2021 Report on the Status of Transport Related SDG Targets in Asia and the Pacific

An Asian Transport Outlook Report

March 2022

ADB TRANSPORT

ADB

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Abbreviations

ADB	Asian Development Bank
ATO	Asian Transport Outlook
BC	Black carbon
CO2	Carbon dioxide
COP	Conference of Parties
COVID-19	Coronavirus disease 2019
EV	Electric vehicle
GDP	Gross domestic product
GHG	Greenhouse gas
ICT	Information and communication technology
ILO	International Labour Organization
NOx	Nitrogen oxides
OECD	Organisation for Economic Co-operation and Development
PM	Particulate matter
PPP	Public-private partnership
SDG	Sustainable Development Goals
Sox	Sulphur oxides

Introduction

1. The transport sector does not have its own Sustainable Development Goal (SDG), but the sector is nonetheless considered an enabler of development and is integrated in various forms across multiple SDGs. It is true that only targets 3.6, 9.1, and 11.2 directly address the transport sector, the transformation of transport infrastructure and services. However, at least 8 of the 17 SDGs include one or more targets that address the transport sector (ITDP 2015; UNstats 2019). Collectively, the transport relevant SDGs and targets indicate how access to economic and social opportunities could be enhanced while considering environmental and other transport externality related objectives.

2. Yet since 2015, when the SDGs were adopted, little has been published on the relevance of the transport sector to the SDGs and, more specifically, on progress in implementing transport-related SDG targets. One exception to this is the periodic review by the Partnership on Sustainable, Low Carbon Transport of the Voluntary National Reviews submitted by countries to report on the implementation of the SDGs (SLOCAT 2021). The SLOCAT review confirms that the transport sector is a crucial contributing factor to SDG implementation. Nonetheless, as the Economic and Social Commission for Asia and the Pacific also comments on, less than half of Voluntary National Reviews have included explicit references to transport sustainability impacts (ESCAP 2020a).

3. Indeed, the transport sector is often considered a black box in terms of data. Collected data are often not easily accessible or are often incomplete. Over the last few years, limited progress has been made in increasing the availability of good quality comparable data for SDG monitoring in geographic coverage, timeliness, and the level of disaggregation required. As a result, almost no country in the developing world has transport data that provides a thorough understanding of the transport sector performance vis-à-vis the transport relevant targets included in the SDGs.

4. Most readers here will be aware that the 2030 Agenda on Sustainable Development is an ambitious plan of action for people, planet, prosperity, peace, and partnerships. At the core of the 2020–2030 decade is the need for action to tackle growing poverty, empower women and girls, and address the climate emergency. It integrates three dimensions of sustainable development—economic, social, and environmental—to stimulate action in all countries and across sectors. The 2030 Sustainable Development Agenda consists of the 17 interlinked global SDGs designed to be a "blueprint to achieve a better and more sustainable future for all".

5. A review of the SDGs (ESCAP 2020b) carried out before the coronavirus disease (COVID-19) pandemic indicated that the rate of global progress is not keeping pace with SDG ambitions, necessitating immediate and accelerated action by countries, sectors, and stakeholders at all levels. It is clear that the ongoing COVID-19 pandemic is likely to slow SDG implementation.

6. This first Asia-specific status report brings together the latest data from official data sources (country statistics, United Nations, World Bank, International Energy Agency, etc.) and non-official data sources (nongovernment organizations, etc.) for Asia and the Pacific to review the implementation of transport related SDG targets. Where possible, the report documents transport sector trends compared to global and other areas to describe progress in Asia. For each area covered, examples of policy action by countries in Asia and the Pacific are provided. The report is in the majority of cases based on information from 2020 or before. This means that the impact of COVID-19 is not yet taken into account, unless specifically indicated.

7. The report uses information contained in the Asian Transport Outlook (ATO), a new initiative by the Asian Development Bank (ADB) to build the knowledge base on transport in Asia and the Pacific. The ATO supports the planning and delivery of transport sector assistance by ADB and transport initiatives by Asian governments, in line with the SDGs, Paris Agreement, and other international agreements (ADB 2021a). The ATO is an open data resource consisting of institutionalized transport data and policy information collection, analysis, and documentation. The ATO collects, organizes, and shares data on the transport sector in 51 countries/regions using about 450 indicators. It also documents the institutional frameworks, policies, and financing of transport in these countries. It is envisaged that this report will be repeated regularly and the scope of analysis will expand in line with progress in development of the ATO.

8. The report is divided in seven themes: transport and the economy, infrastructure and transport activity, urban transport, transport and energy, climate change, air pollution, and road safety. Transport-related SDG targets and SDG indicators have been organized under these headings in Table 2. The SDG indicators are combined with several additional ATO indicators to shape the review of the transport-related SDG targets. The scope of analysis, unless otherwise indicated, is the coverage of the ATO, which contains all developing and developed member countries of the ADB in Asia and the Pacific as well as the Islamic Republic of Iran and the Russian Federation.

Table 1: SDG Targets, Indicators, and ATO Indicators Used to Describe the Status of Transport-Related SDGs

Theme SDG Targets	SDG Indicators	ATO Indicators Used to Describe Status of Transport-Related SDGs (ADB ATO 2021b)
Transport and the economy		
• SDG 8.1 Sustain per capita economic growth in accordance with national circumstances and, in particular, at least seven percent gross domestic product growth per annum in the least developed countries • SDG 8.5 By 2030 achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value • SDG 17.17 Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships	• Indicator 8.1.1: Annual growth rate of real GDP per capita • Indicator 8.5.1: Average hourly earnings of employees, by sex, age, occupation and persons with disabilities • Indicator 8.5.2: Unemployment rate, by sex, age and persons with disabilities • Indicator 17.17.1: Amount in United States dollars committed to public-private partnerships for infrastructure	• Gross Value Added by Transport, Storage and Communications • Transport Sector Employment (+ Storage + Communications) • Workers in transport who are female • Gross Value Added per Employee in Transport Sector • Average monthly earnings of employees in Transport and Storage Sector • Transport Sector PPP Investments
Infrastructure and Transport Activity		
• SDG 9.1 Develop quality, reliable, sustainable, and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all • SDG 9.c Significantly increase access to information and communications technology and strive to provide universal and affordable access to the internet in the least developed countries by 2020	• Indicator 9.1.1: Proportion of the rural population who live within two km of an all-season road • Indicator 9.1.2: Passenger and freight volumes, by mode of transport • Indicator 9.c.1: Proportion of population covered by a mobile network, by technology	• Inland Transport Infrastructure (road, rail) • Passenger and freight volumes • Rural Population without Rural Access in 2018 • Population covered by a mobile network, by technology-2G, 3G, 4G • Individuals using the internet

Theme SDG Targets	SDG Indicators	ATO Indicators Used to Describe Status of Transport-Related SDGs (ADB ATO 2021b)
Urban Transport		
• SDG11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons	• Indicator 11.2.1: Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities	• Share of population with convenient access to public transport • Rapid Transit Kilometers (BRT, Metro, LRT) • Urban Transport Mode Share (PKM)
Transport and Energy		
• SDG 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix • SDG 7.3 double the global rate of improvement in energy efficiency by 2030 • SDG 12.c - Rationalise inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimising the possible adverse impacts on their development in a manner that protects the poor and the affected communities	• Indicator 7.2.1: Renewable energy share in the total final energy consumption • Indicator 7.3.1: Energy intensity measured in terms of primary energy and GDP • Indicator 12.c.1: Amount of fossil-fuel subsidies (production and consumption) per unit of GDP	• Transport Energy Consumption • Transport Energy Intensity • Light Duty Vehicle (LDV) Fuel Economy • Transport Fossil Fuel Subsidy, $ Million • Share of countries with LDV Fuel Economy Policies • Share of countries where gasoline pump prices are fully liberalised • Share of countries with Electrification and renewable energy related targets

Theme SDG Targets	SDG Indicators	ATO Indicators Used to Describe Status of Transport-Related SDGs (ADB ATO 2021b)
Climate Change		
• SDG 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries • SDG 1.5 By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters • SDG 13.2 Integrate climate change measures into national policies, strategies and planning	• Indicator 11.5.2: Direct economic loss in relation to global GDP, damage to critical infrastructure and number of disruptions to basic services, attributed to disasters • Indicator 13.2.2: Total greenhouse gas emissions per year • Indicator 13.2.1: Number of countries with nationally determined contributions, long-term strategies, national adaptation plans and adaptation communications, as reported to the secretariat of the United Nations Framework Convention on Climate Change	• Transport CO2 Emissions • Transport CO2 Intensity (with GDP) • ND Gain Index for Infrastructure Vulnerability • Expected annual damage to Transport surface infrastructure • Transport Focus Nationally Determined Contributions • Transport Focus Long Term Emission Reduction Strategies. • Share of countries with direct Transport CO2 emissions targets
Air Pollution		
• SDG 3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination • SDG 11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	• Indicator 3.9.1: Mortality rate attributed to household and ambient air pollution • Indicator 11.6.2: Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)	• Transport PM 10, NOx, SOx , and BC Emissions • Transport air pollution health impact (PM2.5 and Ozone deaths)

Theme SDG Targets	SDG Indicators	ATO Indicators Used to Describe Status of Transport-Related SDGs (ADB ATO 2021b)
Road safety		
• SDG 3.6 By 2020 (2030), halve the number of global deaths and injuries from road traffic accidents	• Indicator 3.6.1: Death rate due to road traffic injuries	• Road Crash Fatalities • Cost of fatalities and Injuries as a share of GDP • Road crash fatalities by road user types • Share of National Infrastructure with 3 Stars and above

ATO = Asian Transport Outlook, BC = black carbon, BRT = bus rapid transit, CO2 = carbon dioxide, GDP = gross domestic product, LDV = light duty vehicle, LRT = light rail transit, NOx = nitrogen oxides, PPP = public private partnership, SDG = Sustainable Development Goal, Sox = sulphur oxides.
Source: Authors

Theme 1: Transport and the Economy

9. The transport sector is a crucial component of the economy and has a very large impact on employment and economic growth. Nearly every facet of society relies on the transport sector, as it provides the physical network and the related services that enable people and freight movement. Yet, transport is an essential industry and economic sector in its own right. Transport and economy related SDG targets include:

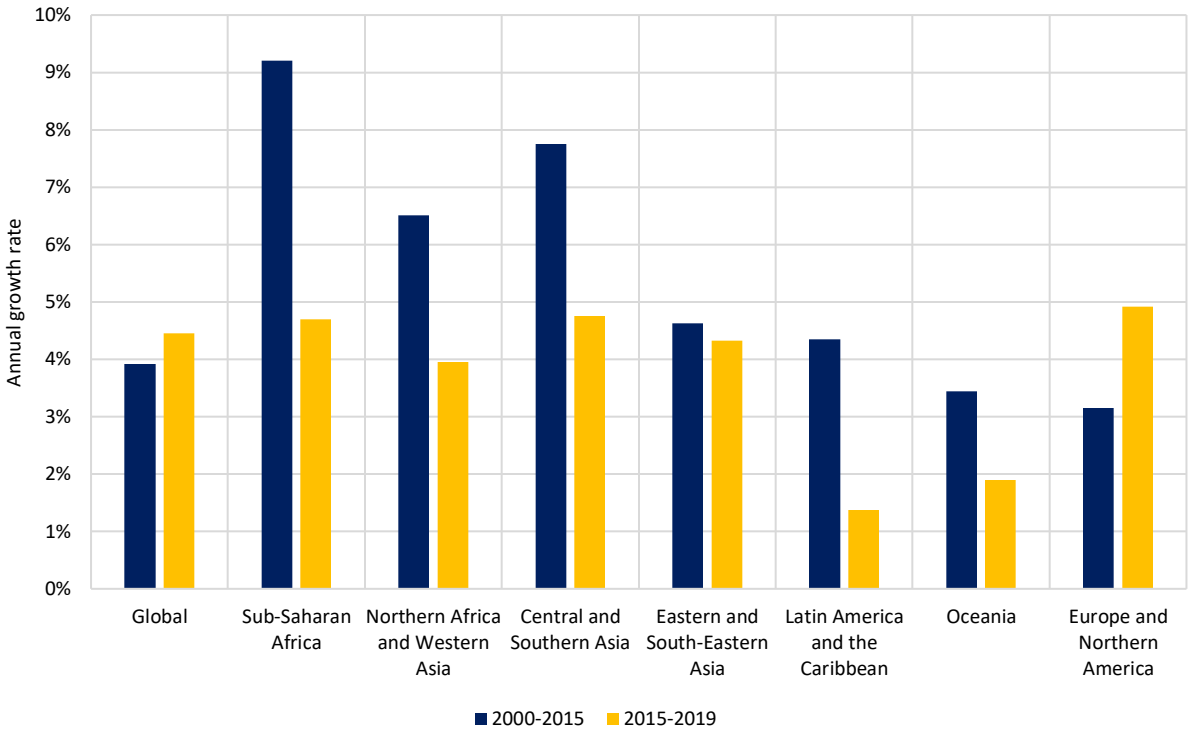
- SDG 8.1 Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7% gross domestic product growth per annum in the least developed countries
- SDG 8.5 By 2030 achieve full and productive employment and decent work for all women and men, including young people and people with disabilities, and equal pay for work of equal value
- SDG 17.17 Encourage and promote effective public, public-private, and civil society partnerships, building on the experience and resourcing strategies of partnerships

Transport and Economy Indicators

1. Gross Value Added by Transport, Storage and Communications

10. In 2019, the transport, storage, and communications sector contributed $2.1 trillion to gross domestic product (GDP) in Asia and the Pacific and about $7.3 trillion globally. Since the start of the implementation of the SDGs, transport gross value-added growth (value of industry production) has increased slightly globally due to high growth in Organisation for Economic Co-operation and Development (OECD) countries. The annual increase in gross value added in the transport sector was most intense in Europe and North America. In the Asia and Pacific economies in the ATO, gross value added by the transport sector either decreased or remained about the same during 2015–2019, compared to 2000-2015.

Figure 1: Annual Growth of Gross Value Added by Transport, Storage, and Communications

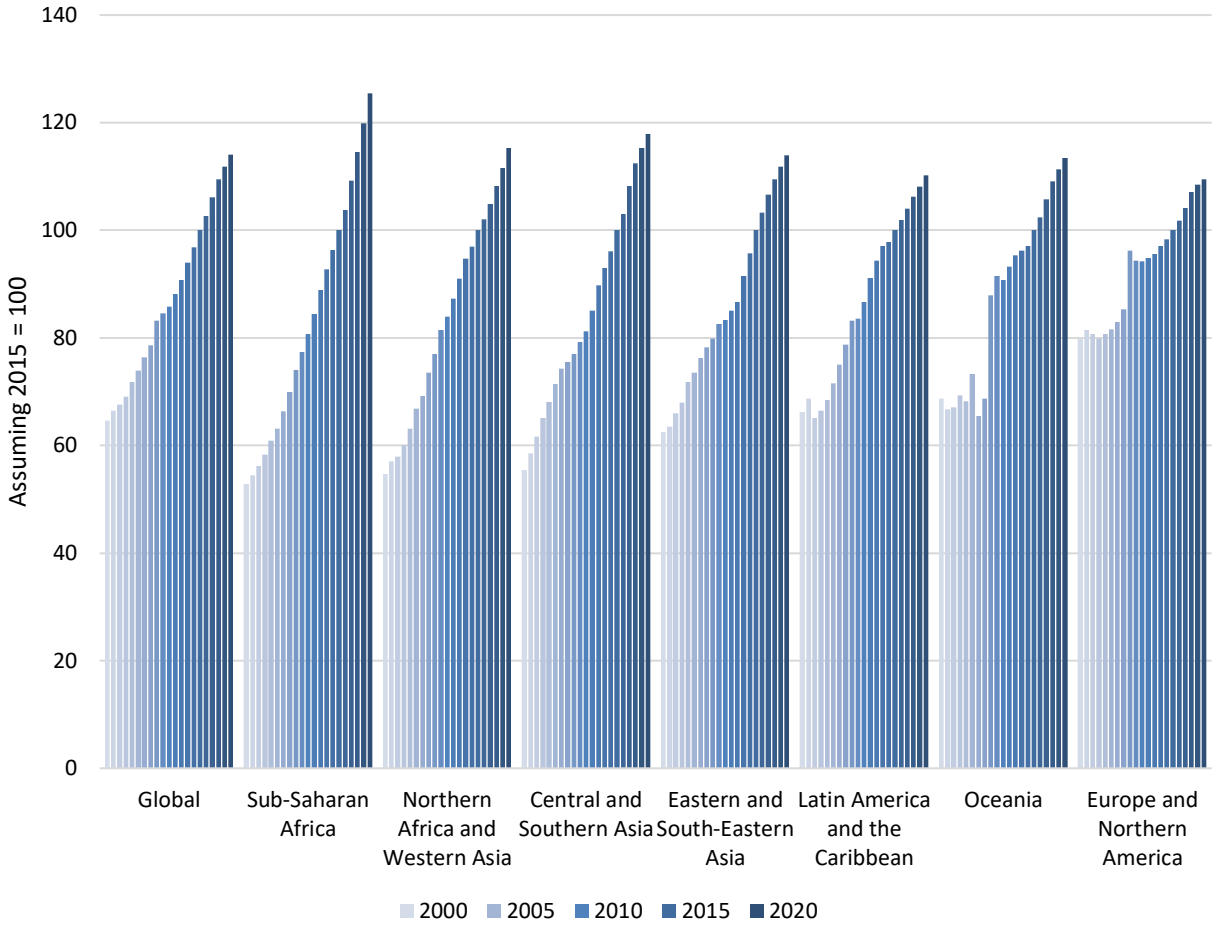


Source: ADB Asian Transport Outlook Database indicators: ATO database. SEC-TIV-001 (UNstats 2021) (accessed December 2021).

2. Transport Sector Employment (+ Storage + Communications)

11. Employment is the primary source of income for the vast majority of households worldwide (ILO 2019). The International Labour Organization (ILO) has estimated that out of the 5.7 billion global working-age population, 3.3 billion people are employed in various sectors. The transportation sector offers a wide variety of employment involving different skill sets. In 2019, in Asia, it was estimated that the transport sector employed more than 165 million people (based on ILO estimates), accounting for more than 8% of total employment in the region. Transport-related employment continues to grow globally and in Asia and the Pacific (Figure 2). These employment numbers do not include informal employment in the transport sector, which is generally believed to be considerable, especially in developing countries that still have sizeable informal transport systems. However, since the start of the implementation of the SDGs, the rate of transport sector employment growth has declined about 2.8% in the region, equal to the global average.

Figure 2: Employment in Transport, Storage, and Communications



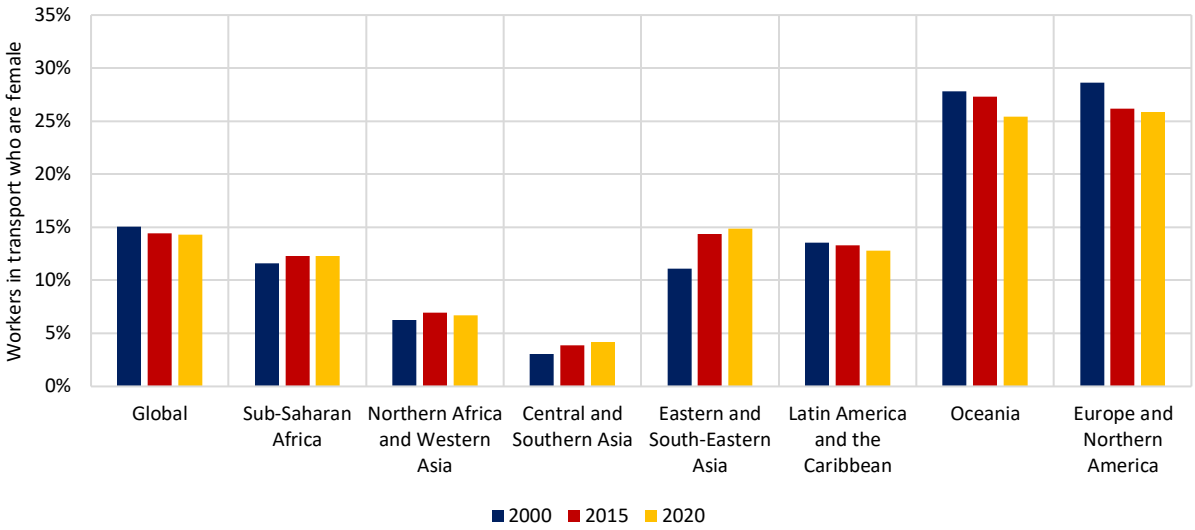
Source: ADB Asian Transport Outlook Database indicators: ATO database. SEC-TRE-002 (ILO 2020a). (accessed December 2021).

