

A Dashboard for Sustainable Transport in Asia and the Pacific







An Asian Transport Observatory (ATO) Publication

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Cover Page Story: The cover photo presents a single photograph, divided into three frames, offering a visual snapshot of transport dynamics. Captured in Seoul, the image illustrates different transport modes—buses moving efficiently in dedicated lanes, cars waiting at a signal, and pedestrians crossing at a zebra crossing. While an urban setting serves as the illustration, the report extends beyond cities, analysing transport trends at national, urban, and regional levels across Asia and the Pacific. It provides insights into how public, private, and active transport modes interact, shaping mobility systems and influencing policy directions for a more sustainable and resilient future.

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Abbreviations

AAGR	Average annual growth rate	LDV	Light-duty vehicle
ADB	Asian Development Bank	LGU	Local government unit
AIIB	Asian Infrastructure Investment Bank	LLDC	Landlocked Developing Countries
ATO	Asian Transport Observatory	LPI	Logistics Performance Index
BC	Black carbon	LRT	Light rail transit
BRT	Bus rapid transit	LSCI	Liner Shipping Connectivity Index
CAREC	Central Asia Regional Economic Cooperation	MJ	Megajoule
CDRI	Coalition for Disaster Resilient Infrastructure	NBS	Nature-based solutions
CO2	Carbon dioxide	NDC	Nationally Determined Contributions
COPD	Chronic obstructive pulmonary disease	NOx	Nitrogen oxides
COVID	Coronavirus disease	NRVI	National Road Vulnerability Index
FM_DAT	Emergency Events Database	O&M	Operations and maintenance
E/(-D/(I	Electric vehicle	ODA	Official Development Assistance
aCO2/kW/h	grams of carbon diaxide par kilowatt bour	OECD	Organisation for Economic Co-operation and Development
	Global Burdon of Disages	PM 2.5	Particulate matter 2.5
GBD	Global bulden of Disease	PPP	Public-Private Partnership
GDF	Chaladel Library Carllenant	RAI	Rural Access Index
GHS	Global Human Settlement	SDG	Sustainable Development Goal
Gr	Gigaton	SIDS	Small Island Developing States
GVA	Gross value added	SNDI	Street Network Disconnectedness Index
HCMC	Ho Chi Minh City	SOx	Sulfur oxides
HSR	High-speed rail	SUV	Sport utility vehicle
iRAP	International Road Assessment Programme	UN	United Nations
IEA	International Energy Agency	UNDESA	United Nations Department of Economic and Social Affairs
IMF	International Monetary Fund	VOC	Volatile organic compounds
KPI	Key performance indicator	WHO	World Health Organization

Executive Summary

The transport sector is at the cusp of something momentous. The United Nations Sustainable Development Goals 2030 are underpinned by well-oiled, well-regulated transport systems around the world, and while the sector did not get an SDG dedicated to its progress, in 2023, the United Nations General Assembly announced the United Nations Decade of Sustainable Transport (2026–2035), with the responsibility of preparing an implementation plan in the hands of the United Nations Department of Economic and Social Affairs (UNDESA).

This presents a unique opportunity for the transport sector. The Decade, as a focused initiative, will enable transportation programmes across the world to get the financing they need, while also highlighting the areas where they're falling short and showcasing the sector's many achievements over the years—all in service of green and sustainable transport.

However, this will be difficult to execute without accurate and reliable data on the sector. A few countries in Europe, for example, have made it a practice to track their sectoral data, making it easier for them to take the necessary decisions and plan. Other parts of the world do not have any mechanisms in place to track their transport sectors, let alone analyse the relevant data and use it to their advantage.

To rectify that, the Asian Transport Observatory (ATO) was established by the Asian Development Bank (ADB) and subsequently supported by the Asian Infrastructure Investment Bank (AIIB). The ATO, an open-access platform, covers fifty-one economies across the Asia–Pacific to curate valuable data and translate it into insights, policies, and investments in support of the region's transport planning and decision-making.

The corresponding paper is the ATO's fourth iteration of the Asia–Pacific status report; it assesses the progress of sustainable transport, contextualizing regional trends within a broader global perspective. It examines the progress of Asia and the Pacific against regional and global benchmarks, demonstrating that progress made in sustainable



transport practices is indeed measurable. It aims to serve as a foundational text for the achievement of the 2030 SDG Agenda as well as the upcoming UN Decade.

The report employs a unique methodology with a set of fifty-four comprehensive indicators.

We look at sustainable transport using six diverse, yet connected, lenses—infrastructure and connectivity; access; mobility, equity and prosperity; energy and carbon emissions; climate resilience and disaster preparedness; and health and environmental impacts. These six perspectives encompass the progress and challenges that the transport sector makes and faces globally, making the analysis thorough and extensive.

With charts and graphs illustrating findings about each indicator, the report delves deep into areas as diverse as infrastructure investment, shipping connectivity, logistics performance, rural and urban transport access, bicycle and vehicle trade, aging populations, public transport, employment and gender gaps, electrification, emissions, disasters, and many others. It uses concrete data to discuss how each of these indicators impacts, or is impacted by, transport in the Asia–Pacific.

Further enriching the analysis, where feasible, the report compares the transport sector's performance against other sectors. The study pinpoints regional strengths and areas demanding intensified focus to accelerate sustainable development. By leveraging historical data from 2000 to 2022/2023 and using roughly 600 transport policy documents covering 36 countries, the report captures the profound impact of the COVID-19 pandemic on the transport sector and its subsequent recovery.

At the end of the report, each indicator is sorted into three broad categories: areas in which significant progress has been made, such as digital connectivity; areas that show positive momentum, but where more work is required, such as public transport; and areas in which minimal or no progress has been made, or, as in some instances, there has been regression, such as transport infrastructure. Our analysis reveals that despite some areas of progress, the upcoming decade for sustainable transport in Asia and the Pacific will encounter significant challenges. There is clear uneven development across subregions, urban and rural divides, and various transport modes, further complicated by gaps in infrastructure that restrict economic growth. Although there has been growth in digital connectivity, disparities remain, notably affecting vulnerable groups such as populations in Pacific Small Island Developing States and those in rural areas. Urban sprawl, an aging demographic, and the sluggish recovery of public transport continue to put pressure on existing systems. Additionally, increasing energy use and CO2 emissions, along with rising climate vulnerability and health issues stemming from pollution and accidents, require immediate action. Furthermore, gaps in data and differences across nations obscure regional trends, highlighting the need for targeted interventions specific to each country.

Although the region experiences slow overall progress, some high-income economies demonstrate notable advancements in sustainable transport. However, the broader landscape is marked by under-investment in infrastructure, productivity lags, and gender disparities within the transport sector. These challenges underscore the need for comprehensive strategies that address connectivity gaps, promote sustainable energy transitions, enhance data collection, and foster inclusive, climate-resilient transport systems. The trends observed in Asia and the Pacific hold global relevance, offering valuable insights for developing and developed nations alike.

The analysis is backed by data from the ATO and several reputed organisations, as well as key policy documents from countries in the Asia-Pacific, **making this** report the most comprehensive look at the transport sector's needs in the region to date, and serving as an invaluable component in unlocking the potential of the UN Decade of Sustainable Transport.

Limited climate resilience and Health and Bridging Ensuring mobility, Growing transport, Bridging transport disaster infrastructure and equity and energy consumption environmental access connectivity gap prosperity for all and carbon emissions preparedness in impacts transport **Aging Population** Transport **Rural Transport** Infrastructure Exposure to Access Disasters **Distribution of Road Crash Fatalities** Transport Infrastructure Transport Energy Investment as a Intensity Road Crash Fatality share of GDP Costs Urban Transport Access Road Safety related Transport Electrification Infrastructure **Damages and Costs** Health toll of Modal shift in cities Shipping Connectivity Contribution to Ambient PM2.5 National Road **Grid Emissions** Vulnerability Index Transport employment **Urban Services** Access Aviation Transport Productivity Connectivity **Climate Finance for** Emissions Female Employment Adaptation **Digital Connectivity** modeshare in Transport CO2 **Transport Sector** Transport Air Wage **Climate Finance for** the Transport Sector Road maintenance investments **Bicycle Trade** Integration of Transport Gender in Transport infrastructure in Sector Policies biodiversity areas

Assessment criteria:

Green: Indicates significant progress when compared to other sectors or regions, or across time.

Amber: Indicates limited progress when compared to other sectors or regions, or across time, but evidence of positive momentum is present. Countries need to accelerate efforts on these goals.

Red: Indicates minimal progress—or even regression—when compared other sectors or regions, or across time. Urgent and transformational change is required in direction and/or speed of transition.

Background

The transport sector is noticeably underrepresented in the United Nations Sustainable Development Goals 2030 (SDG). Despite its crucial role in advancing sustainable development, it is not one of the 17 SDGs. While only targets 3.6, 9.1, and 11.2 explicitly address transport directly—focusing on transforming infrastructure and services—at least 11 of the 17 SDGs contain targets with significant ties to and implications for the sector.

The SDGs are built on the ideas of peace, prosperity, people and the planet, and transport functions as the bedrock of making good on these ideas; an effective and green transportation machinery uplifts people and makes the planet more liveable. But the sector needs the right attention to become its most efficient self.

Transport's centrality to the SDGs stems from three key factors: its ability to generate compounding effects while driving social and economic progress, its vulnerability to external influences, and its rapid growth trajectory.

The Asia–Pacific region is home to over half the world's population and economic output; whether characterised by progress or stagnation, the region's transport landscape has impacts far beyond its borders, influencing and shaping the global pursuit of sustainable development.

While the SDGs were enthusiastically received by all member nations when first introduced, as the midpoint of the 2030 Agenda drew closer, a stark reality emerged: despite great efforts, achieving the SDGs as originally intended has remained out of bounds. Several targets have been lagging or regressing, many of them with transport as a key mover.



As a result, in 2023, the United Nations General Assembly declared the United Nations Decade of Sustainable Transport (2026–2035), entrusting the United Nations Department of Economic and Social Affairs (UNDESA) with the development of the initiative's implementation plan. The proposed plan, currently under development, is envisioned as a global policy document that aims to coordinate actions, mobilise resources, and monitor progress in pursuit of sustainable transport worldwide.

Preliminary consultations organized by UNDESA¹ suggest that the implementation plan can serve as a roadmap to accelerate sustainable transport throughout the Decade. The plan aims to improve coordination and collaboration among member states and stakeholders, mobilise resources for sustainable transport projects at all levels, and raise awareness while building capacity for sustainable transport practices.

Achieving sustainable transport is not simply about replacing one technology with another. It is a complex multi-dimensional challenge shaped by a delicate balance of environmental, social, economic, technological, policy, and behavioural influences, particularly in regions with extensive geographical diversity, varied socio-economic progress, an expanding transport sector, and increasing demands for passenger and freight transport.

Thus, this report offers an essential comparative quantitative analysis to provide a regional perspective on progress towards sustainable transport. It examines the progress of Asia and the Pacific against regional and global benchmarks, demonstrating that progress made in sustainable transport practices is indeed measurable.

We employ a unique methodology with a comprehensive set of fifty-four indicators. We view sustainable transport using six diverse, yet connected, lenses (Figure 1) infrastructure and connectivity; access; mobility, equity and prosperity; energy and carbon emissions; climate resilience and disaster preparedness; and health and environmental impacts. Achieving sustainable transport is a complex multi-dimensional challenge shaped by a delicate balance of environmental, social, economic, technological, policy, and behavioral influences



Figure 1. A Framework of indicators to monitor the sustainability of transport sector

¹ UN. (2025). UN Decade of Sustainable Transport Stakeholder Consultation. https://sdgs.un.org/sites/default/files/2025-03/UN%20Decade%20of%20Sustainable%20Transport%20Stakeholder%20Consultation%20%282%29.pdf



Figure 2. The invisible link: Transport's role across the SDGs

Recognising the extensive prior efforts in creating indicator systems for the transport sector, including sustainability evaluations of both transport systems and policies, we acknowledge the complexities involved in measuring sustainable transport. This concept includes providing access to goods and services that foster economic and social development and the broad range of social, economic, and environmental consequences. Thus, a narrow set of core indicators fails to capture its intricate nature. Various stakeholders, each with distinct priorities within the sustainable transport agenda, highlight different indicators. To meet the diverse needs of these stakeholders, it is crucial to monitor a comprehensive set of indicators that encompasses assessments of the transport sector's structure, performance, and impacts. However, the primary constraint in assessing sustainable transport lies not in the indicators themselves but in the availability and quality of the underlying data required to populate them. This data limitation becomes particularly apparent when conducting measurements across countries or transport systems with disparate data management systems, underscoring the critical need for improved data collection to measure and accelerate sustainable transport effectively. Thus, after careful assessment, we considered fifty-four indicators over six lenses. These six perspectives encompass both the progress and challenges that the transport sector makes and faces globally, making the analysis thorough and comprehensive.

The indicators used in the report also align well with the SDGs. The indicators measure status and progress directly or indirectly across all 17 SDGs. We also measure the three SDGs that concern transport directly— 3.6 on road safety, 9.1 on rural access, and 11.2 on urban access. Beyond these, themes like transport finance, infrastructure development, equity, vehicle trade, economic performance, emissions, and resilience further illustrate transport's strong links with the SDGs, captured here through a wide set of indicators.

This fourth iteration of the Asia–Pacific status report assesses the progress of sustainable transport, contextualizing regional trends within a broader global perspective. Further enriching the analysis, where feasible, the report compares the transport sector's performance against other sectors. The study pinpoints regional strengths and areas demanding intensified focus to accelerate the sustainable development agenda. By leveraging historical data from 2000 to 2022-2024, the report captures the profound impact of the COVID-19 pandemic and subsequent recovery on the transport sector. Notably, this analysis draws extensively from the Asian Transport Observatory (ATO), an award-winning initiative developed by the Asian Development Bank (ADB) and the Asia Infrastructure Investment Bank (AIIB) to translate data into insights, policies, and investments.

This fourth iteration of the Asia–Pacific status report assesses the progress of sustainable transport, contextualizing regional trends within a broader global perspective. Further, it compares the transport sector's performance against other sectors.

Theme 1: Bridging the infrastructure and connectivity gap



1. Transport infrastructure

The continent of Asia is responsible for 47% of the global GDP (World Bank, 2023a) and houses 58% of the world's population (United Nations Department of Economic and Social Affairs Population Division, 2022). However, the region's high economic contribution and demographic size does not represent its surface transport infrastructure, which fares middlingly at just 38% of the global total (International Union of Railways, 2024; ITDP, n.d.; Nirandjan et al., 2021). This disconnect is significant. Moreover, Asia accounts for 26% of the global aerodrome area (Nirandjan et al., 2021) and 49% of the global port area (Hanson & Nicholls, 2020)—an alarming gap, especially with rising incomes leading to increased motorization in Asian economies.

While rapid infrastructure development is underway, the disparity, as of 2023, is glaring (Figure 3). Most Asian and Pacific countries fall far behind OECD nations in terms of surface transport infrastructure availability. Specifically, low- and lower-middle-income, upper-middle-income, and higher-income Asia–Pacific economies have an average availability of 3.8, 4.6, and 11.7 kilometres per thousand population, respectively, compared to the OECD average of 17 kilometres per thousand. The infrastructure density further highlights this shortfall, with Asia's density at 433 kilometres per thousand square kilometres, much lower than the OECD's 690. The most conspicuous gap appears in road infrastructure, where Asia has 309 kilometres per square kilometre versus the OECD's 680. This is notwithstanding notable regional disparities, such as Small Island Developing States averaging only 109 kilometres per square kilometre.

The distribution of surface infrastructure in the Asia and Pacific regions is heavily biased towards roads, which comprise 98% of the total. In contrast, heavy railways, including high-speed trains, represent just 2%, while urban rapid transit systems account for a mere 0.1%.







The distribution of surface infrastructure in the Asia and Pacific regions is heavily biased towards roads at 98% Low and lower-middle-income countries have shown the fastest infrastructure growth, whereas upper-middle-income nations have seen the most substantial overall increase in infrastructure scale.

Since 2000, Asian economies have expanded their transport infrastructure (2.2%) at double the pace of their population increase (1%), but still notably slower than GDP growth (7.5%) (Figure 4). Since 2015, Asia and the Pacific have contributed about 70% of the global transport infrastructure additions. The road network in the region increased from about 13 million kilometres in 2000 to 22 million by 2023. Similarly, heavy railway kilometres grew from about 350 thousand in 2000 to about 520 thousand by 2023, while the rapid urban transit infrastructure increased from 3700 kilometres to about 15,800 kilometres.



Figure 4. Asia-Pacific transport infrastructure growth vs. population and GDP, 2000-2023 Source: Own visualization based on data from International Union of Railways (2024), ITDP (n.d.), Nirandjan et al. (2021), United Nations Department of Economic and Social Affairs, Population Division (2022), and World Bank (2023a).

2. Transport infrastructure investment as a share of GDP

Infrastructure is the first concrete step towards a well-functioning transport sector. Efficient transport systems generate enormous economic and social benefits, including improved market access, enhanced productivity, balanced regional development, job creation, and increased labour mobility, ultimately fostering stronger community cohesion. While investment in infrastructure, which includes new construction and upgrading existing systems, is essential to the sector's efficiency, a persistent challenge exists in the form of under-investment.

Information across various timeframes, funding sources, and specific transport sub-sectors is still scarce. The limited data shows that the average national government expenditure on transport—based on a five-year average—is only 1.5% of GDP. In comparison, OECD countries with well-developed infrastructure networks invested 1.1% of GDP over the same period (Global Infrastructure Hub, n.d.). This demonstrates that despite having more developed transport infrastructure, developed countries spend more on transport infrastructure development in terms of per capita investment (Figure 5).



Figure 5. Transport infrastructure investment per capita, 2022 Source: Own visualization based on data from Global Infrastructure Hub (n.d.) and World Bank (n.d.).

3. Official Development Assistance (ODA) and Public–Private Partnership (PPP) investments

Following adopting the SDGs, the Asian transport sector has garnered a substantial portion of global Official Development Assistance (ODA) investments in transport. From 2011 to 2015, Asia received 43% of the global ODA in this sector, increasing to 55% from 2016 to 2023. On the contrary, due to the disruptions brought on by COVID-19, public-private partnership (PPP) investments in Asia declined from 77% of the global total between 2011 and 2015 to 64% from 2016 to 2023.

The ODA allocated to rail has risen from \$2 billion (26% of total transport) between 2002 and 2005 to \$24 billion (51% of total transport) between 2016 and 2022. The percentage of ODA directed towards roads has also increased from \$5 billion USD between 2002 and 2005 to \$17 billion from 2016 to 2022. In terms of share, however, ODA towards roads decreased from 52% to 35% of the total transport between the two time periods (OECD, n.d.) (Figure 6). In contrast, the road subsector continues to dominate PPP investments, rising from \$13 billion (48% of total transport) between 2000 and 2005 to \$121 billion (63% of total transport) between 2016 and 2022 (World Bank, 2024) (Figure 7).

Road subsector continues to dominate PPP investments



Figure 6. Official development assistance to the transport sector, by mode Source: Own visualization based on data from OECD (n.d.).



Figure 7. Public private partnership investments in the transport sector, by mode Source: Own visualization based on data from World Bank (2024).

