)	USD 865 per capita (constant 2021 USD)	USD 813 per capita (constant 2021 USD)
Share of renewable energy sources in transport	3% (2021)	4.6% (2023)
Carbon intensity of electricity generation (2023)	559.5 gCO_2/kWh	417 gCO_2/kWh
Transport contribution to air pollution (2019)	8%	6%
Premature deaths attributable to air pollution by transport (2019)	3.2 per 100,000 people	2.29 per 100,000 people
Road casualties (2021)	15.5 per 100,000 people	15 per 100,000 people

Source: See endnote 1 for this section.

KEY FINDINGS

Demand, use and access

- In 2023, Asia was home to more than half (58%) of the world's population and accounted for 47% of global GDP. However, the region housed only 38% of the world's transport infrastructure that year.
- Around 60% of Asia's rural population lacked access to all-weather roads network as of 2019, impeding connectivity and limiting access to economic opportunities. Access levels varied widely across countries.
- Although more than half (52%) of Asia's population resided in cities in 2023, slightly less than half (49.1%) of the region's urban population on average had convenient access to public transport (compared with a global average of 52%). Levels ranged from 99.9% in Singapore to only 7.3% in Jordan. A 2024 assessment found that a third of Asian countries (31%) had set targets to enhance public transport, introducing bus rapid transit systems or urban rail.
- As of 2023, only 24% of cities in Asia were providing at least half of their population with access to essential services (such as health care and education) within a 1-kilometre walking distance, compared to 39% of around 1,000 cities globally. Walking and cycling are on the decline in Asian cities, as data from 2018 to 2023 showed a shift to motorcycles and cars.
- Despite considerable expansion of bus rapid transit systems across the region – from around 9,400 kilometres in 118 cities in 2015 to 15,800 kilometres in 154 cities in 2021 – their availability has lagged compared to high-income countries, and the bus sector has continued to face challenges.
- In 2023, less than 20% of the population across most of Asia lived within 300 metres of a physically protected bikeway.
- Progress in enhancing freight transport and logistics performance has been uneven across Asia, with China, India, Indonesia, Thailand, and Viet Nam making strides, while other countries lagged.
- Freight transport in Asian cities grew an estimated 20% in 2020, driven by a surge in e-commerce and online deliveries, particularly by couriers, forwarders and parcel-delivery services.
- Passenger transport demand in Asia fell temporarily in 2020 due to the effects of the COVID-19 pandemic, but by 2023 the sector had recovered to surpass 2018 levels in most sub-regions, except the Pacific.
- Passenger and freight transport demand in Asia is projected to double or even triple between 2020 and 2050.
- Asia has experienced tremendous development in transport infrastructure in recent years, driven by economic growth, transport demand, trade flows, regional connectivity needs and urbanisation.
- Roads accounted for the vast majority (98%) of the region's surface transport infrastructure during 2021-2023, whereas railways made up 2% and urban rapid transit systems a mere 0.1%. Funding for road infrastructure has outweighed that for rail infrastructure in Asia, despite substantial (yet uneven) growth in rail across countries.
- In 2023, the transport infrastructure density in Asia was 433 kilometres per 1,000 square kilometres, well below the density for countries in the Organisation for Economic Co-operation and Development (OECD), at 690 kilometres per 1,000 square kilometres. Asia's road transport infrastructure, at 10 kilometres of road per 1,000 people, was below the global average of 11 kilometres of road per 1,000 people in 2022.
- Asia has experienced steady growth in rail infrastructure since 2015, accounting for 75% of the global growth in railways between 2015 and 2021. The region's railway infrastructure expanded by around 116,000 kilometres between 2010 and 2021.

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- Growth in the region's road transport infrastructure has been greatly outpaced by the surge in private vehicle ownership, which grew 7.3% annually between 2010 and 2022.
- In 2022, the average motorisation rate in Asia (covering four-wheeled motor vehicles) was 140.4 vehicles per 1,000 people, although disparities persist across the region. This was below the global average of 219 vehicles per 1,000 people in 2022, but above Asia's rate of 123 vehicles per 1,000 people in the 2016-2020 period.
- The bus sector in Asia has been in crisis, with bus manufacturing dropping 44% between 2015 and 2022, while manufacturing of other vehicle types rose 3%. The region experienced a 34% decline in bus ridership during this period.
- Motorised two- and three-wheelers comprise a significant share of vehicle fleets in Asia, particularly as shared modes become accessible through ride-hailing apps and offline.
- Regional production of bicycles (both regular and electric) has grown minimally since 2015. Revenue in Asia's bicycle market is projected to increase 2.55% annually between 2025 and 2029, from USD 21.3 billion to USD 23.6 billion.
- Maritime transport has played an important role in meeting the region's socio-economic and connectivity needs. The Asia-Pacific region vastly outperformed other world regions in the Liner Shipping Connectivity Index (LSCI) in 2023, with a score of 177, above the global average of 103. A total of 59 Asian ports ranked among the top 100 globally in the Container Port Performance Index.
- Air transport (domestic, regional and international) plays an important role in the Asian economy, employing 42 million people in 2023 and contributing USD 890 billion to the region's GDP. Air transport in Asia has undergone rapid expansion driven by rising middle-class demand, low-cost carrier networks and international tourism.
- Asia has firmly positioned itself as the global leader in electric vehicles and was home to 85% of the world's battery electric road vehicles in 2024. The region's imports of electric vehicles increased nine-fold between 2017 and 2023 – rising from USD 3 billion to USD 27 billion – while its share of the global electric vehicle export market grew from 27% to 34%. However, this leadership has not been shared equally shared among sub-regions and countries.
- While China dominated the electric vehicle uptake, India and Thailand have made significant strides in electric vehicle deployment through subsidies, domestic manufacturing and investment in charging networks. Across Asia, informal transport services carried out by two- and three-wheelers, jeepneys and other types of collective transport have been gradually electrifying.

Sustainability and climate trends

- In 2023, Asia's transport sector was responsible for around 6% of global greenhouse gas emissions and for around 40% of the world's transport greenhouse gas emissions (excluding international aviation and shipping). Since 2015, the region's transport greenhouse gas emissions have increased around 2% annually.
- Transport has become Asia's second fastest growing source of greenhouse gas emissions, surpassed only by the power sector. However, emission growth rates vary greatly across economies.
- Asian transport emissions increased 6.8% in 2023, adding 182 million tonnes of CO_2 equivalent to reach a record high of 2.87 gigatonnes of CO_2 equivalent, nearly the same level as in Europe and North America combined.
- Asia's per capita transport greenhouse gas emissions totalled 0.61 tonnes of CO_2 equivalent in 2023, below the levels in Europe (1.66 tonnes) and Latin America and the Caribbean (0.94 tonnes) but higher than in Africa (0.26 tonnes).
- Trends show signs of a decoupling between economic growth and transport emissions. Asia's transport emissions relative to economic output increased 3% in 2023 to reach 0.81 tonnes of CO_2 equivalent per USD 10,000, the third highest level among global regions but much lower than in Africa (1.29 tonnes) and Latin America and the Caribbean (1.12 tonnes). By 2022, high-income Asian economies had achieved "absolute" decoupling (where transport emissions fell even as GDP rose), and middle- and low-income countries

KEY FINDINGS

showed "relative" decoupling (with transport emissions rising, but more slowly than economic output).

- Freight transport is expected to contribute around 60% of the region's domestic transport emissions during the 2020-2030 period. Across Asia, urban freight accounted for only 15% of total freight activity, but it produced 43% of freight-related CO_2 emissions in 2022, due to frequent, small-batch deliveries in congested traffic.

- Road transport has fuelled the growth in Asia's transport emissions, responsible for 88% of the total in 2022. Other transport sub-sectors contributed much lower shares of transport emissions, including domestic aviation (5%), inland waterways (5%) and railways (1%).


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- Asia's transport sector accounted for 21% of the region's total primary energy use in 2022, and road transport consumed 83% of the transport sector's energy in 2020. Energy consumption in transport fell 0.2% annually from 2015 to 2021, spurred by energy efficiency improvements in railways linked to greater electrification.

- CO_2 emissions from Asia's rail sector grew 2% annually on average between 2000 and 2010, then fell 0.2% annually between 2010 and 2022. This decline in rail's emissions is attributed to increased rail electrification. As of 2024, 56% of rail tracks in Asia were electrified, up from 34% in 2000, and 60% of railway energy came from electricity.

- The transition to renewable energy in Asia's transport sector has been slower than in other sectors, with the share of renewables used in transport rising from 1.6% in 2015 to 3.0% in 2021. Fossil fuel use dominates, particularly in road transport. Most Asian countries still rely on a carbon-intensive power grid, resulting in the highest carbon intensity of electricity generation among global regions in 2023.

- Biofuels were the leading renewable energy source in transport in South-East Asia in 2023, supplying nearly 10% of road transport energy, well above the global average of 4%.

- Among cities across Asia, car commuters in Istanbul experienced the highest annual hours of traffic delay due to congestion (105 hours) in 2024, followed by Jakarta (89 hours) and Bangkok (74 hours).

- Transport-induced air pollution contributed roughly 8% of total air pollutant emissions in Asia, resulting in 3.2 premature deaths per 100,000 people in 2019, compared to global averages of 6% and 2.3 premature deaths. As of 2024, virtually the entire population in East Asia and in South-East Asia was living in areas where air pollution levels exceeded the World Health Organization's safe air standards.