3. Female Workers in Transport

12. Data on the share of women employed in the transport sector is generally scarce. However, the limited data available from the ILO (ILO 2021a) and the World Bank (SUM4ALL 2021) show that female participation in the transport industry is low in Asia and the Pacific, i.e., below 15%, except in Oceania.[1] Moreover, since the start of the implementation of the SDGs, the growth of women's employment in the transport sector has declined significantly in Asia—whereas the annual growth rate was 4.1% in the period before 2015, this is now only 2.9%. In comparison, growth of women's employment in the transport sector globally has only declined from 2.7% for 2000–2015 to 2.5% after 2015).

[1] Oceania refers to the Pacific as ADB defines it as well as Australia and, New Zealand.

Figure 3: Female Employment in Transport, Storage, and Communications

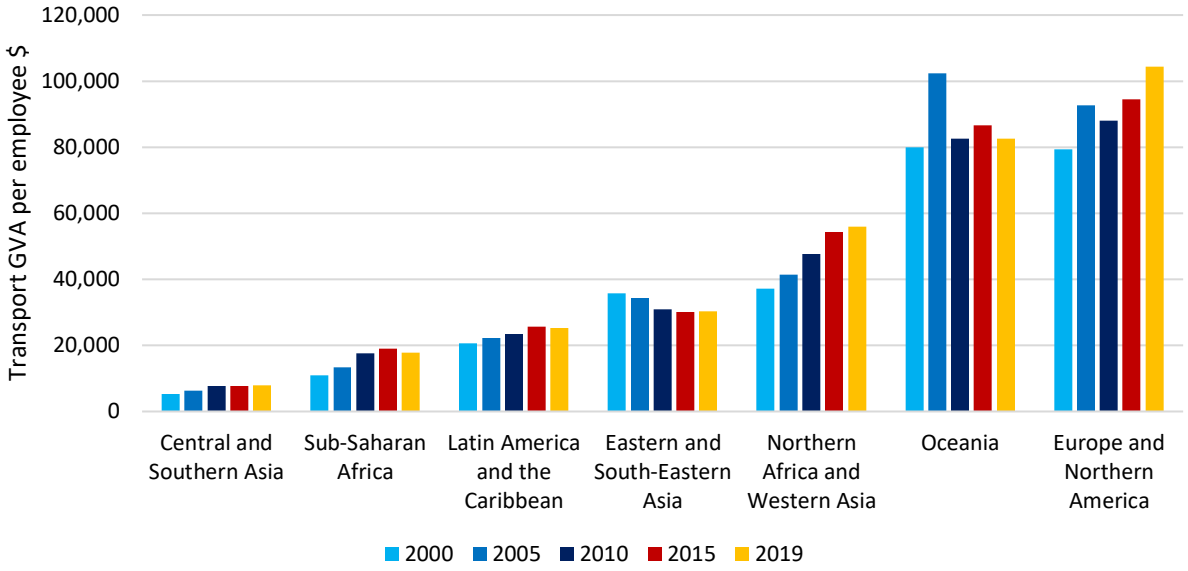


Source: ADB Asian Transport Outlook Database indicators: ATO database. SEC-TRE-014 (ILO 2021a). (accessed December 2021).

4. Gross Value Added per Employee in the Transport Sector

13. The growth of GDP is a combination of employment growth and productivity growth. For productivity growth, the gross value added by the transport sector per employee is considered a proxy. In 2019, the average gross value added per employee in Asia's transport, storage, and communications sector was about $18,000, i.e., roughly half the global average. Since the start on the implementation of the SDGs, transport sector "productivity" has declined slightly in Asia and the Pacific, with an annual growth rate of 1.3%, from 1.4% during 2000–2015. In comparison, global transport sector "productivity" increased from 0.9% in 2000–2015 to 1.6% after 2015.

Figure 4: Gross Value Added per Employee in Transport, Storage, and Communications



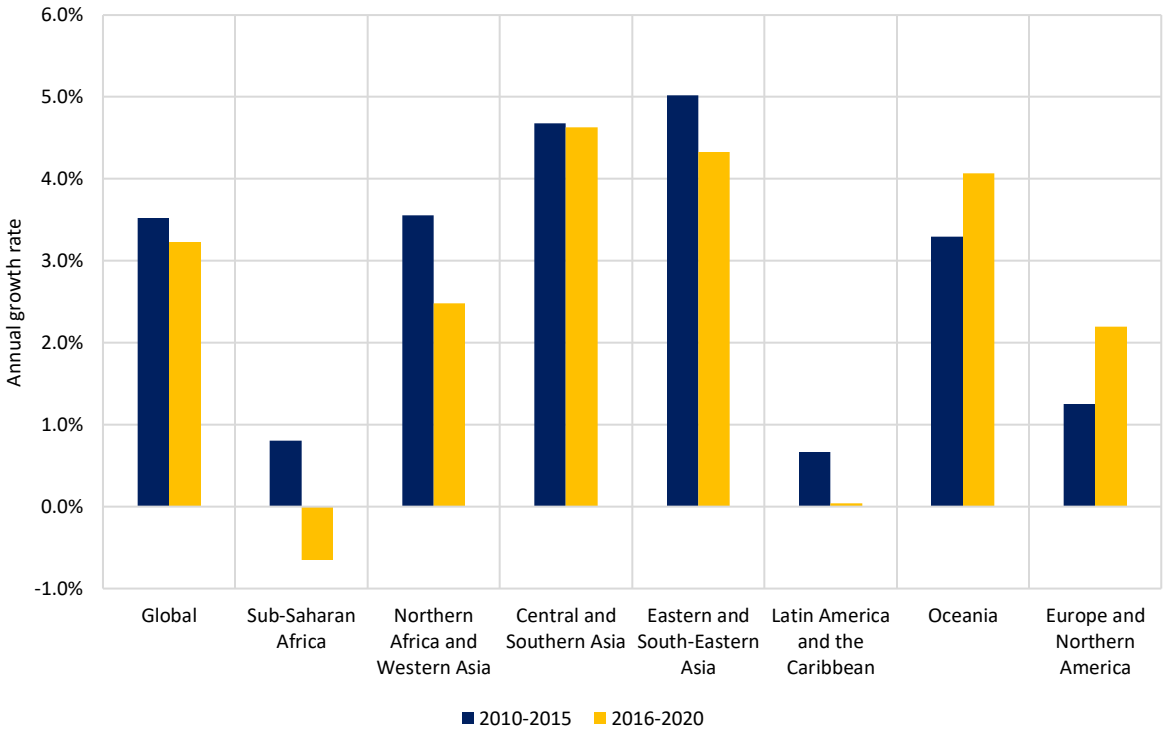
GVA = gross value added.

Source: ADB Asian Transport Outlook Database indicators: ATO database. SEC-TIV-002, SEC-TRE-002 (UNstats 2021a). (accessed December 2021).

5. Monthly Wages in the Transport Sector

14. Since the start of the implementation of the SDGs in 2015, the average wage in the transport and storage industry (ILO 2021b) in Asia was about $1,300, (2017 purchasing power parity), while globally, it was $1,700. In Asia, on average, the monthly wage rate in the transport and storage sector was about $70 (2017 purchasing power parity) lower than the national average. Moreover, since 2015, average monthly salary growth has decreased globally, across Central and Southern Asia and East and Southeast Asia. In contrast, it has increased in Oceania and Europe and North America. The highest transport and storage sector monthly wages in Asia and the Pacific are in Australia, Brunei Darussalam, Japan, the Republic of Korea, and Singapore.

Figure 5: Average Monthly Wages in Transport, Storage, and Communications



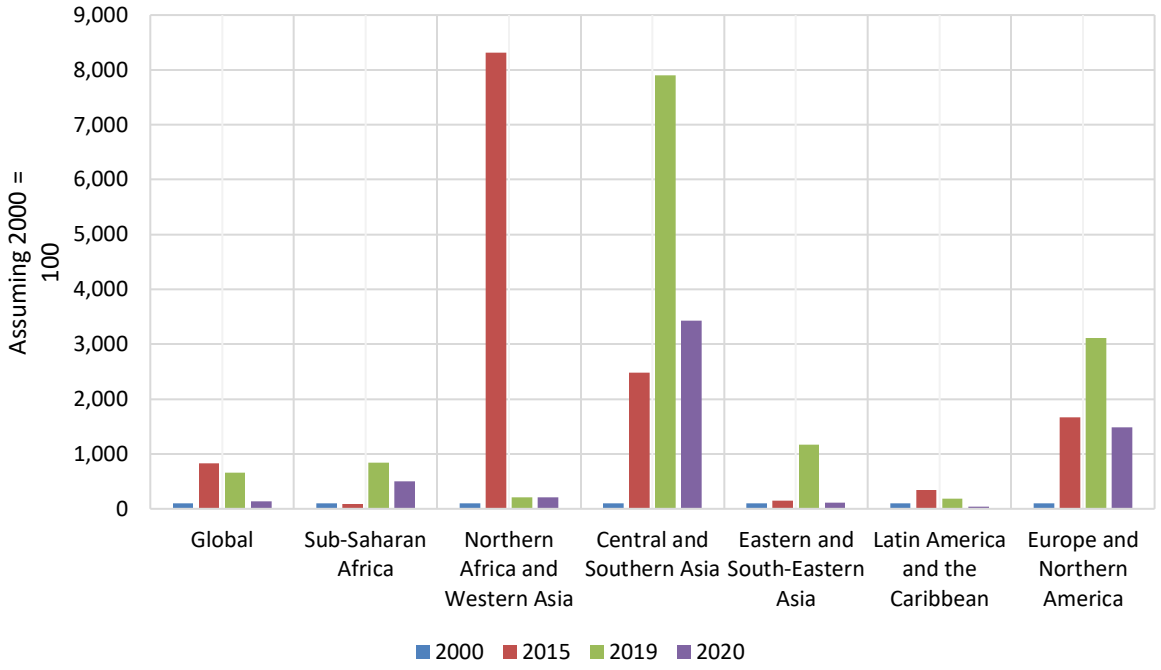
Source: ADB Asian Transport Outlook Database indicators: ATO database. SEC-SEG-001, SEC-TRE-014, SEC-SEG-017 (ILO 2021a). (accessed December 2021).

15. In Asia, while female participation in the transport industry is low, there is almost no wage disparity. In 47% of Asian economies, women are paid marginally more than men in the transport and storage industry. Globally, the ILO estimates that women continue to be paid about 20% less than men across the world (ILO 2020b) and sectors.

6. Transport Sector Public-Private Partnerships Investments

16. Public-private partnerships (PPPs) are a vital instrument for private participation in transport infrastructure investment, delivery, and management. In 2019, close to 73% of global PPPs in the transport sector were in Asia. Since the implementation of the SDGs began, PPP transport investments globally decreased from an annual growth rate of 15% over 2000–2015 to a yearly contraction of -5.5% (2015–2019). However, investment in transport projects with private participation increased 57% annually in the Asian countries in the same period. That participation in transport projects decreased in Asia by 84% and globally by 78% in 2020 from 2019 levels was due to COVID-19.

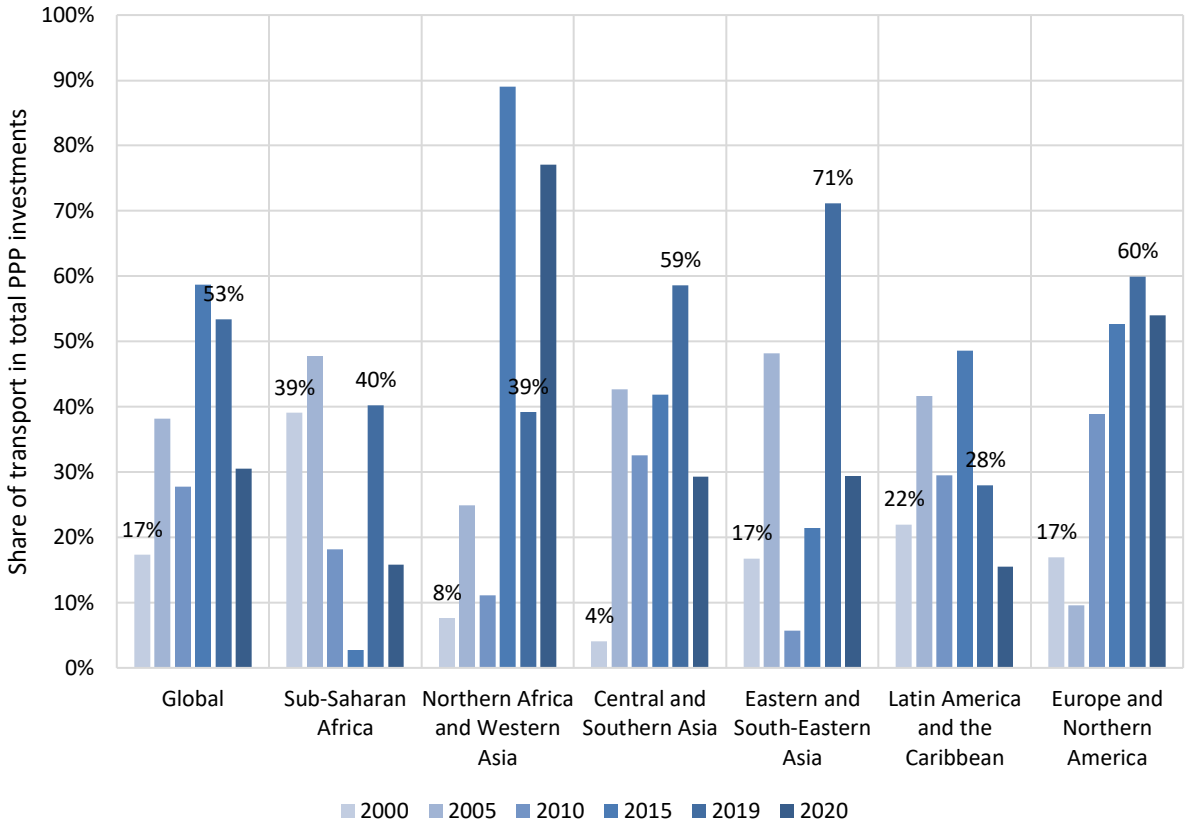
Figure 6: Transport Sector Public-Private Partnerships Investments



Source: ADB Asian Transport Outlook Database indicators: ATO database. SEC-TIV-014 (World Bank 2020). (accessed December 2021).

17. Since 2000, the transport sector share in total PPP investments increased until 2015 across all regions globally. However, since the implementation of the SDGs, the global transport sector share in PPP investments has decreased. In most of Asia, however, the transport share of PPPs peaked in 2020, after which COVID-19 sharply reduced it.

Figure 7: Share of Transport Sector in Total Public-Private Partnerships



PPP = public private partnership.
Source: World Bank (2021).

Illustrative Policy Initiatives on Transport and the Economy

18. Since the start of the implementation of the SDGs, many economies in Asia have tried to better link the transport sector with economic growth. For example, Brunei Darussalam has set a target for 2025 to increase transport sector employment (14,600 jobs in transport and the info-communications sector) (MTIC 2020), while India (NITI 2020) has proposed to increase jobs in the logistics sector (22 million to 40 million by 2022–23) and Malaysia (MITI 2020) has set a target of 323,000 jobs in the automotive sector by 2030). The Philippines in its latest National Transport Policy (NEDA 2020) has proposed to enhance private sector participation in transport investments to harness private sector comparative advantage, gain technology transfers and operational efficiencies, and assign the respective roles and responsibilities to the party best able to control, positively influence, manage, or mitigate risk and consequences.

Theme 2: Transport Infrastructure and Activity

19. Infrastructure is a crucial enabler of economic and social development. This is reflected in the dedicated SDG for infrastructure in the 2030 Sustainable Development Agenda. For the transport sector, this includes infrastructure for the movement of people and goods. In addition, digital infrastructure is becoming more critical, as it can, in part, replace physical travel. The International Telecommunication Union (ITU) considers efficient and affordable information and communication technology infrastructure and services essential for countries to participate in the digital economy and increase overall economic well-being and competitiveness (ITU 2021a).

20. The 2030 Sustainable Development Agenda considers passenger and freight volumes moved by the member states and regions to be a good proxy of regional and transborder infrastructure. Growth in passenger and freight volumes is thus considered an "effect" of robust infrastructure development and economic growth in states and regions. Related SDG targets include:

- SDG 9.1 Develop quality, reliable, sustainable, and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all

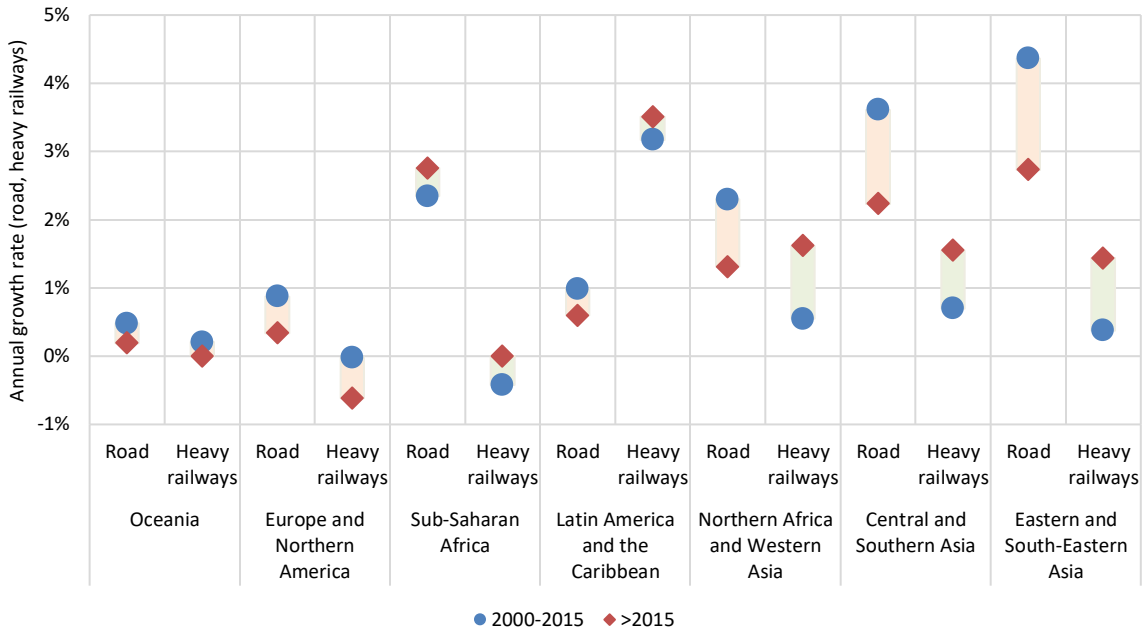
- SDG 9.c Significantly increase access to information and communications technology and strive to provide universal and affordable access to the internet in the least developed countries by 2020

Transport Infrastructure Indicators

1. Inland Transport Infrastructure

21. Transport infrastructure is disproportionately distributed across the regions, with the lowest access in low and lower-middle-income countries and regions. The most significant increase in absolute terms of transport infrastructure can be seen in the expansion of the road network. Overall, roads remain the backbone of transport infrastructure, with most passenger transport and freight transport moved by road, and the role of road transport continues to grow. The growth in infrastructure generally, however, remains well behind the increases in GDP.

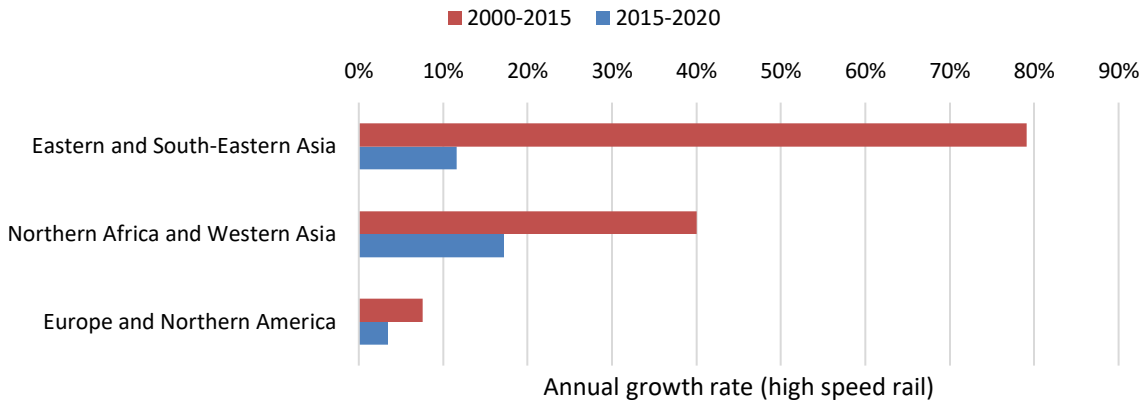
Figure 8 Growth of Transport Infrastructure, Roads and Heavy Railways



Note: The *green bar shows the increase* and the *red bar shows* the *downward trend*.Source: ADB Asian Transport Outlook Database indicators: INF-TTI-005, INF-TTI-016 (UIC 2020). (accessed December 2021).