4. Shipping connectivity

The Liner Shipping Connectivity Index (LSCI) is a comprehensive tool for quantifying a nation's integration into the global maritime network. By aggregating data on ship call frequency, container capacity, service regularity, shipping carrier diversity, largest ship size, and network reach, the LSCI provides a standardized metric to assess a country's access to and efficiency within international liner shipping. The Asia–Pacific's average LSCI of 177 in 2023 significantly outpaces other regions and the global average (103), with nine countries boasting an index exceeding 300. Since 2015, the Asia–Pacific has further improved at a steady pace, showcasing substantially superior global liner shipping connectivity and a positive trend. About one-third of the countries improved their LSCI score by 20%, with two countries improving by more than 50% (Federated States of Micronesia and Viet Nam) (UNCTAD, 2024) (Figure 8).

The Pacific Small Island Developing States exhibit significantly lower LSCI values, ranging from 4 to 50, compared to the broader Asia–Pacific region.

5. Port performance

The global trading network depends significantly on the efficient operation of container ports. Serving as gateways to international trade, ports are vital for the economic growth of countries. We employed the Container Port Performance Index to assess port performance, a vital tool created by the World Bank and S&P Global Market Intelligence. This index is a benchmark that analyses port efficiency and offers essential insights into international shipping connectivity. The Asia–Pacific region notably dominates the segment, with 59 ports in the global top 100 located in the region, underscoring its crucial importance in global trade (Figure 9). Within Asia, East Asia is represented by 36 ports in the top 100, illustrating its influence in the maritime sector (World Bank, 2023c).

It's important to keep in mind that a port plagued by inefficiency becomes a bottleneck, obstructing trade expansion and inflicting significant economic challenges on Landlocked Developing Countries (LLDCs) and Small Island Developing States (SIDS), whose economic fragilities are exacerbated by logistical hurdles and barriers. The container ports of the Pacific Islands rank poorly, with the highest being Port Moresby at 289th rank.



Improved Worsened

Figure 8. Share of countries improving Liner Shipping Connectivity Index between 2015 to 2023, by region Source: Own analysis visualization based on data from UNCTAD (2024)



Figure 9. Container port performance index ranking Source: Own analysis and visualization based on data from World Bank (2023c)

6. Aviation connectivity

Today, the common man's access to air transport has increased enormously. It forms a crucial connection, linking major cities to smaller communities throughout the Asia-Pacific, fostering regional and global development. This connectivity delivers notable economic and social advantages, enhancing tourism and trade, creating millions of jobs, boosting living standards, reducing poverty, providing essential support for remote areas, and allowing quick disaster response. Aviation's overall global economic contribution is projected at \$4.1 trillion, sustaining 86.5 million jobs worldwide, (ATAG, n.d.) with 11.6 million being direct employment. The Asia-Pacific region represents 34.7% of the global passenger market, moving 1.4 billion passengers in 2023 alone. Air transport facilitates 42 million jobs in this region, adding \$890 billion to the GDP. Aviation activities in the Asia-Pacific have progressively increased from an average of one flight per thousand people in 2000 to 2.9 flights per thousand by 2019 (before the pandemic). However, it fell to 1.8 in 2021. Despite this growth, it still trails significantly behind the levels found in Europe (at about 12) and North America (at 30). Deterioration in aviation connectivity in Pacific Islands is a significant cause of concern (Figure 10).



Source: Own visualization based on data from World Bank (2021a)

The Asia-Pacific region represents 34.7% of the global passenger market, moving 1.4 billion passengers in 2023 alone

7. Digital Connectivity

By 2023, 72% of all individuals in Asia were online, a significant rise from just 4% in 2000. In comparison, internet usage in OECD increased from 26% in 2000 to 89% by 2023 (Figure 11). The digital divide between developing and developed countries has rapidly narrowed following the introduction of the SDGs. Since these goals have been introduced, the percentage of people with access to mobile-cellular networks has grown across all regions, particularly with the expansion of 3G and 4G services. At least 98% of the population had access to 3G services in the Asia-Pacific in 2023. Pacific Islands and Central and West Asia subregions had the lowest 3G coverage in Asia at 71% and 83%, respectively, in 2023. However, despite a worldwide surge in network coverage, internet access remains limited for many in the developing world, although progress is being made. There is still considerable opportunity to enhance digital connectivity in low- and middle-income nations.

This digital revolution is transforming the transport sector in complex ways. The Internet facilitates remote work and online services, potentially reducing peak-time travel demand. Telecommuting is gaining ground, with estimates suggesting that nearly 15% of jobs in Asia could be performed from home, alleviating urban congestion and pollution. The growth of e-commerce and online delivery platforms has intensified urban freight traffic. While 25% of the global population over 15 shopped online in 2017, only 22% did so in Asia, indicating growth potential and its associated impact on transport.



Figure 11. Share of population using the internet, by region Source: Own analysis and visualization using data from ITU (n.d.)

By 2023, 72% of all individuals in Asia were online, a significant rise from just 4% in 2000

8. Logistics Performance Index (LPI)

Improvements in infrastructure, connectivity, and related processes and policies directly translate to enhanced logistics performance, as reflected in the Logistics Performance Index (LPI). The LPI is a vital tool for assessing countries' trade facilitation and logistics capabilities, directly influencing their progress towards achieving the SDGs. Between 2016 and 2023, the positive impact of bridging the infrastructure and connectivity gap is evident in the Asia–Pacific region, where most countries saw their LPI rankings rise (Figure 12). Notably, the Asia–Pacific and Sub-Saharan Africa showcased the highest proportion of countries achieving upward movement in their LPI scores. Only two countries saw a significant drop of more than 10 ranks within the Asia–Pacific (World Bank, 2023b).

9. Share of countries with infrastructure and connectivity targets

A review of roughly 650 transport policy documents covering 36 countries between 2000 and 2024 reveals a strong focus on infrastructure and connectivity, especially in Asia. Within the Asian sample, 61% of the analysed countries have established explicit infrastructure and connectivity targets for the road sector, while 39% incorporate targets for other transport modes, demonstrating a multimodal approach to enhancing connectivity.



Figure 12. Logistics performance index ranking of countries, by region and income level Source: Own analysis and visualization using data from World Bank (2023b)

10. Highlights and Snippets: Policies and Targets

An analysis of 36 country policies reveals a consistent increase in policy development, signalling a heightened focus on the sector (Figure 13). A primary emphasis is placed on infrastructure and connectivity improvements, particularly within road infrastructure and operations. Furthermore, policies addressing externalities have gained significant traction in recent years. However, the instruments used to enhance infrastructure and connectivity vary significantly across nations.

For example, Timor-Leste emphasises the development and implementation of road asset management policies, as seen in their Transport Sector Master Plan (2018). Vietnam's Transport Strategy 2020 (2013) focuses on strategic investments in expressway construction and upgrading national highway sections to enhance overall transportation efficiency. Malaysia's National Transport Policy 2019-2030 promotes performancebased contracts for road maintenance. Digital road strategies are also being adopted, as highlighted in Armenia's Government Program 2021-2026, which emphasizes introducing and applying the latest technologies and methods for road construction.

Moreover, policies have been introduced to address rural connectivity and sustainable development. The Solomon Islands' National Development Strategy 2016-2035 aims to expand road networks to connect inland communities, while Indonesia's National Medium Term Development Plan 2020-2024 includes integrated programs for disaster risk management and green infrastructure solutions. Bhutan's National Transport Policy 2017 focuses on providing cost-effective transport services in rural areas and establishing rural public transport services. These examples illustrate the diverse approaches Asian countries are taking to develop robust and sustainable infrastructure and connectivity networks.

Policies addressing externalities have gained significant traction in recent years



Figure 13. Cumulative number of transport policy documents by type Source: Asian Transport Observatory (2024)

Policy measures before 2015

Port infrastructure improvements

General inland waterways (IWT) improvement Technical standards for road infrastructure Measures to improve rural-urban connectivity Public transit integration Urban passenger rail infrastructure improvement

General rail improvement General public transport

General transport asset management Logistics hub Rail infrastructure expansion Road infrastructure expansion

Transport infrastructure resilience General infrastructure improvements

Active transport infrastructure expansion Technical standards for general transport infrastructure General aviation improvements

Intermodality measures

Policy measures after 2015

EV charging infrastructure Port infrastructure improvements Urban passenger rail infrastructure improvement

Urban passenger rail infrastructure improvement Logistics hub Transport infrastructure resilience General transport asset management

General rail improvement Road infrastructure expansion

General infrastructure improvements Railway electrification
General aviation improvements General public transport

Technical standards for general transport infrastructure Active transport infrastructure expansion Rail infrastructure expansion

Measures to improve rural-urban connectivity General shipping improvement General inland waterways (IWT) improvement

General e-mobility Public transit integration

Figure 14. Policy measure typology before and after 2015 Source: Asian Transport Observatory (2024) Table 1. Examples of Policy Measures – Bridging the Infrastructure and Connectivity Gap

Country	Policy measure	Policy document	Country	Policy measure	Policy document
Armenia	a unified railway network will be introduced due to	Armenia Government Program 2021-	Marshall	In the neighboring islands, construction of Perimeter	Voluntary National Review 2021 -
	which all communities will be provided with transport	2026	Islands	Roads is targeted for completion by 2030 as part of	MHL
	services			the Outer Islands Development Plan (by Local	
Azerbaijan	Improving the railway infrastructure	Strategic Roadmap for Development		Government)	
		of Logistics and Trade in the Republic	Mongolia	the formation of a large transportation hub with	State Policy on Railway
		of Azerbaijan, 2016	0	railways, highways, and airports;	Transportation, 2010
Bangladesh	Introduction of high-speed train for passenger	Eighth Five Year Plan, 2020	Myanmar	Expand, modernize and maintain domestic rail lines	Avanmar Sustainable Development
	transportation for connection among important cities.		,		Plan. 2018
Bhutan	Develop integrated transport hubs and warehouses	Low Emission Development Strategy		Upgrade international transport corridors, such as	
	for efficient distribution of goods and last mile	(LEDS) - Surface Transport, 2021		expanding access to expressways for heavy	
	delivery of goods using light trucks			commercial vehicles, rehabilitating and modernizing	
Brunei	140 Km of new road	Review to Formulate a Roadmap and		the pavement for high traffic highways, and	
Darussalam		Draft National Masterplan for a		improving road safety	
		Sustainable Land Transportation	Nonel	East these versions even where versions there are the second terms and the second terms and the second terms are the second terms	Netional Transport Policy, 2001
		System for Brunei Darussalam, 2014	мера	difficult internal water transport evider shall be	National Transport Policy, 2001
Cambodia	Seeking fund to connect railway from Phnom Penh to	National Strategic Development Plan		difficult internal water transport system shall be	
	the new Phnom Penh Autonomous Port	2019-2023		developed by identifying the tedsible dreds	
Fiji	Improve road approaches, new and upgraded links	Fiji Maritime and Land Transport		integrating nearest road system	
	and local traffic management at the main ports and	Policy, 2015	Nepal	A national strategic network of railways will be	The Fifteenth Plan (Fiscal Year
	airports.			developed based on a master plan	2019/20 – 2023/24)
Indonesia	development of efficient and effective sea	Visi Indonesia 2045, 2017	Pakistan	Improve direct connectivity between communities and	National Transport Policy of Pakistan
	connectivity, the main port system of sea highways			between economic zones by enhancing access to	2018
	and 7 international hubs, short sea-shipping, and (d)			national and provincial highway networks,	
	modern port management			modernizing and expanding the rail, pipeline and	
Kazakhstan	creation of a modern logistics hub	Strategic Development Plan until		inland waterways network	
		2025, 2018			
Kiribati	Improve the inter-island transport system.	Kiribati Development Plan 2016-19		Railway intrastructure will be modernized and	
Kyrgyz	creation of a unified railway network	Development Programme of the		expanded to improve capacity, provide connectivity	
Republic		Kyrgyz Republic for the period 2018-		across the country and improve reliability of services.	
Les Desele's			Papua New	Opening up four economic corridors with an extra	Department of Works Corporate
Lao People s	Develop, rendbilitate and maintain water transport		Guinea	1700km of national roads	Strategic Plan, 2015
Democratic	intrastructure and facilities along the Mekong River		Philippines	Cargo and freight rail infrastructure to connect	Philippine Development Plan 2023-
керирііс	and neuang kiver, which are international water	PLAN (2021-2025)		strategic infrastructure such as ports will be	2028
Malaysia	Brovide adequate binterland facilities for part	National Transport Policy 2010 2020		developed and expanded.	
malaysia	expansion and logistics sorvices	realional transport Folicy 2019-2030	Philippines	Dry ports and other inland cargo terminals will be	Philippine Development Plan 2023-
Maldives	Establish causeways and /or mini bridges in	Strategic Action Plan 10-23		connected by freight rail to ease the movement of	2028
muluives	interlinked islands for connectivity in line with	sharegic Action Fiult 17-20		goods to or from the ports.	
	National Spatial Plan		Singapore	Expand rail network to 360km by early 2030s	Singapore Green Plan, 2021

Country	Policy measure	Policy document
Solomon	Expand road networks to connect inland communities to	National Development Strategy 2016 - 2035
Islands	coastal roads and maritime networks and to provide	
	access to agricultural land and for rural communities.	
Sri Lanka	Improve and expand inland water transport, coastal	National transport Policy of Sri Lanka, 2017
	shipping and domestic air transport where	
	appropriate.	
Tajikistan	ensuring year-round transport connections between	Medium terms development program of the
	cities and regions of the country through the	Republic of Tajikistan, 2016
	reconstruction of roads, construction of bypass roads,	
	construction of roads and railway sections	
Thailand	Construction of 32 double-track railways Construction	Thailand Greenhouse Gas Reduction Action
	of 14 new railway lines Development of railway	Plan for Transport Sector, 2021
	container transportation center at Laem Chabang Port	
	Phase 1 and Phase 2	
Timor-Leste	An extensive network of quality and well-maintained	Timor-Leste's National Adaptation Plan, 2021
	roads will connect our communities, promote rural	
	development, industry and tourism and provide access	
	to markets.	
Tonga	Community partnership roads transportation (minor	Tonga National Infrastructure Investment Plan
·	roads). Widen to three lanes Taufa'ahau Rd (Pea to	3 - 2021-2030
	Tofog)	
Turkmenistan	development of transport infrastructure, including new	National strategy of Turkmenistan on climate
	junctions, study of needs and opportunities for multi-	change 2021
	tiered traffic	-
Tuvalu	commenced the construction of small-scale harbor in the	Programme of Action for Least Development
	outer islands and improving operational capacity on	Countries, 2019
	the island of Nukulaelae	
Uzbekistan	creating international logistics centers effective and	On measures to improve transport
	full use of the capabilities of the Navoi International	infrastructure and diversify foreign trade
	Intermodal Logistics Center	routes for the transportation of goods for
	·	2018 - 2022
Vanuatu	construction of five wet crossings/bridges to address	Rural Roads Access Framework, 2013
	connectivity issues along South Santo Road – which are	-
	exacerbated in the rainy season	
Viet Nam	to build a North - South high-speed railway line	Decision 876/QD-TTg in 2022 approving the
		Action Program on green energy
	Prioritize completion of 5,000 km of expressways	transformation, reducing carbon and methane
		emissions of the transport sector issued by the

Prime Minister



Theme 2: Bridging the transport access gap



11. Rural transport access

The Rural Access Index (RAI) measures the proportion of rural population that lives within 2 kms of an all-weather road. In 2006, approximately one billion people living in rural areas worldwide lacked access to all-season roads, corresponding to a Rural Access Index (RAI) of 68.3%. By 2023, this figure decreased, with 20% of the global rural population, or 697 million people, lacking all-season road access, marking growth. Progress is also evident in the Asia–Pacific region. In 2019, an estimated 25% of the region's rural population lacked such access (ReCAP et al., 2019). This improved to roughly 18%, or 400 million people, by 2023 (Socioeconomic Data and Applications Center, 2023a) (Figure 15).

Rural access in Asia varies significantly. Pacific Islands and Small Island Developing States (SIDS) experience the lowest levels, with rates as low as 41%. Low and lower-middleincome economies account for nearly two-thirds of Asia's rural access gap. While Asia's rural access index (RAI) of 84% places it in the mid-range alongside Latin America and the Caribbean (84%) and Northern Africa and Western Asia (80%), it lags considerably behind Europe and Northern America (97%).

12. Urban access

Poor access to economic and social opportunities in cities is a major barrier to the socioeconomic development of cities. To track the progress towards urban access as included in the SDG target 11.2, it is key to measure access to a reliable, quality public transport network. This is done using a proxy of the percentage of the population living within 0.5 kilometres of the low-capacity public transit network or a 1-kilometre walking distance to a high-capacity public transit network. Using this methodological approach, we establish that public transit access is significantly inferior in developing cities in Asia and Africa.

In the Asia and the Pacific region, about 1.4 billion urban residents lacked efficient access to public transit in 2023, or less than a third of the urban population (on simple

- Rural population without access to all-season roads, 2022
- Urban population without convenient access to public transport, 2022



Figure 15. Transport access (rural and urban) gap, by region Source: Own analysis and visualization based on Socioeconomic Data and Applications Center (2023b, 2023a)

average). This contrasts with the situation in Europe—which seems to be the only region that has deviated from the norm—where 82% of all residents have such access (Socioeconomic Data and Applications Center, 2023b).

Furthermore, less than a fifth (17%) of the 3,133 urban centres in the Asia-Pacific have at least half of their population having convenient access to public transport. Notably, nearly 90% of urban centres with 90% or more population with access are in high-income countries, highlighting the massive disparity in urban mobility across the region.

About 1.4 billion urban residents lacked efficient access to public transit in 2023

Cities are rapidly building high-quality transit lines to improve urban access. In 2015, 118 cities had a total rapid transit length of about 10,000 kilometres in Asia and the Pacific. By 2021, due to massive rapid transit investments in the region, about 154 cities had a total network size of 17,000 kilometres (ITDP, n.d.). To put this growth in perspective, according to the Global Human Settlement (GHS) data, the region encompasses nearly 3,300 urban centres with populations exceeding 100,000. This highlights that while rapid transit is expanding, it currently serves a fraction of Asia's total urban transport landscape, indicating significant potential for future development.

Figure 17 below shows the minimum, average, and maximum access to basic services across Asian countries. With 1.8 billion people, or about 40% of the Asian population, without quality access to transport infrastructure, transport presents a bigger barrier to growth when compared with other sectors, such as access gap to electricity (570 million), access gap to clean cooking technologies and fuels (1.2 billion), and access gap to basic water service (680 million) (IEA et al., 2024; World Bank, 2022a).



Figure 17. Access gap in transport vs. other sectors Source: Own analysis and visualization based on data from IEA et al. (2024), ITU (2025), Socioeconomic Data and Applications Center (2023a, 2023b), and World Bank (2022a, 2022b).



Figure 16. Number of cities and their level of public transport access Source: Socioeconomic Data and Applications Center (2023b)

13. Urban population density

By concentrating people and resources in smaller areas, increasing urban density can enhance urban access through efficient public transport, shorter travel distances, and better access to goods and services while reducing infrastructure costs.

Despite the common perception of sprawling urban expansion leading to declining densities, analysis of Asian cities data reveals a nuanced picture of urban development. While there are cities that saw density decreases between 1990 and 2025, the overall trend indicates a substantial 46% average increase in urban population density. (Melchiorri et al., 2024) (Figure 18).