- The enactment of vehicle emission standards and fuel quality standards has led to a 2% annual decrease in certain pollutants in Asia between 2000 and 2022. The share of vehicle registrations in Asian countries that have emission standards at the Euro 4 level or above increased from 9% in 2010 to 89% in 2023.

- Road safety remains a persistent public health challenge in Asia, where road deaths averaged 15.5 casualties per 100,000 people in 2021, above the global average of 15.0 casualties. In 2021, the region accounted for more than half the world's 1.19 million annual road traffic deaths, with 35% representing motorised two-wheeler users, followed by pedestrians at 22%.

- With rising motorisation, there is an urgent need to improve the region's infrastructure for walking and cycling.

- In the Asia-Pacific region, weather hazards related to climate change caused an estimated USD 12 billion in median yearly damage to transport assets (such as roads, railways and ports) – or 60% of the total global damage of USD 20 billion – according to research of 2019 and 2023. Railways shoulder around 25% of these losses.

- Despite bear the bulk of the world's damage to transport infrastructure from climate change, most Asian countries lack robust policies or financing for adaptation. Climate finance for transport heavily favours mitigation, with only 0.13% of transport-related climate finance in Asia in 2022 allocated to adaptation and only 0.06% to a combination of mitigation and adaptation.

KEY FINDINGS

Policy and investment developments

- As of 25 May 2025, only five countries in Asia – Japan, Maldives, Nepal, Singapore and the United Arab Emirates (UAE) – had submitted to the United Nations Framework Convention on Climate Change (UNFCCC) their third-generation Nationally Determined Contributions (NDCs) towards reducing emissions under the Paris Agreement. Among these, Nepal and the UAE were the only countries to include transport greenhouse gas mitigation targets in their NDCs.
- Some of the Asian NDCs include transport adaptation and resilience-related targets and measures that are reflective of existing climate finance flows. In 2022, only an estimated 0.13% of the committed funds for transport-related climate finance in the region were earmarked to support adaptation.
- As of 25 May 2025, 18 Asian countries had submitted to the United Nations their LT-LEDS (Long-Term Low Emission Development Strategies).
- Eleven Asian countries had submitted National Adaptation Plans (NAPs) to the UN as of 25 May 2025, with the majority identifying transport-specific adaptation strategies.
- In addition to national strategies, several Asian countries have strengthened their commitments through international decarbonisation frameworks.
- A growing number of Asian countries have developed strategies to enhance their climate adaptation and preparedness for natural disasters.
- Countries have increasingly recognised that developing efficient public transport networks is central to promoting access for Asia's growing urban populations.
- Since 2021, several countries in the region have advanced road safety through multi-year action plans.
- According to 2025 studies, national government spending on transport in Asia over a five-year period was only 1.5% of GDP on average, and countries with higher per capita GDPs allocated more resources to infrastructure maintenance. The Asian transport sector received 55% of global Official Development Assistance (ODA) from 2016 to 2023, up from 43% between 2011 and 2015.
- In 2023, fossil fuel subsidies in Asia totalled USD 865 per capita, just above the global average of USD 813 per capita, although some countries have taken steps to phase out, reduce or reform these policies. Asian fossil fuel subsidies are projected to increase 32% between 2023 and 2030, further undermining climate and sustainability efforts.

- The momentum around electric vehicle adoption in the region has been coupled with a growing body of policy initiatives, financing mechanisms, and infrastructure programmes at the national and sub-national levels.
- Several countries in Asia are advancing vehicle efficiency and fuel economy regulations to curb emissions, improve air quality and reduce fuel consumption. In parallel, a growing number of countries in the region have sought to increase the use of renewable energy as well as low-carbon fuels in transport.
- Although the aviation industry is an important driver of economic development and employment in Asia, its sustainability hinges on decarbonisation measures.
- For maritime transport, a growing number of Asian countries have embraced green shipping corridors and engaged in other emission reduction measures.
- Inland waterway transport had gained attention in countries with extensive river networks and coastlines.
- Although freight transport remains less prominent than passenger transport in many Asian NDCs, its profile has grown within national transport strategies.

Context, challenges and opportunities

Asia is a highly diverse region, hosting two of the world's largest economies (China and India) as well as low- and middle-income and extremely climate-vulnerable countries such as Afghanistan, Myanmar, Nepal and Timor-Leste. The region reflects varying levels of development, infrastructure, policy capacity and mobility patterns.

In 2022, low- and middle-income countries in Asia represented roughly half the world's population and global gross domestic product (GDP), yet they housed only around one-third of the world's surface infrastructure.[2] Although transport infrastructure development has increased greatly in recent years, it has been dominated by road transport and by a strong increase in private vehicle ownership. Expansion of transport infrastructure has been unevenly distributed, leaving many countries with inadequate access.

A large share of Asia's population – including the elderly, low-income groups and women – depends on walking, cycling and public transport for daily mobility.[3] Despite this, on average less than half (49.1%) of Asia's urban residents had convenient access to public transport in 2020, and only 40.8% of the rural population had access to primary and secondary roads.[4]

The share of women employed in Asia's transport and storage industries was 13.3% in 2023, well below the levels in North America (28.1%) and Europe (24.9%), and the second lowest share after Africa.[5] Limited access and safety of transport services are the greatest obstacles to labor participation in low- and middle-income countries of the region. Women rely more on walking and informal transport than men do.[6]

Since 2015, the implementation of national policies and actions has greatly improved Asia's transport emissions outlook. Even so, the region's transport greenhouse gas emissions increased 6.8% in 2023, reaching a record high of 2.8 gigatonnes of carbon dioxide (CO_2) equivalent, nearly the same as in Europe and North America combined.[7] Asia contributed around 40% of global transport emissions in 2023, underscoring the region's crucial role in transport decarbonisation and sustainability.[8] Passenger and freight transport demand in Asia are projected to double or even triple between 2020 and 2050.[9] Under current policies, the region's transport emissions could reach 4 gigatonnes of CO_2 by 2050, well short of the 0.3 to 1 gigatonnes required to meet the emission reduction goals of the Paris Agreement.[10]

Further compounding Asia's transport sector challenges are strong dependence on imported fossil fuels, slow uptake of renewables in transport and limited progress in reducing fossil fuel subsidies. In many countries, a large share of foreign exchange is spent on importing vehicles and fossil fuels, straining national budgets and underscoring the urgent need for multi-modal transport planning and fuel efficiency.[11] Renewable energy use in the region's transport sector ranged from 12.9% in Indonesia to 0% in Saudi Arabia in 2022.[12] Asia remained the region with the highest carbon intensity of electricity generation, despite some improvement since 2015.[13] Overall, regional progress on sustainable, low-carbon transport has been impeded by inadequate national policy frameworks and insufficient financing.

Asia has established itself as an epicentre of electric mobility globally, accounting for 60% of the global increase in electric vehicles and 90% of growth in electric buses from 2015 to 2023, driven largely by China's market leadership.[14] In 2024, 85% of the world's battery-electric road vehicles were in Asia.[15] In recent years, India, Indonesia and Viet Nam all have introduced ambitious policies to scale up the use of electric vehicles (especially two- and three-wheelers) and public transport.

Given the region's vulnerability to the impacts of climate change, Asia has already felt the significant financial burden of multi-hazard damage to surface transport infrastructure. As of 2019 research, the Asia-Pacific region suffered an estimated USD 12 billion in median yearly damage to transport assets (such as roads, railways and ports), or 60% of the global total.[16] The COVID-19 pandemic had lasting effects on Asia's economies and transport, which are reflected in trade disruptions, reduction in public-private partnership investments and decreased public transport use, putting additional pressure on investments for sustainable transport.[17]

Asia has made important advances towards reducing transport-related air pollution and road fatalities.[18] Even so, transport-induced air pollution remains a leading health hazard in the region, responsible for roughly 8% of total air pollutant emissions and causing 3.2 premature deaths per 100,000 people in 2019.[19] Road safety remains a concern in Asia, which recorded 15.5 road casualties per 100,000 people in 2021, above the world average.[20]

Efforts to decarbonise and enhance the sustainability of Asia's transport sector must be pursued alongside infrastructure expansion and a rise in passenger and freight activity to accommodate economic growth. This calls for tailored approaches to transforming transport that cater to local contexts and needs – economic, social and infrastructural – while integrating broader sustainable development objectives.