22. Since the start of the implementation of the SDGs, heavy railways in Asia have grown faster than the historical trend; but overall, since 2010, heavy railways only increased 4.4%. In comparison, high-speed rail grew 285%, albeit from a very low baseline, and in Asia a growing number of countries are getting involved in it.

Figure 9: Growth of Transport Infrastructure, High-Speed Rail

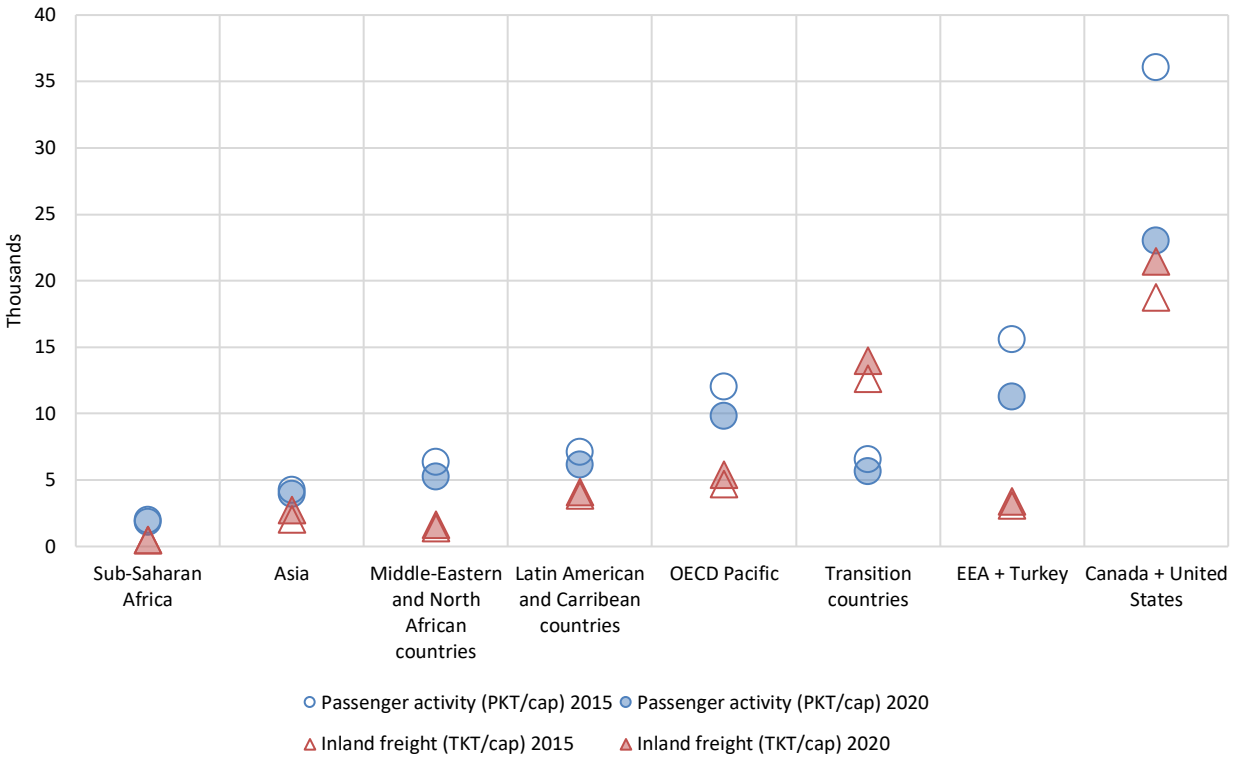


Source: ADB Asian Transport Outlook Database indicators: INF-TTI-019 (UIC 2020). (accessed December 2021).

2. Passenger and freight volumes

23. The demand for passenger and inland-freight transport is closely correlated with growth in population, economic activity, and trade. However, not all populations and geographic regions contribute equally to global transport demand. The International Transport Forum has estimated that low- and middle-income economies have significantly lower mobility levels than high-income economies (ITF 2021). However, as growth in per capita income increases ownership and use of private vehicles and consumption of goods and services to meet social, economic, educational and recreational needs, demand for transport will significantly increase in low- and middle-income economies. The ratio of passenger kilometers (km) travelled per capita in the developed world decreased between 2015 and 2020, but did not in Asia.

Figure 10: Growth of Transport Activity

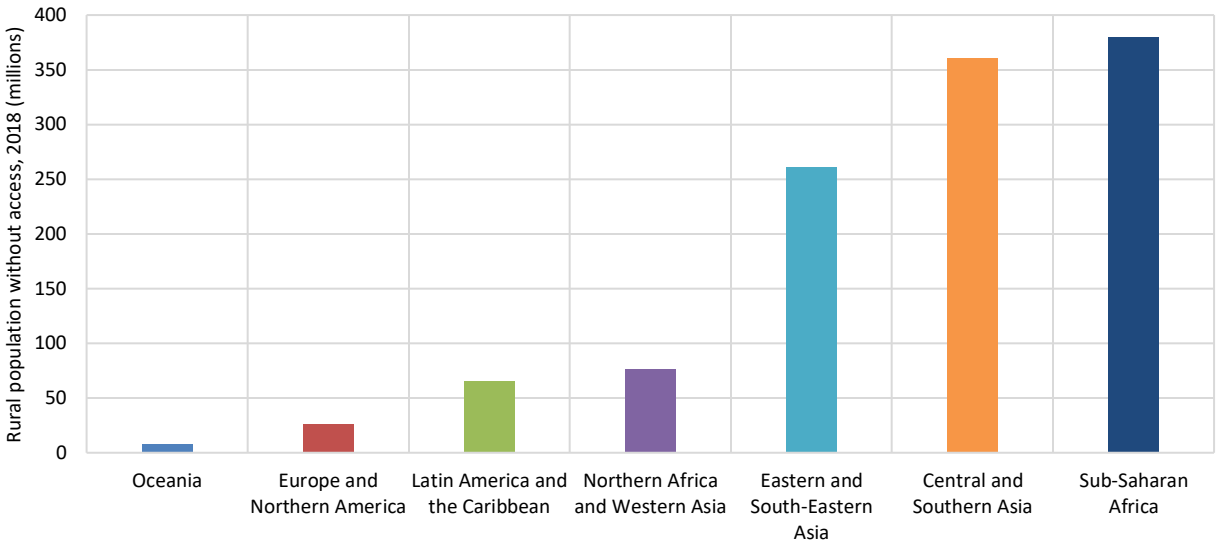


PKT = passenger kilometer travelled, TKT = ton kilometer travelled.
Source: ITF 2021.

3. Rural Population without Access in 2018

24. Accessibility is key to eradicating poverty. Good rural access positively impacts the rural economy and indirectly leads to greater food security and zero hunger (SDG, Goal 2). However, globally, about 1.2 billion rural residents, about 30% of the world's rural population, still do not have all-season access to road networks. In Asia and the Pacific, 25% of the rural population, i.e., 560 million, or half of the global rural population, live more than 2 km from an all-season road.

Figure 11: Rural Population with No Access



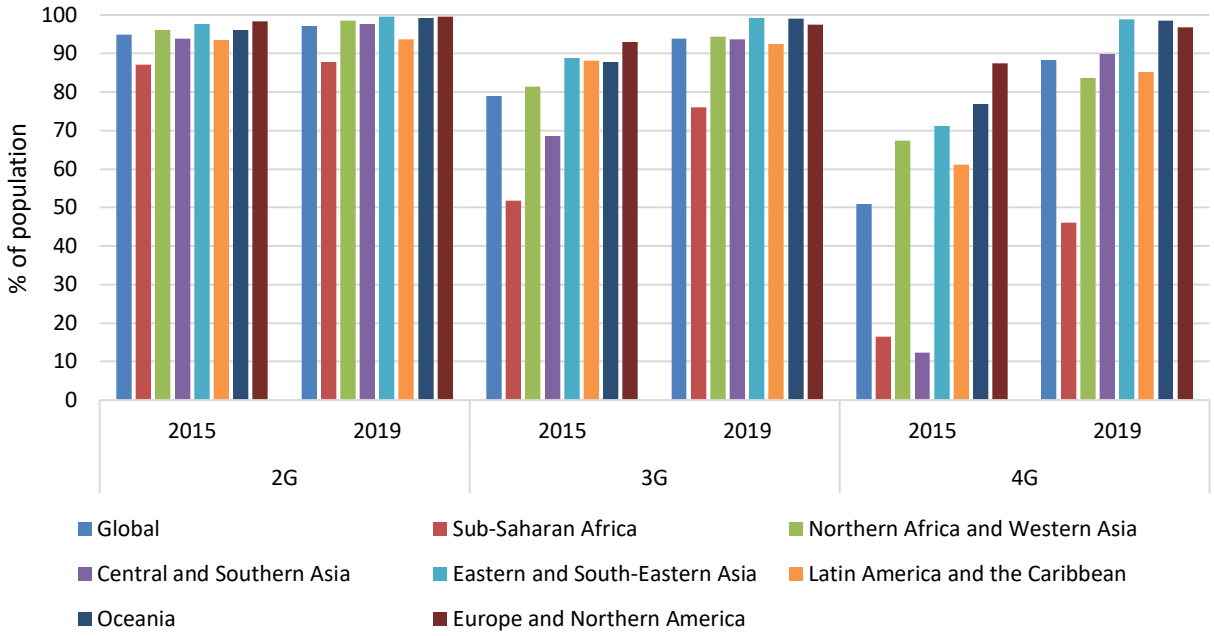
Source: ADB Asian Transport Outlook Database indicators: ACC-RAC-001 (TRL 2019). (accessed December 2021).

4. Population Covered by a Mobile Network, by Technology—2G, 3G, 4G

25. Access to ICT is covered by SDG Goal 9.c, which aims to "significantly increase access to ICT and strive to provide universal and affordable access to the internet in the least developed countries by 2020:. Enhancing affordable digital connectivity using a computer, mobile phone, or personal digital assistant can be positively linked to achieving most of the 17 SDGs (GESI 2021).

26. Since the implementation of the SDGs, the percentage of inhabitants living in range of a mobile-cellular network has increased across all regions, especially for 3G and 4G connectivity. However, despite a global rise in network penetration, access to internet connections remains lower for residents across the developing world, although those people have started to catch up. Conversely, limitations in access, affordability, and speed of internet connections undercut the ability of technology to bridge existing digital inequality. Overcoming the digital divide will thus be key to ensuring that ICT can replace physical travel to its maximum extent.

Figure 12: Population Covered by a Mobile Network by Technology—2G, 3G, 4G

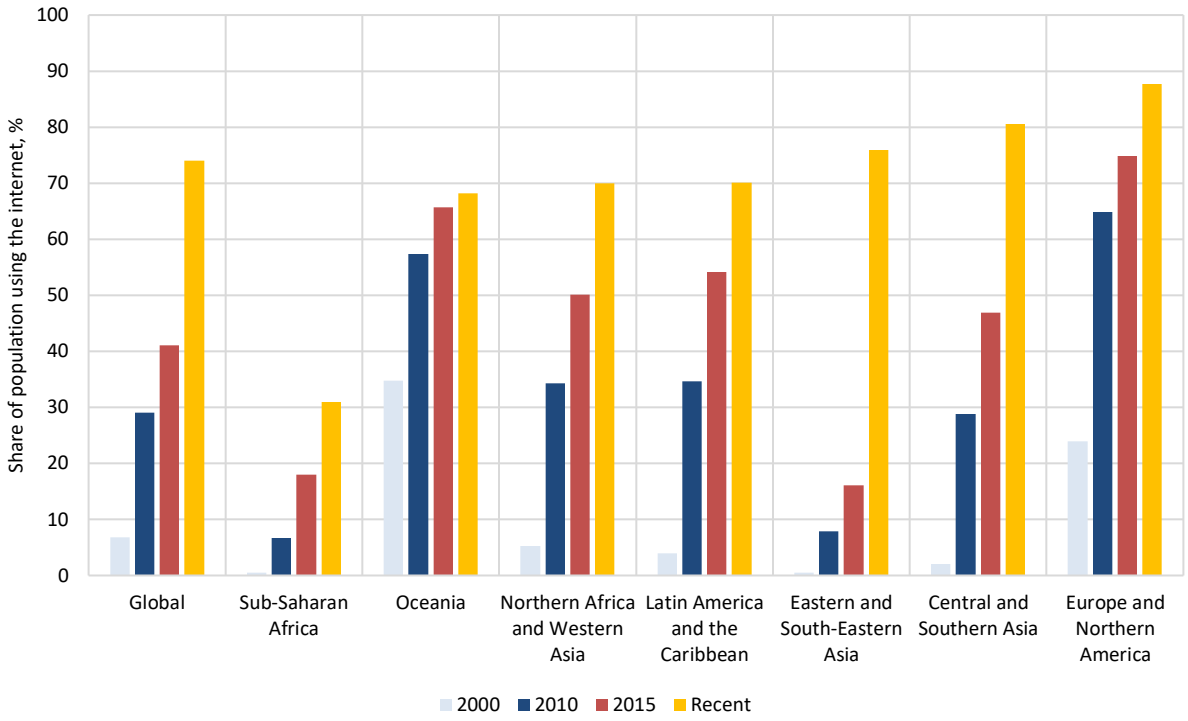


Source: ADB Asian Transport Outlook Database indicators: INF-ICT-010 (UNstats 2021a). (accessed December 2021).

5. Percentage of Individuals Using the Internet

27. In Asia, as of 2018, 44% of individuals were using the internet, compared to 3% in 2000. In comparison, in Europe and North America, this share was 24% in 2000 and 88% in 2018. Since the implementation of the SDGs, the digital divide between developing and developed countries is rapidly being bridged. However, potential is considerable to improve digital connectivity across low- and middle-income economies.

Figure 13: Share of Population Using Internet



Source: ADB Asian Transport Outlook Database indicators: INF-ICT-006 (ITU 2021b). (accessed December 2021).

Illustrative Policy Initiatives on Infrastructure and Transport Activity

28. Countries in Asia and the Pacific have taken many policy actions to improve transport infrastructure. The Kyrgyz Republic has set a 2022 target of “5,000 km comission of new roads and 100% coverage of all settlements with high-speed internet access and digital broadcasting" (Kyrgyz Republic 2018). Papua New Guinea in its Medium Term Development Plan III (2018–2022) included targets for “25,000 km of national roads (triple current value) by 2030; 80% of population with access to internet; 100% of national roads in good condition by 2030” (CCDA 2018). Afghanistan in its Railway Development Plan targeted 4,791 km cumulative track length by 2030 (ARA 2019). Viet Nam has announced a 2030 target of 1,600 km high speed rail” (MONRE 2018). The Islamic Republic of Iran has set transport activity targets for 2024 of “34.2 (billion passenger kilomters [PKM]) per year passenger rail systems capacity expansion (from 17.4 bn pkm per year in 2017); 75.8 ton-kilometer per year freight rail capacity extension by 2024 (from 21.7 ton-kilometer per year in 2017)” (Government of Iran 2017). And Bangladesh intends to have the share of the rural population within 2 km of an all-season road to 90% in 2025, up from 83% in 2016 (Government of Bangladesh 2020).

Theme 3: Urban Transport

29. The global urban population continues to grow, including in Asia, raising concerns about the economic, social, and environmental sustainability of the world's cities. Cities are instruments for sustainable development and transport is acknowledged as an essential component of urban development. Indeed, urban dwellers and the business sector depend on the availability of transport infrastructure and services to make cities function and prosper. With efficient and accessible urban transport, cities can become more productive encouraging innovation and creating economic growth. This is reflected in the SDG target:

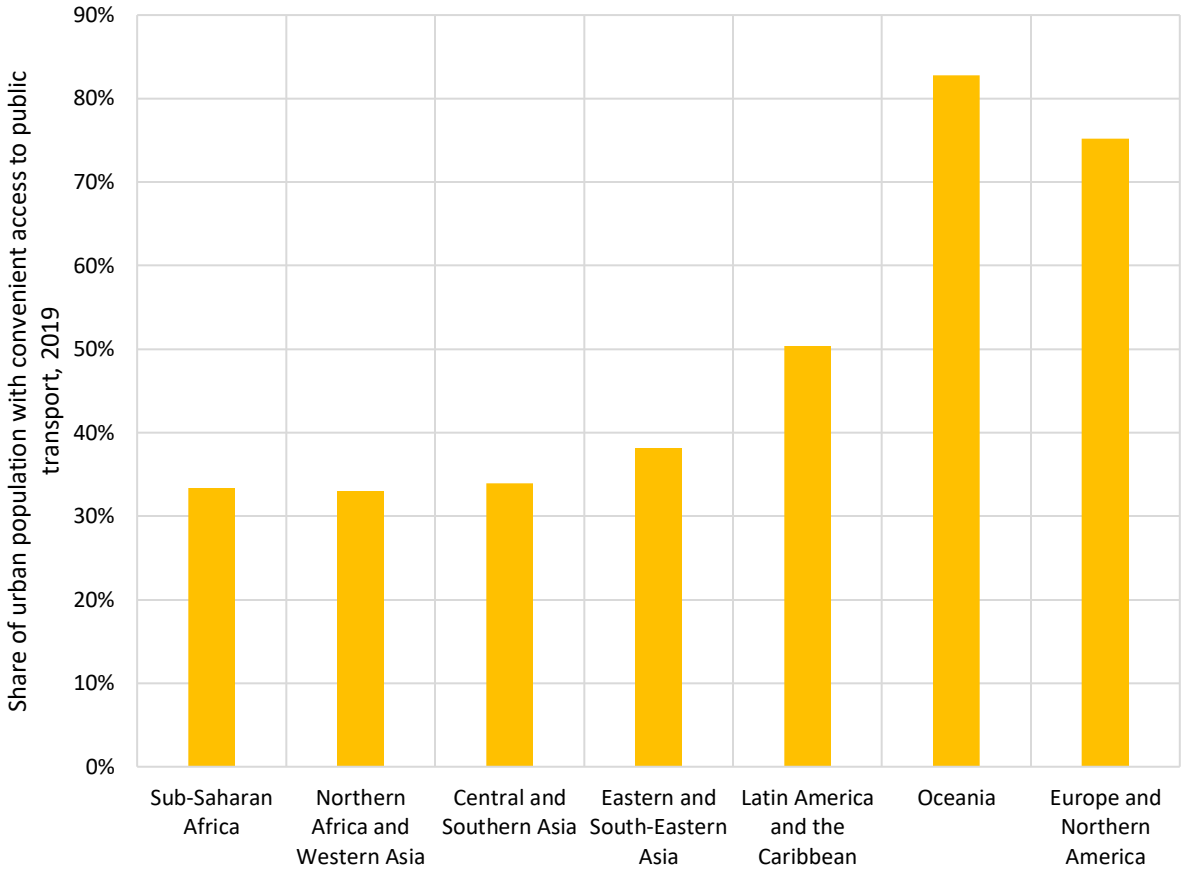
- SDG11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons

Urban Transport Indicators

1. Share of Population with Convenient Access to Public Transport

30. Intense urbanization in the past decade, especially in Asia and Africa, has increased the demand for public transport, but unfortunately convenient access to public transportation is not enjoyed by all urban residents. To measure progress towards achieving SDG Target 11.2, it is important to measure the access to reliable public transportation, using a proxy of the percentage of population within [0.5] kilometers of public transit running at least every 20 minutes. Public transportation is defined as a shared passenger transport service available to the public. It includes buses, trolleys, trams, trains, subways, and ferries (SDSN 2020). Based on the data collected and reported by UN-Habitat (UN-Habitat 2020), public transit access is still inferior in the developing cities of Asia and Africa. Out of 10 people, only 3 to 4 have convenient access to urban public transit. For Asia, this means 1.37 billion urban residents lack such efficient access. For the Pacific and Oceania, the data is available only for Australia and New Zealand.