This densification has accelerated, particularly in more populous cities, with notable growth in city area, built-up area, and population density since 2000. Interestingly, higher-income cities exhibit lower densities, with lower-middle-income cities showing the most intense densification since 2000.

While, on average, urban population densification has increased, existing estimates show that the rate of change is decreasing globally. The Asia–Pacific urban centres are leading this declining rate of growth in terms of population density (Figure 19).⁴

Higher-income cities exhibit lower densities, with lower-middle-income cities showing the most intense densification since 2000

⁴ Based on the analysis of data from GHS (limited by the availability of urban centre area to the year 2025).





Figure 19. Average annual growth rate of population density in urban centers Source: Own analysis and visualization based on data from Melchiorri et al. (2024)

Low income

High income

Lower middle income

Upper middle income

Urban centres in high-income Asian economies have exhibited lower average growth rates than their lower-income counterparts. Urban centres in high-income economies in the Asia–Pacific also have lower densities (on average) than those in lower-income economies (Figure 20). However, the dispersion of urban centres in terms of population densities vary across different countries.



AUS

BRN

JPN

KOR

NZL

Figure 20: Population density of cities by cities based on country income classification and by country Source: Own analysis and visualization based on data from Melchiorri et al. (2024) Strategic infrastructure investments towards the expansion of rapid transit systems can play a pivotal role in optimizing urban access and efficient land use across the region. There are, however, many dense urban centres in the region that still have low levels of rapid transit infrastructure (i.e., route-km) as shown in Figure 21.

Urban centres in highincome economies in the Asia–Pacific also have lower densities (on average) than those in lower-income economies



Figure 21. Rapid transit route kilometer (constructed and planned) vs. population density Source: Own visualization based on data from Melchiorri et al. (2024) and The Transport Politic (2024)

High income

Upper middle income

Lower middle income

14. Urban sprawl

Urban accessibility in Asian cities is keenly influenced by their road network's typology and its vulnerability to street sprawl. Street sprawl is a pattern of road development that decreases access, i.e., road connections resulting in dead ends or greater distances between intersections, which in turn result in higher driving and trip lengths, reducing the viability of transit operations.

While globally, a trend of decreasing street dysconnectivity has emerged since the early 2010s, the Asia–Pacific region lags, exhibiting a slower reduction rate of -1.5% per annum compared to the global average of -3.3% (Barrington-Leigh & Millard-Ball, 2025) (Figure 22). However, in contrast, low-income economy cities in Asia have witnessed an average annual increase of 5% in the estimated dysconnectivity index, highlighting persisting challenges in achieving connected and accessible urban spaces.

Based on the existing estimates from Barrington-Leigh & Millard-Ball (n.d.) for 199 urban centres globally, (Figure 23), urban centres in the Asia–Pacific, on average, have achieved the fastest growth rates in terms of urban extent (hectares) at 6% per annum between the early 2000s and 2015, as opposed to the global average annual growth rate of 4%. The expansion of the extent of the urban footprint, by itself, may not necessarily be sufficient in determining the incidence of sprawl. However, further indicators from the suggest that cities in the Asia–Pacific are exhibiting signs of sprawling expansion. Table 2 shows that the built-up density has been decreasing at the fastest rate (annual average) as compared to the cities in the other regions. In terms of compactness, the average cohesion index —which indicates how urban extents resemble a circle—has decreased on average, while the saturation ratio has been increasing.⁷



Figure 22. Street Network Disconnectedness Index Source: Own visualization based on Barrington-Leigh & Millard-Ball (n.d.)

⁶ Ratio of the average beeline distance of all points to all other points in the equal area circle and the average beeline distance of all points to all other points in the urban extent ### Atlas urban expansion.

⁷ Ratio of the built-up area within the urban extent of the city and its urban extent. Fragmentation measures the degree to which the built-up area saturates the city's urban extent or, conversely, the extent to which the built-up area within it is fragmented by urbanized open space.



Metro Manila, Philippines



Palembang, Indonesia



Suva, Fiji



Bangkok, Thailand



Dhaka, Bangladesh



Tehran, Iran



Pokhara, Nepal



Rawang, Malaysia



Beijing, PRC Figure 23. Urban expansion between 1990 to 2015 (not to scale) Source: Authors' own visualization using data from Angel S. et al (2016)



Shymkent, Kazahkstan



Bukhara, Uzbekistan



HCMC, Viet Nam

	Built-up Density	Compactness- Cohesion Index	Saturation
Asia-Pacific (ATO)	-2.30%	-0.10%	0.20%
Asia - (other)	-1.40%	0.20%	0.20%
Europe	-1.60%	-0.10%	0.20%
Latin America and the			
Caribbean	-0.30%	0.10%	0.10%
Northern Africa	-1.50%	-0.30%	0.10%
Northern America	-0.70%	0.10%	0.20%
Sub-Saharan Africa	-0.80%	-0.60%	0.00%

Table 2. Calculated Built-up Densities, Compactness-Cohesion Index, Saturation Indicators

Source: Based on Angel et al. (2016)

15. Urban services access

Access to essential services, such as healthcare and education, are also inconsistent, with varying travel times and distances across the globe. A geospatial analysis of 1,034 cities globally shows that 39% of these cities have at least half of their populations able to reach healthcare and education within a 1-km walk (Figure 24). In Asia specifically, only 24% of cities meet this population criterion (ITDP, 2024).





Figure 24. Share of cities with poor access to healthcare and education (less than 50% of the city population have access) Source: Own analysis and visualization based on data from ITDP (2024)
16. Bicycle trade

Asia has a small share in the global bicycle trade, with about 20% of total imports. Unlike the expanding motorised vehicle industry, the Asian bicycle market has struggled to achieve comparable growth in trade volume. Bicycle trade volume offers valuable insights into usage patterns (Figure 25). Despite a notable 33% increase between 2020 and 2021, fuelled by pandemic-related pent-up demand, by 2023, the region's bicycle trade had fallen 12% below 2015 levels. Only 40% of Asian countries experienced faster bicycle trade growth than road vehicle trade between 2015 and 2023. Furthermore, major import markets like Australia, Japan, and Republic of Korea, holding 55% of the market share, saw a 15-33% decline in imports. Concurrently, leading export hubs such as the People's Republic of China (PRC) and Taipei, China, which command 80% of the export market, faced a reduction of at least 25% in exports.



Figure 25. Bicycle import and export trade in Asia-Pacific, 2003-2023 Source: Own visualization based on data from International Trade Centre (n.d.).

17. Highlights and Snippets: Policies and Targets

An analysis of policy documents across 36 Asian countries reveals a growing emphasis on improving urban access. Notably, 25% of these countries have proposed measures to enhance urban density, while 31% have implemented transit-oriented development policies, indicating a shift towards integrated land-use and transport planning. Furthermore, 25% of the countries have established explicit targets to improve urban access, showcasing a commitment to measurable progress. Examples include Indonesia's goal of developing six metropolitan cities with mass transit systems by 2024 and Singapore's ambitious aim of having 8 in 10 households within a 10-minute walk of a train station by 2030. These targeted approaches reflect a region-wide recognition of the need for efficient and accessible urban mobility.

Specific national strategies highlight interesting and diverse approaches to urban access improvement. Singapore, for instance, is focusing on developing "45-minute cities" and "20-minute towns" by 2040, prioritizing walk-cycle-ride mobility through enhanced rail access, bus coverage, and pedestrian/cycling infrastructure. Sri Lanka emphasizes active

mobility, aiming to increase non-motorized transport to 20% by 2030 and 30% by 2035. Vietnam has adopted a comprehensive approach, setting progressive public transport mode share targets for major cities by 2030 and 2050. Malaysia has also demonstrated increased ambition, raising its public transport mode share target from 40% by 2030 to 50% by 2040. While tailored to specific national contexts, these varied strategies collectively underscore a regional trend toward prioritizing sustainable and accessible urban transport systems.

A significant focus on rural access improvement is evident across Asia, with 67% of countries implementing specific measures and targets to enhance connectivity. These initiatives aim to bridge the gap between rural populations and essential services through infrastructure development. For instance, Palau is working towards placing 100% of its rural population within 2 km of an all-season road by 2030. Turkmenistan plans to construct and reconstruct over 3,400 km of motorways between 2022 and 2028 to improve rural access. Vietnam's strategy emphasizes

upgrading district and commune roads to technical grade, ensuring they meet the transport demands of rural areas by 2030.

Furthermore, countries like the Solomon Islands are focusing on expanding road networks to connect inland communities to coastal roads and maritime networks, providing vital access to agricultural land and supporting rural populations. The Solomon Islands' National Development Strategy also promotes shared taxi and minibus services, alongside the formulation of local routes. Bhutan's National Transport Policy highlights utilizing local resources, such as Boleros within each gewog (an administrative unit comprising a group of villages), and community participation to develop effective service models. Bhutan also has KPIs to measure progress on connecting villages by roads, aiming to connect at least 80% by all-season roads, and 90% by any kind of road. Myanmar's National Strategy for Rural Roads and Access further underlines the widespread commitment to enhancing regional rural connectivity. These targeted efforts reflect a widespread recognition of rural access's critical role in economic development and social inclusion.

Table 3. Example Policy Measures – Bridging the Transport Access Gap

Country	Policy measure	Policy document
Afghanistan	Preparation of a new program in coordination with	Strategic plan of the ministry of
	the city of Kabul for how to use the buses that use the	Transportation (2019 - 2023)
	lines in Kabul and provinces	
Armenia	Expansion of the public transport network and	Long-term (until 2050) low emissions
	improvement of the system	development strategy of the republic
		of Armenia, 2023
Azerbaijan	Development of metro and increasing the number of stations	Updated Nationally Determined Contribution of the Republic of
		Azerbaijan, 2023
Bangladesh	5 MRT Line and 2 BRT Line be opened by 2035	Roadmap and Action Plan for
	development of rural transport infrastructure by	Implementing Bangladesh NDC, 2018
	integrating road and inland water transport and	
	improving channel and waterway conditions	
Bhutan	Mass transit improvements in bus systems and the	Second Nationally Determined
	introduction of open-bus rapid transit (BRT) network	Contribution - BTN, 2021
	(electric and diesel) and light rail transit.	

Country	Policy measure	Policy document
Bhutan	promote transit oriented development over key transit	National Transport Policy 2017 -
	corridors in urban centres of Bhutan especially in Thimphu	Policy Protocol Report
Brunei	Maggures include expanding the bus fleet from 105	Intended Nationally Determined
Darussalam	to 275 buses creating a national school bus system	Contribution - BPN 2015
Darossalam	creating separate bus rapid transit (BRT)	
	infrastructure in four corridors from 2017 onwards.	
	and further increasing the capacity by 2035.	
Cambodia	Promote integrated public transport systems in main	Updated Nationally Determined
cumoculu	cities	Contribution - KHM, 2020
Fiii	Adopting better transport management systems	5-Year and 20-Year National
	through bus rapid transit (BRT)	Development Plan, 2017
Indonesia	Strengthening urban infrastructure with a strategy to	Strategic Plan for the Railway Sector
	develop urban mass public transportation systems in 6	2020-2024
	metropolitan cities.	
Indonesia	Integration of inter- and intermodal services based on	National Railways Master Plan, 2018
	Transit Oriented Development (TOD	
Kiribati	Public transportation service improved and co- ordinated	Ministry Strategic Plan (MICTTD) 2021-2024
Kyrgyz	public transport system will be transformed	Development Programme of the
Republic		Kyrgyz Republic for the period 2018- 2022
Lao People's	New Bus Rapid Transit system in Vientiane Capital	Updated Nationally Determined
Democratic	and associated Non-Motorized Transport component	Contribution - LAO, 2021
Republic		
Malaysia	Constructing and Upgrading Rural Paved Roads = 2,800 km	Twelfth Malaysia Plan 2021-2025
Maldives	By 2023, at least 60% of the population in the	Strategic Action Plan 19-23
	Greater Male' Region utilise public transport services on a regular basis	
Marshall	Undertake a study of an efficient public transport	National Energy Policy and Energy
Islands	systems in Pacific islands, with similar traffic patterns for implementation	Action Plan, 2016
Mongolia	connecting provincial centers with the capital by road	Three Pillar Development Policy, 2018
Myanmar	Improve rural transport connectivity, including through	Myanmar Sustainable Development
	a new National Rural Road Access Program	Plan, 2018

Country	Policy measure	Policy document	Country	Policy measure	Policy document
Nepal	Promote high-density and compact city development (minimize travel)	National Sustainable Transport Strategy (NSTS) for Nepal (2015- 2040), 2015	Timor-Leste	Develop the core road network with major urban roads, roads linking municipals to each other, upgraded municipal roads linking municipal centers	Transport Sector Master Plan, 2018
Pakistan	systems (multi-modal transport model) to at least 10 major cities by 2030	National Clean Air Plan, 2022		access to villages and the more remote areas	
Papua New Guinea Philippines	Reduce vehicle-miles through more compact development patterns; Regulate where to situate high-density establishments and integrate transit eriented development (TOD) in	Second Biennial Update Report, 2022 Philippine Road Safety Action Plan	Tonga	decentralisation of services from urban to rural areas in order to decrease traffic congestion around Tongatapu, but it is also applicable to the centre of island districts.	Low Emission Development Strategy 2021-2050
Singapore	the local development plans By 2040, the growth of employment centres outside the CBD will bring more jobs closer to homes,	Land Transport Master Plan 2040, 2019	Turkmenistan	in order to strengthen the rural transport system in 2022–2028, the construction and reconstruction of 3,43304 km of motorways will be carried out;	Voluntary National Review of Turkmenistan, 2023
Solomon	shortening daily commutes for those who work near their homes. Expand road networks to connect inland communities	National Development Strategy 2016	Uzbekistan	development of urban, suburban passenger and local transport systems, including the metro and electric passenger transport	Draft Strategy for the Development of the Transport System of the Republic of Uzbekistan until 2035
Islands	to coastal roads and maritime networks and to provide access to agricultural land and for rural communities	- 2035	Vanuatu	Provide equitable and affordable access to efficient transport in rural and urban areas Establish effective partnerships that facilitate the development of the	Vanuatu 2030
Sri Lanka	Introduce new bus services especially in rural areas where there are no such services currently	Public Investment Program 2021		private sector and rural communities as service suppliers in the provision of transport and the	
Tajikistan	access of the rural population to climatic sustainable road system that takes into account social, age and	Updated Nationally Determined Contribution, 2021		infrastructure sector	
Thailand	gender aspects Promoting walking and bicycles to connect with	Thailand Greenhouse Gas Reduction	viet Nam	complete the rural transport intrastructure network	Road network planning for 2021- 2030, vision to 2050
Thailand	transportation systems	Action Plan for Transport Sector, 2021 Climate change Master Plan 2015-	Viet Nam	implement the metro system in major urban areas.	Decision 896 QD TTg 2022 Approving the National Strategy-for
manana	and short-distance public transit networks.	2050			Climate Change until 2050

Theme 3: Ensuring Mobility, Equity, and Prosperity for all



18. Aging population

The Asia–Pacific region is undergoing an unprecedented demographic shift. Over 60% of the world's 65 and older population lives in Asia, totalling nearly 800 million individuals. The PRC, India, the Russian Federation, and Indonesia collectively house half of the global elderly population, with the PRC alone accounting for a staggering 202 million. This aging trend is accelerating in the Asia–Pacific, with the over-65 population growing at an annual rate of 3.2% between 2000 and 2023, surpassing the global average of 2.8% and population growth of 1% (United Nations Department of Economic and Social Affairs Population Division, 2022).

The aging population growth is particularly pronounced in uppermiddle and high-income economies, as the countries with the highest percentage of people over 65 in the region are high-income economies (Japan, Australia, Hong Kong, China, the Russian Federation) (Figure 26).

Developing Asian nations like Thailand, the Philippines, Iran, Malaysia, and Cambodia are also experiencing rapid growth, exceeding 3% per year, with elderly populations surpassing one million in 2023. This rapid aging necessitates critical adaptations in transport infrastructure and services. As life expectancy rises and birth rates decline, more elderly individuals require infrastructure that addresses reduced mobility, sensory impairments, and diverse health conditions.

Over 60% of the world's 65 and older population live in Asia



Figure 26. Population over 65 years old

Source: Own analysis and visualization based on United Nations Department of Economic and Social Affairs Population

41

19. Motorisation

Australia

LDV sales per thousand population

The Asia-Pacific region has witnessed rapid motorisation. From 2000 to 2023, around one billion new vehicles were registered (Figure 27). Although infrastructure development has accelerated, with road construction growing at 2.5% per year since 2010, this progress pales compared to the 7.3% yearly increase in vehicle ownership (Country Official Statistics, n.d.). The pace of motorisation has exceeded population growth in all Asian countries, and in almost half the countries, it has surpassed GDP growth rates since 2010. Despite five years of stagnant car sales, which proved a temporary aberration, Asia has not yet reached its 'peak motorisation.' At the same time, it is essential to note that motorisation in most Asian countries is not following the historical high motorisation trends of the high-income economies. The most significant growth in motorisation continues to be in the two and three-wheelers segment. Since 2015, in 64% of countries, twowheeler registration exceeded car registration growth rates (see also Figure 28).



Figure 27. Motorization rate per thousand population, 2000-2022 Source: Own analysis and visualization based on official country statistics

Figure 28. Passenger car sales per thousand population, 2005-2023 Source: Own analysis and visualization using data from OICA (2024b)

holoysic Toipei Chino Kotokhston rederation Tholland Urbekiston Viet Hom

India

Indonesia Philippines Policitar

20. Trade of vehicles

The Asia–Pacific vehicle trade has witnessed substantial expansion, achieving a valuation of roughly \$600 billion by 2023. This growth elevated Asia's contribution to global road vehicle trade from 16% in 2003 to 22% by 2023 (International Trade Centre, n.d.) (Figure 29).

Light-duty vehicles (LDVs) constitute approximately 80% of the region's vehicle trade value. However, the growth rate for LDVs, buses, and goods vehicles slowed from 9-13% between 2003 and 2010 to 3-5% between 2010 and 2023. Conversely, the 2/3-wheeler segment experienced accelerated growth, rising from 5% in 2003-2010 to 8% in 2010-2023. In approximately one-fifth of Asian economies, , 2/3-wheeler trade represents 20% of total vehicle trade.

The COVID-19 pandemic significantly disrupted global trade, including vehicle imports and exports. Following a decline in 2020, imports rebounded with a 15% increase, while exports surged by 23%.

Between 2015 and 2023, the region imported 6.5 million units of used passenger cars, accounting for 10% of the global total (ITF, 2024). A notable shift in import distribution has occurred. East Asia's share of used passenger car imports, which was 57% between 1990 and 2000, decreased to 11-13% post-2010. Conversely, Southeast Asia and Central and West Asia have become the dominant importers since 2010, collectively absorbing 60-70% of the region's used passenger car imports.





Figure 29. Share of Asia-Pacific in global imports of used passenger cars Source: Own analysis and visualization based on data from ITF (2024)

Light-duty vehicles (LDVs) constitute approximately 80% of the region's vehicle trade value.