Demand, use and access

In 2023, Asia was home to more than half (58%) of the world's population and accounted for 47% of global GDP.[21] **However, the region housed only 38% of the world's transport infrastructure that year.**[22] The transport sector employed 148 million people, or 7% of the region's total workforce, in 2023.[23] Yet the share of women employed in the transport and storage industries in Asia was only 13.3%, well below the levels in North America (28.5%), Oceania (23.3%) and Europe (22.3%) in 2023.[24]

Around 60% of Asia's rural population lacked access to all-weather roads network as of 2019, impeding connectivity and limiting access to economic opportunities.[25] **Access levels varied widely across countries:** whereas 78% of Lebanon's rural population lived within 2 kilometres of an all-season primary and secondary road, only 5.1% of Turkmenistan's did.[26]

Although more than half (52%) of Asia's population resided in cities in 2023, slightly less than half (49.1%) of the region's urban population on average had convenient access to public transport (compared with a global average of 52%).[27] **Levels ranged from 99.9% in Singapore to only 7.3% in Jordan.**[28] **A 2024 assessment found that a third of Asian countries (31%) had set targets to enhance public transport, introducing bus rapid transit systems or urban rail.**[29]

As of 2023, only 24% of cities in Asia were providing at least half of their population with access to essential services (such as health care and education) within a 1-kilometre walking distance, compared to 39% of around 1,000 cities globally.[30] **Walking and cycling are on the decline in Asian cities, as data from 2018 to 2023 showed a shift to motorcycles and cars.**[31] Walking is a critical enabler of public transport access, and its integration with public transport is a key strategy for reducing private car use.[32]

Despite considerable expansion of bus rapid transit systems across the region – from around 9,400 kilometres in 118 cities in 2015 to 15,800 kilometres in 154 cities in 2021 – their availability has lagged compared to high-income countries, and the bus sector has continued to face challenges.[33] Overall, Asia's urban public transport infrastructure tripled between 2000 and 2022.[34]

In 2023, less than 20% of the population across most of Asia lived within 300 metres of a physically protected bikeway.[35] This was above the world average of 5% but well below the shares of top-performing cities in 2023, all of which were in Europe.[36]

- China led the region in the share of people living near protected bikeways in 2023, with several cities exceeding the Asian average, including Sucheng District area at 40% and Ma On Shan area at 38%.[37]
- In Tel Aviv (Israel), 30% of residents lived close to protected bikeways in 2023, whereas the share in Jeonju (Republic of Korea) was 25%.[38]

Progress in enhancing freight transport and logistics performance has been uneven across Asia, with China, India, Indonesia, Thailand, and Viet Nam making strides, while other countries lagged.[39] Freight demand by road increased 21% and by rail increased 15% between 2015 and 2020, due to the expansion of infrastructure networks and economic development.[40] Inland waterways and domestic shipping are important modes of freight transport in most Asian countries (aside from the landlocked central Asian countries), and their share is projected to increase from 45% in 2020 to 50% in 2030 thanks to modal shift policies and infrastructure investments.[41]

Freight transport in Asian cities grew an estimated 20% in 2020, driven by a surge in e-commerce and online deliveries, particularly by couriers, forwarders and parcel-delivery services.[42] Although this growth has given rise to innovative solutions such as cargo bikes and scooters for last-mile deliveries, trucks and vans still dominate urban freight operations in the region.[43] Under current policies, urban freight demand in Asia could grow 3.7% annually between 2020 and 2050, overtaking the growth in urban passenger transport demand (2.1%).[44]

Passenger transport demand in Asia fell temporarily in 2020 due to the effects of the COVID-19 pandemic, but by 2023 the sector had recovered to surpass 2018 levels in most sub-regions, except the Pacific.[45] Lockdowns and other pandemic-related measures to contain the spread of coronavirus severely restricted transport and mobility. As in other global regions, passenger transport demand was more heavily impacted than freight demand across Asia.

- Metro ridership across Asia fell 32% on average in 2021, compared to a 63% drop in North America and a 40% decline globally.[46]
- Air travel was the transport mode most severely affected by COVID-19 travel restrictions in Asia, falling nearly 50% between 2015 and 2020; however, it has since recovered to pre-pandemic levels.[47]
- Asia ranked second among global regions in public transport ridership growth in 2024, after the Middle East and North Africa.[48]

Passenger and freight transport demand in Asia is projected to double or even triple between 2020 and 2050.[49] This very high growth trajectory implies that Asia alone could be


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responsible for roughly half of the global increase in transport demand during this period.[50] Trends point towards substantial growth in Asian transport activity, potentially outpacing population and infrastructure growth.

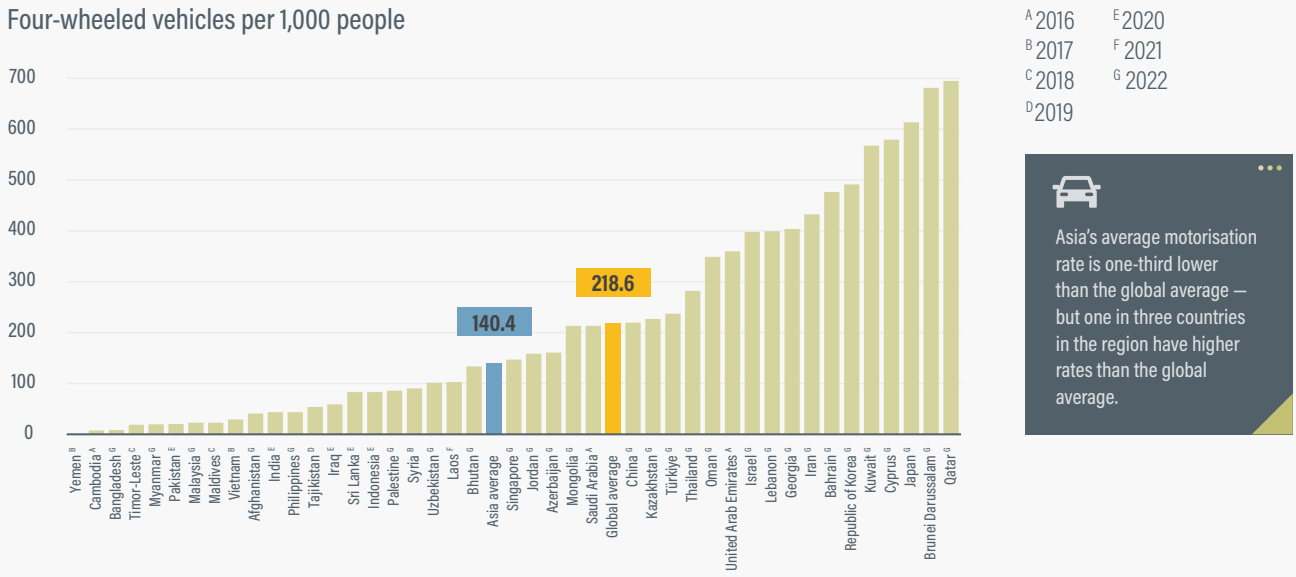
Asia has experienced tremendous development in transport infrastructure in recent years, driven by economic growth, transport demand, trade flows, regional connectivity needs and urbanisation. Roads accounted for the vast majority (98%) of the region's surface transport infrastructure during 2021-2023, whereas railways made up 2% and urban rapid transit systems a mere 0.1%.[51] **Funding for road infrastructure has outweighed that for rail infrastructure in Asia, despite substantial (yet uneven) growth in rail across countries.** Between 2010 and 2022, the region's road infrastructure length expanded 2.5% annually, greatly outperforming the growth of rail.[52]

In 2023, the transport infrastructure density in Asia was 433 kilometres per 1,000 square kilometres, well below the density for countries in the Organisation for Economic Co-operation and Development (OECD), at 690 kilometres per 1,000 square kilometres.[53] **Asia's road transport infrastructure, at 10 kilometres of road per 1,000 people, was below the global average of 11 kilometres of road per 1,000 people in 2022.**[54] By country, road infrastructure in the region ranged from well above the global average in Mongolia (32.9 kilometres per 1,000 people) and Bhutan (23.4 kilometres), to well below the Asian average in Bangladesh (0.9 kilometres) and Pakistan (1.1 kilometres).[55]

Asia has experienced steady growth in rail infrastructure since 2015, accounting for 75% of the global growth in railways between 2015 and 2021.[56] **The region's railway infrastructure expanded by around 116,000 kilometres between 2010 and 2021.**[57] China has continued to expand the rail network by improving regional connectivity, reducing travel times, and enabling cross-continental rail freight activities.[58]

- Sri Lanka added 344 kilometres of heavy railway routes between 2008 and 2021, reflecting annual growth of 1.9%.[59] It was among the region's top performers in the density of its railway network, with 26 kilometres of rail per 1,000 square kilometres in 2021.[60]
- As of early 2025, China's railway network exceeded 162,000 kilometres, including 48,000 kilometres of high-speed rail (the largest such network in the world).[61]
- Operating since 2011, the total number of freight trains traveling between China and Europe surpassed 100,000 in 2024.[62]

FIGURE 1. Motorisation rates per 1,000 people in Asia, various years



Asia's average motorisation rate is one-third lower than the global average — but one in three countries in the region have higher rates than the global average.

Source: See endnote 65 for this section.