Figure 14: Share of Urban Population with Convenient Access to Public Transport, Stations/Stops

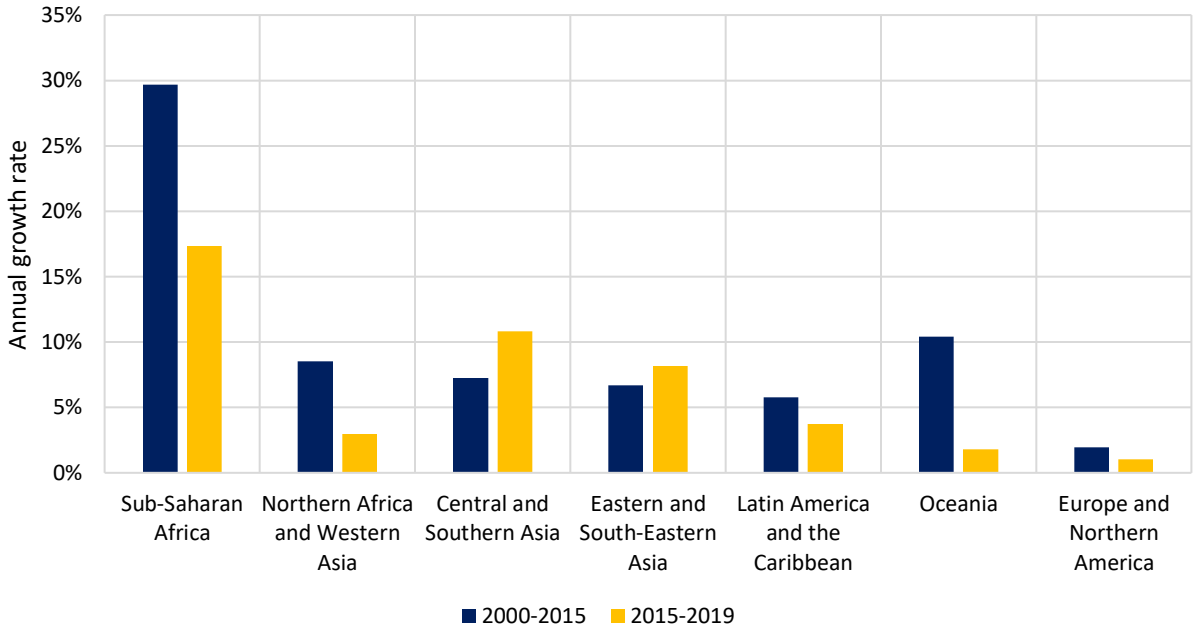


Source: ADB Asian Transport Outlook Database indicators: ACC-UDB-001 (SDG 2020). (accessed December 2021).

2. Rapid Transit Kilometers (Bus Rapid Transit, Metro, Light Rail Transit)

31. Since the start of the implementation of the SDGs in 2015, Asia is the only global region where rapid public transport infrastructure has increased faster than historically and compared with other regions. However, this growth was exclusively in urban rail infrastructure lines, while rapid bus transit system growth has stagnated.

Figure 15: Annual Growth Rate of Rapid Transit—BRT, Metro, Light Rail Transit

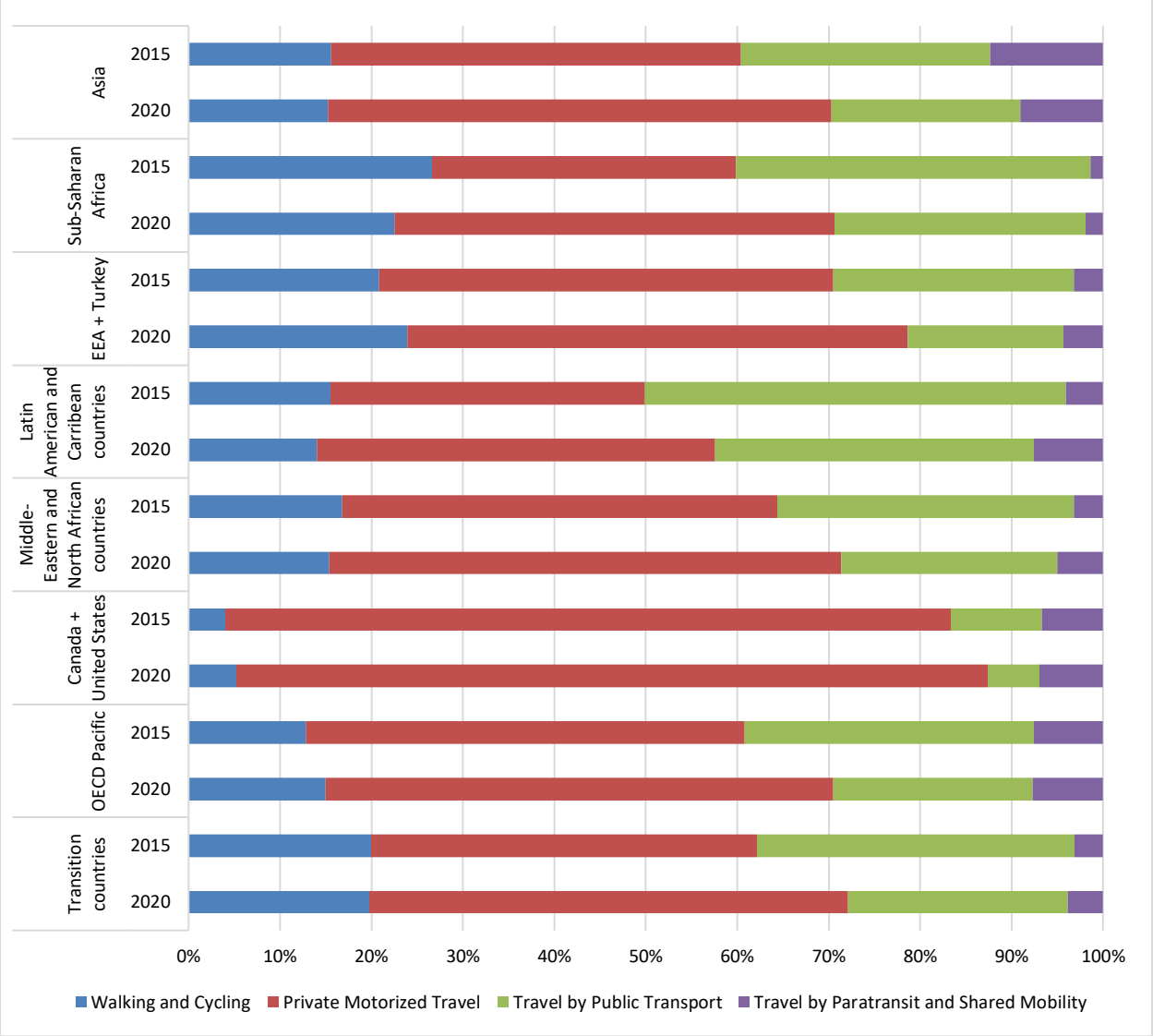


BRT = bus rapid transit.
Source: ADB Asian Transport Outlook Database indicators: INF-UTI-001 to 003 (ITDP 2021). (accessed December 2021).

3. Urban Transport Mode Share

32. The passenger activity modal share reflects total urban passenger activity by different modes of urban transport: i.e., active mobility (walking, cycling), public transit (bus, rail), intermediate public transit and shared mobility (shared auto-rickshaws, private autos, taxis/cabs, shared bikes) and private transport (two-wheelers and cars). In 2015 in Asia, the urban travel mode share predominately favored personal motorized mobility (two-wheelers and cars) followed by the formal and informal public transit with shared mobility. In contrast, urban travel mode share in Latin American and Caribbean countries was dominated by public transit. However, where restrictions were put in place in some places to control COVID-19, mobility shifted significantly to private modes from public transit and shared mobility.

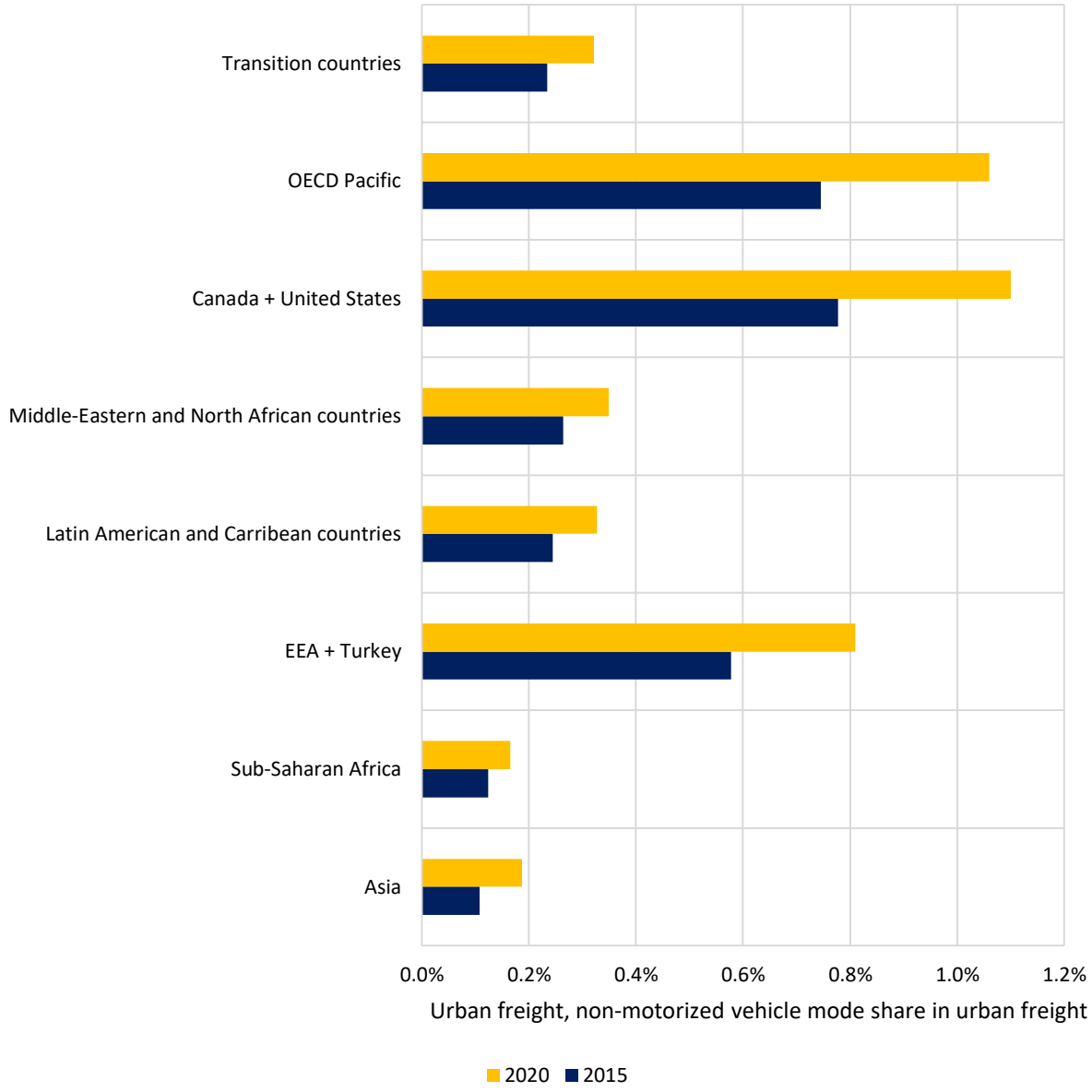
Figure 15: Urban Transport Mode Share



EEA = European Economic Area, IPT = intermediate public transport, OECD = Organisation for Economic Co-operation and Development.
Source ITF transport Outlook 2021 (ITF 2021).

33. In urban freight, since SDG implementation began, the non-motorized vehicle activity mode share in urban freight has started to show up across all regions. However, the International Transport Forum estimates that only in OECD economies does the non-motorized vehicle activity mode share in urban freight exceed 1%.

Figure 17: Urban Transport Mode Share, Regions



EEA = European Economic Area, OECD = Organization of Economic Cooperation and Development.
Source: ITF transport Outlook 2021 (ITF 2021).

Illustrative Policy Initiatives on Urban Transport

34. Asian countries have issued various policies to improve urban transport. The expansion of public transport infrastructure and infrastructure for walking and cycling is mostly done on the basis of urban transport policies and projects. However, the Russian Federation has issued a national target for urban road networks and it aims to increase the share of urban road networks

from 42% (2017) to 85% by 2024" (Government of Russia 2020). National level policies focus on improving access standards. Nepal in its 15th Plan has set a 2023/24 target of "Number of households with access to transport within a distance of 30 minutes = 95% (from 82% in base year)" (NPC 2019). Singapore in its Sustainable Singapore Blueprint (2015) calls for "'20-Minute Towns' and a '45-Minute City'. Walk-Cycle-Ride modes are the preferred way to travel, making up 9 in 10 of peak-period journeys by 2030" (MSE 2015). Vanuatu in its National Sustainable Development Plan 2016–2030 Monitoring and Evaluation Framework introduced a 2030 target: "100% share of population with access to transport by road" (Government of Vanuatu 2016). And Hong Kong, China in its Railway Development Strategy (2014) stated as a 2031 target a 45%–50% rail modal share in public transport" (Transport and Housing Bureau 2014).

Theme 4: Transport and Energy

35. Access to energy, like infrastructure, is considered a fundamental prerequisite for development and, as such, there is a dedicated SDG for energy. The transport sector is not able to function without energy. Transport relevant components of the energy SDG focus on the source of energy and the amount of renewables in the energy mix used in the sector as well on the efficiency with which energy is used. The SDGs consider implementing energy efficiency measures across sectors a priority for all countries. The SDGs also propose the use of energy intensity, i.e., the ratio between the gross consumption of energy and GDP as a proxy for energy efficiency. Transport and energy related SDG targets include:

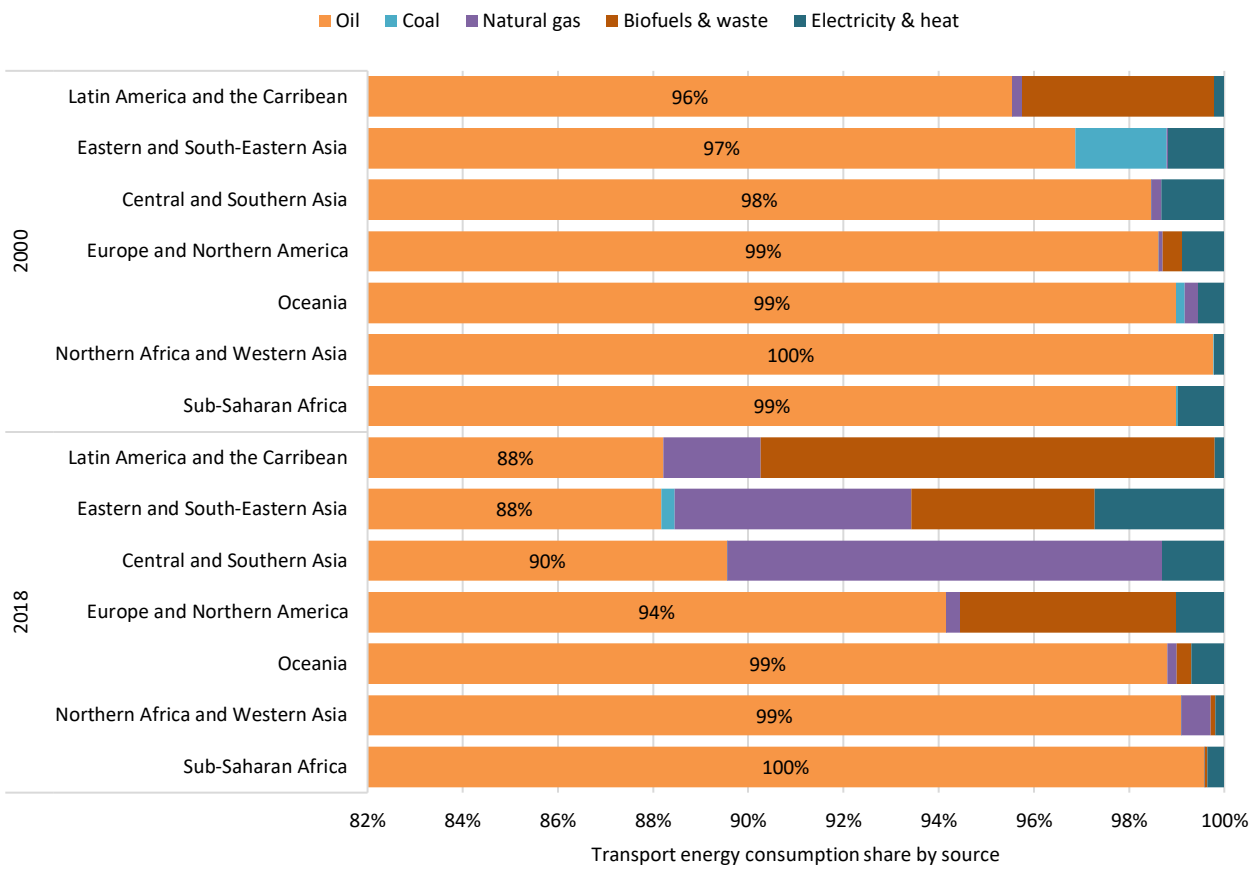
- SDG 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix
- SDG 7.3 Double the global rate of improvement in energy efficiency by 2030
- SDG 12.c Rationalise inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimising the possible adverse impacts on their development in a manner that protects the poor and the affected communities

Transport and energy-related Indicators

1. Transport Energy Consumption

36. Transport sector energy demand has grown steadily over the past decade, yet the transport sector remains the least diversified energy consumption sector. The primary sources of renewable energy in the transport sector include renewable hydrogen, synthetic fuels, electro-fuels when electricity is renewable, biofuels, and so on. Of all the renewable energy consumed in the energy sector, global transport accounts for 6%, and only about 3.6% in Asia and the Pacific. Globally, oil still drives about 92% of the transport sector, with electricity still meeting only 1% of transport fuel demand in 2018. In Asia, oil drives about 88% of the transport sector, with electricity meeting about 3% of transport fuel demand in 2018. Since the start of the implementation of the SDGs, renewable energy consumption in the transport sector has grown 5% annually globally and 17% in Asia.

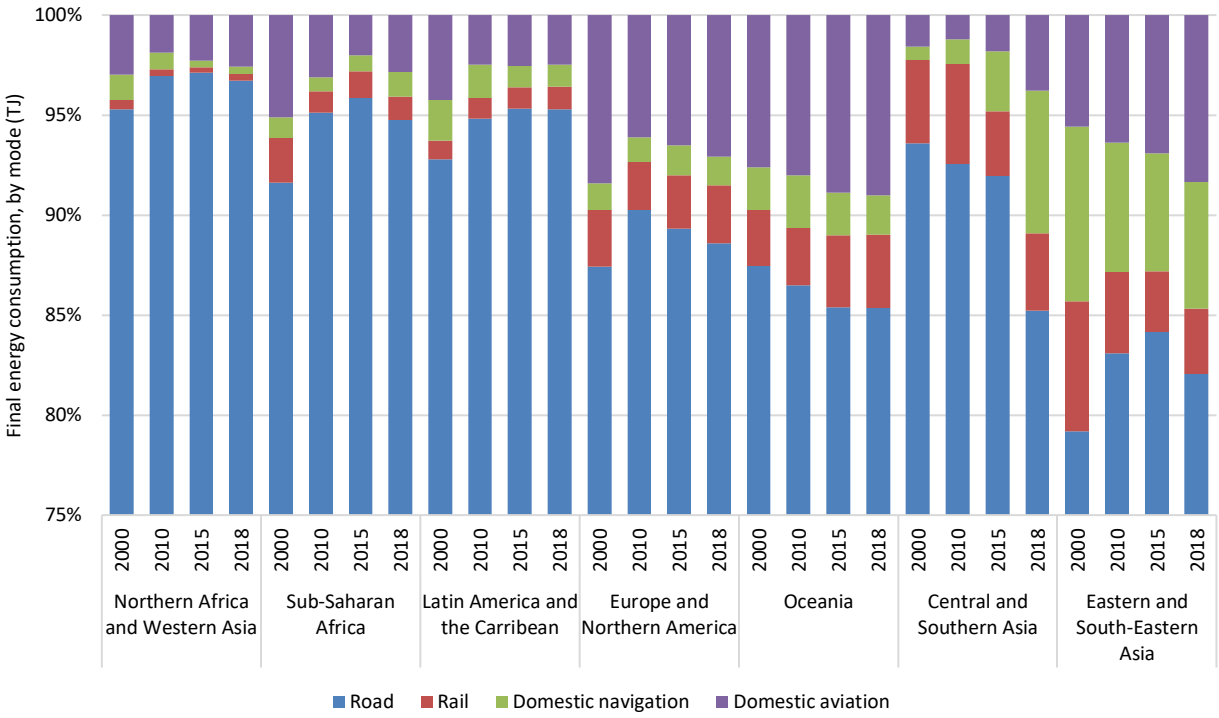
Figure 16: Transport Energy Consumption Share by Source



Source: UNstats (2021b).

37. Across global regions, most growth in transportation energy use is projected to occur in the developing non-OECD economies and, within all global regions, most transport energy consumption is within the road sector. Globally, among modes, roads, railways, aviation, and waterways are responsible for 89%, 2%, 7%, and 2% of energy consumption, respectively (IEA 2018). Railways have made most progress in terms of energy transition. Globally, three-quarters of passenger rail transport and almost half of all freight rail are now electric (IEA 2019a). In Asia, railways have also made significant progress in the transition away from fossil fuel: The People's Republic of China (PRC) railway network is 70% electrified and India's 50%. Since 2000, electricity consumption in railways in ATO economies has increased by 100%, while diesel consumption has declined by 40%.