21. Public transport

Despite Asia's dominance in global bus manufacturing, accounting for over 80% of production, the sector has experienced a notably slow rebound (OICA, 2024a). Following a steep 44% decline in bus production between 2015 and 2022, a significant 70% year-over-year increase from 2022 to 2023 indicates a recovery (Figure 30).

Bus imports in Asia and the Pacific, which reduced by 45% between 2019 and 2021 due to the COVID-19 pandemic, have only recently returned to 2019 levels, driven by a 61% year-over-year increase from 2022 to 2023 (International Trade Centre, n.d.). However, overall vehicle registrations since 2015 reveal a slow, incremental growth of just 2%, translating to an average annual increase of roughly 200,000 buses, or 50 buses per million people. Critically, 45% of countries experienced a decline in bus numbers starting 2015, while another 24% saw only marginal growth (below 20%) between 2015 and 2022, highlighting the sluggish recovery in Asia (Country Official Statistics, n.d.).

The COVID-19 pandemic declared by the WHO in March 2020 triggered a severe decline in public transit ridership across major Asian cities. This downturn has proven to be persistent, with prolonged and lingering effects. Analysis of nine metro and LRT systems reveals a continued reduction in ridership (Figure 31). By 2023, these systems experienced an average 16% decrease in ridership compared to prepandemic levels in 2017 across nine metro systems with detailed ridership data, highlighting a significant and ongoing crisis in public transit usage.



Figure 30. Bus registrations, manufacturing, and imports, 2010-2023

Source: Own visualization based on data from Country Official Statistics (n.d.), International Trade Centre (n.d.), and OICA (2024a).



Figure 31. Metro ridership per kilometer (2017-2023) Source: Own visualization based on data collected from the official website of the operators

Despite substantial railway infrastructure expansion driven by Asia's rapid economic development, urbanization, and ecommerce boom, the paradox lies in declining railway average utilization rates (measured in passenger-km and tonkm per kilometre of rail – see Figure 32) since 2010. The increased track length is not translating proportionally into increased passenger and freight demand per kilometre, indicating a modal shift policy gap.

Another indicator we are tracking to understand the public transit crisis is the railway equipment trade, which includes locomotives, rolling stock, parts, railway track fixtures and fittings, other mechanical parts, traffic signalling equipment of all kinds, and more. As of 2023, railway equipment was about 20% below 2012 levels in Asia and the Pacific (International Trade Centre, n.d.) (Figure 33).

The increased track length is not translating proportionally into increased passenger and freight demand per kilometre



Figure 32. Railway utilization ratio (combined passenger-km and tonne-km per kilometer of heavy rail) Source: Own analysis and visualization based on International Union of Railways (2024)



Figure 33. Railway equipment trade, 2003-2023 Source: Own visualization based on data from International Trade Centre (n.d.)

22. Modal shift in cities

An in-depth examination of mobility trends in 80 sampled cities from 2018 to 2023 highlights a prominent shift towards private motorized transport (Figure 34). The data shows that motorcycles have become increasingly popular, with significant usage growth in 58 cities. Specifically, 18 of these cities saw a rise of over 10% in motorcycle mode share, indicating a strong inclination towards two-wheelers, especially in Asian regions. Car usage also increased in 32 cities. Notably, while some cities experienced a decrease in car usage alongside a rise in motorcycle adoption, these reductions often surpassed 10%. In contrast, walking and cycling declined in most cities (65), with 9 cities experiencing a drop greater than 5%. This indicates a movement away from active forms of transport towards motorcycles and cars. Public transport remained relatively unchanged during this period. While 36 cities saw a modest increase (less than 5%) in public transport mode share, a greater number, 41 cities, reported a decline. Remarkably, only two cities had increases exceeding 5% (Almaty and Tbilisi)



Figure 34: Modal shift in 80 cities between 2018 to 2023 Source: Own analysis and visualization using data from Google (2025)



23. Transport's contribution to GDP

Gross Value Added (GVA) gauges the value added to the economy by producing goods and services within a specific sector. Transport's GVA has slowed down globally and across Asia. In the Asia–Pacific, the transport sector reduced its pace from 8% growth annually between 2000-2010 to only 5% growth annually between 2010-2023 (UNDESA Statistics Division, 2023) (Figure 35). COVID-19 profoundly disrupted various sectors in Asia, especially in the beginning. Shortly afterward, in 2021, the economy began recovering at a rapid pace. Since then, the transport, communications, trade, and hospitality sectors have maintained their growth and contribution to the region's economy.

Since 2010, the contribution of transport to total GVA in the region remained steady at about 8-9%. Within Asia, Central Asia, West Asia and South Asia saw the highest contribution from transport to the economy, at about 10%.

24. Transport employment

Asia contributes to about 61% of total transport sector employment. The transport sector in Asia has experienced steady employment growth, rising from 85 million in 2000 to 148 million in 2023. Despite this growth, employment has decelerated significantly, from a roughly 4% annual growth rate between 1990 and 2000 to about 2% since 2010 (International Labour Organization, 2024) (Figure 36).

Transport accounts for approximately 7% of total employment in the Asian region and 4-11% of the transport workforce in other regions, indicating the sector's vital importance to the region's economy. Although this sector's employment growth surpasses traditional sectors such as agriculture, fishing, and industry, which have significant employment share, it still falls short compared to construction and other emerging sectors. As a result, the transport sector's share of total employment has gradually increased from 4% in 2000 to about 7% in 2023 (see Figure 37).



■ 1990-2000 ■ 2000-2010 ■ 2010-2023



Figure 36. Annual average growth rate of employment in the transport sector, by region Source: Own visualization based on data from International Labour Organization (2024)

Figure 35. Annual average growth rate of gross value added by transport Source: Own visualization based on data from UNDESA Statistics Division (2023)

Within the transport sector in Asia, a significant majority of all employment, close to 66%, is in land transport, while roughly 20% is engaged in motor vehicle sales and maintenance (Figure 38).

These statistics do not account for the large informal workforce, which plays a crucial role in the sector but is mainly unrecorded. This could lead to an underrepresentation of actual transport employment in Asia.

Transport accounts for approximately 7% of total employment in the Asian region and 4-11% of the transport workforce in other regions



Figure 37. Annual average growth rate of employment, by sector Source: Own visualization based on data from International Labour Organization (2024)



Figure 38. Share of transport subsector in total economy-wide employment in Asia-Pacific countries, various years Source: Own visualization based on data from International Labour Organization (2024)

25. Transport productivity

We use the transport sector's gross value added per employee to evaluate productivity growth as a proxy indicator. In 2022, the average gross value added per employee for Asia's transport, storage, and communications sector was approximately \$22,000, nearly four times less than that in Europe and seven times less than in Northern America (International Labour Organization, 2024; UNDESA Statistics Division, 2023) (Figure 39).

From 2010 to 2023, the Asia–Pacific region demonstrated the most substantial improvements in transport sector productivity, achieving an annual growth rate of 4%, outpacing Europe and North America. South Asia witnessed the most significant improvements within the region, while upper-middle-income Asian countries also experienced significant transport productivity increases. In contrast, transport productivity has stagnated in low and lower-middle-income countries since the COVID-19 pandemic and has seen a decline in highincome nations (Figure 40).

From 2010 to 2023, the Asia-Pacific region demonstrated the most substantial improvements in transport sector productivity, achieving an annual growth rate of 4%





Figure 40. Gross value added per employee in the transport sector of Asia-Pacific, 1991-2023 Source: Own visualization based on data from International Labour Organization (2024) and UNDESA Statistics Division (2023)

26. Female employment

Data on the share of women employed in the transport sector remains scarce. The limited information indicates that employment in the transport sector is highly gendered and unequal, especially in Asia and the Pacific. Of the total female workers in the formal sectors in Asia in 2023, transport constitutes only about 2.6%, indicating a significant gender disparity (International Labour Organization, 2024) (Figure 41).

In 2023, within the transport sector, female transport sector employment in Asia was only 14% of total transport employment, while it was roughly half of the share in Europe and Northern America. Since the adoption of the SDGs, there has been only a marginal change in the share of female employment in transport. Before 2015, female employment in Asia's transport sector grew 2% per year. After 2015, the growth slowed to 1.3% per year, now behind the global average of 1.7%.

Research indicates that men overwhelmingly dominate high-level roles across Asia in the transport, environment, and energy sectors, with women holding only 5-37% of these positions. Notably, the Russian Federation, New Zealand, and Myanmar exhibit the highest female representation within this range.

Of the total female workers in the formal sectors, transport constitutes only about 2.6%



Figure 41. Share of female employment in the transport sector, 2023 Source: Own visualization based on data from International Labour Organization (2024)

27. Transport sector wage

In 2022, in Asia, the monthly wages in the transport and storage sector were roughly half the global average and five times lower than in Europe and Northern America. Moreover, since 2015, wages have only marginally increased in Asia. In 2015 and 2022, the average salaries in the transport and storage sector in the Asia–Pacific low- and lowermiddle-income countries were between \$260 and 320; for uppermiddle-income countries, it was \$320 and 560; for high-income countries, it was \$2,100 and 2,600. By 2021, 86% of the economies in Asia will still have wages below the global average. In contrast, transport sector wages have increased significantly in Europe and North America (International Labour Organization, 2024) (Figure 42).

28. Share of transport in household expenses

Transport is a major household expense in Asia and the Pacific. Understanding how households spend on transport is crucial for effective public policy, impacting both the transport sector and the broader economy. In terms of household expenditure, we measure spending on purchasing vehicles, operating personal transport equipment, and using transport services. In 2021, transport-related household spending in Asian economies reached an estimated \$2.4 trillion (PPP), representing roughly 7.6% of total household expenditure. Asia's share in global household transport expenditure is 37% (World Bank, 2021b) (Figure 43).

Transport-related household spending in Asian economies reached roughly 7.6% of total household expenditure



2010 2015 2020 2022

Figure 42. Average monthly wage in the transport sector Source: Own visualization based on data from International Labour Organization (2024)



Figure 43. Share of transport in household expenses, 2021 Source: Own visualization based on data from World Bank (2021b)

29. Integration of gender in transport sector policies

Out of the 36 countries with 600 policy documents, we don't see bidirectional gender integration, i.e., transport policies in gender policy documents and incorporation of gender in transport policies. Among the 36 countries, only 3 had transport policy measures within their gender policies, and only 9 had gender-specific elements in their national transport policy. Furthermore, gender-specific policy measures are more visible in road policies than other modes.

30. Highlights and Snippets: Policies and Targets

a. Integration of transport employment in policies

An analysis 600 policy documents across 36 countries revealed that while 42% of nations implemented transport employment measures, only 11% established specific employment targets within the sector. Recent policy examples highlight a growing focus on emerging employment issues. Bhutan's 2021 Low Emission Development Strategy prioritizes women's entrepreneurship, improved working conditions, and EV-related skills, including preferential subsidies for female EV taxi drivers. Similarly, Papua New Guinea's 2022 EV Policy Draft anticipates new job creation for all genders in areas like charging station operation and EV maintenance. Thailand's 2023-2027 National Economic and Social Development Plan addresses the potential displacement of workers in petrochemicals and biofuel agriculture due to EV adoption, proposing remedial measures.

42% of nations implemented transport employment measures, only 11% established specific employment targets

Table 4: Integration of gender in transport sector policies

Policy type	Number of countries
Gender-focused strategy	3
National development policy	13
National transport policy	9
Road infrastructure and operations policy	4
Rail policy	0
Shipping and aviation policy	1
Logistics policy	0
Active transport policy	0
Climate change and energy strategy	8
Air pollution strategy	1
Road safety strategy	1

Source: (Asian Transport Observatory, 2024)

Table 5. Example Policy Measures – Transport and Employment

Country	Policy measure	Policy document
Afghanistan	Enable women to join the local, regional, and national labor markets, and compete on an equal footing in various social, political and economic affairs in the country	Afghanistan National Peace and Development Framework (ANPDF II) 2021 to 2025
Bhutan	Promote entrepreneurship of women. Improve working conditions and guarantee better payment to them	Low Emission Development Strategy (LEDS) - Surface Transport, 2021
Brunei Darussalam	Enhance human capital and skill set through training and development programmes that upskill and reskill current capacities into technical field of EV	Brunei Darussalam National Climate change Policy, 2020
Cambodia	Updating and implementing Neary Rattanak Strategic Plan by continuing to mainstreaming gender in the development policies and plans in all sectors and at all levels	Rectangular Strategy Phase IV, 2018
Fiji	The Government will actively encourage women's participation throughout the transport sector through skills development programmes, targets and monitoring.	Fiji Maritime and Land Transport Policy, 2015

Country	Policy measure	Policy document	Country	Policy measure	Policy document
Kyrgyz Republic	creation of high added value jobs and green industries in transport, logistics, infrastructure a	Voluntary National Review on the Implementation of the Sustainable	Papua New Guinea	New jobs for all genders can be created due to increased EV adoption	EV Policy Draft for PNG, 2022
		Development Goals in the Kyrgyz Republic 2020	Philippines	Gender mainstreaming, inclusion, and accessibility will be main considerations in all stages of transport	Philippine Development Plan 2023- 2028
Lao People's	Ensure gender equality in economic opportunities,	8th Five-Year National Socio-		project implementation	
Democratic	including access to resources such as land, funds,	Economic Development Plan (2016-	Sri Lanka	Economy-wide: 75% of new jobs supported by	Climate Prosperity Plan, 2022
Republic	technologies and basic infrastructure (electricity,	2020)		reskilling and training for industries of the future	
	roads, markets).		Thailand	The number of automotive workers upskilled to EVs	The Thirteenth National Economic and
Malaysia	Create employment centres near Public Transport Transit Centres	National Physical Plan_Chapter 7 (Implementation), 2020		and employed in the new industry increases by 5,000 by 2027.	Social Development Plan (2023- 2027)
Maldives	Conduct awareness and information dissemination to school leavers on employment prospects and job opportunities within the seafaring industry	Strategic Action Plan 19-23	Timor-Leste	Address the jobs-skills mismatch in key sectors – agriculture, tourism, blue economy and entrepreneurship	Voluntary National Reviews 2023 - TLS
	Coordinate with job centres to promote employment opportunities in the industry		Turkmenistan	Additional working positions will be created in the transport sector and related industries.	Third National Communication of Turkmenistan, 2015

b. Growing public transport policies

Public transport is central in Asian transport policy, with widespread integration of improvement strategies. While nearly all countries prioritize public transport development, specific modal shift targets are absent, appearing in only 25% of 36 countries analysed across 600 policy documents. However, 31% of these countries set targets for enhancing public transport systems, encompassing infrastructure like BRT, urban rail, and HSR, and operational improvements such as frequency, coverage, and ridership. One of the challenges of the policies in public transport is the inherent vagueness of policy recommendations for improving public transit. Only about half of public transport policy measures identify specific interventions (Figure 44).

Analysis of urban transport growth in Asia since 2000 reveals a significant divergence between Bus Rapid Transit (BRT) and metro/Light Rail Transit (LRT) systems. Infrastructure expansion demonstrates this disparity, with BRT networks adding approximately 2,000 kilometres, compared to the substantial 13,000-kilometre growth of metro and LRT systems. This trend is mirrored in policy documents, where 18 countries explicitly



Figure 44. Transport policy measures on public transport improvement Source: (Asian Transport Observatory, 2024) reference metro/LRT compared to 15 referencing BRT. Furthermore, policy document references show a roughly one-third to two-thirds split in favour of urban rail systems. These observations suggest a strong correlation between policy emphasis and the scale of urban transit infrastructure development.

Table 6. Example Policy Measures – Public Transport

Country	Policy measure	Policy document
Afghanistan	construction of the Kabul Ring Road, urban BRT corridors	Afghanistan National Infrastructure Plan 2017-2021
Armenia	Replacement minibuses by larger passenger buses and route optimization	Second National Energy Efficiency Action Plan for Armenia, 2015
Azerbaijan	development of metro and increase of the total number of stations,	FOURTH NATIONAL COMMUNICATION , 2021
Bangladesh	Modal shift from road to rail, delivered through a range of measures, including underground metro systems and bus rapid transit systems in urban areas.	Intended Nationally Determined Contributions, 2015
Bhutan	New public routes introduced with subsidies encouraging passenger transport services, to enhance mobility of people living in the most remote parts of the country	Voluntary National Review 2021 - BTN, 2021
Brunei Darussalam	Install Cyclists and Public Buses facilities	The Brunei Darussalam Road Safety Strategic Plan 2025
Cambodia	Promote integrated public transport systems in main cities	Cambodia's Third National Communication, 2022
Fiji	Bus Network Information Transport System (ITS)	NDC Investment Plan, 2022
Indonesia	Development of Mass Rapid Transit/MRT, Light Rail Transit/LRT, and tram;	Roadmap of SDGs Indonesia: A Highlight, 2019
Kiribati	Public transportation service improved and co- ordinated	Ministry Strategic Plan (MICTTD) 2021-2024
Kyrgyz Republic	public transport system will be transformed	Development Programme of the Kyrgyz Republic for the period 2018-2022
Lao People's Democratic Republic	New Bus Rapid Transit system in Vientiane Capital and associated Non-Motorized Transport component	Updated Nationally Determined Contribution - LAO, 2021
Malaysia	Increase the number of Stage Buses in GKL and main cities	Low Carbon Mobility Blueprint 2021-2030

Country	Policy measure	Policy document
Maldives	Strengthen Public transport system	National road safety action plan 2019 –2023
Marshall Islands	Undertake a study of an efficient public transport systems in Pacific islands, with similar traffic patterns	National Energy Policy and Energy Action Plan, 2016
Mongolia	Implement bus rapid transport in public transport in Ulaanbaatar to reduce traffic jam	Third National Communication of Mongolia, 2018
Myanmar	The railway network will play a key role in Urban MRT in Myanmar as more trains will be introduced	Updated Nationally Determined Contributions - MMR, 2021
Nauru	The government shall also develop a framework for the private sector to provide regular, reliable, low cost public road transport.	Voluntary National Review 2019
Nepal	A bus rapid transit system will be prioritized by emphasizing on mass transport.	The Fifteenth Plan (Fiscal Year 2019/20 – 2023/24)
Pakistan	Improvement of urban public transport systems, especially Bus Rapid Transport at Lahore,	Pakistan's Intended Nationally Determined Contribution, 2015
	transport (Orange Line) at Lahore	
Philippines	Bus rapid transit systems will be adopted to enhance the efficient use of public transport vehicles and existing road spaces.	Philippine Development Plan 2023- 2028
Singapore	Taking steps to make public and shared transport and active mobility are the preferred mode of travel	Second Update of First Nationally Determined Contribution, 2022
Sri Lanka	Introduce Mass public transportation (BRT/MRT) systems	Clean Air 2025 - Action plan for Air Quality Management, 2016
Thailand	Development of public or mass transit systems in major cities	Strategies for the Development of Thailand's Transport System for a 20-Year Period (2018-2036)
Timor-Leste	New Dili Central Bus Terminal	Transport Sector Master Plan, 2018
Turkmenistan	Support for the development of public transport	Nationally Determined Contributions under the Paris Agreement, 2022
Uzbekistan	development of urban, suburban passenger and	Draft Strategy for the Development
	local transport systems, including the metro and	of the Transport System of the
	electric passenger transport, in particular	Republic of Uzbekistan until 2035
Viet Nam	Shifting passengers to public transport: BRT: 4	Implementation of NDC for
	routes in 3 cities (13 routes in 5 cities - conditional)	Transport in Viet Nam, 2021

Theme 4:

Growing transport energy and carbon emissions



31. Transport energy consumption

In 2022, the transport sector in Asia consumed a substantial share of energy, accounting for roughly 18% of the region's total final energy consumption. Although the sector saw rapid growth in energy demand between 2000 and 2015, surpassing other sectors and regions with an annual growth rate of 4.1%, the adoption of the SDGs has marked a turning point. Following the implementation of the SDGs, transport energy consumption in the Asia–Pacific region has increased at an annual rate of 0.3% from 2015 to 2022. The push towards achieving the SDGs drives a visible rise in renewable energy adoption within the Asian transport sector. This is reflected in the near doubling of renewable energy's share in the sector's energy mix, from 1.7% in 2015 to 3% in 2022. However, fossil fuels dominate particularly road transport, which consumes 87% of the sector's energy (United Nations Statistics Division, 2024) (Figure 45).