Growth in the region's road transport infrastructure has been greatly outpaced by the surge in private vehicle ownership, which grew 7.3% annually between 2010 and 2022.[63] A staggering 1 billion vehicles were added to Asia's roads between 2000 and 2023, mirroring the region's rising motorisation rates.[64]

In 2022, the average motorisation rate in Asia (covering four-wheeled motor vehicles) was 140.4 vehicles per 1,000 people, although disparities persist across the region (Figure 1).[65] **This was below the global average of 219 vehicles per 1,000 people in 2022, but above Asia's rate of 123 vehicles per 1,000 people in the 2016-2020 period.**[66] Motorisation growth has been driven by rising incomes, the explosion in private car ownership, and continued low levels of accessibility to public transport services in both urban and rural areas. These trends have put immense pressure on the region's road infrastructure to sustain a rapidly growing vehicle fleet.[67]

- The highest motorisation rates in Asia in 2022 were in Qatar (694.9 vehicles per 1,000 people) and Brunei Darussalam (681.2 vehicles), both of which were well above the global average.[68]
- The region's lowest motorisation rates were in Yemen (0.9 vehicles per 1,000 people in 2017) and Cambodia (7.6 vehicles per 1,000 people in 2016); more recent data are lacking due to challenges with data availability and collection across the region.[69]

The bus sector in Asia has been in crisis, with bus manufacturing dropping 44% between 2015 and 2022, while manufacturing of other vehicle types rose 3%.[70] **The region experienced a 34% decline in bus ridership during this period.**[71] These trends suggest a shifting preference away from buses, despite policy measures to improve public transit since 2015.[72]

- Annual production of buses and motor coaches in China declined from 140,686 units in 2019 to 89,008 units in 2022, and in Japan it fell from 123,097 units in 2017 to 84,611 units in 2022.[73]
- Imports of buses in Asia grew 7% between 2015 and 2023, compared to a 53% increase in imports of other vehicles.[74]
- Bus registrations in Asia increased 16% between 2015 and 2022, while registrations of other vehicles grew 56%.[75]

Motorised two- and three-wheelers comprise a significant share of vehicle fleets in Asia, particularly as shared modes become accessible through ride-hailing apps and offline. These vehicles often operate within the informal economy. Given the prevalence, high annual mileage, and operating patterns of motorised two- and three-wheelers, many governments across the region are looking to transition them to cleaner vehicles to reduce emissions and pollution in urban areas.

Regional production of bicycles (both regular and electric) has grown minimally since 2015.[76] **Revenue in Asia's**

bicycle market is projected to increase 2.55% annually between 2025 and 2029, from USD 21.3 billion to USD 23.6 billion.[77] This growth is driven mainly by China, where bicycle revenues were expected to total USD 12 billion in 2025.[78]

Maritime transport has played an important role in meeting the region's socio-economic and connectivity needs. The Asia-Pacific region vastly outperformed other world regions in the Liner Shipping Connectivity Index[i] **(LSCI) in 2023, with a score of 177, above the global average of 103.**[79] **A total of 59 Asian ports ranked among the top 100 globally in the Container Port Performance Index.**[80]

- China had the region's highest LSCI score in the second quarter of 2023, followed by the Republic of Korea, Singapore and Malaysia.[81]
- Between 2015 and 2023, Viet Nam improved its LSCI score by more than 50%.[82]
- In East Asia alone, 36 ports ranked among the global top 100 in port performance, underscoring the sub-region's significance in global trade and the maritime sector.[83]

Air transport (domestic, regional and international) plays an important role in the Asian economy, employing 42 million people in 2023 and contributing USD 890 billion to the region's GDP.[84] **Air transport in Asia has undergone rapid expansion driven by rising middle-class demand, low-cost carrier networks and international tourism.** The number of flights per 1,000 people in the region increased from 1.0 in 2001 to 2.9 in 2019, then falling to 1.8 in 2020 during the COVID-19 pandemic.[85] The Asia-Pacific region recorded its strongest annual increase in passenger traffic in 2024, at 16.9% (above the global average of 10.4%), driven mainly by strong domestic markets in China and India, although international travel in the region remained below 2019 levels.[86]

Asia has firmly positioned itself as the global leader in electric vehicles and was home to 85% of the world's battery electric road vehicles in 2024.87 The region's imports of electric vehicles increased nine-fold between 2017 and 2023 – rising from USD 3 billion to USD 27 billion – while its share of the global electric vehicle export market grew from 27% to 34%.88 However, this leadership has not been shared equally shared among sub-regions and countries.[89]

- In the Asia-Pacific region, electric vehicles accounted for 16% of motorised two- and three-wheelers (a total of 77 million), 11% of buses (726,200), 6.7% of cars (35 million), 2.2% of vans (1.3 million) and 0.8% of trucks (377,200) in 2024.[90]
- China continued to dominate electric bus exports, with 15,000 units exported in 2024, a 25% increase from 2023.[91]

i A comprehensive tool for quantifying a nation's integration into the global maritime network, which provides a standardised metric to assess a country's access to and efficiency within international liner shipping.

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Chinese manufacturers provided 80% of electric buses operating in Latin America and the Caribbean in 2024, and China's Yutong was the best-selling electric bus company in Europe between 2022 and 2024.[92]

While China dominated the electric vehicle uptake, India, Indonesia, Thailand and Viet Nam have made significant strides in electric vehicle deployment through subsidies, domestic manufacturing and investment in charging networks.[93] **Across Asia, informal transport services carried out by two- and three-wheelers, jeepneys and other types of collective transport have been gradually electrifying.**[94] Wider adoption of electric vehicles in many Asian low- and middle-income countries has been hampered by high upfront costs, limited awareness of alternative transport modes, inadequate charging infrastructure and limited technical capacity.[95]

- India has made important advances in the uptake of electric vehicles, notably through its ambitious electric bus programme, high fuel quality standards and policies under the Faster Adoption and Manufacturing of Electric Vehicles (FAME) scheme.[96] India is the second largest market for electric two-wheelers globally, with annual sales expected to increase from 1 million units in 2023 to 7-9 million units in 2030.[97]
- Electric two-wheeler sales in South-East Asia are projected to reach 3-4 million units in 2030.[98]
- Spurred by a strong policy framework, Thailand has led the electric vehicle transition in South-East Asia, with a 10.8% adoption rate for battery electric vehicles in 2023.[99] In 2025, Bangkok announced that it would retire 60% of its 2,300 combustion engine buses and replace them with electric buses by 2029.[100]
- Viet Nam doubled its sales of battery electric cars in 2024, with sales of 69,000 units (17% of total car sales), while sales of electric two-wheelers reached 250,000 (a near 10% sales share).[101] Viet Nam laid important groundwork in 2024 by developing a strategic framework to transition to electric vehicles.[102]

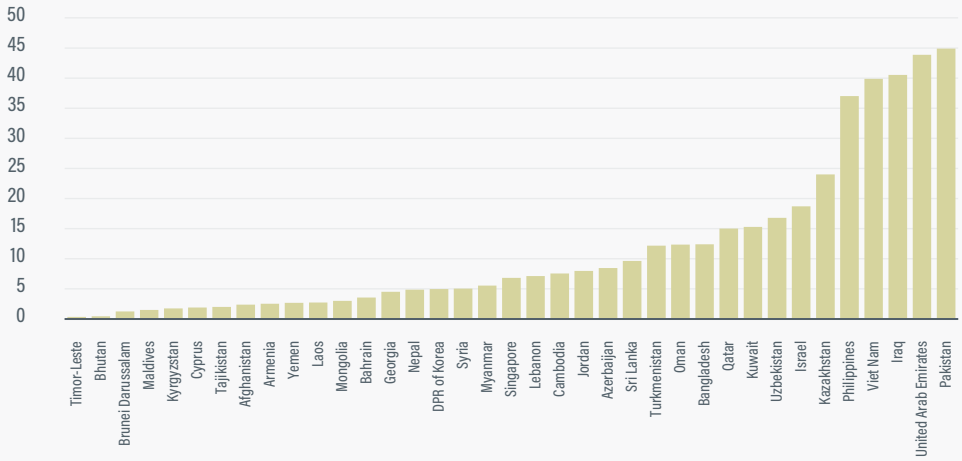
Sustainability and climate trends

In 2023, Asia's transport sector was responsible for around 6% of global greenhouse gas emissions and for around 40% of the world's transport greenhouse gas emissions (excluding international aviation and shipping).[103] **Since 2015, the region's transport greenhouse gas emissions have increased around 2% annually.**[104] This contrasts with the near-stagnant growth in transport emissions in Europe and North America (0.3%) and the slow annual increases in Latin America and the Caribbean (0.5%) and Africa (1.3%).[105]

Transport has become Asia's second fastest growing source of greenhouse gas emissions, surpassed only by the power sector.[106] **However, emission growth rates vary greatly across economies.** In Malaysia (an upper-middle-income country), transport emissions grew only 1% annually since 2015, whereas in Cambodia they grew 8% annually.[107] The share of high-income economies in total transport emissions fell from 36% in 2000 to 16% in 2022, confirming that their emission growth intensity has been much lower than in low- and middle-income economies.[108]

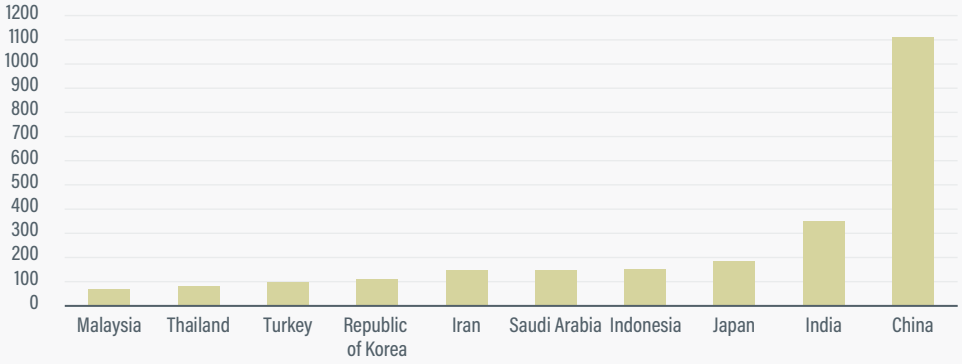
FIGURE 2. Transport greenhouse gas emissions in Asia, 2023

Asian countries with transport greenhouse gas emissions with less than 50 million tonnes, 2023



Transport greenhouse gas emissions in Asia vary widely. China alone emits more than 43 of the region's 46 countries combined (except India, Indonesia and Japan).