Figure 19: Transport Final Energy Consumption by Mode

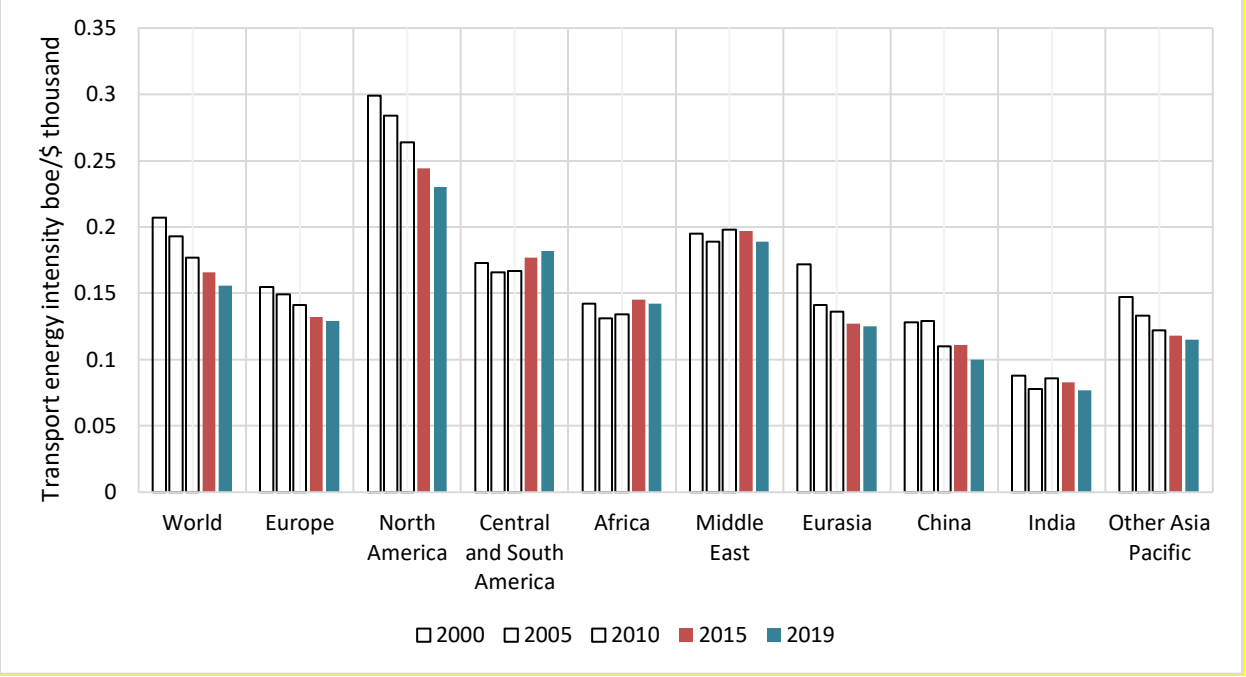


TJ = terajoule.
Source: UNstats (2020b).

2. Transport Energy Intensity

38. Global transport sector energy intensity (total energy consumption per unit of GDP) dropped by 2.3% in 2019, says the IEA, after falling an average of 1.4% per year between 2000 and 2018. Further, transport sector energy intensity in Asian economies is lower than in the OECD economies.

Figure 20: Transport Energy Intensity



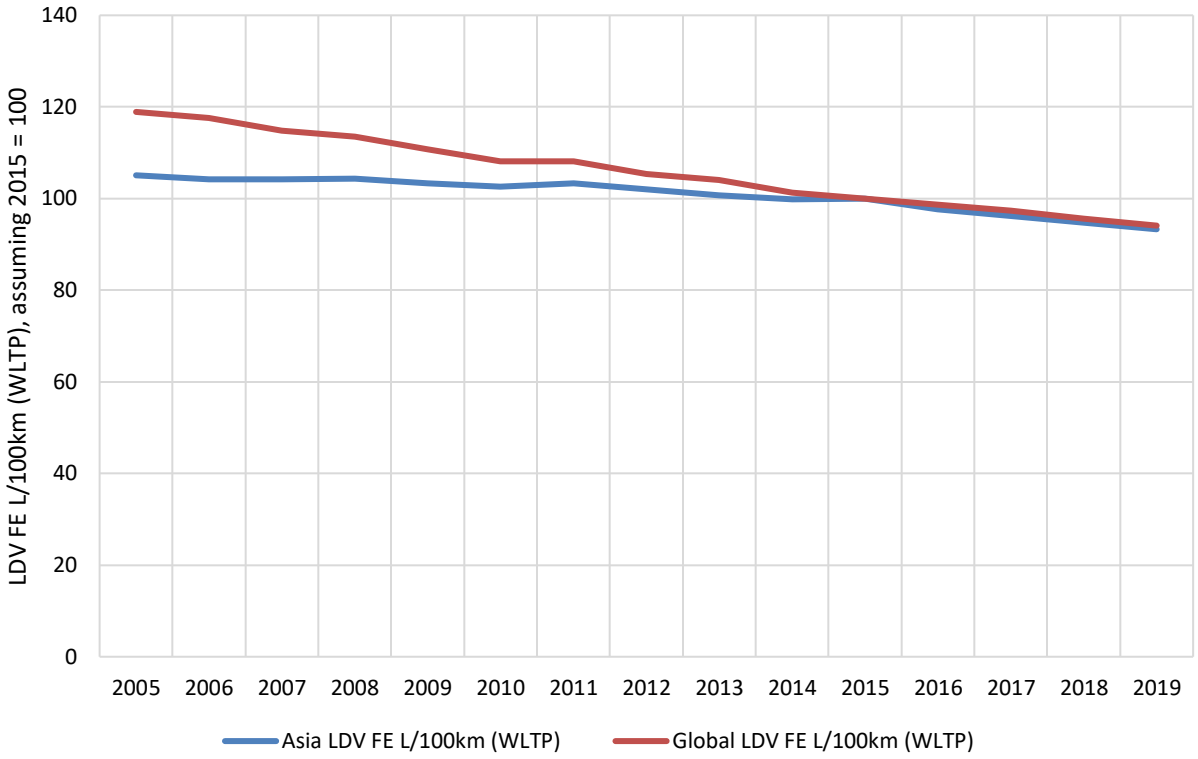
boe = barrel of oil equivalent, USD = United States dollar.
Source: IEA (2020).

39. Before the start of the implementation of the SDGs, the annual rate of improvement in transport sector energy intensity in the PRC (-0.9%), India (-0.4%) was significantly lower than other countries in Asia and Pacific region (-1.5%), the global average (-1.5%), North America (-1.3%), and Europe (-1.1%) (IEA 2020). However, since the adoption of the SDGs, transport sector energy intensity improvement in PRC and India exceeds the SDGs target of the doubling rate of improvement in energy efficiency.

3. Light Duty Vehicle Fuel Economy

40. The IEA has estimated that transport energy use covered by mandatory energy efficiency policies increased from 23% in 2010 to 35% in 2018 as economies adopted fuel economy policies (IEA 2021a). For example, the Global Fuel Economy Initiative partnership now works with more than 100 countries to initiate and implement fuel economy policies on light duty vehicles (GFEI 2020). Since the start of the implementation of the SDGs, the fuel economy of light duty vehicles in Asia has improved at a much faster pace but still significantly lower than global targets (double passenger vehicle fuel economy by 2030). During 2005–2015, the average vehicle fuel economy of new light duty vehicles (l/100km) globally improved 1.7% annually and in Asia 0.5%. Since 2015, fuel economy has improved 1.5% globally and 1.7% in Asia.

Figure 17: Light Duty Vehicle Fuel Economy

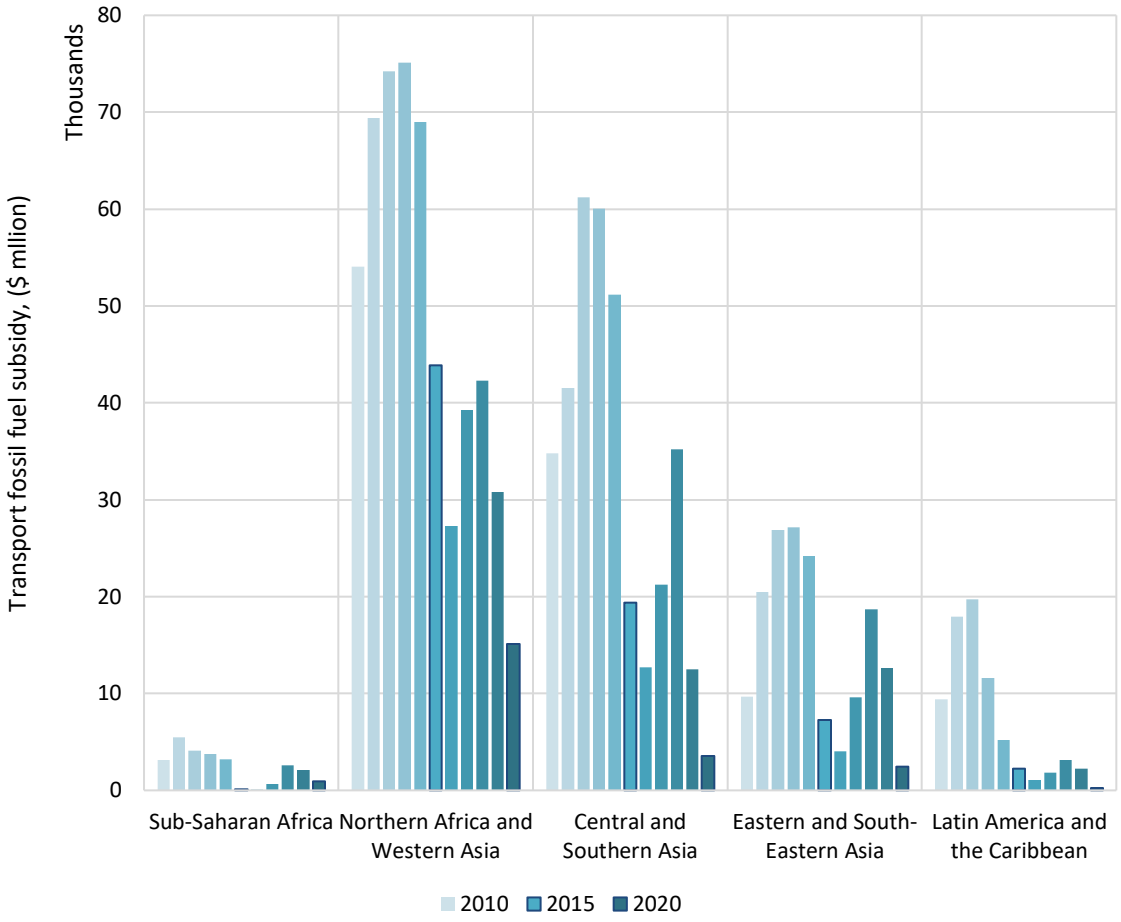


FE = fuel economy, L = liters, LDV = light duty vehicle, WLTP = World Harmonised Light Vehicle Test Procedure.
Source: UNEP (personal communication, 2020)

4. Transport Fossil Fuel Subsidies

41. Over the past decade, countries have increasingly recognized the negative economic, environmental, and social consequences of fossil fuel subsidies. Within the transport sector, fossil fuel subsidies encourage excessive energy consumption, disincentivize investments in transport renewable energy and energy efficiency, and aggravate the vulnerability to volatile international energy prices. From 2010 to 2015, the total global fossil fuel subsidy in the transport sector was $782 billion. Since 2015 when the SDGs were adopted, for 2015–2020, this declined to $352 billion, down 55% in the total amount of transport sector related fossil fuel subsidies (sensitive to crude oil price fluctuations). In 2019, Asian countries spent nearly $34 billion to subsidize fossil fuels in the transport sector, accounting for about 44% of the global transport sector fossil fuel subsidy.

Figure 18: Fossil Fuel Subsidy for Transport Sector

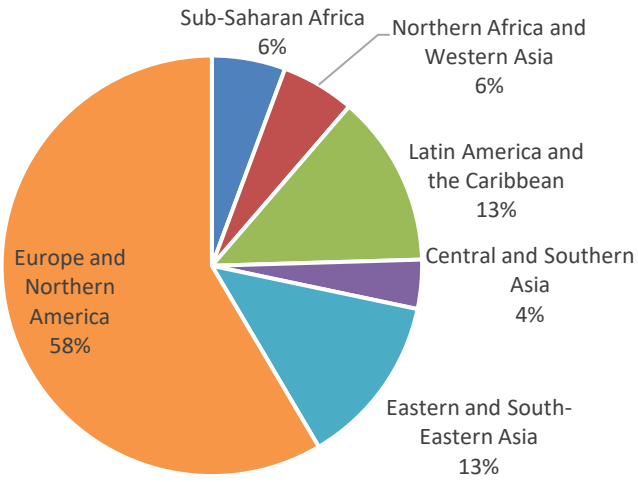


USD = united states dollar.
Source: IEA Fossil Fuel Subsidies (IEA 2021b).

5. Share of Countries with Light Duty Vehicle Fuel Economy Policies

42. Globally, 53 countries have adopted fuel economy policies for light duty vehicles, and within Asia 9 countries have. Several Asian countries since 2015 have proposed new or stronger existing fuel economy regulations for light duty -vehicles. For example, the PRC has progressively improved light duty vehicle fuel economy standards by recently setting corporate average fuel consumption targets of 4.0 liters (L)/100 km for 2025 and 3.2 L/100km for 2030 (IEA 2019b). Southeast Asian countries have adopted the ASEAN Fuel Economy Roadmap for Transport Sector 2018–2025, which proposes to reduce average fuel consumption per 100 km of new light duty vehicles sold in the Association of Southeast Nations (ASEAN) by 26% between 2015 and 2025 (ASEAN 2018). In India, new light duty vehicles sold were subjected to fuel-consumption standards starting 2017–2018. By 2022–2023, a second set of fuel economy standards will come into force.

Figure 19: Share of Countries with Light Duty Vehicle Fuel Economy Policy

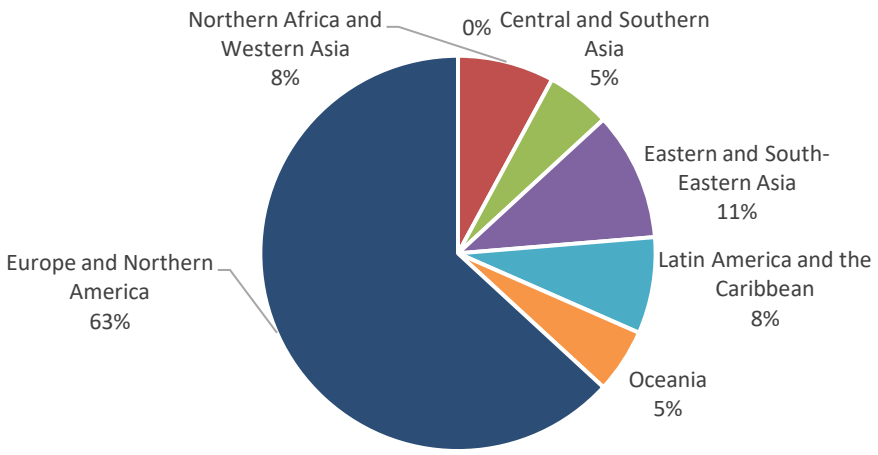


LDV = light duty vehicle.
Source: UNEP (2021a).

6. Share of Countries Where Fossil Fuel Pump Prices Are Fully Liberalized

43. Having true market prices for transport fuels will help reduce kilometers driven. Thirteen percent of countries in Asia have fully liberalized gasoline prices and 15% globally. In Asia, the economies include Armenia; Georgia; Hong Kong, China; India; Kazakhstan; the Philippines; Singapore; Tajikistan; and Uzbekistan have fully liberalized gasoline and diesel prices while Australia, Japan, the Republic of Korea, New Zealand, and Thailand have fully liberalized gasoline prices.

Figure 20: Share of Countries with Fully Liberalized Gasoline Pump Prices

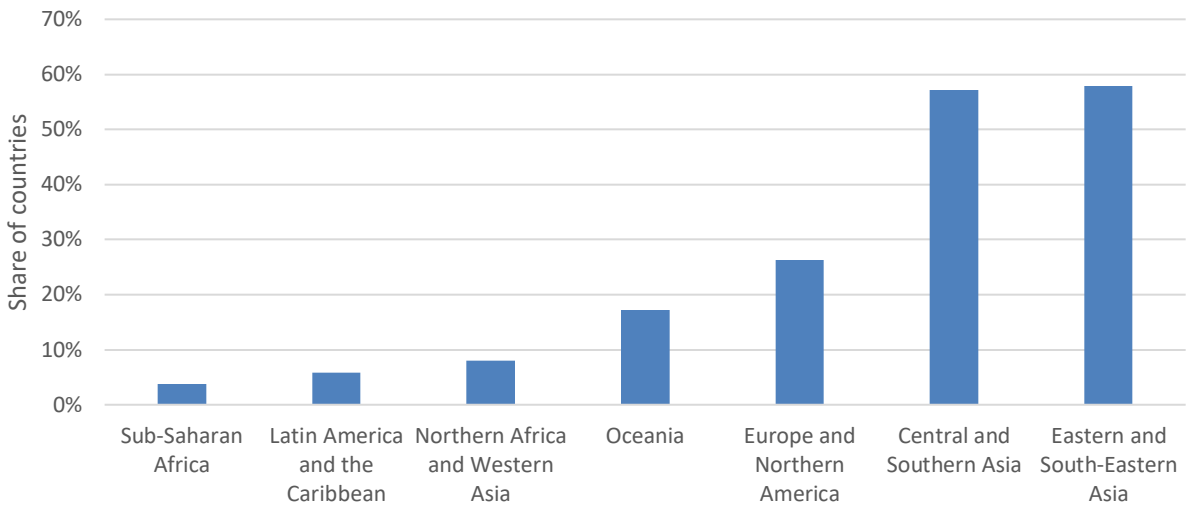


Source: IEA Gasoline Prices (IEA 2021c).

7. Share of Countries with Electrification and Transport Renewable Energy Targets

44. By end of 2021, 29 countries in Asia (ADB 2021b) and 46 globally (Changing Transport 2021) have announced targets to electrify transport and/or phase out internal combustion vehicles over the next 10–30 years in their Nationally Determined Contributions or in other policy documents. If biofuel-related targets are included as well, the dominance of Asia in number of targets in place is even more pronounced.

Figure 21: Share of Countries with Targets on Renewable Energy Share in Transport and Electric Vehicle/Phase Out



Source: GFEI (2021), REN21 (2021).

Illustrative Policy Initiatives on Transport and Energy

45. In addition to the policies on fuel economy, electrification and the liberalization of the market for transport fuels, countries in Asia have also taken policy action in different fields. Indonesia has set a 2025 target of “14% biofuel share in transport energy demand” (Government of Indonesia 2019). Georgia through increasing the share of electric passenger cars from 0.2% in 2018 to 50% by 2030 expects to a 25.6% and 9.4% reduction in the share of petroleum-fuelled and diesel-fueled passenger cars, respectively (Government of Georgia 2020). The PRC has set a target of about a 20% share for new energy vehicles in new vehicle sales by 2025 and account for 70% of PRC’s new car sales by 2030. Fiji intends to reduce domestic maritime shipping emissions by 40% as a contribution to reduce 30% of business-as-usual emissions from the energy sector by 2030 (Government of Fiji 2020). India has set a target for 2023–2024 for “100% electrification of broad-gauge track (from the 40 per cent level in 2016–17)” (NITI 2021). Kiribati in its Integrated Energy Roadmap (2017–2025) states targets as “The goal for Kiritimati is a 60% reduction in fossil fuels by 2025. 40% is to be achieved through deployment of renewable energy and 20% through improvements in energy efficiency. The goal for the Outer Islands is a 60% reduction in fossil fuel use in all rural public infrastructure" (Government of Kiribati 2017). Lao People’s Democratic Republic has called for “10% biodiesel blend” by 2030 (Government of Lao PDR 2021).