32. Transport energy intensity

Since 2000, the global transport sector has witnessed a significant decrease in energy intensity, i.e., the ratio of transport energy consumption to GDP, with an average annual reduction of about 4%. This trend is mirrored in Asia, where transport energy intensity has improved considerably. Further, Asian economies consistently demonstrate lower transport energy intensity than other regions. This positive shift towards greater energy efficiency is widespread across the continent (United Nations Statistics Division, 2024; World Bank, 2023a) (Figure 46).

Transport energy intensity has improved considerably



Figure 45. Energy consumption by mode and source, 2021 Source: Own visualization based on data from United Nations Statistics Division (2024)



Figure 46. Transport energy consumption intensity with GDP, 2000-2021 Source: Own visualization based on data from United Nations Statistics Division (2024) and World Bank (2023a)

33. Transport electrification

Asia stands as the clear leader in the global electric vehicle revolution. The region has experienced significant growth in EV adoption, representing 60% of the overall increase in electric cars and about 90% of the rise in electric buses globally from 2015 to 2023 (IEA, 2024). This shift is also evident in Asia's electric vehicle trade, which has expanded twelve-fold, from 9 billion to 106 billion in 2023 (International Trade Centre, n.d.).

Although a large part of this trade consists of two- and three-wheelers, which have lower economic value and might not entirely depict the true extent of growth, it is essential to highlight that approximately 90% of the world's electric two- and threewheelers are based in Asia.

Asia's dominance in the EV revolution extends beyond mere trade figures (Figure 48). The region demonstrates high readiness for a full-scale transition to electric mobility. Increasing supportive policies, robust financing mechanisms, infrastructure creation, and widespread access to EV technology have created a fertile ground for the rapid expansion of the electric vehicle market (Figure 47).

The region has experienced significant growth in EV adoption, representing 60% of the overall increase in electric cars globally from 2015 to 2023



Significant progress has been made in railway electrification. In 2023, 56% of tracks were electrified , up from 34% in 2000 (International Union of Railways, 2024), leading to nearly 60% of railway energy now being sourced from electricity (United Nations Statistics Division, 2024) (Figure 49).



Figure 48. Share of electric vehicles in road vehicle imports, 2017-2023 Source: Own analysis and visualization based on data from International Trade Centre (n.d.)



Figure 49. Rail energy consumption in Asia-Pacific, share by fuel Source: Own visualization based on data from United Nations Statistics Division (2024)

Significant progress has been made in railway electrification

34. Fossil fuel subsidy

Between 2010 and 2015, fossil fuel subsidies in Asia's transport sector totalled \$306 billion. However, adopting the Sustainable Development Goals (SDGs) marked a pivotal change. From 2016 to 2021, these subsidies decreased significantly, reaching \$232 billion. Unfortunately, this positive trend was disrupted in 2022 when subsidies increased to \$113 billion, the highest annual figure in a decade. This was followed by a \$64 billion subsidy in 2023 (International Energy Agency (IEA), n.d.) (Figure 50).

Asia's share of global transport fossil fuel subsidies rose from 34% (2010-2015) to 48% (2015-2023), suggesting that transport policies became more effective in other regions. However, Asian policymakers have made significant strides in reducing subsidies within the transport sector compared to other sectors. This progress is evidenced by the reduction in the transport sector's percentage of total fossil fuel subsidies in Asia, which declined from 20% in 2010-2015 to 15% in 2015-2023. The International Monetary Fund (IMF) estimates that implicit fossil fuel subsidies—stemming from undercharging for environmental costs, externalities, and forgone consumption taxes—constitute a substantial portion of the fossil fuel subsidies for petroleum, totalling approximately 1.4 trillion in 2023. Among these, 230 billion is attributed to road crashes, another 230 billion for congestion, and 20 billion for damages to road infrastructure (IMF, 2024).

35. Grid emissions

Electric vehicles produce no direct tailpipe emissions. As a result, the emissions from electricity generation become crucial in assessing their climate impact. In Asian economies, fossil fuels are the primary source for electricity production, leading the region to have one of the highest grid emission intensities, which measures CO2 emissions per unit of electricity generated (gCO2/kWh). Since 2000, the carbon intensity of electricity grids in Asia has barely changed, dropping by only 1% from 2000 to 2020, i.e., decreasing from 635 gCO2/kWh in 2015 to 581 gCO2/kWh in 2022 (Ember, 2024). This is compounded by the region's slower transition to renewable energy sources, with only 29.5% renewable energy utilization compared to the global average of 35%, highlighting the need for accelerated clean energy deployment to realize the full potential of EVs in mitigating climate change (IEA et al., 2024).



Figure 50. Fossil fuel subsidies in transport, 2010-2023 Source: Own visualization based on data from International Energy Agency (IEA) (n.d.)



Figure 51. Grid emission factor Source: Own visualization based on data from Ember (2024)

36. Transport CO2 emissions

In 2023, the region reached an unprecedented 2.8 Gt CO2, a 6.6% increase (174 Mt CO2) from 2022, now equalling the combined emissions of Europe and Northern America (Crippa et al., 2023) (Figure 52). The region is a major global contributor, accounting for 40% of global domestic transport emissions and driving approximately 83% of the worldwide increase in transport fossil CO2 emissions since the Paris Agreement, with a growth rate twice the global average. Significant variations exist while the region's transport sector represents 12% of its total fossil CO2 emissions, lower than the worldwide average of 19%. High-income Asian economies mirror the global average at 19%, while upper middle-income economies stand at 10%. Notably, high-income economies have seen their share of regional transport emissions decrease from

36% in 2000 to 16% in 2022, indicating lower growth intensity than developing economies. Most subregions have rebounded from pandemic-related disruptions, surpassing 2018 emissions by 2023, except for the Pacific subregion.

While transport is a rapidly expanding emissions source, its growth rate mirrors that of the power and industrial sectors, resulting in a stable share of total emissions at 10-12% since 1970. However, post-Paris Agreement, transport has emerged as Asia's second-fastest growing emissions sector, trailing only the power sector, and remains the energy sector's third-largest contributor overall (Figure 53).



Figure 52. Domestic transport CO2 emissions, 2000-2023 Source: Own visualization based on data from Crippa et al. (2023)



Asia, CO2 Emissions Growth

2000-2015 2015-2023

Figure 53. Annual average growth of fossil CO2 emissions in Asia-Pacific, by sector Source: Own visualization based on data from Crippa et al. (2023)

37. Emissions mode share in transport CO2

Road transport dominates Asia's transport-related carbon emissions, contributing approximately 89% of transport CO2 emissions. In contrast, railways, domestic aviation, and inland waterways contributed significantly less, at 1%, 5%, and 5%, respectively. Since 2000, annual fossil fuel emission growth rates have been 3.2% for road transport, 0.7% for railways, 2.9% for domestic aviation, and 2.5% for domestic navigation (Crippa et al., 2023) (Figure 54).

The composition of road transport emissions varies sharply by income level. Light-duty vehicles (cars, SUVs, taxis) account for a substantial portion, but their share decreases with rising income: 55% in low/lower-middle-income economies, 45% in upper-middle-income economies, and 41% in high-income economies. Conversely, two-wheeler emissions rise with lower-income levels, from 1% in high-income economies to 14% in low/lower-middle-income economies (International Council on Clean Transportation, 2023).

The railway sector presents a unique case. While Asia significantly expanded its railway infrastructure (approximately 150 thousand km between 2010 and 2022), its fossil CO2 emissions significantly declined. After a 1.7% annual growth rate from 2000 to 2010, emissions only increased by an average of 0.9% annually between 2010 and 2023.



Figure 54. Transport fossil CO2 emissions in Asia-Pacific, by mode Source: Own visualization based on data from Crippa et al. (2023)

Road transport dominates Asia's transport-related carbon emissions, contributing approximately 89% of transport CO2 emissions.

In terms of aviation CO2 emissions, there has been moderate growth since 2000 for the region (4% AAGR), but there had been notable deviations. For example, in the Pacific, fossil CO2 emissions in aviation have decreased by an average of -1% per annum since 2000, and the overall share of aviation emissions has decreased from more than a fifth of the total (domestic) transport emissions to less than a tenth. This is primarily due to the significant decrease in aviation emissions in Palau (-7% per annum). The same is true for Central and West Asia, wherein Uzbekistan's domestic aviation emissions have decreased at -16% per annum since 2000 (see Figure 55 for the visualization of the distribution of the attributable domestic aviation emissions).



Figure 55. Domestic aviation emissions Source: Own visualization based on data from Climate Trace (2025)

38. Climate finance for the transport sector

Effective climate finance is crucial for realizing alobal sustainability objectives, particularly in mitigating and adapting to climate change. Within Asia's climate finance landscape, the transport sector receives 32% of total funding, second only to energy systems. Notably, financing within the transport sector is heavily skewed towards mitigation, with these initiatives comprising 99% of total investments. In 2022, private and public funding contributed relatively equally, with private sources accounting for 55%. A striking feature of transport sector finance is the substantial role of household/individual investment, representing nearly half of the total, primarily driven by electric vehicle purchases. This personal contribution level is unique across regional sectors, contrasting sharply with the 5% in energy systems and 7% in buildings and infrastructure. highlights a Furthermore, the data geographical concentration, with East Asia and the Pacific receiving 95% of Asia's total climate finance for the transport sector (Buchner et al., 2023) (Figure 56).

Transport sector receives 32% of total funding

(million USD for year 2022)



Figure 56. Climate finance in the transport sector of Asia-Pacific Source: Own visualization based on data from Buchner et al. (2023)

39. Share of population with climate targets

The Asia–Pacific region has witnessed a dramatic shift in its commitment to addressing climate change. In 2015, less than 1% of the region's population resided in countries with ambitious long-term climate goals. However, by 2024, this number increased to a remarkable 93%, highlighting a substantial increase in climate ambition (Figure 57).

Despite this progress, the transport sector in the Asia–Pacific still lags in terms of longterm climate mitigation efforts. Currently, only 10% of the region's population lives in countries with explicit greenhouse gas emission reduction targets for the transport sector outlined in their Nationally Determined Contributions (NDCs). However, there is a silver lining: at least 76% of the population resides in countries with indirect transport-related targets with various intensities within their NDCs.



Figure 57. Share of population of countries with net zero targets Source: Asian Transport Observatory (2024)

Table 7. Example Policy Measures - Climate and Transport

Country	Policy measure	Policy document
Afghanistan	Options for alternative fuel vehicles: from electric cars to natural gas-powered buses and trucks that run on biodiesel	Afghanistan Energy Efficiency Policy, 2016
Armenia	Expansion and modernization of the electrified public transport	Second National Energy Efficiency Action Plan for Armenia, 2015
Azerbaijan	Electrification of railways and transition to alternating current traction	Fourth National Communication, 2021
Bangladesh	Phasing out all fossil fuel subsidies and redirecting them to loss and damage, adaptation, renewable energy, and storage technology, should low-cost capital be made available for renewable energy and storage, while enabling the lowest income groups to benefit from financial support and subsidized clean energy. Shift at least 30% of the transportation fleet to electric by 2030	Mujib Climate Prosperity Plan, 2021

39. Highlights and Snippets: Policies and Targets

National climate targets for the transport sector are infrequently explicitly defined within Nationally Determined Contributions (NDCs). Only 7 of the 36 nations analysed included direct transport emission reduction targets within their NDCs. 9 others referenced indirect targets, such as modal shift, electrification, and alternative fuel adoption within their NDCs. Conversely, the Aichi 2030 Declaration demonstrates a positive trend, with 21 Asian countries committing to peak transport carbon emissions by 2030 and pursue decarbonization by 2050, representing 86% of the region's transport CO2 emissions. Effective implementation remains the biggest hurdle.

Country	Policy measure	Policy document	Country	Policy measure	Policy document
Bhutan	Subsidies for purchasing alternative fuel vehicles or for converting traditional fuel vehicles to alternative fuel vehicles	National Transport Policy 2017 - Policy Protocol Report, 2017	Marshall Islands	As currently estimated, progress towards achieving RMI's targets would entail reducing emissions from transportation (including domestic shipping) by 16% in 2025 and 27% in 2030	RMI First NDC, 2016
	Foster mandatory vehicle fuel efficiency or CO2 emission standards		Mongolia	Support import of fuel-efficient vehicles by alleviating certain taxes.	Third National Communication of Mongolia, 2018
Brunei Darussalam Cambodia	Increase total share of electric vehicles (EV) to 60% of the total annual vehicle sales by 2035. 390 MtCO2e reduction	 Nationally Determined Contribution - BRN, 2020 Cambodia's Third National Communication, 2022 	Nauru Nepal	Implementation of energy efficiency in transport. By 2030, develop 200 km of the electric rail network to support public commuting and mass	Nauru Energy Roadmap 2018-2020 Second Nationally Determined Contribution, 2020
Fiji	Promote the use of fuel-efficient vehicles.	Fiji Maritime and Land Transport Policy, 201 <i>5</i>	Pakistan	target of 30% and 90% share in sale of passenger vehicles and heavy-duty trucks by 2030 and 2040	Pakistan Updated NDC 2021
Indonesia	Provide incentives for clean truck purchase and operation	Mitigation Action Outline on Truck Fleet Modernization Scheme in Indonesia, 2021	Palau Papua New Cuinea	Procure and operate fuel efficient vehicles Encourage the introduction of fuel-efficient transport	Climate Change Policy, 2015 Updated NDC, 2020
Kazakhstan	infrastructure for electric and gas vehicles	Updated Nationally Determined Contribution of the Republic of Kazakhstan, 2023	Philippines	equipment; Mitigated GHG emissions increased (MtCO2e) = 26.04 (from 0 in 2019)	Philippine Development Plan 2023- 2028
Kiribati	Introduce regulations on minimum standards for energy efficiency	Kiribati Joint Implementation Plan for Climate Change and Disaster Risk Management, 2019	Singapore Solomon Islands	All vehicles to run on cleaner energy by 2040 Improving operational and energy efficiency in the transport sector to reduce emissions and phase down	Singapore Green Plan, 2021 Solomon Islands National Climate Change Policy 2023-2032
Kyrgyz Republic	ensuring a gradual transition to environmentally friendly transportation through the use of electric vehicles;	Voluntary National Review on the Implementation of the Sustainable Development Goals in the Kyrgyz	Sri Lanka	fossil fuels. 50% of public transportation, including suburban railway, is electrified including through retrofitting.	Climate Prosperity Plan, 2022
Lao People's Democratic Republic	15% of the emissions in transport sector reduced by 2030	Republic 2020 The First Biennial Update Report of the Lao PDR, 2020	Thailand	Set fuel prices which reflect the true cost and use tax mechanisms to promote energy conservation and	Contribution, 2021 Climate change Master Plan 2015- 2050
Malaysia	Rationalise transport fuel subsidies, with only targeted exception-based for low-income households.	National Energy Policy 2022-2040		renewable energy consumption in the shift towards high efficiency transportation;	
Maldives	Formulate and implement fuel economy policy Economy-wide: BY 2030, double the global rate of improvement in energy efficiency	Maldives National Energy Policy and Strategy, 2016	Thailand	In this regard, transportation from the energy and transport sectors has the combined potential as of 2030 (2030) to reduce greenhouse gas emissions by 41 MtCO2e as additional measures.	Thailand Greenhouse Gas Reduction Action Plan for Transport Sector, 2021

Country	Policy measure	Policy document	Country	Policy measure	Policy document
Thailand	In this regard, transportation from the energy and transport sectors has the combined potential as of	Thailand Greenhouse Gas Reduction Action Plan for Transport Sector,	Tuvalu	Introduce energy efficient vehicles.	Second National Communication of Tuvalue, 2015
	2030 (2030) to reduce greenhouse gas emissions by 41 MtCO2e as additional measures .	2021	Uzbekistan	an increase in the share of the fleet of vehicles with hybrid, electric and alternative fuels by 2025 by 10%	First Biennial Update Report of the Republic of Uzbekistan, 2021
Tonga	Promote the use of Hybrid electric vehicles (HEVs)	Third National Communication on Climate Change Report, 2019	Vanuatu	ensuring improvements in the fuel efficiency for the transport sector (land, sea and air) by standardising engine fuel efficiency	Vanuatu Climate Change and Disaster Risk Reduction Policy 2016- 2030, 2016
Turkmenistar	Upgrading of the transport -eet of Turkmenistan with vessels that meet international standards with economical fuel consumption	Third National Communication of Turkmenistan, 2015	Viet Nam	implement the roadmap to phase out subsidies for fossil fuels	Intended Nationally Determined Contribution of Viet Nam (2015), 2015

Table 8. Summary of Climate-relevant Targets for the Transport Sector in Asia

	Policy measure	Document	Year
Policy measures from NDCs •	Mass transit through improvements in bus systems and the introduction of open-bus rapid transit (BRT) network (electric and diesel)	Second Nationally Determined	2021
	and light rail transit	Contribution - BTN	
Selected policy measures from•	Implement Passenger Information System (PIS) for all public buses and taxis	Low Emission Development Strategy	2021
national policy documents		(LEDS) - Surface Transport	
•	Promote and provide e-ticketing services for all modes of transport		
•	314 intra-city and 358 inter-city buses		
•	Provide government subsidy for non-profitable routes	12th Five Year Plan 2018-23	2019
•	Revision and printing of bus and taxi fares		
•	Procurement of security equipment at all bus terminals (CCTV cameras)		
•	Provide consumers a fair choice between alternative modes of transport	National Transport Policy 2017 - Policy	2017
•	Provide subsidies on non-profitable bus routes	Protocol Report	
•	Bus route rationalisation		
•	Reducing headways (from current 10-15 mins to lower levels)		
•	Regulatory mechanism for private operators to operate		
•	Explore possibilities of introducing electric/hybrid public transport system in major urban centres	Economic Development Policy (2016)	2016

Country	Document	Policy measure
Bhutan	NDC •	Low emission freight transport system for heavy and commercial trucks and freight trains
	Selected policy measures from •	Develop logistics policy
	other transport policy documents •	Develop inland container depots or dry ports including railway links together with supporting facilities such as customs, immigration, quarantine, etc., at the border crossings
		Introduce low emission freight trucks including EV trucks
		Land use planning to develop land use controls to ensure urban renewal near freight terminal is compatible with the terminal's operations
	•	Optimise freight vehicles loading, improve utilisation, reduce vehicle kilometre travelled
Cambodia	NDC •	Shift long-distance freight movement from trucks to train
	Selected policy measures from • other transport policy documents •	Prepare a logistic system master plan to serve as an efficient, reliable and highly competitive platform for trade facilitation
		The MPWT has proposed to shift long-distance freight movement by 40% and 75% from trucks to train by 2030 and 2050 respectively
		Promoting the implementation of agreements on cross-border transport along the Cambodian-Thai railway
	•	Promoting investment in logistics centres, warehouse, container terminal and dry port
Sri Lanka	NDC •	Switch back to rail from road transport
	Selected policy measures from • other transport policy documents	A key focus of the strategy is reforming the logistics ecosystem by adjusting key regulations such as the Sri Lanka Port Authority Act, Electronic Transactions Act
		and Commercial Hub Reaulations in order to increase the sophistication and auality of services
		Relocation of freight and container yards closer to expressway entry points and railway
	•	Use train for freight transport
T I - 11 - 1		Development of new business models to enhance freight transport by railways in consultation with relevant public and private agencies Promote road to rail model shift for both freight and passanger transport.
Indiland		Adapt intelligent logistics management systems which will increase officiency by increasing the use of freight distribution networks, reducing the number of
	other transport policy documents	Adopt intelligent togistics management systems which will increase efficient and law amission transmoster tradition
		empty truck journeys while simultaneously shifting to more efficient and low-emission transport modalities
		Promote the transportation of both domestic and international goods to use rail and water transportation
		Establishment of a distribution centre
	•	Upgrading standards of transportation management by trucks to support Enhancing energy efficiency and reducing greenhouse gas emissions
Vietnam	NDC •	Restructure freight towards a reduction in the share of road transport in exchange for an increase in the share of transportation via rail and inland waterways
	Selected policy measures from •	Promote the transition of freight transport from roads to railways, waterways and coastal transport
	other transport policy documents	Reduce the proportion of empty runs of vehicles, reduce congestion of goods in transportation activities and logistics service supply chains
	•	Establishing a network of multi-level distribution centres (inland ports, warehouses, cargo yards) and freight collection and collection routes in major cities and
		key economic regions

Theme 5:

Limited climate resilience and disaster preparedness in transport



41. Exposure to Disasters

Since the turn of the century, 65% of all global geophysical disasters, more than 40% hydrological and meteorological disasters, and a fourth of all climatological disasters have occurred in the Asia-Pacific (Centre for Research on the Epidemiology of Disasters, 2025) (Figure 58).