Asian countries with transport greenhouse gas emissions with more than 50 million tonnes, 2023



Transport greenhouse gas emissions in Asia vary widely. China alone emits more than 43 of the region's 46 countries combined (except India, Indonesia and Japan).

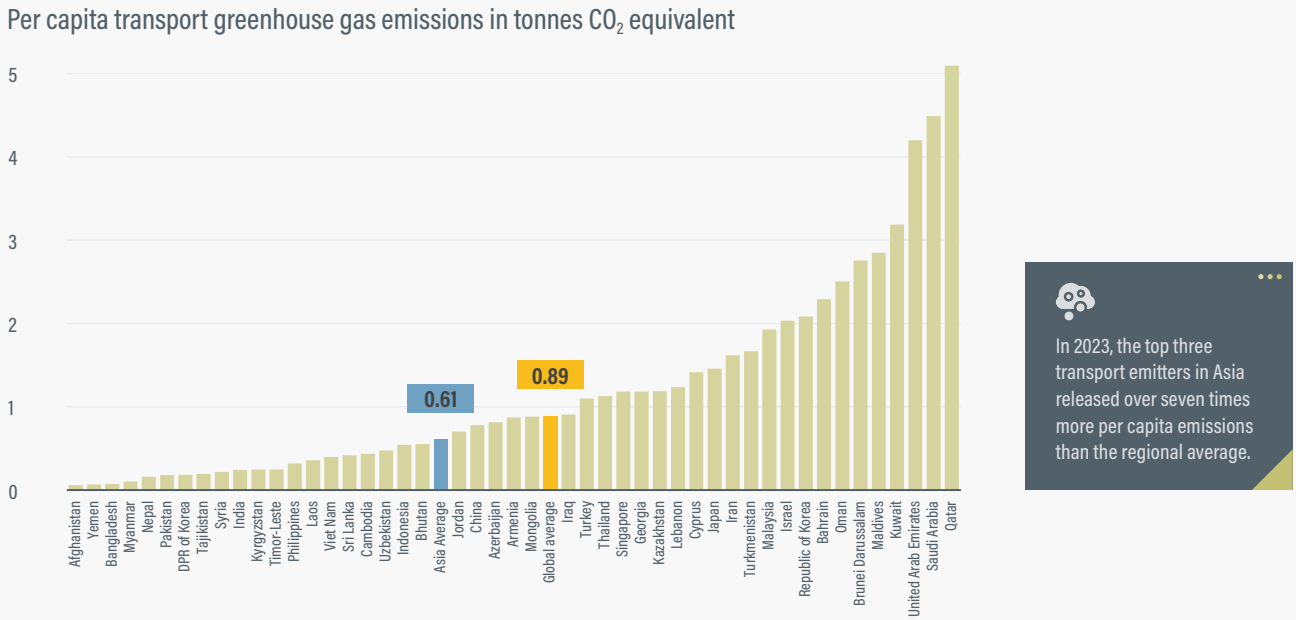
Source: See endnote 110 for this section.

Asian transport emissions increased 6.8% in 2023, adding 182 million tonnes of CO_2 equivalent to reach a record high of 2.87 gigatonnes of CO_2 equivalent, nearly the same level as in Europe and North America combined.[109] China was responsible for most of these emissions (1,110.2 million tonnes of CO_2 equivalent), followed distantly by India (349.3 million tonnes) and Japan (182 million tonnes) (Figure 2).[110] The region's lowest transport emissions were in Timor-Leste (0.3 million tonnes) and Bhutan (0.4 million tonnes).[111]

Asia's per capita transport greenhouse gas emissions totalled 0.61 tonnes of CO_2 equivalent in 2023 (Figure 3)**, below the levels in Europe (1.66 tonnes) and Latin America and the Caribbean (0.94 tonnes) but higher than in Africa (0.26 tonnes).**[112] With its high motorisation rate, Qatar was the region's highest per capita transport emitter at 5.1 tonnes in 2023, followed by Saudi Arabia (4.5 tonnes) and the United Arab Emirates (UAE) (4.2 tonnes).[113] The region's lowest per capita transport emissions were in Afghanistan (0.06 tonnes) and Yemen (0.07 tonnes), reflecting low motorisation rates and underdeveloped road and public transport networks.[114]

Trends show signs of a decoupling between economic growth and transport emissions. Asia's transport emissions relative to economic output increased 3% in 2023 to reach 0.81 tonnes of CO_2 equivalent per USD 10,000, the third highest level among global regions but much lower than in Africa (1.29 tonnes) and Latin America and the Caribbean (1.12 tonnes).[115] **By 2022, high-income Asian economies had achieved "absolute" decoupling (where transport**

FIGURE 3. Per capita transport greenhouse gas emissions in Asia, 2023



In 2023, the top three transport emitters in Asia released over seven times more per capita emissions than the regional average.

Source: See endnote 112 for this section.

emissions fell even as GDP rose), and middle- and low-income countries showed "relative" decoupling (with transport emissions rising, but more slowly than economic output).[116] These trends are driven by factors such as slower growth in emissions than economic growth, increased vehicle efficiency and greater electric vehicle adoption.[117]

Freight transport is expected to contribute around 60% of the region's domestic transport emissions during the 2020-2030 period.[118] **Across Asia, urban freight accounted for only 15% of total freight activity, but it produced 43% of freight-related CO_2 emissions in 2022, due to frequent, small-batch deliveries in congested traffic.**[119] Freight also contributes to traffic delays and pollution, with high economic costs and health impacts. The freight sector, particularly urban freight, has been under-emphasised in many national climate and sustainable development strategies.

Road transport has fuelled the growth in Asia's transport emissions, responsible for 88% of the total in 2022.[120] **Other transport sub-sectors contributed much lower shares of transport emissions, including domestic aviation (5%), inland waterways (5%) and railways (1%).**[121] Between 2000 and 2022, emissions from road transport increased 3.2% annually, compared with 2.9% for domestic aviation, 2.5% for domestic navigation and 0.7% for rail transport.[122] Road transport accounted for up to 73% of Myanmar's transport emissions and 100% of Kazakhstan's in 2022.[123] This dependence on carbon-intensive road transport modes can be attributed to heavy reliance on oil products, rapid growth in private vehicles and inadequate access to public transport.[124]

Asia's transport sector accounted for 21% of the region's total primary energy use in 2022, and road transport consumed 83% of the transport sector's energy in 2020.[125] **Energy consumption in transport fell 0.2% annually from 2015 to 2021, spurred by energy efficiency improvements in railways linked to greater electrification.**[126]

CO_2 emissions from Asia's rail sector grew 2% annually on average between 2000 and 2010, then fell 0.2% annually between 2010 and 2022.[127] **This decline in rail's emissions is attributed to increased rail electrification.**[128] **As of 2024, 56% of rail tracks in Asia were electrified, up from 34% in 2000, and 60% of railway energy came from electricity.**[129] China and India together account for the majority of Asia's rail network and have led aggressive electrification programmes.

- Between 2000 and 2023, the length of electrified rail routes increased substantially in China (up 800% to reach 119,400 kilometres) and achieving around 75% railway electrification in 2023.[130]
- As of March 2025, 98% of India's rail network was electrified, expanding by more than 4,500 kilometres annually between 2014 and early 2025.[131]

The transition to renewable energy in Asia's transport sector has been slower than in other sectors, with the share of renewables used in transport rising from 1.6% in 2015 to 3.0% in 2021.[132] **Fossil fuel use dominates, particularly in road transport.**[133] **Most Asian countries still rely on a carbon-intensive power grid, resulting in the highest carbon intensity of electricity generation among global regions in 2023** – at 559.5 grams of CO_2 equivalent per kilowatt-hour – despite falling 1.6% on average since 2015.[134] As of mid-2025, China derived 18% of its electricity from solar and wind, while India reached 10%, limiting the full emission-reduction potential of transport electrification.[135]

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Biofuels were the leading renewable energy source in transport in South-East Asia in 2023, supplying nearly 10% of road transport energy, well above the global average of 4%.[136] This trend is supported by long-standing blending mandates and a maturing palm oil biodiesel industry, especially in Indonesia and Thailand.[137]

Among cities across Asia, car commuters in Istanbul experienced the highest annual hours of traffic delay due to congestion (105 hours) in 2024, followed by Jakarta (89 hours) and Bangkok (74 hours).[138] Congestion, delays and excessive fuel consumption related to rising road traffic all contribute to higher vehicle emissions and lower quality of life.

Transport-induced air pollution contributed roughly 8% of total air pollutant emissions in Asia, resulting in 3.2 premature deaths per 100,000 people in 2019, compared to global averages of 6% and 2.3 premature deaths.[139] **As of 2024, virtually the entire population in East Asia and in South-East Asia was living in areas where air pollution levels exceeded the World Health Organization's safe air standards.**[140] Asia's transport sector generates further societal costs in the form of noise pollution, road fatalities, ecosystem degradation and loss of agricultural land, among others.

