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Regional Trends in Transport Demand and Emissions, and Policy Developments

SLOCAT Partnership on Sustainable, Low Carbon Transport

Transport, Climate and Sustainability
Global Status Report - 3rd edition

Contents

MODULE 2 2.1

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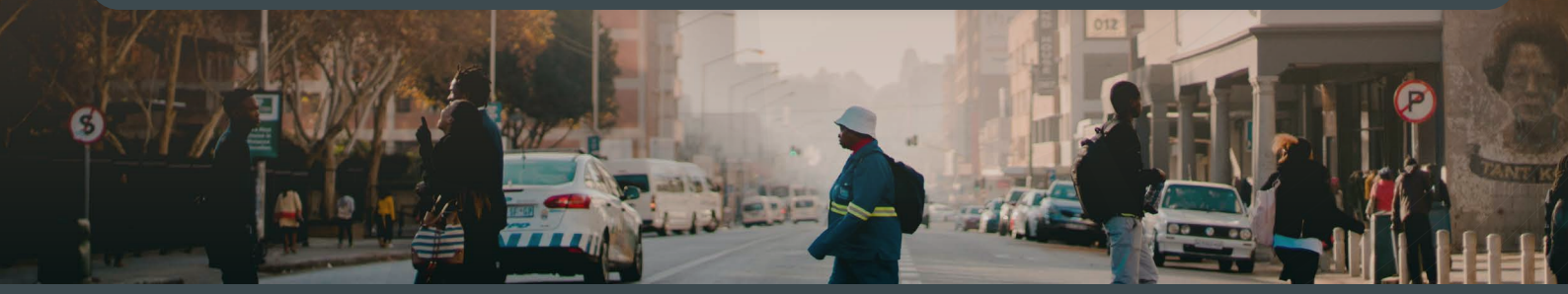
Africa Regional Overview

Demographics

Population size:	Population growth:	Urban population share:	Urban population growth:	GDP per capita:	GDP growth:
1,409 million	+35%	47%	+44%	USD 1,956	+33%
(2022)	(2010-2020)	(2022)	(2010-2022)	(2021)	(2010-2021)

Source: See endnote 1 for this section.



SLOCAT Partnership on Sustainable, Low Carbon Transport

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Key findings

Demand trends

- The motorisation rate in Africa (covering four-wheeled motorised vehicles) is the lowest globally, at 43 vehicles per 1,000 people during the 2016-2020 period, compared to a global average of 197 vehicles per 1,000 people.
- Africa accounts for less than 1% of global vehicle production and is highly dependent on used vehicles. In most African countries, used light-duty vehicles comprise 85-100% of the total fleet. Between 2015 and 2018, Africa imported the largest share of used light-duty vehicles among world regions, at 40%.
- In 2022, people in Africa spent an average of 56 minutes per day walking or cycling for transport, compared to the global average of 43.9 minutes per day. Low-income households are most dependent on walking and cycling, and their urban transport expenditures represent up to 20% of the household income (10% in smaller cities)
- As many as 95% of Africa's roads fail to provide an acceptable level of service for pedestrians, and 93% fail to provide an acceptable level of service for cyclists. More than half (53%) of the population is considered "vulnerable" road users (pedestrians, bicyclists and motorcyclists), a share that is 1.5 times above the global average of 26%.
- Access to public transport in Africa is limited. In 2020, only 31.7% of the population was able to access either formal or informal public transport within a walking distance of 500-1,000 metres, well below the global average of 56%.
- At least 105 million people in African cities did not have reliable information on their collective transport systems as of 2021. This makes it difficult to achieve target 11.2 of Sustainable Development Goal (SDG) 11, aimed at ensuring that all citizens have access to safe, affordable, accessible and sustainable transport systems by 2030. In various cities across the region, informal transport accounts for between 40% and 98% of trips by public or shared transport.
- Roads are the predominant mode of transport in Africa, carrying at least 80% of goods and around 90% of passengers. Limited rail transport and the high costs of air transport leave road transport as the only practicable alternative for freight in most countries in Sub-Saharan Africa.

Emission trends

- Africa contributed the lowest share of global greenhouse gas emissions (3.9%) among world regions in 2022, despite being home to 18% of the world's population. At the same time, the region is most vulnerable to the effects of climate change and is already experiencing high temperature increases.
- Between 2020 and 2021, due to COVID-19 travel restrictions, Africa's economy-wide carbon dioxide (CO_2) emissions fell 7.4%, and transport CO_2 emissions fell 11%.
- Transport contributed nearly one-quarter (24%) of total CO_2 emissions in Africa in 2021. The region's transport CO_2 emissions increased 34% between 2010 and 2021, the second highest regional growth rate after Asia (36%).
- However, Africa's per capita transport CO_2 emissions are 3.4 times below the global average of 0.85 tonnes.