Theme 5: Transport and Climate Change

46. It is hard to overemphasize the importance of the risk that climate change poses to global development, as is acknowledged by having a dedicated SDG. This SDG focuses both on adaptation to climate change and the mitigation of climate change. There is a direct link between the climate SDG and the Paris Agreement, which calls on countries to radically reduce emissions to limit temperature increases to well below 2°C and pursuing efforts to limit it to 1.5°C. Emissions from the transport sector are an important contributor to climate change and continue to grow; indeed, in Asia, they remain the fastest-growing sector in terms of emissions. Transport and climate change SDG related targets include:

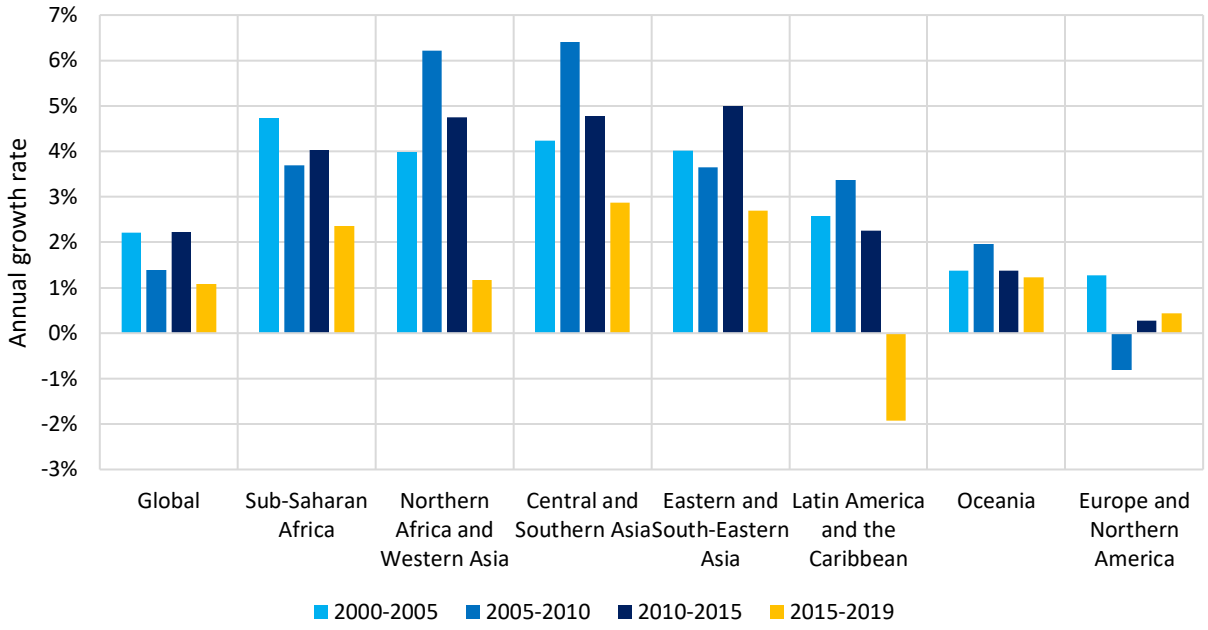
- SDG 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries
- SDG 1.5 By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters
- SDG 13.2 Integrate climate change measures into national policies, strategies and planning Transport and Climate Change Indicators

Transport and Climate Change Indicators

1. Transport CO2 Emissions

47. Since the SDGs were adopted in 2015, transport CO2 emissions have increased 1.1% globally and 2.7% in Asia annually. Since 2010 globally, among all sectors, CO2 emissions growth was most intense and fastest in Asia. Carbon emissions in the Asian transport sector are predominantly from the road transport sector, with about 89% in 2018. Asian railways, domestic navigation, and domestic aviation have a share of 1.8%, 4.5% and 5.2%, respectively.

Figure 22: Transport CO2 Emissions Annual Growth

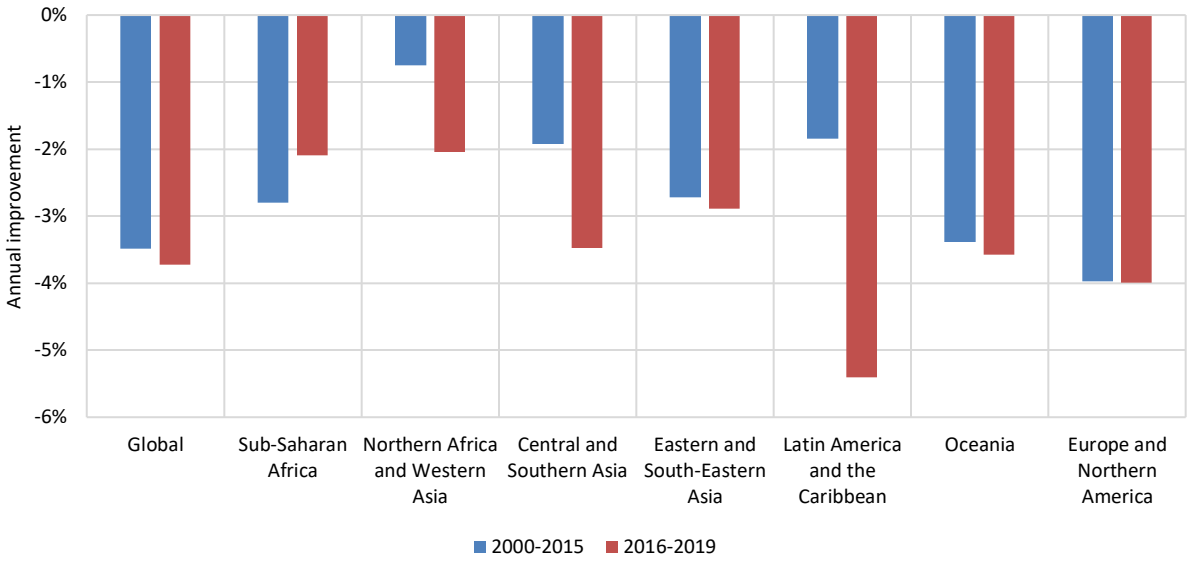


Source: ADB Asian Transport Outlook Database indicators: CLC-VRE-048 (EDGAR 2021). (accessed December 2021).

2. Transport CO2 Intensity (with GDP)

48. Since 2000, transport CO2 emissions in close to 85% of Asian economies increased at a slower pace than GDP (relative decoupling), indicating greater resource-use efficiency, often resulting from the adoption of clean and environmentally sound technologies. The highest level of relative decoupling of transport CO2 emissions with GDP is observed in Latin America and Caribbean countries during 2016–2019, followed by Europe and North America.

Figure 23: Annual Improvement of Transport CO2 Intensity (with GDP)



GDP = gross development product.

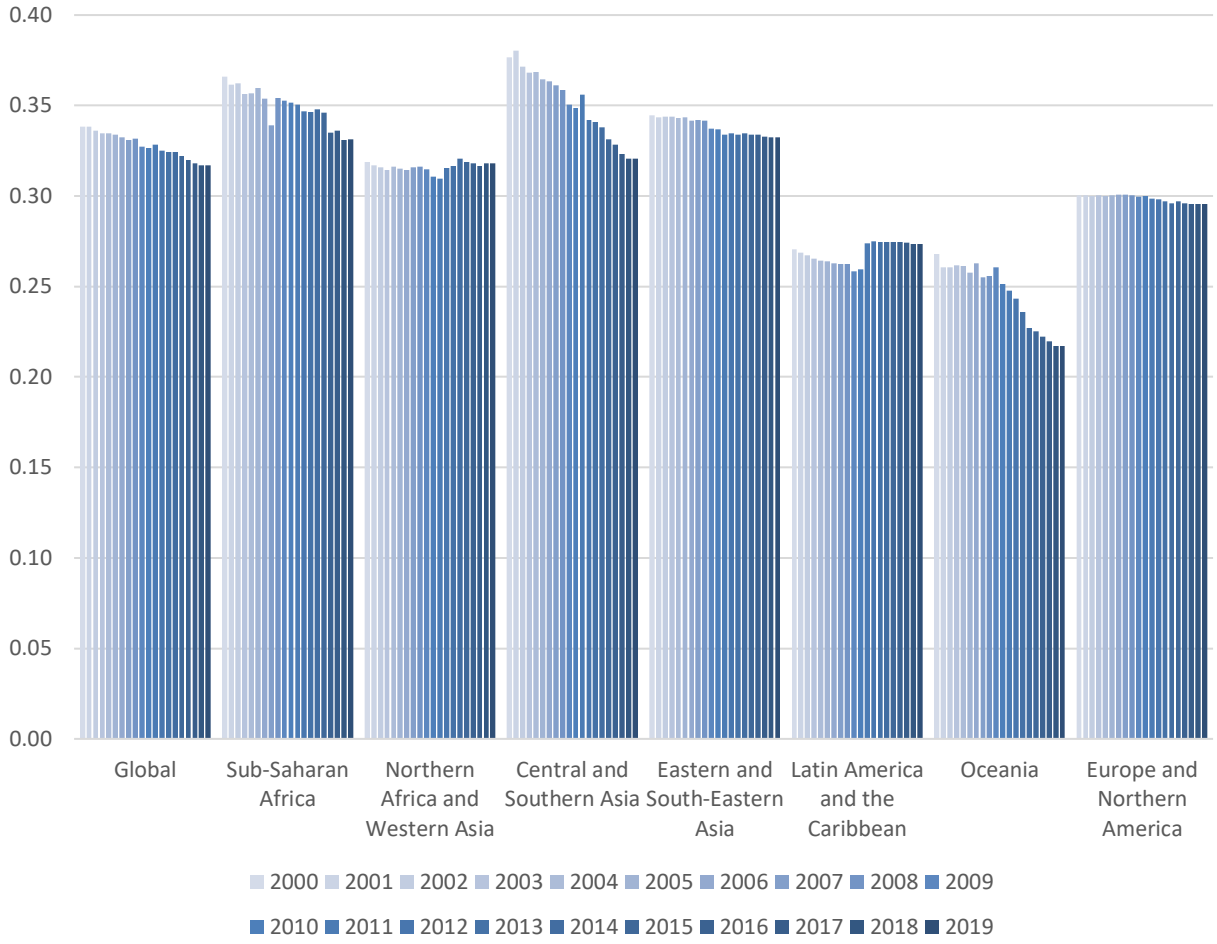
Source: EDGAR (2021).

3. ND Gain Index for Infrastructure Vulnerability

49. Data from the Notre Dame Global Adaptation Index (ND-GAIN) indicates that, since 2000, the climate vulnerability of infrastructure decreased marginally from 0.34 to 0.32 (multiple sectors including transport).[2] This shows only a very slight improvement in adaptive capacity of the overall infrastructure to cope or adapt to climate-exacerbated hazards. Further, infrastructure resilience of lower-income countries, including in Asia, is significantly lower than in more prosperous countries.

[2] ND-GAIN. 2021. https://gain.nd.edu/.

Figure 24: ND Gain Index for Infrastructure Vulnerability



Source: ADB Asian Transport Outlook Database indicators: CLC-CVT-001 (ND-GAIN 2021). (accessed December 2021).

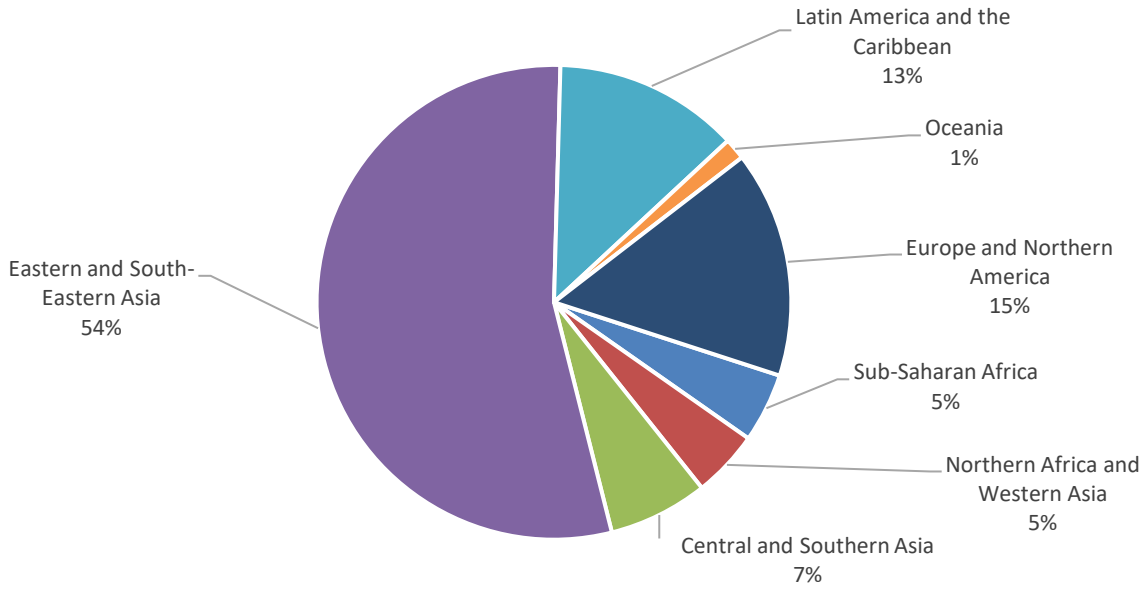
4. Expected Annual Damage to Transport Surface Infrastructure

50. Countries are at a growing risk from environmental hazards that are projected to increase in frequency and severity due to climate change and ecological devastation. The latest Intergovernmental Panel on Climate Change Working Group I contribution to the Sixth Assessment Report (IPCC 2021) indicates that hot extremes, heat waves, and heavy rain have been becoming more intense and frequent globally over the past 7 decades.

51. Future population growth, urbanization, and infrastructure development will affect future vulnerability and exposure, especially in developing countries. One SDG indicator relevant for the transport sector is "Direct economic loss in relation to global GDP, damage to critical infrastructure and number of disruptions to basic services, attributed to disasters". Koks et al. (2019) has estimated that about 27% of all global surface transport assets are exposed to at least one hazard, and about 7.5% of all surface transport assets are exposed to a 1/100 year flood event. The global

expected annual damage due to direct damage to surface transport assets range from $3.1–$22 billion, of which 60% occurs in Asia, which constitutes about 30% of surface transport infrastructure. While the global expected annual damage is insignificant compared with GDP (0.02%), it reaches about 0.5% of GDP in some small island development states, which is significant. Unfortunately, time-series data is not available to track the Increase of frequency and severity of damages.

Figure 29: Expected Annual Damage to Transport Surface Infrastructure



Source: ADB Asian Transport Outlook Database indicators: CLC-CVT-002. (accessed December 2021).

5. Transport Focus Long-Term Emission Reduction Strategies

52. Until now, 12 countries in Asia and the Pacific (Australia, PRC, Fiji, Indonesia, Japan, Marshall Islands, Nepal, New Zealand, Republic of Korea, Singapore, Thailand, and Tonga) region have submitted their long-term strategies out of 48 in total, by all the Paris Agreement parties. Generally, the coverage of transport is through listing various mitigation activities and scenarios for their role out. No quantified emission reduction targets for the transport sector are provided, except Japan.

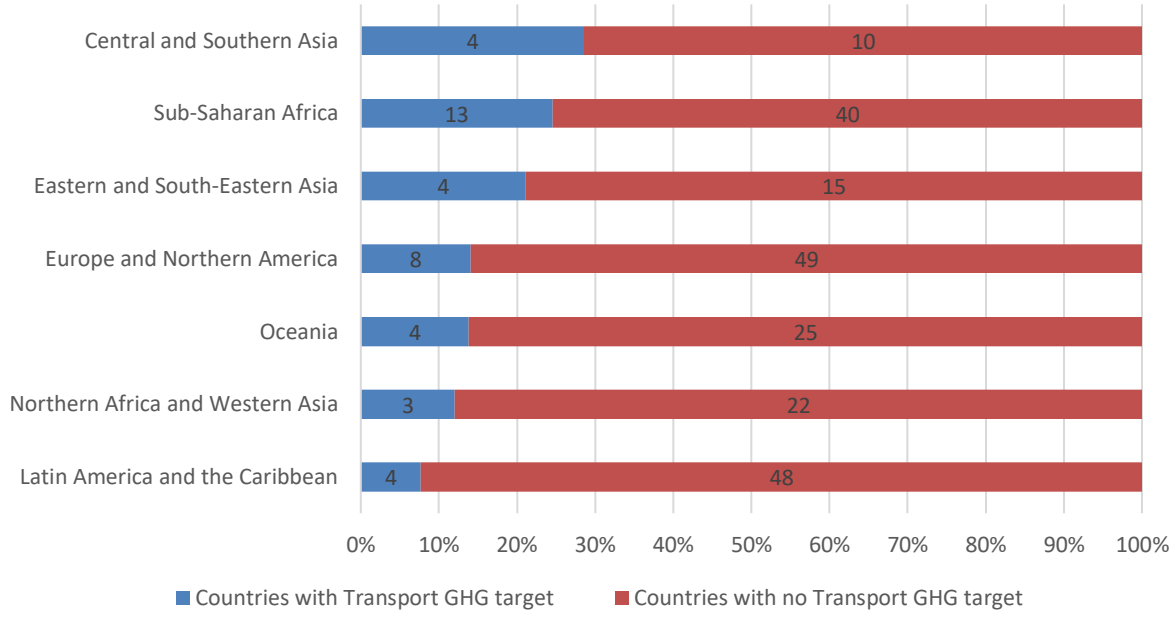
6. Transport Focus Nationally Determined Contributions

53. Initial National Determined Contributions were submitted in 2015 prior to COP21, which resulted in the adoption of the Paris Agreement. In almost 53% of the first generation contributions submitted by Asian countries (26 out of 49), transport is acknowledged as a sector where action will be taken. About 26 of the initial National Determined Contributions, submitted in 2015 lists a number of envisaged mitigation activities in the transport sector.

54. In preparation of COP26 in 2021 all parties to the United Nations Framework Convention on Climate Change were invited to submit enhanced ambition National Determined Contributions. For Asia, this resulted in 33 updated or second generation National Determined Contributions. Part of the updated contributions (14) show increased ambition on transport by including or raising transport related emission reduction targets. Fourteen of the National Determined Contributions have included additional mitigation activities in the transport sector in the updated National Determined Contributions.

55. The coverage of adaptation to climate change in the transport sector is more limited than the coverage of mitigation actions. Only 9 out of the initial 49 National Determined Contributions submitted in 2015 cover transport specific adaptation actions (Bangladesh, Bhutan, Cambodia, Lao PDR, Maldives, Pakistan, Singapore, Timor-Leste, and Tajikistan) (Changing Transport 2021). In addition, in 27 updated National Determined Contributions, adaptation in the transport sector has not gained much more focus.

Figure 30: Share of Countries with Transport GHG Targets in NDC or LTS



GHG = greenhouse gas, LTS = long-term strategy, NDC = Nationally Determined Contributions.
Source: Changing Transport (2021).

Illustrative Policy Initiatives on Transport and Climate Change

56. In its updated Nationally Determined Contribution, Maldives will establish a National Planning Act and Physical Planning Act to facilitate the integration of climate change into development planning (Government of Maldives 2020). The government of Bhutan aims to transform Thimphu into the first electric city in the world and to reduce fuel imports by 70% by 2020 (Government of Bhutan 2013). Cambodia has communicated a 2030 target calling for “390 Gg of CO2eq reduction in transport sector” (Government of Cambodia 2015). Japan aims to achieve a reduction of 163 million tonnes of CO2 emissions in the transport sector compared to 225 million tonnes in 2013 (Government of Japan 2015). Mongolia aims for a 22.7% reduction in total national GHG emissions. In the transportation sector it will switch the coal export transportation to rail transport from auto transportation; and it will switch the heating of passenger train to electric heating (Government of Mongolia 2020). The Republic of Korea has set a target of deploying 3 million units of electric vehicles and 850,000 hydrogen vehicles by 2030 (Government of Republic of Korea 2020). Singapore intends to phase out internal combustion engine vehicles by 2040, and to provide rebates to encourage takeup of cleaner vehicles on new electric vehicle purchases (Government of Singapore 2020). Azerbaijan in its Nationally Determined Contribution announced the use of environmentally friendly forms of transport, enhancement of the use of electric vehicles at public transportation, and electrification of railway lines (Government of Azerbaijan 2015).