- In 2024, cities across South and Central Asia dominated the global rankings for air pollution from particulate matter (PM) 2.5.[141] The most polluted cities included Byrnihat, Delhi and Mullanpur in India; Lahore and Dera Ismail Khan in Pakistan; and Karaganda (Kazakhstan).[142]
- Among the cleanest urban air in the region was in Kashiwazaki, Sumoto, and Kushiro in Japan, and in Tra Vinh (Viet Nam).[143]

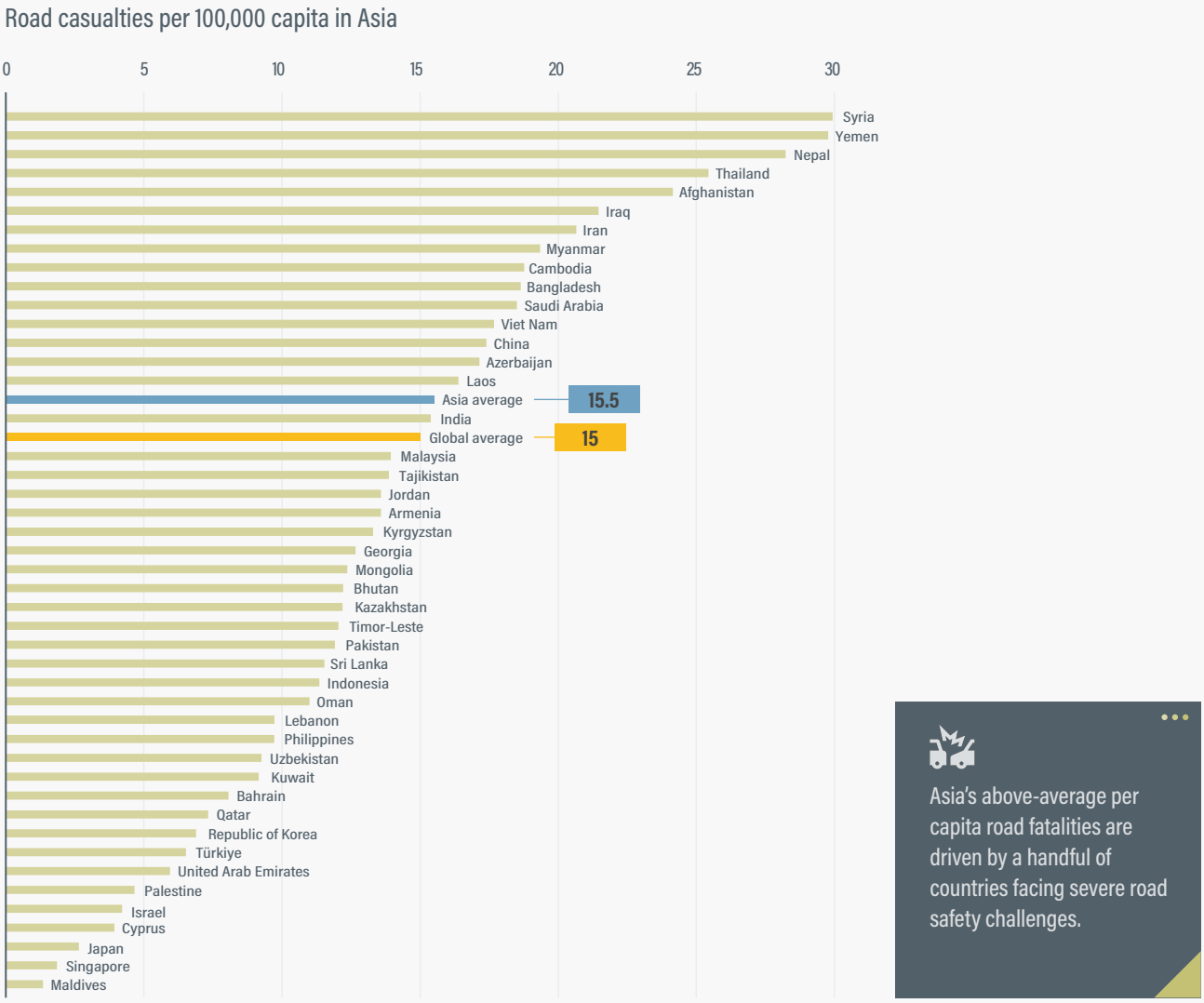
The enactment of vehicle emission standards and fuel quality standards has led to a 2% annual decrease in certain pollutants in Asia between 2000 and 2022.[144] **The share of vehicle registrations in Asian countries that have emission standards at the Euro 4 level or above increased from 9% in 2010 to 89% in 2023.**[145] However, rising emissions from other transport modes, such as domestic waterways and shipping, has undermined progress.[146]

Road safety remains a persistent public health challenge in Asia, where road deaths averaged 15.5 casualties per 100,000 people in 2021, above the global average of 15.0 casualties (Figure 4).[147] **In 2021, the region accounted for more than half the world's 1.19 million annual road traffic deaths, with 35% representing motorised two-wheeler users, followed by pedestrians at 22%.**[148]

- Syria had the region's highest level of road casualties, at 29.93 deaths per 100,000 people in 2021, whereas Maldives had the lowest at 1.34 per 100,000 people.[149]

With rising motorisation, there is an urgent need to improve the region's infrastructure for walking and cycling.[150] In 2021, less than 20% of roads assessed in Asia met the recommended three-star or better safety standard for pedestrians and cyclists; the share was less than 25% for motorcyclists and less than 40% for vehicle occupants, underscoring a widespread lack of safe road design.[151] South Asia and South-East Asia have especially high-risk road networks.[152]

FIGURE 4. Road casualties per 100,000 people in Asia, 2021



Asia's above-average per capita road fatalities are driven by a handful of countries facing severe road safety challenges.

Source: See endnote 147 for this section.

In the Asia-Pacific region, weather hazards related to climate change caused an estimated USD 12 billion in median yearly damage to transport assets (such as roads, railways and ports) – or 60% of the total global damage of USD 20 billion – according to research of 2019 and 2023.[153] **Railways shoulder around 25% of these losses,** despite accounting for only around 2% of Asia's total transport infrastructure.[154]

- Pakistan ranked 26th out of 208 countries in national road vulnerability in 2023 and faces significant climate risks, with average annual losses to transport infrastructure estimated at USD 218.7 million in 2023.[155]
- Bangladesh, where 9% of the population lived in low-elevation coastal zones as of 2023, the average annual loss to transport infrastructure due to climate-related hazards in 2023 was USD 178.95 million, equivalent to 0.01% of the GDP; this loss is concentrated in roads (79%), followed by rail (14%), airports (5%) and ports (2%).[156]

Despite bear the bulk of the world's damage to transport infrastructure from climate change, most Asian countries lack robust policies or financing for adaptation. Climate finance for transport heavily favours mitigation, with only 0.13% of transport-related climate finance in Asia in 2022 allocated to adaptation and only 0.06% to a combination of mitigation and adaptation.[157] The gap between rising climate risks and limited transport adaptation measures leaves critical infrastructure exposed, particularly in coastal and flood-prone areas.[158]

Policy and investment developments

As of 25 May 2025, only five countries in Asia – Japan, Maldives, Nepal, Singapore and the United Arab Emirates (UAE) – had submitted to the United Nations Framework Convention on Climate Change (UNFCCC) their third-generation Nationally Determined Contributions (NDCs) towards reducing emissions under the Paris Agreement.[159] **Among these, Nepal and the UAE were the only countries to include transport greenhouse gas mitigation targets in their NDCs.**

- Nepal's 2025 NDC extends the country's previous targets for electric vehicle share from 2030 to 2035, and commits to reduce transport greenhouse gas emissions by 1,426.22 gigagrams of CO_2 equivalent by 2030 and 2,731.57 gigagrams by 2035.[160]
- The NDC of the UAE sets a target to reduce transport greenhouse gas emissions at least 20% below 2019 levels by 2035, to reach 24.2 million tonnes of CO_2 equivalent; it touches on all three pillars of the "Avoid-Shift-Improve" (A-S-I) Framework, with plans to enhance walking and public transport use and to improve vehicle energy efficiency while promoting wider adoption of electric vehicles.[161]
- Japan's NDC of 2025 sets targets to reduce economy-wide emissions 60% below 2013 levels by 2035, 75% by 2040 and net zero by 2050.[162] However, analysis suggests that Japan would need to reduce its emissions 81% below 2013 levels (from all sectors, including land use and forestry) to align with Paris Agreement goals.[163] Japan's NDC does not include sector-specific commitments, which are to be elaborated in an upcoming national "Plan for Global Warming Countermeasures".[164]

The NDCs of the UAE (2024) and Singapore (2025) establish direct links between the outcomes of the First Global Stocktake (GST) on the implementation of the Paris Agreement, and take a comprehensive approach to sustainable transport activities, including through developing walking, cycling and public transport infrastructure and rapid deploying zero- and low-emission vehicles.[165]

Some of the Asian NDCs include transport adaptation and resilience-related targets and measures that are reflective of existing climate finance flows. In 2022, only an estimated 0.13% of the committed funds for transport-related climate finance in the region were earmarked to support adaptation, and only 0.06% of funds were earmarked for actions with multiple objectives, including mitigation and adaptation.[166]

- The UAE's NDC of 2024 acknowledges the importance of climate-proofing infrastructure, including through its design, location, construction, operation and maintenance. The UAE is preparing a roadmap covering all aspects of the urban environment (including sustainability guidelines for roads and other infrastructure), investing in research and development of climate-resilient construction materials and developing infrastructure proofed against sea-level rise.[167]
- The Maldives aims to ensure climate-proof infrastructure and facilities, particularly critical infrastructure such as airports, maritime ports, powerhouses and utilities.[168]

For the latest analysis of transport commitments in NDCs, including those expected ahead of COP 30, see the NDC Transport Tracker by GIZ and SLOCAT*, a database on ambition, targets and policies in NDCs and Long-Term Strategies.*169

As of 25 May 2025, 18 Asian countries had submitted to the United Nations their LT-LEDS (Long-Term Low Emission Development Strategies).[170] LT-LEDS complement NDCs and reflect countries' strategies to 2050 and beyond.[171] Between 2023 and March 2025, a total of nine Asian countries (Armenia, Bhutan, Cyrus, Georgia, Kazakhstan, Oman, Sri Lanka, Türkiye and United Arab Emirates) submitted LT-LEDS.