65% of all global geophysical disasters have occurred in Asia-Pacific

	Sub-Saharan Africa											
	Asia-Pacific (ATO)											
	Latin America and the Caribbean											
Climatological	Northern America	USA										
	Europe											
	Asia - (others)											
	Northern Africa											
	Asia-Pacific (ATO)	CHN	IDN									
	Latin America and the Caribbean											
	Europe	11										
Geophysical	Asia - (others)											
	Sub-Saharan Africa											
	Northern America	USA										
	Northern Africa											
	Asia-Pacific (ATO)	CH	N	IND	IDN	PHL	VNM PAK	AFG	THA			
	Sub-Saharan Africa											
	Latin America and the Caribbean	BRA	COL PE	ER HTI								
Hydrological	Europe											
	Northern America	USA										
	Asia - (others)											
	Northern Africa											
	Asia-Pacific (ATO)	CHN	IND	D PHL	VNM J	PN BGD						
	Europe	FRA										
	Latin America and the Caribbean	MEX										
Meteorological	Northern America		USA									
	Sub-Saharan Africa											
	Asia - (others)											
	Northern Africa											
		0	200	400	600	800	1000	1200	1400	1600	1800	2000
	Number of Disaster Events (Since 2000) 🖵											
		1										

High income

Upper middle income

Lower middle income

Low income

Figure 58. International disaster events by type, region, and income group Source: Own visualization based on data from Centre for Research on the Epidemiology of Disasters (2025).



The Asia-Pacific hosts three-fourths of the urban population that is exposed to 100-year flooding events, 90% of those exposed to coastal floods, and 70% in low-elevation coastal zones (Figure 59).

Figure 59. Total built-up area exposed to 100-year floods Source: Own visualization based on data from Melchiorri et al. (2024)

42. Damages and costs

E. E. Koks et al (2019) estimate that the overall annual expected damages to transport infrastructure (road and rail) equates to \$8.5 billion per year.⁸ CDRI on the other hand, estimates that the average annual damage to transport infrastructure including roads, rail, ports, and airports—in the Asia–Pacific amounts to around \$53 billion per year (Figure 60).⁹

Transport's share in the overall financial losses incurred due to environmental hazards vary across countries in the region. Asia bears half of the global costs in terms of road infrastructure, 40% of rail-related costs, 30% of airport-related costs, and 60% of the ports-related costs (Figure 61).

At the country-level, there are cases where the share of losses to transport infrastructure is more than a fourth of the overall damages caused by environmental hazards. For example, Niue's transport sector is disproportionately impacted, as 40% of the overall losses due to environmental hazards happen to transport infrastructure.

Asia bears half of the global costs in terms of road infrastructure

⁸ Infrastructure damages are estimated using a variety of sources of cost data, fragility curves, and assumed parameters for each hazard. These represent direct damages to road and rail assets, and do not include the costs from transport delays and disruption, or wider economic impacts.

⁹ The study considered the existing climate scenario as the future modelled scenario. Flooding includes flooding, tropical cyclones, and tsunami; roads include roads, bridges, and tunnels; rail includes railway tracks and tunnels.



Figure 60. Average annual losses to transport infrastructure, by mode and region Source: Own analysis and visualization based on data from CDRI (n.d.)



Figure 61: Share of transport in annual losses due to environmental hazards Source: Own analysis and visualization based on data from CDRI (n.d.)

43. National Road Vulnerability Index

The National Road Vulnerability Index measures the number of trips that could be delayed or disrupted due to missing segments caused by natural hazards. A higher ranking indicates that countries have significant redundancies in their road networks. The index demonstrates that Pacific Island nations are particularly vulnerable to disruptions because of inadequate networks and limited geographical space. Moreover, several North and Central Asian countries rank lower due to deficiencies in their road networks resulting from challenging terrain. A notable concern is the group of countries that still rank low despite having extensive road networks (at least 100,000 kilometres), mainly due to a lack of redundancy within the system (Figure 62).

Pacific Island nations are particularly vulnerable to disruptions because of inadequate networks and limited geographical space


44. Climate finance for adaptation

Existing evidence suggests that transport-sector climate financing currently heavily favours mitigation. According to the Climate Policy Initiative, just 0.13% of Asia's committed transport-related climate finance in 2022 was designated for adaptation, while a mere 0.06% was allocated to actions addressing both mitigation and adaptation (Buchner et al., 2023). This distribution is particularly concerning, as the transport sector—along with key interconnected sectors essential for its decarbonization, such as infrastructure, buildings, and energy systems—receives the lowest share of climate finance dedicated to adaptation (Figure 63)



Figure 63. Climate finance flows by sector Source: Own analysis and visualization based on data from Buchner et al. (2023)

45. Road maintenance investments

Spending on infrastructure maintenance is crucial for the resilience of transport systems. Data reveals significant road maintenance investment per capita differences between developing Asia–Pacific countries and OECD nations. Generally, countries with a higher GDP per capita allocate more resources to infrastructure maintenance. This proactive approach helps reduce the risks of infrastructure failures during severe weather and improves the transport network's ability to withstand environmental challenges, thus enhancing its resilience. Conversely, many Asia–Pacific nations allocate significantly less per capita for road maintenance. This long-standing issue of neglect undermines transport



assets' durability, safety, and efficiency, ultimately weakening their transport networks' overall resilience. The disparities illustrated in the figure underline the importance of prioritizing infrastructure maintenance spending to develop a robust and resilient transport system capable of overcoming various challenges (Figure 64).

Generally, countries with a higher GDP per capita allocate more resources to infrastructure maintenance



Figure 64: Road maintenance investment per capita and GDP per capita

Source: Own analysis and visualization based on data from Infrastructure Maintenance (n.d.) and van Dissel (2024)

46. Highlights and Snippets: Policies and Targets

Asia is confronted with a twofold challenge: a policy and implementation gap. Many countries in the Asia–Pacific region find it difficult to guarantee that their local government units (LGUs) properly execute disaster risk reduction strategies in accordance with national plans. Approximately half of the countries in the region have less than 50% of their LGUs adopting and/or executing local disaster risk reduction strategies that correspond with national disaster risk reduction efforts (Figure 65). Some countries have developed dedicated strategies, policies, and action plans to improve climate resilience and adaptation. Others include climate resilience in National Transport Strategies, National Climate Change Policies, National Logistics Master Plans, and National Railway Master Plans.

A variety of policy tools are being utilized across countries. Some countries focus on new regulations, while others are amending existing ones. There are efforts to coordinate across government agencies, define the roles and accountabilities of different agencies, and develop institutional capacity. There is also a focus on setting targets, establishing monitoring and evaluation frameworks, and enhancing data collection.

Examples of specific policy highlights and snippets include the following.

	Australia and New Zealand								US		<mark>0</mark> NZL
	Central and West Asia		🛕 GEO	▽	РАК		٨				KAZ 🕁
	East Asia										
Asia-racific (ATO)	Pacific	SLB	▽ FSM		∆ TON				MHL		Q
	South Asia	U	KA <mark> ▽</mark> ▽ BGD								
	South East Asia	∑ LAO				TH A	łA		V PHL		mys ♦
Asia - (non-ATO)					(ARE				Δ	QAT 😝
Europe				BGR		CHE			SRB		нин
Latin America and the Caribbean		A MEX							CHL O	Aco Aco	L 🧕
Northern Africa										V EGY	DZA 🛕
Northern America											CAN 8
Sub-Saharan Africa		CIV	BDI *	⊽ UGA ★		BWA	BEN N	IAM	∦ LBR		ZAF
		0	10	20 30	0 40	50	60	70	80	90	100

O High income

∆ Upper middle income

▼ Lower middle income

Figure 65: Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies (%) Source: Own analysis and visualization based on data from Statistisches Bundesamt (n.d.)

★ Low income

Table 9. Example Policy Measures – Resilience

Country	Policy measure	Policy document	Country	Policy measure	Policy document
Afghanistan	O&M programs for national and tertiary roads – Road Authority Fund	Afghanistan National Infrastructure Plan 2017-2021	Lao People's Democratic	Increase the resilience of urban development and infrastructure to climate change, including through the	Updated Nationally Determined Contribution - LAO, 2021
Armenia	Assessing the climate change risks on the motor roads of common use of the Republic of Armenia and	The 2021-2026 action plan of the government of the Republic of	Republic	use of green infrastructure and nature-based solutions	
	elaborating a plan on climate change adaptation in the current works in accordance with the best	Armenia (Annex No 1)	Malaysia	Upgrade critical roads connecting Port Klang	Logistics and Trade Facilitation Master Plan 2015-2020
Bangladesh	international practice We will enable the climate resilience of the Bangladesh Railway 30-year revised master plan including protection measures from extreme weather,	Mujib Climate Prosperity Plan, 2021	Marshall Islands	Plans for major road repairs in both Ebeye and Majuro are included in the National Infrastructure and Investment Plan (NIIP)	Voluntary National Review 2021 - MHL, 2021
	heavy rain, high temperatures, high wind speeds, and reduced soil stability		Myanmar	Adapt infrastructure systems, including transport systems, to mitigate against heightened risks of	Myanmar Sustainable Development Plan, 2018
Bhutan	Promote green and climate resilient infrastructures	Bhutan. National communication (NC). NC 3., 2021		natural disasters and new climatic conditions, while facilitating a transition to more efficient, low-carbon	
Brunei Darussalam	Improve road quality and maintenance	Strategic Plan 2018-2023		technologies	
Cambodia	Repairing and rehabilitating existing road infrastructure and ensuring effective operation and maintenance, taking into account climate change impacts.	Cambodia Biennial Update Report, 2020	Nauru	implementing a proactive infrastructure maintenance program to target reductions in accelerated infrastructure aging and premature impairment of infrastructure assets	Nauru Integrated Infrastructure Strategic Plan, 2024
Fiji Indonesia	To enhance resilience by upgrading, repairing and relocating existing critical public infrastructure Developing and improving the quality of disaster- resilient infrastructure in disaster-prone priority areas;	Fiji's Updated Nationally Determined Contribution, 2020 National Medium Term Development Plan 2020-2024	Nepal	Promote and use climate-resilient and environment friendly tools, technologies, and inclusive measures in roads and transport (e.g., green belts, avenue	National Adaptation Plan (NAP) 2021 - 2050
Kazakhstan	Design, construction, reconstruction, repair, the maintenance of roads and management of them in the territory of the Republic of Kazakhstan have to be	On the road traffic: The Law of the Republic of Kazakhstan of April 17, 2014 No. 194-V, 2022		plantations, bioengineering, bypasses, distance shortening, electric vehicles, waterways, railways, charging stations, etc.)	
	carried out on a basis and with observance of satety requirements of road traffic established by the real Law, technical regulations in the field of highways		Pakistan	strengthen asset management practices in each subsector	National Transport Policy of Pakistan 2018
Kiribati	Enhance transport and logistics infrastructure to be safer and more climateresilient to promote outer island tourism	Kiribati Joint Implementation Plan for Climate Change and Disaster Risk Management 2019	Palau	Climate proofing of low lying roads and causeways and paving priority unpaved roads - Airai to Koror	Palau National Infrastructure Investment Plan 2021-2030
Kyrgyz Republic	quality of road infrastructure in the key cities will be improved	Development Programme of the Kyrgyz Republic for the period 2018- 2022	Papua New Guinea	Conduct a rigorous risk and vulnerability assessment including inland road network, coastal roads and buildings.	National Adaptation Plan, 2023

Country	Policy measure	Policy document	Country	Policy measure	Policy document
Philippines	Climate resilience will be mainstreamed in infrastructure planning and investment so that climate risks are considered and managed across all types of	Philippine Development Plan 2023- 2028	Tonga	conduct sector-specific vulnerbility assessment to establish baselines and to inform resilience planning	Joint National action plan 2 on climate change and disaster risk management 2018 - 2028
	infrastructure and throughout the lifecycle of infrastructure assets and operations. Moreover, innovative technologies, including nature-based		Tuvalu	Climate-proofing design of coastal infrastructure	Second National Communication of Tuvalue, 2015
	solutions (NBS), will be employed in infrastructure planning and design.		Uzbekistan	introduce adaptation criteria into public investment projects for construction, modernization, operation	Updated Nationally Determined Contribution - UZB, 2021
Singapore	Singapore is strengthening the resilience of its critical services	Updated Nationally Determined Contribution - SGP, 2020		of the economy	
Solomon Islands	Ensure maintenance and rehabilitation of existing roads is effectively carried out	National Development Strategy 2016 - 2035	Vanuatu	Implement asset management system Improve partnerships and the costeffective use of resources to	Vanuatu Roads for Development Program, 2017
Sri Lanka	Identification of climate resilient improvements in - Transport planning - Infrastructure development -	National Adaptation Plan for Climate change Impacts in Sri Lanka, 2016		ensure sustainable asset management and maintenance.	
Thailand	Implementation of plans Road and bridge maintenance project on the land network Road and bridge maintenance project on rural road network	Strategic Plan of the Ministry of Transport 2017-2021	Viet Nam	Fundamentally overcome traffic jams and flooding in major urban centres	NATIONAL ACTION PLAN FOR THE IMPLEMENTATION OF THE 2030 SUSTAINABLE DEVELOPMENT AGENDA , 2017
Timor-Leste	Timor-Leste will undertake substantial and long-term investment in roads to maintain our current road network, including a major program of road rehabilitation, repair and improvement	Transport Sector Master Plan, 2018	Viet Nam	integrate factors of climate change, sea level rise, efficient use of resources in the implementation of projects;	Road network planning for 2021- 2030, vision to 2050

• Armenia: Define roles and accountabilities across agencies; development of other transport-related plans/policies; development of transport asset management plans/policies; general capacity building; general data repositories and data collection; general transport asset management; general transport institutional reform; investment required for specific projects; involvement of subnational government for transport activities; rail infrastructure expansion; reference to finance mechanisms; routine transport asset maintenance; stakeholder involvement; technology and knowledge transfer; transport asset condition assessment; transport infrastructure resilience; and transport law.

• Bhutan: Adaptation-related education and training; climate-resilient design standards; coordinate planning across government agencies; define roles and accountabilities across agencies; development of climate change/low carbon plan/policy; development of logistics plan/policy; development of national development plan/policy; development of other transport-related plan/policy; development of road plan/policy; development of transport adaptation/emergency/disaster plan/policy; development of transport asset management plan/policy; development of transport plan/policy; disaster monitoring and risk assessment for transport infrastructure; disaster notification/early warning system; general aviation improvements; general capacity building; general data repositories and data collection; general infrastructure improvements; general transport asset management; general transport finance; general transport institutional reform; intelligent transport systems (ITS); investment required for specific projects; involvement of subnational government for transport activities; performance-based transport maintenance contracts; relocation from climate-risk areas; resilient transport technologies; routine transport asset maintenance; technical standards for road infrastructure; technologies on transport asset management; technology and knowledge transfer; transport asset condition assessment; transport infrastructure resilience; and transport law.

Cambodia: Adaptation transport laws, regulations, and programs; climateresilient design standards; coordinate planning across government agencies; data modelling improvements; define roles and accountabilities across agencies; development of automotive plan/policy; development of e-mobility transport plan/policy; development of other transport-related plan/policy; development of public transport plan/policy; development of rail plan/policy; development of road plan/policy; development of transport adaptation/emergency/disaster plan/policy; development of transport plan/policy; disaster notification/early warning system; general adaptation measures; general capacity building; general data repositories and data collection; general international conventions; general transport asset management; general transport finance; general transport institutional reform; general vehicle improvements; investment required for specific projects; involvement of subnational government for transport activities; rail infrastructure expansion; reference to finance mechanisms within the country; reporting, transparency, feedback mechanism; routine transport asset maintenance; stakeholder involvement; technologies on transport asset management; transport asset condition assessment; transport asset management funding strategy; transport asset management information system; transport infrastructure resilience; and transport law.

• Fiji: Adaptation transport laws, regulations, and programs; asphalt mix resurfacing; climate-resilient design standards; data modelling improvements; define roles and accountabilities across agencies; development of e-mobility transport

plan/policy; development of public transport plan/policy; development of transport asset management plan/policy; development of transport plan/policy; disaster monitoring and risk assessment for transport infrastructure; disaster notification/early warning system; employment in transport, communication, and storage; general adaptation measures; general capacity building; general data repositories and data collection; general international conventions; general transport asset management; general transport finance; general transport institutional reform; general vehicle improvements; investment required for specific projects; investment volume for transport; involvement of subnational government for transport activities; reference to finance mechanisms within country; relocation from climate-risk areas; resilient transport technologies; routine transport asset maintenance; stakeholder involvement; technology and knowledge transfer; transport asset condition assessment; transport asset management funding strategy; transport infrastructure resilience; transport law; and transport services adaptation.