Theme 6: Air pollution

57. The SDGs consider pollution of the air, water, and soil an essential threat to ensuring healthy lives and promoting well-being for all ages. The transport sector is a significant contributor to outdoor air pollution and associated health impacts. Transport operations emit a complex mixture of air pollutants, many harmful to health. Evidence from several epidemiological studies has demonstrated that exposure to mobile air pollution is linked to acute respiratory infections, cerebrovascular diseases (stroke), ischaemic heart diseases, chronic obstructive pulmonary disease, and lung cancer. Air pollution related SDG-related targets include:

- SDG 3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

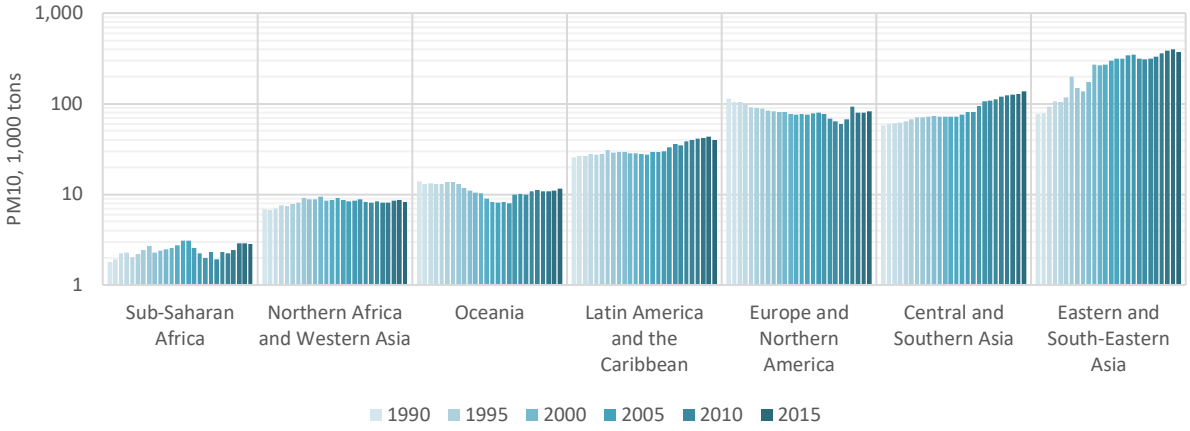
- SDG 11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

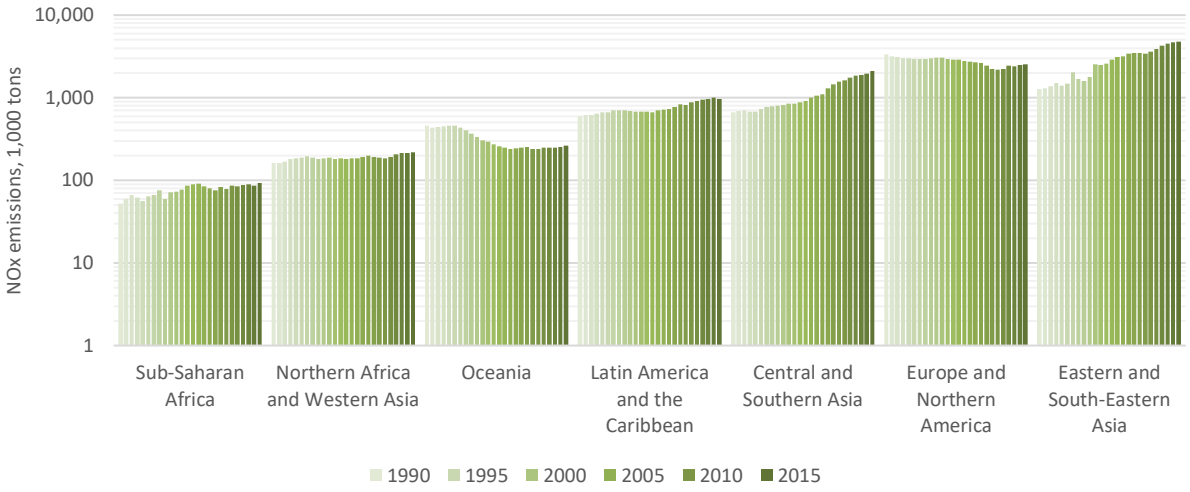
Air Pollution and Transport Indicators

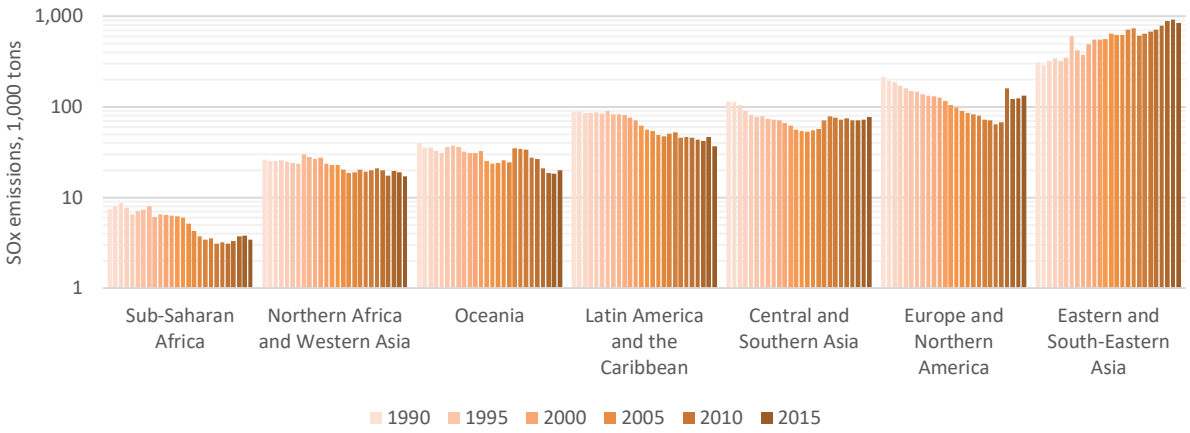
1. Transport PM 10, NOx, Sox, and BC Emissions

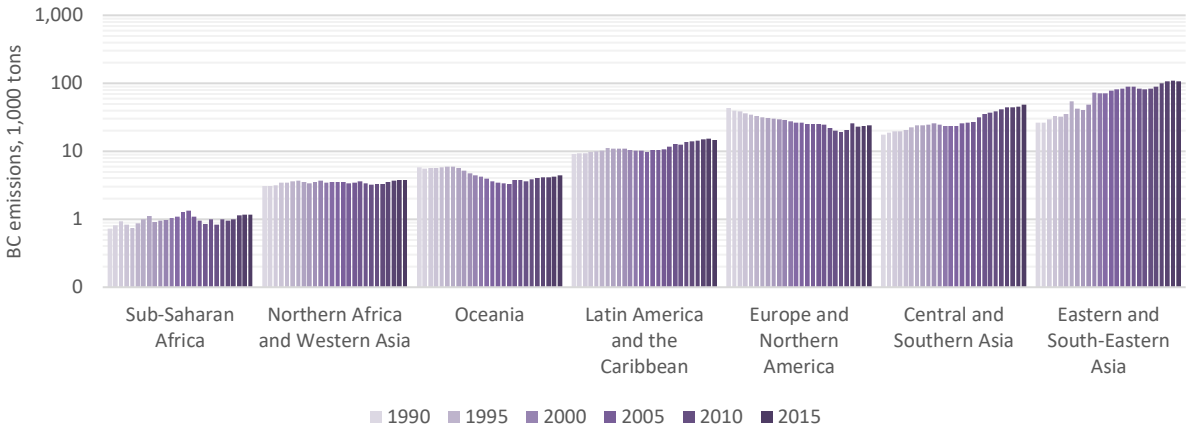
58. From 2000 to 2015, transport sector air pollutant emissions (particulate matter 10, nitrogen oxides, sulfur oxide, and black carbon) grew most in Europe and the North America region. By 2015, Asia contributed to about 8%, 11%, 5% and 9% of each of these, respectively. In Asia, in 1990–2000, air pollutant emissions from the ATO economies' transport sector, especially in Eastern and Southeast Asia, grew faster than the other sectors in the economy. Following this, in overall terms the growth of transport emission (particulate matter 10, nitrogen oxides, sulfur oxide, and black carbon) slowed in the 2000s. However, since 2010, growth rates in transport are higher again than for other sectors, due to a rapid increase in transport activity and a relative slowing in tightening of transport related regulatory standards, that is, emission standards and fuel quality. The growth of transport related air pollution emissions, however, is lower than the growth in transport related CO2 emissions, which shows the relevance of transport related regulatory standards. These are more developed until now for transport related air pollution compared to transport related CO2 emissions.

Figure 31: Air Pollution—PM10, NOx, SOx, BC Emissions









PM = particulate matter, NOx = nitrogen oxides, Sox = sulphur oxides, BC = black carbon.

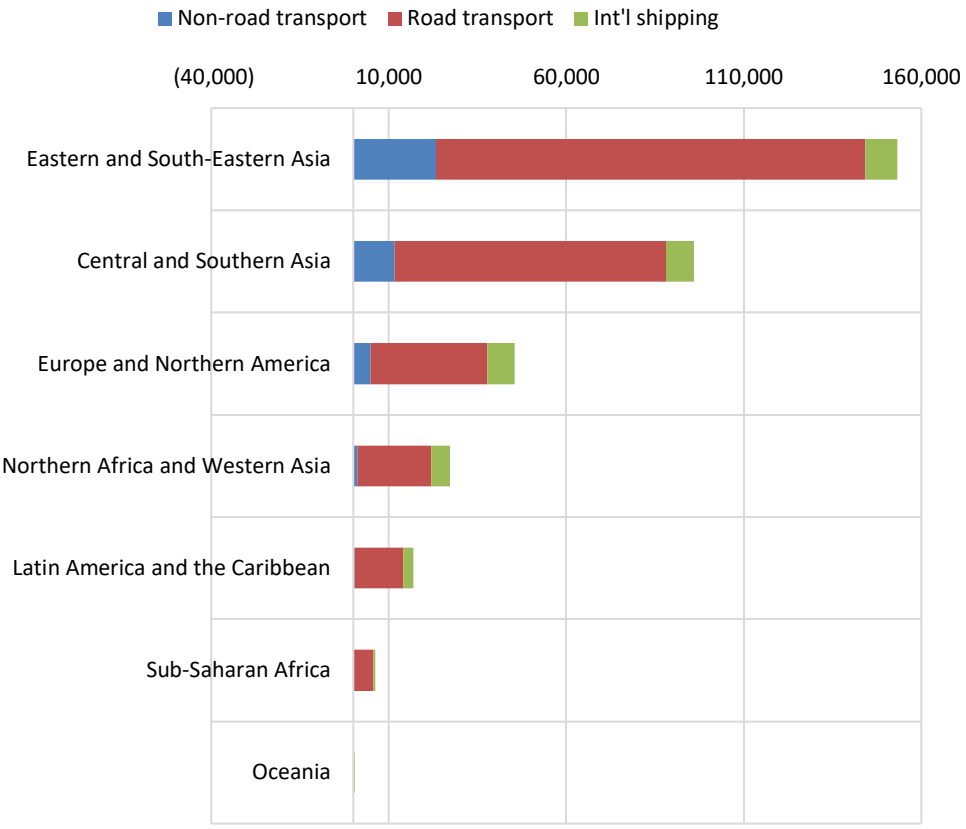
Source: ADB Asian Transport Outlook Database indicators: APH-VAP-021, APH-VAP-022, APH-VAP-023, APH-VAP-024, APH-VAP-025, APH-VAP-005, APH-VAP-010, APH-VAP-015, APH-VAP-020 (EDGAR 2018). (accessed December 2021).

2. Transport Air Pollution Health Impact

59. In terms of health impact, it has been estimated that the economies in the Asia and Pacific region economies, which accounted for 41% of global GDP (purchasing power parity) and 34% of transport fine particulate matter (PM 2.5) emissions contribute up to 73% of the transport sector global disease burden associated with PM2.5 in 2019 (McDuffie et al. 2021). The current transport sector share in ambient fine particulate matter and ozone pollution-related deaths in the Asia and the Pacific region stands at 10% (ICCT 2019).

60. Road diesel vehicles cause a disproportionate share of road transport-related fine particulate matter (PM2.5) and ground-level ozone deaths. Diesel vehicles account for 72% of the total road disease burden associated with PM2.5 and ground-level ozone pollution in the Asia and Pacific region. Since the start of the implementation of the SDGs, transport sector global disease burden associated with PM2.5 increased with 3.3% globally and 3.8% in Asia annually.

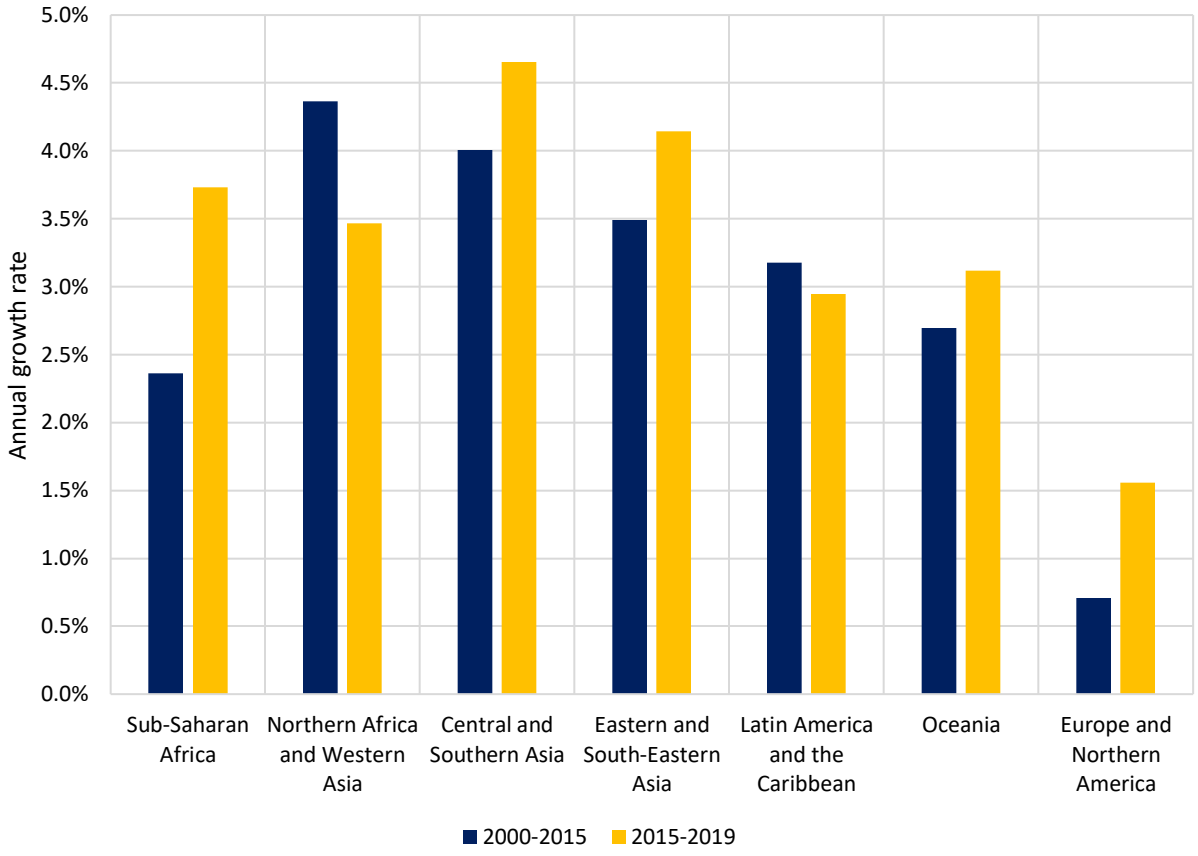
Figure 32: Mortality Rate Attributed to Transport Air Pollution



Source: ADB Asian Transport Outlook Database indicators: APH-HAT-002 (McDuffie et al. 2021) (accessed December 2021).

61. High exposures to diesel are common in the bus industry, trucking, heavy vehicle repair, mining, and railroads. The number of deaths due to occupational exposure of diesel engine exhaust continues to increase in most parts of Asia, also since the implementation of the SDGs.

Figure 33: Deaths due to Occupational Exposure to Diesel Engine Exhaust



Source: ADB Asian Transport Outlook Database indicators: APH-HAT-001 (LANCET 2019). (accessed December 2021).

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62. By adopting Euro 6/VI vehicle emission standards, countries can achieve singificant reductions in the emission of pollutants like fine particulate matter (PM2.5) and subequently reducing the related health impacts, i.e., ischemic heart disease, lung cancer, stroke, and asthma. Light-duty vehicles (3.5 tons or below) in the PRC are since January 2021 required to meet PRC 6a standards effective 1 January 2021. Effective 1 July 2021, heavy-duty vehicles also are also subject to PRC 6a standards. PRC 6b emission standards, scheduled for introduction in 2023, targets reductions of 50% for hydrocarbons, 40% for NOx, and 33% for PM over Euro 6 levels (MEE 2017). Cambodia targets “10 ppm sulphur levels in fuel by 2024, Euro 4 in 2022, and Euro 5 in 2025", according to the United Nations Environment Programme Partnership for Clean Fuels and Vehicles database (UNEP 2021b). The Malaysian government introduced the Euro-5 standards as the Malaysia Petrol Standards and Diesel Standards in April 2021 (MSJCE 2018). In Viet Nam, new assembled or imported cars need to comply with Euro 5 standards from 1 January 2022. The Ministry of Transport is requested to urgently develop a national programme to develop the means for environmentally friendly transport and public transport (Government of

Viet Nam 2015). India, in its National Clean Air Programme states as target for 2024 “20–30% reduction in particulate matter concentrations from 2017 baseline” (MOEF 2019). Thailand in its Country Report for the 11th Regional EST Forum states target for 2026 as “Euro 5 emissions standards for passenger cars by 2023 and buses and trucks” (Government of Thailand 2018).

Theme 7: Road Safety

63. The SDGs consider road safety a prerequisite to ensure healthy lives, promote well-being, and make cities inclusive, safe, resilient, and sustainable. The road safety landscape varies significantly among countries and regions. However, overall, the emerging pattern reveals—growing traffic crash fatalities in developing countries while reducing in upper-middle and high-income economies. Globally, road traffic crashes kill more than 1.35 million people every year, with over 90% of these fatalities occurring in low- and middle-income countries. The road safety related SDG related target is:

- SDG 3.6- By 2020 (2030), halve the number of global deaths and injuries from road traffic accidents (adjusted to 2030)

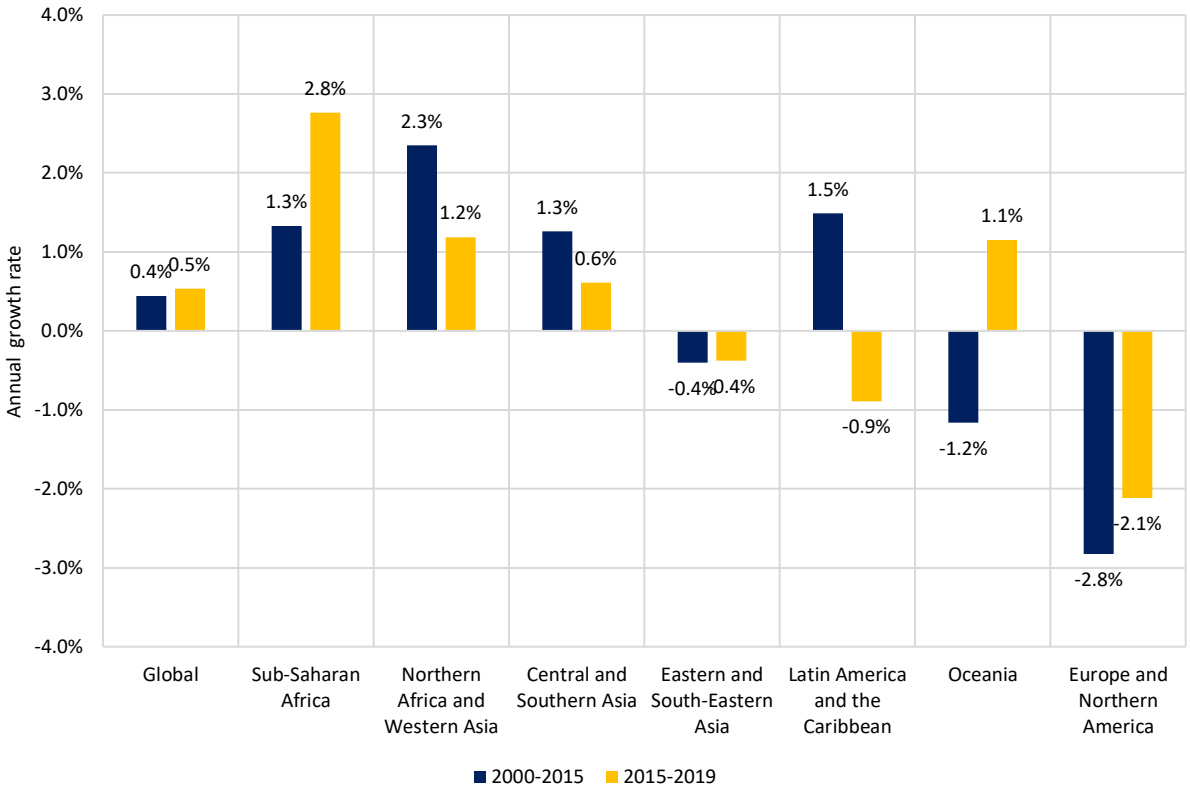
Road safety Indicators

1. Road Crash Fatalities

64. Since 2015, road traffic crashes have increased 0.7% annually globally, 0.3% in Asia and the Pacific, and declined 0.5% annually in Latin America and the Caribbean region. Asia and the Pacific region still contributes a disproportionate share of global road traffic crash fatalities, i.e., 60% of total road traffic crash fatalities: around 800,000 people killed each year in Asia due to road crashes.

65. Recognizing that countries will not meet the SDG target 3.6 by 2020, governments have proposed the 2020 Stockholm Declaration—an ambitious and forward-looking declaration building upon the Moscow Declaration of 2009 and the Brasilia Declaration of 2015. The Stockholm Declaration calls upon the member states to reduce road traffic deaths by at least 50% from 2020 to 2030.