- Kazakhstan's LT-LEDS of 2024 outlines actions across all components of the A-S-I Framework; the country aims to pursue the efficient management of passenger and freight traffic, enhance public transport systems, promote efficient urban planning to reduce the need for vehicle trips, and encourage the widespread use of alternative fuels and large-scale electrification of transport.[172]
- Bhutan's LT-LEDS of 2023 aims to reduce greenhouse emissions from surface transport through both demand and supply side management; sets a target to transition 100% of light vehicle and bus sales to electric vehicles by 2045 and 25% of heavy vehicle (freight) imports to electric vehicles by 2050, and encourages the use of shared mobility, public transport and non-motorised transport.[173]

Eleven Asian countries had submitted National Adaptation Plans (NAPs) to the UN as of 25 May 2025, with the majority identifying transport-specific adaptation strategies.[174] NAPs support countries, especially developing and least-developed countries, in planning and implementing medium- and long-term adaptation to climate change.

- Bangladesh's NAP of 2023 sets out to improve urban environments and drainage systems through interventions linked to the expansion and conservation of green and blue infrastructure as well as the promotion of environmentally friendly vehicles and mass transit.[175]
- The Philippines' NAP of 2024 highlights comprehensive planning and response mechanisms and sufficient capacity as key adaptation priorities to ensure resilient,

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sufficient and sustainable transport infrastructure and related services; concrete measures include factoring in climate risk when planning roadways and transport hubs, and climate-proofing critical transport infrastructure (e.g., through landslide protection measures).[176]

- Thailand's NAP of 2024 underlines mixed-use developments to discourage reliance on long-distance transport.[177]

In addition to national strategies, several Asian countries have strengthened their commitments through international decarbonisation frameworks.

- At the 2023 UN Climate Change Conference (COP 28), Israel joined the Global Memorandum of Understanding on Zero-Emission Medium- and Heavy-Duty Vehicles, committing to 100% zero-emission new truck and bus sales by 2040.[178]
- Multiple Asian governments (Armenia, Azerbaijan, Israel and Türkiye) as well as sub-national governments in India, Japan and the Republic of Korea participate in the Accelerating to Zero (A2Z) Coalition, which supports the global transition to 100% zero-emission vehicle sales by 2040 at the latest.[179]

A growing number of Asian countries have developed strategies to enhance their climate adaptation and preparedness for natural disasters.

- Bangladesh's Mujib Climate Prosperity Plan seeks to ensure that at least 50% of the country's railway infrastructure is climate-resilient and energy efficient by 2030.[180]
- Sri Lanka's National Road Master Plan 2021-30 proposes developing a Disaster Planning System to document information on natural disasters such as flooding, landslides and river/sea erosion.[181]
- Türkiye's Climate Change Adaptation Strategy and Action Plan (CCASAP) for 2024-2030 identifies 11 priority sectors that are highly vulnerable to climate change, including transport.[182]

Countries have increasingly recognised that developing efficient public transport networks is central to promoting access for Asia's growing urban populations. Between 2015 and 2023, references to public transit measures tripled in the region's NDCs, and they increased more than 17 times in national transport policy documents.[183]

- To cut emissions, Azerbaijan's NDC of 2023 underscores the promotion of environmentally friendly modes of transport, improvements in intelligent transport management systems and the enhanced use of public transport; it also announces measures aimed at improving walking and cycling infrastructure to promote their wider use.[184]
- Oman's updated NDC of 2023 sets out to develop urban transport plans to reduce emissions and promote public transport; these plans are explicitly linked to efforts to reduce traffic congestion and improve air quality in urban areas.[185]
- Singapore's 2025 NDC reaffirms the country's commitment to "Walk-Cycle-Ride" (WCR) by encouraging wider uptake of walking, cycling, and public and shared transport; by 2040, the aim is for all journeys to the nearest neighbourhood centre using 15 WCR modes to take no more than 20 minutes, and for 90% of all peak-period WCR journeys to be completed in less than 45 minutes.[186] Singapore seeks to expand its rail network from 270 kilometres in 2025 to 360 kilometres by the early 2030s – putting 80% of households within a 10-minute walk from a train station – and to extend the cycling path network from more than 600 kilometres in 2025 to around 1,300 kilometres by 2030.[187]
- Uzbekistan's Voluntary National Review (VNR) of 2023 seeks to increase the share of public transport use in large, medium and small cities and envisages adapting public transport infrastructure for sedentary populations, including people with disabilities.[188]

Since 2021, several countries in the region have advanced road safety through multi-year action plans.

- Laos has committed to reduce road traffic fatalities and serious injuries by 70% by 2035, supported by helmet enforcement, speed regulations, improved infrastructure and seat belt laws.[189]
- Nepal, which had the third-highest rate of road traffic fatalities in the region in 2021, enacted its Road Safety Action Plan (2021–2030) that same year. The plan commits to reducing road traffic fatalities and injuries by 50% by 2030 and achieving Vision Zero by 2050, in alignment with SDG 3.6 on road traffic injuries.[190]
- The Philippines released the Philippine Road Safety Action Plan 2023–2028, targeting a 35% reduction in road traffic deaths by 2028.[191]

According to 2025 studies, national government spending on transport in Asia over a five-year period was only 1.5% of GDP on average, and countries with higher per capita GDPs allocated more resources to infrastructure maintenance.[192] **The Asian transport sector received 55% of global Official Development Assistance (ODA) from 2016 to 2023, up**

from 43% between 2011 and 2015.[193] However, public-private partnership (PPP) investments in Asia fell from 77% to 64% of the global total during 2016-2023, due largely to the COVID-19 pandemic.[194]

- ODA for rail transport grew substantially, from USD 2 billion (26% of total transport ODA) during 2002-2005, to USD 24 billion (51%) during 2016-2022.[195]
- ODA for roads grew in absolute terms from USD 5 billion to USD 17 billion during the same period, while its share of total transport ODA fell from 52% to 35%.[196]
- Road projects remained dominant in PPP investments, reflecting USD 121 billion (63% of total transport PPPs) between 2016 and 2022.[197]

In 2023, fossil fuel subsidies in Asia totalled USD 865 per capita, just above the global average of USD 813 per capita, although some countries have taken steps to phase out, reduce or reform these policies.[198] **Asian fossil fuel subsidies are projected to increase 32% between 2023 and 2030, further undermining climate and sustainability efforts.**[199] Although the transport sector's share of total fossil fuel subsidies in Asia fell from 22% in 2014 to 14% in 2022, the absolute value of transport-related subsidies rose sharply in 2022, in line with the spike in fossil fuel subsidies.[200] The region allocated a total of USD 97 billion to transport fuels in 2022, the highest annual level in a decade.[201]

- Indonesia enacted several policy measures in 2022 to address growing energy subsidies while reallocating resources more efficiently.[202]
- In 2024, Malaysia announced reforms to revamp its petrol subsidies by introducing targeted assistance; the measures, to be implemented from mid-2025 onwards, would mainly affect foreigners and high-income individuals and save around USD 1.9 billion annually.[203]

The momentum around electric vehicle adoption in the region has been coupled with a growing body of policy initiatives, financing mechanisms, and infrastructure programmes at the national and sub-national levels.[204]