• Mongolia: Asphalt mix resurfacing; coordinate planning across government agencies; development of automotive plan/policy; development of other transport-related plan/policy; development of transport adaptation/emergency/disaster plan/policy; development of transport plan/policy; disaster notification/early warning system; general capacity building; general data repositories and data collection; general international conventions; general transport asset management; general transport finance; general transport institutional reform; general vehicle improvements; investment required for specific projects; rail infrastructure expansion; reference to finance mechanisms within the country; reporting, transparency, feedback mechanism; request for financial support to develop transport; routine transport asset maintenance; stakeholder involvement; technologies on transport asset management funding strategy; transport asset management information system; transport law.

Theme 6: Health and Environmental impacts



47. Road crash fatality rate

Globally, progress in reducing road crash deaths has slowed since adopting SDGs. The state of road safety in Asia is complex. There has been slight progress in fatality rates over the course of a decade, dropping from 22 deaths per 100,000 individuals in 2010 to 19 in 2021. Between 2010 and 2016, global reductions were -0.6% per year, and the Asia–Pacific saw a reduction of -1.4% per year. After the adoption of the SDGs, between 2016 and 2021, the average reduction globally was -0.3% per year, and Asia reduced -0.6 % per year (WHO, 2023) (Figure 66).

Nonetheless, the region still accounts for an alarming 60% of global road crash fatalities. This progress is uneven; high-income Asian nations have made significant strides, whereas low and lower-middle-income countries struggle to see similar improvements.



Figure 66: Road crash fatality rate, 2010-2021 Source: Own analysis and visualization based on data from WHO (2023)

The ambitious goal of the Decade of Action for Road Safety—to halve road fatalities by 2030—remains distant, as the current annual reduction rate is significantly below the necessary 7.4% ¹⁰ (Figure 67). Additionally, concerning trends show that countries like India and Nepal are witnessing rising road fatalities, underscoring the pressing need for targeted interventions and enhanced road safety measures.

¹⁰ Annual average reduction rate required to achieve 50% decrease from 2021 to 2030



Figure 67: Road crash fatality growth rate vs. reduction goal Source: Authors' own calculations based on data from WHO (2023)

48. Distribution of road crash fatalities

The distribution of road crash fatalities across different road user categories reveals distinct patterns. Powered two-wheeler users constitute the largest share of deaths at 35%, followed by pedestrians at 22%. Regional variations exist, with Southeast Asia and South Asia reporting the highest proportions of two-wheeler fatalities, while pedestrians are particularly vulnerable in Central and West Asia (WHO, 2023).

Global road crash fatality data analysis uncovers clear trends across different demographics (Figure 68). From 2010 to 2021, the percentage of female road traffic deaths has stabilized at 23% on a worldwide scale, though there are noticeable regional differences. In 2021, low and lower-middle-income countries reported a rate of 21%, upper-middle-income countries 25%, while high-income nations showed a markedly higher rate of 31%. Within subregions, the Pacific region had the highest incidence at 28%, whereas South Asia recorded the lowest at 20%(IHME, 2024). Additionally, data from the Global Burden of Disease (GBD) reveals a significant change in the age distribution of fatalities. The proportion of deaths among individuals under 14 years old fell sharply from 15% (around 89,000 deaths) in 2000 to 7% (about 36,000 deaths) by 2019. In contrast, deaths in those aged over 65 years increased from 14% (approximately 85,000 deaths) to 26% (about 131,000 deaths) during the same timeframe, underscoring the shifting demographics of road traffic deaths (Global Burden of Disease, 2021) (Figure 69).

Powered two-wheeler users constitute the largest share of deaths at 35%



Figure 69. Share of road crash fatalities by age group, 1990-2019 Source: Own visualization based on data from Global Burden of Disease (2021)

<14 years old

5%

0%

>65 years old

49. Road crash fatality costs

The economic burden of road crashes in Asia is immense, with the International Road Assessment Programme (iRAP) estimating the total cost at approximately \$1.5 trillion. This figure encompasses the loss of lives, property damage, and diminished productivity, national economies taking the hit. In some countries, road crash costs can reach as high as 8% of their GDP, underscoring the severe financial implications of inadequate road safety measures. Notably, at least 11 Asian countries experience costs exceeding 5% of their GDP (Figure 70).

In some countries, road crash costs can reach as high as 8% of their GDP



Figure 70. Cost of road crash fatalities in Asia-Pacific vs. GDP of countries, 2021 Source: Own analysis and visualization based on iRAP (2024) and World Bank (n.d.)

50. Road safety related infrastructure

A comprehensive iRAP survey with roughly 220,000 kilometres of roads uncovered significant inconsistencies in infrastructure safety. In total, only 41% of the surveyed roads received a 3-star rating or higher for vehicle occupants, while the percentages were even lower for motorcyclists (26%), bicyclists (22%), and pedestrians (14%). High-income nations exhibited the best road infrastructure, with an average of 45% of roads rated 3-star or above for vehicle occupants, 42% for pedestrians, 32% for motorcyclists, and 24% for bicyclists. Notably, upper-middle-income countries showed the best quality road infrastructure for bicyclists, with around 42% meeting the 3-star or higher standard. In contrast, low and lower-middle-income economies had the worst infrastructure quality for pedestrians, with only 8% attaining the 3-star or better rating (Figure 71).



Figure 71. Share of road infrastructure in Asia-Pacific with 3-star or better IRAP rating, per road user Source: Own visualization based on data from iRAP (2024).

51. Fatalities due to transport-related disasters

Since the turn of the century, there have been more than 4,000 transport-related disasters, all of which have been documented by the Centre for Research on the Epidemiology of Disasters in its Emergency Events Database, or EM-DAT.¹¹ A third of these events took place in the Asia-Pacific (29% of road, 32% of water, 44% of air, and 49% of rail-related disasters).

Almost 7,100 people have died in the region due to these disasters. 41% of the deaths are associated with water transport-related events, while a third (33%) are road fatalities. Half of all deaths due to rail disasters are in Asia. Less than a fifth

(18%) of the aviation disaster fatalities occurred in Asia. On the bright side, the number of transport-related disaster events and their consequences have reduced significantly since the year 2000. For example, overall deaths in the Asia–Pacific have reduced by more than -60% in 2024 as opposed to 2000 (Centre for Research on the Epidemiology of Disasters, 2025) (Figure 72).

Half of all deaths due to rail disasters are in Asia

¹¹ For an event to be included under the EM-DAT database, it must meet at least one of the following criteria: at least ten deaths (including dead and missing); at least 100 affected (people affected, injured, or homeless); a call for international assistance or an emergency declaration



East Asia South Asia

South East Asia

Other Regions

Figure 72. Number of deaths due to transport-related disaster events Source: Own visualization based on data from Centre for Research on the Epidemiology of Disasters (2025).

52. Transport sector's contribution to ambient PM2.5 Pollution

Particulate Matter (PM 2.5) consists of tiny inhalable particles with diameters typically measuring 2.5 micrometres or less. The origins of PM 2.5 pollution differ across countries and regions; some of the primary sources include the transport sector, residential fuel combustion, energy generation, industrial production, agriculture, dust carried by the wind, waste incineration, and construction activities. The relative contributions from these sources to ambient PM 2.5 levels differ globally (Figure 73). In 2019, surface transport contributed to about 6.2% and shipping contributes to about 1.5% to ambient PM2.5 pollution in Asia and Pacific (simple average).

53. PM2.5 emissions

In terms of absolute emissions, the transport sector's share of global PM2.5 emissions was 11% in 2022, compared to 16% in 2000. In the Asia–Pacific, transport accounts for 8% of total PM2.5 emissions, decreasing from 11% in 2000. Between 2000 and 2015, PM2.5 emissions from transport grew at an annual rate of 0.4% in the region (Ferrario et al., 2022).

The Asia–Pacific region generates 54% of global PM2.5 emissions from transport, an increase from 44% in 2000. Notably, efforts within the transport sector to reduce air pollutant emissions have been slower relative to other sectors. However, since adopting the SDGs in 2015, this growth rate has accelerated slightly to 1.2%. Despite the generally slow progress in the transport sector, the road transport category—a big source of pollution—has shown promising trends. Its proportion of total transport emissions has decreased, while emissions from domestic shipping have risen.



Figure 73. Transport contribution to ambient PM 2.5 Source: Own visualization based on data from Health Effects Institute (2024) A closer look at PM2.5 emissions from the transport sector reveals that the road sector's share fell from 49% in 2000 to 25% in 2022, whereas domestic shipping's contribution grew from 38% to 64% during the same period. This trend indicates the growing importance of inland navigation as an air pollution source. However, it is essential to highlight that there are still limitations in data for modelling transport emissions, especially concerning domestic vessel operations in inland waterways and domestic shipping (Figure 74).

Asia–Pacific region generates 54% of global PM2.5 emissions from transport

54. Black Carbon (BC) emissions

Black carbon (BC), commonly known as soot, is recognized as a short-lived climate pollutant and a significant component of particulate matter pollution. It is the sooty black material released during the incomplete burning of fossil fuels, biofuels, and biomass. The Asia–Pacific region is responsible for 72% of global BC transport emissions, an increase from 58% in 2000. Markedly, the transport sector's initiatives to reduce air pollutant emissions in this area have lagged behind other sectors (Ferrario et al., 2022) (Figure 75).

Within the Asia–Pacific, the transport sector accounts for 19% of total BC emissions, down from 30% in 2000. Between 2000 and 2015, transport-related BC emissions in the region experienced an annual reduction of -1%. Yet, after the SDGs were adopted in 2015, this growth rate increased to 0.2%. Although the transport sector has generally made slow progress, the road transport sector, a major pollution contributor, has shown encouraging trends. Its share of total transport emissions has declined, while emissions from domestic shipping have increased.

An examination of BC emissions from the transport sector indicates that the road sector's share dropped from 76% in 2000 to 49% in 2022, while the contribution from domestic shipping increased from 22% to 49% in the same timeframe (Crippa et al., 2023). This points to the rising significance of inland navigation as a source of air pollution. However, it is worth noting that data for transport emission modelling remains limited, particularly for domestic vessel activity in inland waterways and domestic shipping.



Figure 74. Fossil transport PM 2.5 emissions Source: Own visualization based on data from Ferrario et al. (2022)



Figure 75. Fossil transport BC emissions Source: Own visualization based on data from Ferrario et al. (2022)

55. NOx emissions

The term Nitrogen Oxides (NOx) refers to a mixture of two primary gases: nitric oxide (NO) and nitrogen dioxide (NO2). While other oxides of nitrogen exist, NO and NO2 are the principal nitrogen oxides associated with combustion sources, such as in the transport sector.

The Asia–Pacific region is responsible for 46% of global NOx transport emissions, an increase from 30% in 2000 (Ferrario et al., 2022). The transport sector's initiatives to reduce air pollutant emissions in this area have lagged other sectors. In the Asia–Pacific, the transport sector accounts for 31% of total NOx emissions, down from 37% in 2000. Between 2000 and 2015, transport-related NOx emissions in the region experienced an annual growth rate of 0.8%. After the SDGs were adopted in 2015, this growth rate decreased to 0.5%. Although the transport sector has generally made slow progress, the road transport sector, a major pollution contributor, has shown encouraging trends. Its share of total transport emissions has declined, while emissions from domestic shipping have increased (Figure 76).

Examining NOx emissions from the transport sector indicates that the road sector's share of NOx emissions dropped from 79% in 2000 to 72% in 2022, while contributions from domestic shipping increased from 15% to 22% in the same timeframe (Crippa et al., 2023). This points to the rising significance of domestic shipping as a source of air pollution. However, it is worth noting that data for transport emission modelling remains limited, particularly for domestic vessel activity in inland waterways and domestic shipping.

56. SOx emissions

Sulphur Oxides (SOx) are a group of molecules composed of sulphur and oxygen atoms, with sulphur dioxide (SO2) being the most prevalent and environmentally relevant form. These gases are primarily formed due to burning sulphur, a component found in various fossil fuels such as coal, oil, and natural gas. The Asia–Pacific region is responsible for 66% of global SOx transport emissions, an increase from 53% in 2000 (Ferrario et al., 2022). The transport sector's initiatives to reduce air pollutant emissions in this area as well have lagged other sectors. In the Asia-Pacific, the transport sector accounts for 4% of total SOx emissions, which is the same as in 2000. Between 2000 and 2015, transport-related SOx emissions in the region experienced an annual growth rate of 1.2%. Since the adoption of the SDGs in 2015, this growth rate has increased to 3.2%. Although the transport sector has generally made slow



Figure 76. Fossil transport NOx emissions Source: Own visualization based on data from Ferrario et al. (2022)



Figure 77. Fossil transport SOx emissions Source: Own visualization based on data from Ferrario et al. (2022)

progress, the road transport sector, a major pollution contributor, has shown encouraging trends. Its share of total transport emissions has declined, while emissions from domestic shipping have increased (Figure 77).

The road sector's portion of SOx emissions dropped from 13% in 2000 to 1% in 2022, while domestic shipping's increased from 84% to 97% in the same timeframe (Crippa et al., 2023), reiterating the increased role of domestic shipping in air pollution. However, it is worth noting that data for transport emission modelling remains limited, particularly for domestic vessel activity in inland waterways and domestic shipping.

57. Health impact of transport-related air pollution

In 2021, air pollution led to 8.1 million deaths worldwide (State of Global Air, 2024), making it the second leading risk factor for mortality, particularly among children under five. Nearly 90% of these deaths are linked to noncommunicable diseases, such as heart disease, stroke, diabetes, lung cancer, and chronic obstructive pulmonary disease (COPD), all of which have a root in air quality.

The transport sector plays a major role in outdoor air pollution, releasing diverse pollutants through tailpipe emissions, tire and brake wear, and resuspended dust. Key pollutants include particulate matter (PM), nitrogen oxides (NOx), and volatile organic compounds (VOCs), all of which are associated with serious health threats like respiratory and cardiovascular diseases, cancer, and negative birth outcomes. Research indicates that in 2019, transport-related air pollution was responsible for approximately 800 premature deaths per day around the globe (McDuffie et al., 2021). The consequences are particularly severe in Asia, where lower- and middle-income countries account for 96% of premature deaths in the region and 92% globally from transport-related air pollution. In fact, PM2.5 and ground-level ozone from road transport contribute to 79% of the health burden in Asia.

Asia faces a disproportionate share of the global health effects from transport-related air pollution, responsible for an alarming 75% of premature deaths linked to this issue. This serious health impact results in a considerable economic burden, with the average health cost estimated at around 7% of the region's GDP (World Bank, 2022c). The magnitudes in terms of the health damages (estimated costs) are depicted in Figure 78.



Figure 78. Health damages from PM 2.5 exposure, 2019 Source: Own visualization based on data from World Bank (2022c)

58. Vehicle emission standards and fuel quality

Overall, the advancement of fuel quality and vehicle emission standards worldwide has stalled since the adoption of the SDGs. Nevertheless, Asia is steadily working towards implementing fuel and vehicle standards that either meet or surpass Euro 4/IV+ and a Sulphur limit of 50 parts per million (ppm). This transition aims to significantly reduce vehicle emissions while fostering a fair environment for high-quality fuels and vehicles. To demonstrate this advancement, in 2010, merely 9% of Asia's vehicle fleet complied with Euro 4/IV+ or above emission standards and the corresponding fuel quality. This percentage rose significantly to 36% by 2015 and approached 89% by 2023, highlighting a significant transition towards cleaner transportation in the region (Figure 79).



Figure 79: Share of countries with Euro 4 or better LDV emissions standards implemented (in terms of vehicles registered)

Source: Own visualization based on data from UNEP (2024b)

	Current and Planned Sulphur Levels in Fuel (max, ppm)		Vahiela Enviroien Standards and Enforcement	
Country	(nationwide unless	otherwise stated)	venicle Emission Standards and Enforcement	
	Diesel (ppm)	Petrol (ppm)	Emission Standards (Current)	
Afghanistan	500	50	Less than Euro 4 – to be confirmed for specific standard	
Australia	10	150	Euro 5/V	
Decision I and	500	500	Euro 1 (LDV)	
Bangladesn		500	new petrol and CNG LDVs is Euro 2	
Rhutan	500	No info	Euro 6 from 2022	
Dhuran	500	148 1018	Move back to Euro 4 for vehicles in 2024 October	
Brunei Darussalam	50	50	Euro 4/IV	
			Euro 4 in 1 Jan 2022	
		50	Euro III still as of 2024	
Cambodia	50		Euro 5/V by 2027	
			Euro 6 target year– 2030 proposed	
			Euro 6 roadmap finalised not yet adopted	
e's Republic of China	10	10	China 6/VI, 2020	
Taipei, China	10	10	Euro 6/VI, 2019	
Cook Islands	No info	No info	No info	
			Euro 4 for LDVs (petrol)	
Fiji 10 10		10	Euro IV for HDVs (diesel)	
			-2019	
India	10	10	Bharat Stage VI	
la den esta	500 (from 2021)	500	Euro 4 in 2018	
indonesia	500 (trom 2021)	500	Euro IV postponed to April 2022	

Table 10. Current Sulphur levels in fuels and vehicle emission standards and enforcement

Current and Planned Sulphur Levels in Fuel (max, ppm)		ur Levels in Fuel (max, pp	Valida Enviroing Chundhada and Enforcement		
Country	(nationwide unles	s otherwise stated)	venicle Emission Standards and Enforcement		
	Diesel (ppm)	Petrol (ppm)	Emission Standards (Current)		
Japan	10	10	Equivalent to Euro 5/6 and V/VI standards for light-duty and heavy-duty vehicles		
Kiribati	No info	No info	No info		
na Danula's Danaamatia Danulalia	50	50	Euro 4 (in practice it is Euro 3)		
do People's Democratic Republic	50	50	Euro 5 on the horizon due to imports from Thailand		
Malaysia	10	10	Less than Euro 4 equivalent		
Maldives	No limit	No limit	Plans underway to adopt vehicle emission standards and equivalent fuel quality		
Marshall Islands	50	150	No info		
Nicronesia (Federated States of)	No info	No info	No info		
			Euro 5 70% by 2025		
Mongolia	5,000	500	Euro 5 100% by 2030		
			Has a target to increase hybrid vehicles share in their NDC.		
Myanmar	50	50	Euro 4/IV proposed in 2021 delayed		
Nauru	500	500	None. Available gasoline and diesel in the market have 50ppm and 500ppm sulphur leve		
Nepal	50	50	Euro 3/III		
			Euro 5/V (2024)		
			Euro 4/IV for vehicles registered on or before 3 Jan 2008		
New Zealand	10 10		Euro 6 for new from 2031		
			Euro 6 for used from 2028		
			Euro VI step C from November 2025		
Niue	No info	No info	No info		
Pakistan			New HDVs 100% EV by 2040		
Palau	No info	No info	No info		
Papua New Guinea	No info	No info	No info		
	50	50	Euro 4/IV		
Philippines	50	50	Plans to adopt Euro 5/V in 2027		
Republic of Korea	10	10	Euro 6/VI		
Samoa	No info	No info			
Singapore	10	10	Euro 6/VI		
Solomon Islands	No info	No info	No info		
			Euro 4		
Sri Lanka	51-500ppm	51-500ppm	100% of LDVs to EVs by 2040		
			Euro 6/VI plan exists		
Thailand	10	10	Euro 4		
Timor-Leste	No info	No info	No info		
Tonga	No info	No info	None (2023, NREL)		
ΤυναΙυ	No info	No info	None		
Vanuatu	No info	No info	Euro $5/V$ (2023) for new and used		
			Euro 5 from 2022 for LDVs		
Viet Nam	10	10	Euro IV for HDVs and diesel vehicles		
			Plans to adopt Euro VI standards for all vehicle classes by 2024.		