Figure 34: Annual Growth Rate of Road Crash Fatalities

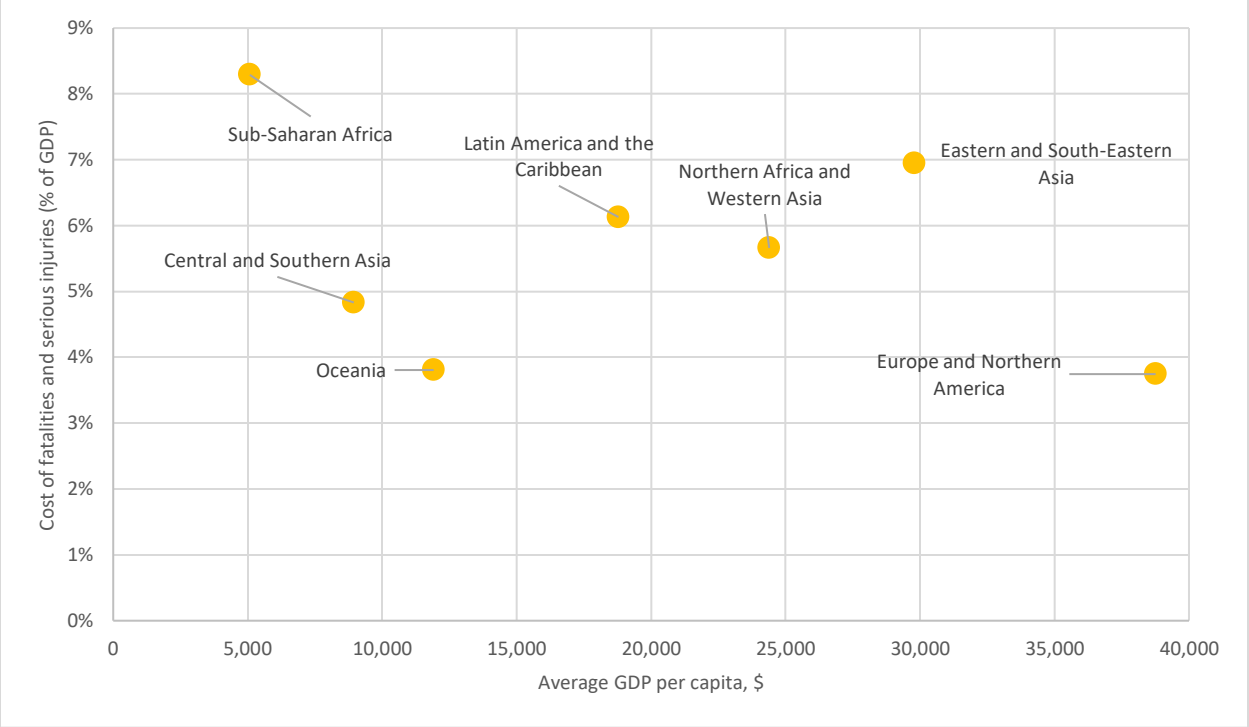


Source: ADB Asian Transport Outlook Database indicators: RSA-RSI-003 (WHO 2021a). (accessed December 2021).

2. Cost of Fatalities and Injuries as Share of Gross Domestic Product

66. Road crashes are among the 10 leading causes of death worldwide. In 2016, fatalities and serious injuries were estimated to cause economic damage of $1.7 trillion to the world economy and about $1.1 trillion in Asia. These economic impacts amount to 4%–8% of annual GDP, depending on the region. The burden of road fatalities and injuries and its impacts is very large and it is disproportionately distributed across countries and world regions.

Figure 25: Average Cost of Fatalities and Serious Injuries as a Share of GDP, 2016

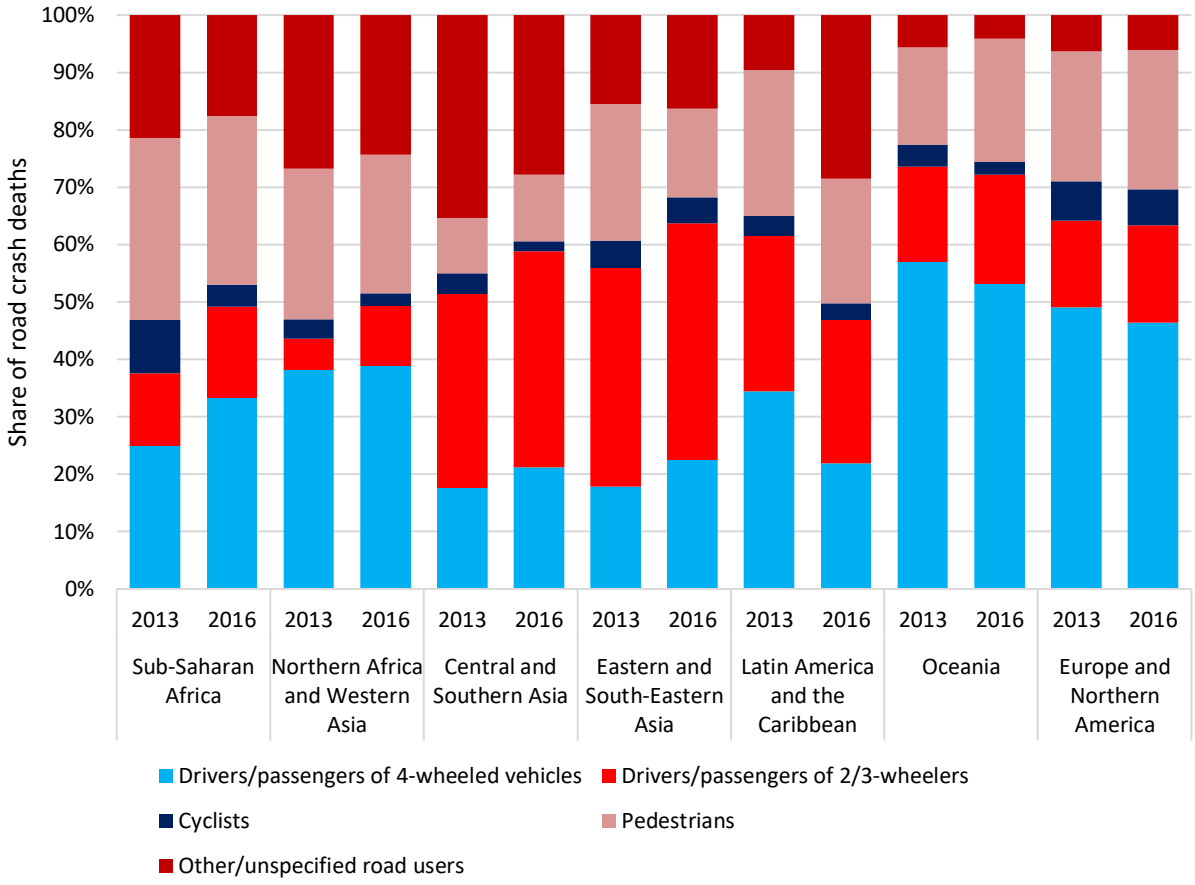


GDP = gross development product.
Source: ADB Asian Transport Outlook Database indicators: RSA-RSI-012 (World Bank 2019). (accessed December 2021).

3. Road Crash Fatalities by Road User Type in 2016 - Asia

67. The World Health Organization has estimated that more than half of all road traffic deaths in 2016 were among vulnerable road users: pedestrians, cyclists, and motorcyclists (WHO 2021b). Within Asia, pedestrians and cyclists represent 14% of all road crash related deaths, while motorized two-and three-wheelers represent 43%, car occupants up to 17% of all deaths, and the remaining 27% are unidentified road users. There is a significant difference in the types of road users mostly affected by road traffic crash fatalities in high-income and middle-income and low-income economies. The share of motorized two-and-three-wheelers stands at 43% in low-income and middle-income economies and only about 17% in high-income economies.

Figure 26: Share of Road Traffic Deaths by Road User

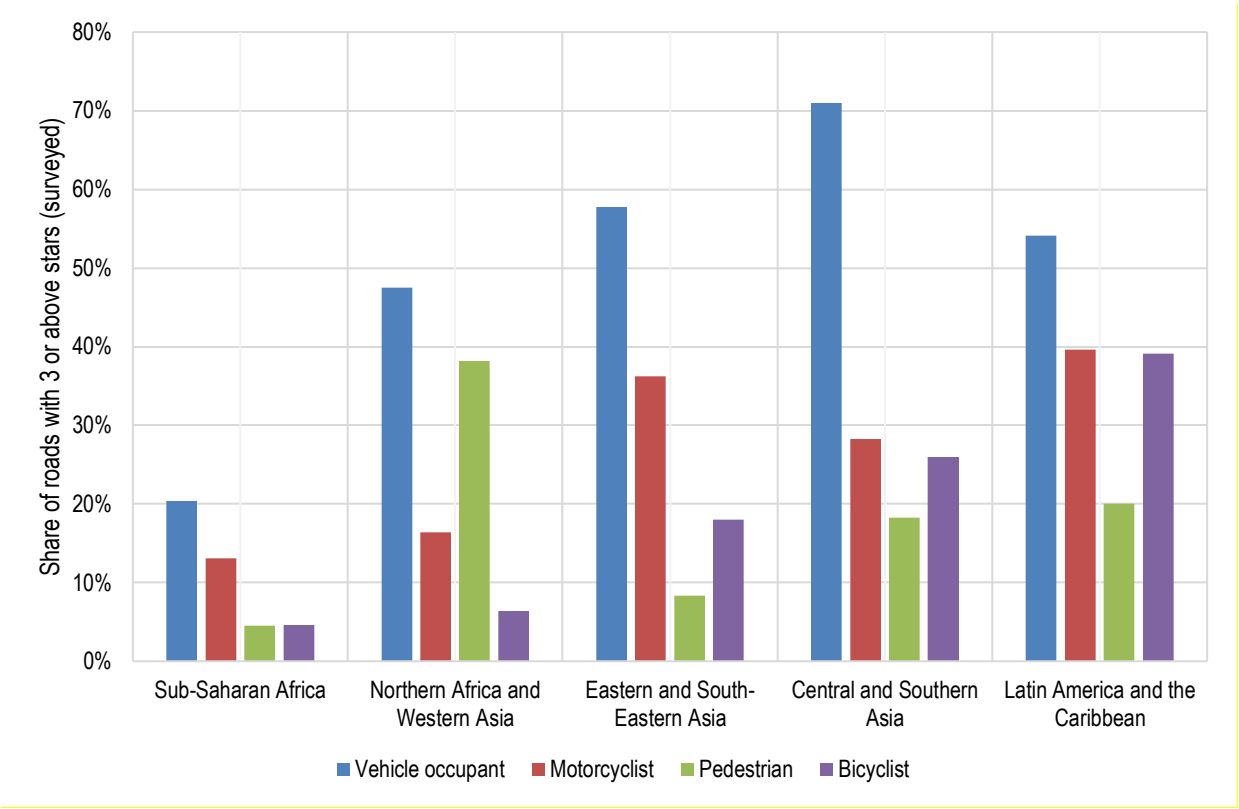


Source: ADB Asian Transport Outlook Database indicators: RSA-RSI-004 to 008 (WHO 2021c). (accessed December 2021).

4. Share of Road Infrastructure with 3 Stars or Above

68. Star ratings, derived using road inspection surveys, provide a simple measure of the level of safety provided by a road infrastructure design for vehicle occupants, motorcyclists, bicyclists, and pedestrians. The International Road Assessment Programme considers that improving the world's roads to at least a 3-star or better standard is essential for achieving the SDGs.

Figure 27: Share of National Infrastructure with 3 Stars or Higher for Each User



Source: IRAP (2020).

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69. Australia, in its Draft National Road Safety Strategy (2021–2030), targets for 2030 that "Fatalities per capita reduced by 50%; serious injury per capita reduced by 30%" (ORS 2021). Bangladesh, in its 8th Five Year Plan (2020–2025) aims to reduce by 2025 the number of fatalities due to road traffic accidents on national highways by 25% (Government of Bangladesh 2020). Brunei Darussalam, in its Road Safety Strategic Plan 2025, states the 2025 vision "Zero road accident fatalities" (NRSC 2020). The Russian Federation has a 2030 "Zero road traffic fatalities" target (Stroyinf 2018). New Zealand plans that the implementation of its Road Safety Strategy (2020–2030) will result in 750 fewer people killed and 5,600 fewer seriously injured over the next ten years (Ministry of Transport 2019). Tonga, in its Strategic Development Framework (2025), plans to equip 89% of highway, trunk, and feeder roads with safety signs (Government of Tonga 2020).

Conclusion

70. Overall It is difficult to accurately assess progress on the majority of the transport related SDG goals as they are vague and lack quantified targets. The use of phrases like "increase substantially", or "double the share" is not helpful in this regard. Also, most of the indicators indicate what needs to be measured but do not provide a desired performance level.

71. The analysis of the transport related SDG targets revealed an inherent tension between different categories of those targets. The infrastructure related transport target 9.1 and the rural and urban access related targets are likely to result in an increase of road based transport. At the moment, most Asian countries, like other developing parts of the world, have comparatively lower amounts of transport infrastructure and services than the developed world. An increase, especially in road based passenger and freight transport, will make it more difficult to realize several of the sustainability related SDG targets, such as those on air pollution, road safety, energy efficiency, and climate change.

72. With constrained progress, the transport sector in Asia could hinder achieving the sustainable development goals by 2030. Economies progressing most on the SDGs in Asia are often high-income economies that already have more comprehensive sustainable transport infrastructure, services, and policy frameworks in place. In contrast, those with the lowest progress have inadequate transport systems and services with more limited policy instruments. However, several good examples exist where economies have managed to reverse their regressing trends on some goals and targets and made significant progress.

73. Overall, we find the following progress in Asia: solid gains on some goals and evidence of favorable trends, and significant work remains for several of the transport related SDG targets:

- Good progress on SDG goals related to energy efficiency, information and communications technology, fossil-fuel subsidies and PPP projects.

- Initial momentum building on SDG goals related to air pollution, renewable energy, economic growth, employment, resource-use efficiency, climate resilience, climate change. countries now need to redouble efforts on these goals.

- Minimal progress on SDG goals related to road safety, urban and rural access (considering the ambitions). 800,000 people are still being killed annually in fatal road crashes, 560 million people lack proper rural access and 1.3 billion urban dwellers lack access to proper public transport.

74. The very large deficiency in access indicates that countries as well as development agencies cannot ignore the development of transport infrastructure and services. While climate change is increasingly dominating the development discussion, including in the transport sector, the priority for many of the economies in Asia and the Pacific is still the creation of transport

infrastructure and services, rather than the sustainability of the transport sector. In the developed world, where transport sectors are more or less mature, it is justified to focus now more exclusively on strengthening sustainability.

75. This analysis had a specific focus on Asia and the Pacific but it is clear that several of the trends observed for this region also apply to other developing regions in the world and in some cases also to the developed world.

76. While transport sector challenges are interrelated, we find significant heterogeneity in transport sector performance along three sustainability dimensions, across sub-regions, between urban and rural areas, and across modes, resulting in uneven progress.

77. COVID-19, an unprecedented crisis, presents both an enormous challenge and immense opportunities for reaching the 2030 SDG goals. Sustainable transport policies have slowly built up over the last decades. The Millennium Development Goals, in part because of a lack of sectoral focus, did not have a major impact on sustainable transport policies. The intersection of SDGs (with increased sectoral focus), the Paris Agreement and the COVID-19 crisis could create a tipping point for the transport sector in which policies and investments over the next years can pave the transport sector path towards the 2030 SDGs.

Table *2*: Regional Summary Stating Progress in Achieving the SDGs

SDG Goals/Targets	Transport Sector Objective	Asia (ATO)
SDG 3.6	Road Safety	
SDG 3.9, SDG 11.6	Air Pollution	
SDG 7.2	Renewable Energy	
SDG 7.3	Energy Efficiency	
SDG 8.1	Economic Growth	
SDG 8.5	Employment	
SDG 9.1	Equitable Access	
SDG 9.4	Resource-use Efficiency	
SDG 9.c	Information and Communications Technology	
SDG11.2	Urban Public Transport	
SDG 1.5, SDG 11.5, SDG 13.1	Climate Resilience	
SDG 12.c	Fossil-fuel Subsidies	
SDG 13.a	Climate Finance	
SDG 13.2	Climate Change	
SDG 17.17	PPPs	

	Good progress indicating SDG goal is on track to being achieved
	Good momentum building on SDG goals. Progress has been made but is insufficient to meet the objectives of SDG goals. Countries need to redouble efforts on these goals.
	Minimal progress or no progress. Urgent change is required in direction and speed of transition.

ATO = Asian Transport Outlook.

Source: Authors.

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Annex: UN Regional Breakdown

Sub-Saharan Africa	Northern Africa and Western Asia	Central and South Asia	Eastern and South-Eastern Asia	Latin America and the Caribbean	Oceania	Europe and North America
British Indian Ocean Territory	Algeria	Kazakhstan	China	Anguilla	Australia	Belarus
Burundi	Egypt	Kyrgyzstan	Hong Kong, China	Antigua and Barbuda	Christmas Island	Bulgaria
Comoros	Libya	Tajikistan	Taipei,China	Aruba	Cocos (Keeling) Islands	Czechia
Djibouti	Morocco	Turkmenistan	China, Macao Special Administrative Region	Bahamas	Heard Island and McDonald Islands	Hungary
Eritrea	Sudan	Uzbekistan	Democratic People's Republic of Korea	Barbados	New Zealand	Poland
Ethiopia	Tunisia	Afghanistan	Japan	Bonaire, Sint Eustatius and Saba	Norfolk Island	Republic of Moldova
French Southern Territories	Western Sahara	Bangladesh	Mongolia	British Virgin Islands	Fiji	Romania
Kenya	Armenia	Bhutan	Republic of Korea	Cayman Islands	New Caledonia	Russian Federation
Madagascar	Azerbaijan	India	Brunei Darussalam	Cuba	Papua New Guinea	Slovakia
Malawi	Bahrain	Iran (Islamic Republic of)	Cambodia	Curaçao	Solomon Islands	Ukraine
Mauritius	Cyprus	Maldives	Indonesia	Dominica	Vanuatu	Åland Islands
Mayotte	Georgia	Nepal	Lao People's Democratic Republic	Dominican Republic	Guam	Guernsey
Mozambique	Iraq	Pakistan	Malaysia	Grenada	Kiribati	Jersey
Réunion	Israel	Sri Lanka	Myanmar	Guadeloupe	Marshall Islands	Sark
Rwanda	Jordan		Philippines	Haiti	Micronesia (Federated States of)	Denmark
Seychelles	Kuwait		Singapore	Jamaica	Nauru	Estonia
Somalia	Lebanon		Thailand	Martinique	Northern Mariana Islands	Faroe Islands
South Sudan	Oman		Timor-Leste	Montserrat	Palau	Finland
Uganda	Qatar		Viet Nam	Puerto Rico	United States Minor Outlying Islands	Iceland
United Republic of Tanzania	Saudi Arabia			Saint Barthélemy	American Samoa	Ireland
Zambia	State of Palestine			Saint Kitts and Nevis	Cook Islands	Isle of Man
Zimbabwe	Syrian Arab Republic			Saint Lucia	French Polynesia	Latvia
Angola	Turkey			Saint Martin (French Part)	Niue	Lithuania
Cameroon	United Arab Emirates			Saint Vincent and the Grenadines	Pitcairn	Norway
Central African Republic	Yemen			Sint Maarten (Dutch part)	Samoa	Svalbard and Jan Mayen Islands
Chad				Trinidad and Tobago	Tokelau	Sweden
Congo				Turks and Caicos Islands	Tonga	United Kingdom of Great Britain and Northern Ireland
Democratic Republic of the Congo				United States Virgin Islands	Tuvalu	Albania
Equatorial Guinea				Belize	Wallis and Futuna Islands	Andorra
Gabon				Costa Rica		Bosnia and Herzegovina
Sao Tome and Principe				El Salvador		Croatia
Botswana				Guatemala		Gibraltar
Eswatini				Honduras		Greece
Lesotho				Mexico		Holy See
Namibia				Nicaragua		Italy
South Africa				Panama		Malta
Benin				Argentina		Montenegro
Burkina Faso				Bolivia (Plurinational State of)		North Macedonia
Cabo Verde				Bouvet Island		Portugal

Sub-Saharan Africa	Northern Africa and Western Asia	Central and South Asia	Eastern and South-Eastern Asia	Latin America and the Caribbean	Oceania	Europe and North America
Côte d'Ivoire				Brazil		San Marino
Gambia				Chile		Serbia
Ghana				Colombia		Slovenia
Guinea				Ecuador		Spain
Guinea-Bissau				Falkland Islands (Malvinas)		Austria
Liberia				French Guiana		Belgium
Mali				Guyana		France
Mauritania				Paraguay		Germany
Niger				Peru		Liechtenstein
Nigeria				South Georgia and the South Sandwich Islands		Luxembourg
Saint Helena				Suriname		Monaco
Senegal				Uruguay		Netherlands
Sierra Leone				Venezuela (Bolivarian Republic of)		Switzerland
Togo						Bermuda
						Canada
						Greenland
						Saint Pierre and Miquelon
						United States of America

Source: UNstats (2021). https://unstats.un.org/unsd/methodology/m49/.