- Azerbaijan's NDC of 2023 outlines a plan to equip all passenger buses operating in the administrative area of Baku city with compressed natural gas or electric motors starting in January 2025, and to exempt electric vehicle imports and sales, as well as their chargers, from value-added tax (VAT).[205]
- India introduced the FAME II scheme (Faster Adoption and Manufacturing of Hybrid and Electric Vehicles) in 2019, and since then it has incentivised 1.6 million electric vehicles, including two-, three- and four-wheelers. Since 2021, India has launched several additional schemes, such as a production-linked incentive programme to support domestic electric vehicle and battery manufacturing, along with programmes to scale up electric buses, trucks and charging infrastructure.[206]
- Indonesia aims to deploy 2.1 million electric vehicles and 13 million electric motorcycles by 2030, supported by Presidential Regulation No. 55/2019, which promotes domestic electric vehicle production, battery supply chains and nationwide charging infrastructure.[207] The government also offers tax incentives and has introduced a roadmap for electrification of public and private fleets.[208]
- Oman's NDC and LT-LEDS of 2023 reaffirm a vision to transition to electric light-duty vehicles and hydrogen fuel cells for long-distance trucks and buses, while supporting behavioural changes to reduce (individual) car use.[209]
- Oman's Sustainable Transport Master Plan aims to reduce the carbon intensity of the transport sector 20% and to electrify 34% of cars by 2030; as part of a goal to reduce 0.85 tonnes of CO_2 equivalent per capita per year, the plan includes initiatives to develop public transport systems, promote electric vehicles and create a dedicated bus lane on Sultan Qaboos Street.[210]
- Singapore's latest NDC reaffirms its commitment to phasing out pure internal combustion engine vehicles by 2040 and enabling the adoption of electric and other clean energy vehicles; since 2020, all new public bus purchases in the country have been cleaner energy models, including electric and diesel-hybrid buses.[211]
- Thailand's Thirteenth National Economic and Social Development Plan (2023-2027) sets out various goals for 2027, including converting at least 40,000 vehicles to modified electric vehicles; increasing the number of public charging stations (including fast chargers) by 5,000 while supporting grid reinforcement; and ensuring that an additional 5,000 automotive workers are upskilled for employment in the electric vehicle industry.[212] These goals support Thailand's "30@30" goal from 2022 of having 30% of the country's vehicle production be electric by 2030.[213]
- In 2024, the UAE set goals to increase the electric vehicle share to 50% of total car sales by 2050 and to reduce transport energy consumption 40% by 2050.[214]
- Dubai (UAE), through its Dubai Green Mobility Strategy 2030, aims to increase the number of electric and hybrid vehicles while making all public transport carbon-free by 2050.[215] Ras Al Khaimah launched solar-powered bus shelters using locally sourced materials as part of the RAKTA plan 2023-2030, and Ras Al Khaimah Insurance offers reduced rates for battery electric vehicles.[216] Sharjah has integrated an 83% share of hybrid and eco-friendly vehicles into its taxi fleet and aims for 100% by 2027.[217]
- Uzbekistan's VNR of 2023 sets a target to convert 80% (around 6,500 units) of public transport to gas-fuelled or electrically powered units by 2030; it exempts electric vehicle imports from excise taxes, customs duties, and

automobile fees, and aims to increase the electrification of railway infrastructure to 60% by 2026.[218]

- In 2024, Viet Nam announced a target for 30% of cars and 22% of motorbikes to be electric by 2030.[219] The government developed a National Programme for Transition to Electric Transport Vehicles outlining a strategic framework and mandating that all road vehicles use electricity or clean energy sources by 2050.[220]

Several countries in Asia are advancing vehicle efficiency and fuel economy regulations to curb emissions, improve air quality and reduce fuel consumption.

- Thailand has developed and implemented fuel economy policies through its Eco Sticker programme, requiring every new car to display information on fuel consumption and CO_2 emissions.[221]
- Thailand's Thirteenth National Economic and Social Development Plan (2023-2027) aims to reduce transport-induced air pollution ($PM_{2.5}$) and greenhouse gas emissions 4% annually by 2027.[222] In 2024, Thailand's House of Representatives approved several drafts of the Clean Air Act, which introduces comprehensive air quality controls (including on pollution from transport) and was expected to be enacted in April 2025.[223]
- Viet Nam has established a fuel economy baseline for passenger cars with under nine seats and is exploring regulatory pathways for setting efficiency standards.[224]

In parallel, a growing number of countries in the region have sought to increase the use of renewable energy as well as low-carbon fuels in transport.

- India has stood out in the promotion of alternative fuels to cut vehicle emissions: the Ministry of Road Transport and Highways has set emission standards for fuels, to ensure safety and support the use of cleaner fuels while exploring how combining different transport modes could help lower fuel costs.[225]
- To further India's integration of renewables in transport, the government advanced its target of 20% ethanol blending in petrol from 2030 to 2025.[226]
- Indonesia has strong biofuel blending mandates in place, with a 35% blend in 2023 and plans to increase the share to 40% in 2025 and 50% in 2029.[227]
- Thailand's Thirteenth National Economic and Social Development Plan (2023-2027) aims to increase the share of renewables in final energy consumption at least 24% by 2027.[228]

Although the aviation industry is an important driver of economic development and employment in Asia, its sustainability hinges on decarbonisation measures.[229] Several countries in the region have launched sustainable aviation fuel initiatives, including mandates, incentives and blending targets. Thailand plans to replace 1% of conventional jet fuel with sustainable aviation fuel in 2026, while China, Japan and Singapore are scaling up sustainable aviation fuel production and supply chain investment.[230]

For maritime transport, a growing number of Asian countries have embraced green shipping corridors and engaged in other emission reduction measures. In 2024, Singapore and Australia signed a Memorandum of Understanding (MoU) formalising their co-operation on a Green and Digital Shipping Corridor, which would pilot solutions to enhance the resilience, efficiency and sustainability of global supply chains and logistics between the countries.[231]

Inland waterway transport had gained attention in countries with extensive river networks and coastlines. In China, inland shipping is being modernised and decarbonised through shore power and vessel electrification policies, and Viet Nam has included waterway transport improvements in its national climate and transport strategies.[232]

Although freight transport remains less prominent than passenger transport in many Asian NDCs, its profile has grown within national transport strategies. Several countries have introduced new measures to support a modal shift to rail and to electrify freight fleets.

- In 2024, China released the Action Plan for Reducing Costs and Improving Quality and Efficiency in Transportation and Logistics. Key targets for 2027 include reducing the cost of social logistics to around 13.5% of GDP, increasing rail freight tonne-kilometres by around 10%, growing rail-waterway intermodal container transport at ports by an average of 15% annually, and ensuring that over 80% of port cargo is transported via rail, waterways, enclosed belt conveyors and new energy vehicles.[233]
- To expand its rail freight sector, the Philippines' Development Plan 2023-2028 aims to connect cargo and freight rail infrastructure to strategic infrastructure such as ports.[234]
- In its Action Plan Logistics Development 2023-2027, Thailand sets a target for rail to carry 7% of the country's total freight volume on average during the period 2023-2025.[235]
- In 2024, Viet Nam laid out new national plans to electrify its transport sector, including targets for freight vehicles: electric trucks are expected to account for 15% of sales by 2030, 20% by 2040 and 25% by 2050. This represents the slowest growth among all road vehicle segments.[236]

Partnerships in action

SLOCAT partners engaged in dozens of actions during 2023-2024, including:

- The **Asian Transport Observatory (ATO)**, developed with the support by the Asian Development Bank and the Asian Infrastructure Investment Bank, provides a platform to strengthen the knowledge base on transport in the Asia-Pacific region. The ATO supports comprehensive yet focused data towards enabling better informed investments, and policy decisions in the transport sector.[237]
- As of 2024, several Asian actors – including India, Thailand and non-governmental stakeholders in Azerbaijan – have endorsed the **Global MoU committing to 100% zero-emission truck and bus sales by 2040**.[238] Facilitated by the Drive to Zero initiative, the MoU promotes collaboration on policy harmonisation, technology deployment, and freight sector decarbonisation, offering a platform for both governments and cities to accelerate zero-emission freight adoption.[239]
- The **Leadership Group for Clean Transport in Asia** supports knowledge exchange and peer learning on sustainable urban mobility, and since 2022 has addressed themes including infrastructure for walking and cycling, electrification of public transport and climate-smart urban freight. The Group is convened by the Asia LEDS Partnership / ICLEI South Asia in collaboration with national and local governments, including Bangladesh, Bhutan, India, Indonesia, Lao PDR, Mongolia, Nepal, the Philippines, Sri Lanka and Thailand. In 2023, at the 16th Regional Environmentally Sustainable Transport (EST) Forum in Asia, the Group launched a communiqué underscoring six priority areas: intermodal, low-carbon freight transport systems; increasing the share of electric two-and three-wheelers, cars, trucks and buses; electric vehicle charging infrastructure and safe and resilient grid integration; robust fuel efficiency and emission standards; renewable energy; and zero emission energy sources for all transport modes.[240]
- **MobiliseYourCity** has supported the development of Sustainable Urban Mobility Plans (SUMPs) in Asian countries including India, Cambodia and Nepal.[241] Through technical co-operation, capacity building, and financing facilitation, the initiative helps cities mainstream climate, accessibility and inclusion in mobility planning.[242] Since 2022, projects in Kochi (India) and Battambang (Cambodia) have helped align local transport strategies with national climate targets.[243]
- The **NDC Transport Initiative for Asia**, launched in 2020 and active across China, India, Viet Nam, and regional platforms, supports the integration of transport decarbonisation into NDC implementation and long-term strategies.[244] The initiative engages national ministries, research institutions, and city governments in developing climate-aligned roadmaps; monitoring, reporting, and verification (MRV) systems; and finance strategies.[245]
- The Regional Action Programme for Sustainable Transport, implemented by the **United Nations Economic and Social Commission for Asia and the Pacific,** is focused on decarbonisation, digitalisation and resilience.[246] Through policy dialogues, capacity building, and support to member states, the initiative aims to align transport systems with the Sustainable Development Goals and the Paris Agreement. Recent work includes regional forums on freight efficiency, low-carbon fuels and the integration of transport in climate adaptation plans.[247]

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