59. Transport infrastructure in biodiversity areas

Key Biodiversity Areas (KBAs) are ecologically significant regions. Asia is home to many of the world's recognised biodiversity hotspots, areas noted for their remarkable concentrations of endemic species experiencing severe habitat degradation. However, constructing roads, railways, and similar linear infrastructures causes habitat fragmentation, raises wildlife fatalities from collisions, and disrupts animal movements and migrations. These barriers can be physical (restricting species access) or functional (creating dangerous and unfamiliar conditions), making it challenging to maintain robust wildlife populations. The ripple effects extend beyond the immediate area affected by infrastructure, further restricting animal movement through a broader "effect zone." Worldwide, there are over 14 terrestrial KBAs, with about one-third located in the Asia–Pacific region. Data indicates that road infrastructure exists in 68% of Asia's KBAs, while railways, ports, and airports occupy 13%, 1%, and 5% of these regions, respectively (Figure 80). In comparison with other global areas, transportation infrastructure is least common in Asian KBAS. With planned expansions of transport networks to fill the infrastructure gap and anticipated increases in traffic, the cumulative environmental effects could surpass the ecosystems' carrying capacities.



Figure 80: Share of key biodiversity areas containing road infrastructure Source: Own visualization based on data from Simkins et al. (2023)



60. Highlights and Snippets: Policies and Targets

a. Road safety policies and targets

An analysis of 600 policy documents across 36 countries shows that the adoption of road safety targets is still limited. Only 28% countries have specific targets that go beyond the ambitions outlined in the SDGs, while 39% have dedicated road safety strategies. The primary focus of policy is on building capacities and institutional improvements, which highlights the need for developing skilled professionals and strong organizational frameworks essential for effective road safety. Infrastructure also receives a good amount of attention, underlining the necessity for safe road design and maintenance. In contrast, operational measures, vehicles, and services attract comparatively limited policy focus, indicating potential areas for enhancement. Data and information, along with plans and targets, receive a moderate level of attention, pointing to possible gaps in data-driven approaches and thorough planning. Importantly, funding and financing is identified as the least addressed aspect, suggesting a shortfall in securing resources necessary for implementing road safety initiatives (Figure 81).

0 20 40 60 80 100 120 **Building Capacities** Institutional Setup Infrastructure Operational Vehicles Services Data and Information Plans and Targets Funding and Financing

Figure 81: Number of policy measures by typology, within road safety strategies

Table 11. Example Policy Measures – Road Safety

Country	Policy measure	Policy document	Country	Policy measure	Policy document
Afghanistan	Conducting basic training for drivers and assistant drivers	Strategic plan of the ministry of Transportation (2019 - 2023)	Kiribati	Work closely with MOE and other stakeholders on road safety	Ministry Strategic Plan (MICTTD) 2021-2024
Armenia	Reducing the number of road accidents conditioned by road malfunction by up to 20%	The 2021-2026 action plan of the government of the Republic of Armenia (annex no 1)	Lao People's Democratic Republic	Develop a road safety action plan until 2030, based on the policies and necessary investments to achieve the 2030 goals	2021-2030 National Road Safety Strategy and 2021-2025 Action Plan
Bangladesh	Target 2025: Road safety accident death rate by country (WHO 2018) (Per 100,000) = 13	Eighth Five Year Plan, 2020		By 2035, the road safety vision of Lao PDR is to	
Bhutan	Annual road fatality reduced per 10,000 vehicles = 8 (12 - 2017)	12th Five Year Plan 2018-23		reduce the rate of deaths and serious injuries to 70% in 2035	
Brunei Darussalam	Hot Spot Identification and Mitigation Programs	The Brunei Darussalam Road Safety Strategic Plan 2025	Malaysia	Increasing user awareness in selecting a safer vehicle	Malaysia Road Safety Plan 2022- 2030, 2022
Cambodia	Continuing to promote the private sector to deliver road traffic law training to the company's workers.	National Strategic Development Plan 2019-2023	Maldives	Conduct Road safety awareness	National road safety action plan
Fiji	First aid training to communities and Police/LTA patrols;	Fiji Maritime and Land Transport Policy, 2015	Marshall	Adoption of best transport safety practices (e.g.	Marshall Islands urban resilience
Indonesia	Implementing action plans for the five pillars of traffic safety and road transport;	National Medium Term Development Plan 2020-2024	Islands	emphasizing safety aspects among drivers, improving driving skills);	project, 2022

Country	Policy measure	Policy document	Country	Policy measure	Policy document
Mongolia	creation of a system for road traffic safety audits in the planning, design, construction, use, and post-use	National Program on Road Safety, 2019	Sri Lanka	prioritizing steps to improve road safety and achieve the vision zero goal by 2030	Sustainable Sri Lanka 2030 Vision and Strategic Path
Nepal	stages of highways and road facilities; Encourage local training establishments to run training modules to enhance the capacity of road safety-	Nepal Road Safety Action Plan (2021-2030)	Thailand	Disseminate public knowledge about buying a motorcycle that meets safety standards and the safe use of motorcycles	Thailand Road Safety Master Plan 2022-2027
Pakistan	relevant institutions By 2030, all new national and provincial highway construction or improvements achieve technical standards for all road users that take into account	National Road Safety Strategy 2018- 2030, 2018	Thailand	All new 4-wheel vehicles or buses from domestic and foreign manufacturers Advanced Driver- Assistance Systems (ADAS) are also available, including Electronic Stability Control (ESC).	Thailand Road Safety Master Plan 2022-2027, 2022
	road safety, or, alternatively meet a 3-star rating or better By 2030 all new or rehabilitated (improvement) road designs should always have a higher safety rating than the existing road and have		Timor-Leste	Plan and implement initial road safety plan and awareness campaign Establish road safety policies, standards, procedures and guidelines for roads	Transport Sector Master Plan, 2018
Pakistan	at least a 3-star rating standard for all road users Save at least 6,000 lives than would otherwise have been lost by 2030. Halve the fatalities on CAREC	National Road Safety Strategy 2018- 2030	Tonga	provide training for motor vehicle drivers and such other responsibilities as may be provided for under this Act.	Traffic Act 2020
Papua New Guinea	corridors by 2030 National road safety strategy and action plan	Road Traffic Authority Corporate Plan 2017-2019	Turkmenistan	development of scientific research in the field of safety increase, ecological purity and overall performance of transport system	Law of Turkmenistan of June 9, 2018 "About fundamentals of transport policy of Turkmenistan"
Philippines	Repair and rehabilitate high-risk (blackspots) and potential hazardous national and local roads	Philippine Road Safety Action Plan 2023-2028	Uzbekistan	A significant reduction in the accident rate, risks and security threats for all modes of transport	Draft Strategy for the Development of the Transport System of the
Singapore	We are also testing if LED Traffic Light Strips can nudge people to become more aware of and comply better with traffic light signals.	Land Transport Master Plan 2040	Viet Nam	dealing with black spots	Republic of Uzbekistan until 2035 Road network planning for 2021- 2030, vision to 2050

b. Air pollution policies and targets

In the last two decades, vehicle emission standards have tightened noticeably, and fuel quality has improved. These advancements have led to a notable decrease in emissions from newly manufactured vehicles, enhancing air quality, especially in urban areas, and diminishing related health risks. For instance, in 2010, just 9% of the Asian automotive fleet was in countries meeting Euro 4 or higher emission standards with corresponding fuel quality. By 2023, this number soared to nearly 89%, indicating a significant transition to cleaner vehicles. Nonetheless, it's important to acknowledge a recent halt in

the progression of emission standards. The drop in air pollutant emissions does not happen instantly; it takes time for these standards to counter the rapid increase in vehicle activity, and their full effect is observed only as the existing vehicle fleet shifts to compliant models. This transition takes time, leading to a delayed response in emission reductions, as illustrated in Figure 82.



Figure 82: Road PM2.5 emissions and vehicle registrations Source: Own visualization based on data from Ferrario et al. (2022) and Country Official Statistics (n.d.)

Additionally, thorough legislation must address all transport modes to make real progress in reducing air pollution. In the Asia–Pacific region, progress in enforcing strict emission standards for heavy-duty vehicles and two-wheelers has been relatively slow. This underscores the necessity for a broader approach to tackling air quality challenges across various transport modes. An analysis of 600 policy documents across 36 countries shows that 39% had explicit air pollution policy targets, and 30% of the documents had policy measures directly addressing air pollution.

Table 12. Example Policy Measures – Transport and Air Pollution

Country	Policy measure	Policy document
Afghanistan	Establishing standard technical inspection centers	Strategic plan of the ministry of
	for road vehicles and checking technical vehicles at	Transportation (2019 - 2023)
	city gates	
Armenia	Development of legislative background on fuel	Second National Energy Efficiency
	efficiency and emission norms	Action Plan for Armenia, 2015
Azerbaijan	preparation and application of vehicle utilization	Fourth National Communication,
	program to ensure the removal of obsolete,	2021
	technically safe, and environmentally unfavorable	
	vehicles in order to improve road safety in the	
	Republic of Azerbaijan,	

Country	Policy measure	Policy document	Country	Policy measure	Policy document
Bangladesh	Vehicle maintenance and eco-driving	Roadmap and Action Plan for Implementing Bangladesh NDC, 2018	Papua New Guinea	Establish low carbon fuel standards;	Second Biennial Update Report, 2022
Bangladesh	withdrawal of 86,000 unfit vehicles from the roads	First Nationally Determined Contributions (Interim Updated), 2020	Philippines	Conduct annual and random inspection of Motor Vehicle Inspection System (MVIS) facilities and	Philippine Road Safety Action Plan 2023-2028
Bhutan	Low emission freight transport system for heavy and commercial trucks and freight trains	Second Nationally Determined Contribution - BTN, 2021	Solomon	Private Motor Vehicle Inspection Centers (PMVICS) Build modern vehicle inspection facility with	Ministry of Infrastructure
Brunei Darussalam	Establish Stringent Vehicle-Safety Test Standards for VIS	The Brunei Darussalam Road Safety Strategic Plan 2025	Islands	appropriate technology and software (identification device) for inspection and servicing	Development Corporate Plan, 2016
Cambodia	Sulfur level to meet Euro V level	Clean Air Plan of Cambodia, 2022	Sri Lanka	of vehicles Improve vehicle emission testing programme, and	First Nationally Determined
Fiji	Imported cars to meet Euro V in 2027 All vehicle replacement programmes would institute an enhanced sub-industry for the scrappage of old	NDC Implementation Plan 2030		spot testing for all vehicles, Introduce a heavy smoke vehicles spotter programme Introduce a road side vehicle emission testing programme	Contributions, 2016
Indonesia	vehicles and recycling of materials Reduce fuel consumption and emissions from in-use	Mitigation Action Outline on Truck	Tajikistan	creation of capacities for collecting and processing old items car recycling	Updated Nationally Determined Contribution, 2021
indonesid	fleet	Fleet Modernization Scheme in Indonesia, 2021	Thailand	Exploring and determining directions for domestic disposal of used vehicles and parts in line with the	The Thirteenth National Economic and Social Development Plan
Lao People's Democratic Republic	Determine and prepare tender documents to introduce the inspection and management of the new vehicle safety system.	2021-2030 National Road Safety Strategy and 2021-2025 Action Plan		global automobile trends, as well as promoting reuse in accordance with circular economy principles.	(2023-2027)
Malaysia	Update regulations requiring new vehicles meet Euro 5 requirements for all petrol engine vehicles in 2026.	Low Carbon Mobility Blueprint 2021- 2030	Timor-Leste	establishing regimen for inspection, licensing, monitoring operation and enforcement of	Transport Sector Master Plan, 2018
Maldives	introduce emission standards and labelling for road transport	National Communication (NC). NC 2., 2016		regulations covering vehicles, vessels and aircraft, and education, testing, licensing, and enforcement of their operations	
Marshall Islands	Vehicle inspections and maintenance	RMI First NDC, 2016	Tonga	overhaul and maintenance services for all types of vehicles and enforcement of related regulations	Low Emission Development Strategy
Mongolia	Development of comprehensive vehicle technical control, auto service and registration services based	State Policy on Automobile Sector, 2018	Turkmenistan	for both public and government vehicle fleets increasing environmental requirements for	National strategy of Turkmenistan
Myanmar	Emissions testing of new private vehicles take place	Updated Nationally Determined	Tuvalu	transport infrastructure and vehicles Promote the use of cleaner petroleum products.	on climate change 2021 Second National Communication of
	three years after registration, whereas commercial vehicles have to be tested annually	Contributions - MMR, 2021	Uzbekistan	carrying out "clean air" campaigns	Tuvalue, 2015 Third National Communication of the Republic
Nepal	By 2050, Nepal will decrease its dependency on fossils in the transport sector by 50%. (NDC)	Assessment of Electric Mobility Targets for Nepal's 2020 Nationally Determined			of Uzbekistan under the UN Framework Convention On Climate change, 2016
Pakistan	Introduce plan for gradual phasing out of obsolete	National Clean Air Plan, 2022	Viet Nam	Use energy effectively in transport by applying standards regarding fuel consumption and	Decision 896 QD TTg 2022 Approving the National Strategy-
	technology in engines			emission norms	tor Climate Change until 2050



Figure 83: Policy measures on transport air pollution (including measures with indirect benefits)

Summary

Since 2020, the Asian Transport Observatory (ATO) has tracked sustainable transport advancements in Asia and the Pacific, providing vital data to member nations and the public. The transport sector is crucial in achieving the SDGs because of its impact on socio-economic growth, vulnerability to external factors, and rapid expansion. The growth of a nation hinges on its ability to move and mobilise its people and goods with ease across rural and urban landscapes, as well as cities, states, and countries. Without a streamlined transport apparatus that caters to all demographics, progress will be keenly, and negatively, impacted. As we transition to the UN Decade for Sustainable Transport, this report serves as a foundational text for achieving sustainability in the transport sector during that time and beyond, by providing a comprehensive review of sustainable transport performance from the year 2000 onwards, examining trends, driving forces, and challenges.

This study employs a unique approach by analysing 50 indicators spanning six interconnected domains—infrastructure and connectivity, accessibility, mobility, equity and prosperity, energy and carbon emissions, climate resilience and disaster preparedness, and health costs associated with mobility—and focuses on the Asia–Pacific region. This fast-growing, fast-moving region is a key player in sustainable development and is home to more than half of the world's population and economic output. While the challenges faced here reflect those in other developing countries, they also offer collaborative solutions and economic growth opportunities.

This report assesses the performance of sustainable transport practices since 2000, emphasizing changes in that performance, key factors affecting these changes, and barriers hindering further advancement. It reveals that the challenges in Asia and the Pacific are interconnected, suggesting that successful solutions could be applied across different situations, fostering economic and business opportunities. However, prevailing negative transport trends, such as the rise in domestic shipping's contribution to harmful emissions and air pollution, hinder the shift towards sustainable and green solutions.



Key findings:

- Uneven progress and diversity: Transport performance varies significantly among subregions, urban/rural areas, and modes, leading to inconsistent progress.
- Infrastructure gap: The region's surface transport infrastructure doesn't match up to its economic capabilities and demographic contributions.
- Infrastructure investment: Investing in transport infrastructure is essential for economic and social advantages, yet under-investment remains a challenge.
- **Connectivity disparities:** Although overall connectivity has improved, disparities persist, especially impacting Pacific Small Island Developing States.
- Growth in digital connectivity: Digital connectivity has notably expanded in Asia, changing the transport landscape, yet low- and middle-income countries face challenges.
- Gaps in rural and urban access: Large segments of rural and urban populations lack sufficient access to transport and essential services.
- **Urban sprawl issues:** Urban sprawl in Asian cities is reducing access and increasing travel distances, creating challenges for efficient transport systems.
- **Aging population:** Demographic shifts, including aging populations, necessitate transport infrastructure and services adaptations.
- **Public transport obstacles:** Public transport is slowly recovering, with lower ridership and stagnant contributions to GDP and employment.
- **Productivity and gender disparity:** While productivity in the transport sector is rising, it still lags behind other sectors, and a notable gender gap exists in employment and wages.

- **Energy use and emissions:** Energy consumption in the transport sector is increasing, with a gradual shift to renewable energy and rising CO2 emissions, mainly from road transport.
- **Climate vulnerability:** The region is highly susceptible to climate disasters, which can lead to significant economic losses and insufficient adaptation investment.
- **Health consequences:** Road accidents and transport-related air pollution present severe health threats, resulting in fatalities, medical burdens, and economic costs.
- **Data deficiencies:** Ongoing issues with data collection restrict comprehensive evaluations, with significant gaps in geographic coverage, timeliness, and disaggregation.
- **Country-specific differences:** Regional averages can obscure substantial national variations. Based on the methodological framework identified in this study, country narratives may be developed.
- Global relevance: Trends in Asia and the Pacific are important for other developing regions and, in some cases, developed countries. Despite slow regional progress, some countries show notable advancements, particularly highincome economies with established sustainable transport systems (Figure 84).



Figure 84: Asia-Pacific's share in global total

Assessment criteria^a:

Green: Indicates significant progress when compared to other sectors or regions, or across time.

Amber: Indicates limited progress when compared to other sectors or regions, or across time, but evidence of positive momentum is present. Countries need to accelerate efforts on these goals.

Red: Indicates minimal progress—or even regression—when compared other sectors or regions, or across time. Urgent and transformational change is required in direction and/or speed of transition.

^a Buchner, B., Naran, B., Padmanabhi, R., Stout, S., Strinati, C., Wignarajah, D., Miao, G., Connolly, J., & Marini, N. (2023). Global Landscape of Climate Finance 2023. CPI. https://www.climatepolicyinitiative.org/publication/globallandscape-of-climate-finance-2023/



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Annex

Country Code	Name	Country Code	Name
AFG	Afghanistan	MMR	Myanmar
ARM	Armenia	NIU	Niue
AUS	Australia	NRU	Nauru
AZE	Azerbaijan	NPL	Nepal
BGD	Bangladesh	NZL	New Zealand
BTN	Bhutan	PAK	Pakistan
BRN	Brunei Darussalam	PLW	Palau
KHM	Cambodia	PNG	Papua New Guinea
CHN	People's Republic of China	PHL	Philippines
СОК	Cook Islands	KOR	Republic of Korea
FJI	Fiii	WSM	Samoa
GEO	Georgia	SGP	Singapore
IND	India	SLB	Solomon Islands
IDN	Indonesia	LKA	Sri Lanka
IPN	lapan	TJK	Tajikistan
κ Δ7	Kazakhstan	THA	Thailand
	Kuzukisian Kiribati	TLS	Timor-Leste
KIR KOZ		TON	Tonga
KGZ		TKM	Turkmenistan
LAO	Lao People's Democratic Republic	TUV	Tuvalu
MYS	Malaysia	UZB	Uzbekistan
MDV	Maldives	VUT	Vanuatu
MHL	Marshall Islands	VNM	Viet Nam
FSM	Micronesia (Federated States of)	IRN	Iran (Islamic Republic of)
MNG	Mongolia	RUS	Russian Federation