Policy developments

- The African Road Safety Action Plan, the region's framework to implement the United Nations (UN) Road Safety Decade 2021-2030 and SDGs 3 and 11, recognises the dearth of road safety data in Africa and has requested the UN Economic Commission for Africa, the African Union Commission and the African Development Bank to develop mechanisms to strengthen data collection for effective policy intervention and analysis.
- In African cities, many residents depend on walking and cycling as their primary means of transport. As of 2019, around 59% of people walking and cycling in Africa were supported by a walking and cycling policy, either stand-alone or as part of an integrated transport strategy.
- To address challenges related to safety and the quality of service, initiatives have emerged to consolidate public transport operations.

- Bus rapid transit (BRT) corridors and/or systems have been implemented or are being developed in Addis Ababa (Ethiopia), Cairo (Egypt), Dar es Salaam (Tanzania), Lagos (Nigeria), Nairobi (Kenya) and the cities of Cape Town, George, Johannesburg and Pretoria in South Africa.
- The electric mobility landscape is evolving rapidly, pushed by the need to decarbonise economies by 2050. Several African governments have put in place policies and regulatory measures for the adoption and transition to e-mobility.
- Rapidly rising urbanisation and motorisation rates have prompted an urgent response to Africa's growing transport needs, including through the development of sustainable urban mobility plans (SUMPs) and national urban mobility plans (NUMPs).
- As of the end of 2022, Africa accounted for 43% of the countries that included time-bound targets for reducing transport greenhouse gas emissions in their second-generation Nationally Determined Contributions (NDCs) under the Paris Agreement (10 out of 23 countries).

Overview

The Africa region comprises 54 countries[i] spanning from Northern Africa to Sub-Saharan Africa. Transport is key for promoting sustainable economic growth in the region and for addressing a complex set of challenges related to climate change and the demand for mobility. The United Nations (UN) 2030 Agenda for Sustainable Development recognises the importance of transport in achieving a sustainable future for all regions, through direct, indirect and cross-cutting targets that bear a direct link to green, equitable, healthy, safe and resilient mobility. For Africa specifically, Agenda 2063, released in 2013, is the blueprint to transform the region into a global powerhouse by delivering sustainable and inclusive development.[2]

The main challenges facing the transport sector in Africa include a lack of integrated planning across various transport modes, insufficient data on public transport systems, poor transport infrastructure and access, and the highest road fatality rates globally. Most African cities rely on some form of informal or semi-formal transport, which is dominated by fragmented, privately operated services.

Transport activity and transport energy demand in Africa are expected to increase significantly, alongside high rates of both urbanisation and motorisation. By 2050, around 60% of the region's population is projected to live in urban areas, with unprecedented numbers also living in peri-urban and rural areas.[3] To address the ever-increasing demand for mobility, there is a growing need for greener, more equitable, healthier, safer and more transport systems. This need has been made glaringly clear by the mobility challenges posed by the COVID-19 pandemic and by the Russian Federation's war in Ukraine.[4]

For many decades, transport investments in Africa have been skewed towards motorised transport infrastructure. However, several countries in the region, with the support of development agencies, have committed to improving the landscape of active mobility and formal public transport, through financing and the development and implementation of new and existing policies and strategies.[5]

Demand trends

Transport is essential for addressing the rising demand for mobility in Africa. The region is the world's least urbanised, yet it has the highest rate of urbanisation globally, at 3.5% per year.[6] The continent's urban population share is projected to grow from 47% in 2022 to 60% in 2050.[7] By 2050, African cities are projected to be home to an additional 300 million urban residents, of which the vast majority are expected to rely on walking, cycling and public transport for their daily journeys.[8]

The motorisation rate in Africa (covering four-wheeled motorised vehicles) is the lowest globally, at 43 vehicles per 1,000 people during the 2016-2020 period, compared to a global average of 197 vehicles per 1,000 people (see Figure 1).[9] In addition, 21.3 million motorcycles are in use in Africa.[10] In Burkina Faso and Mauritius, more than 100 motorcycles per 1,000 people were in use in 2020.[11]

Motorisation rates in Africa increased 32% on average between 2015 and 2020.[12] Rising vehicle ownership reflects the desire of Africa's expanding populations to become mobile and to gain access to more economic activities as levels of real income increase and economies develop.[13] The continent's electric mobility (e-mobility) ecosystem also has expanded, with South Africa and Uganda providing good examples of the potential of this emerging vehicle industry.[14]

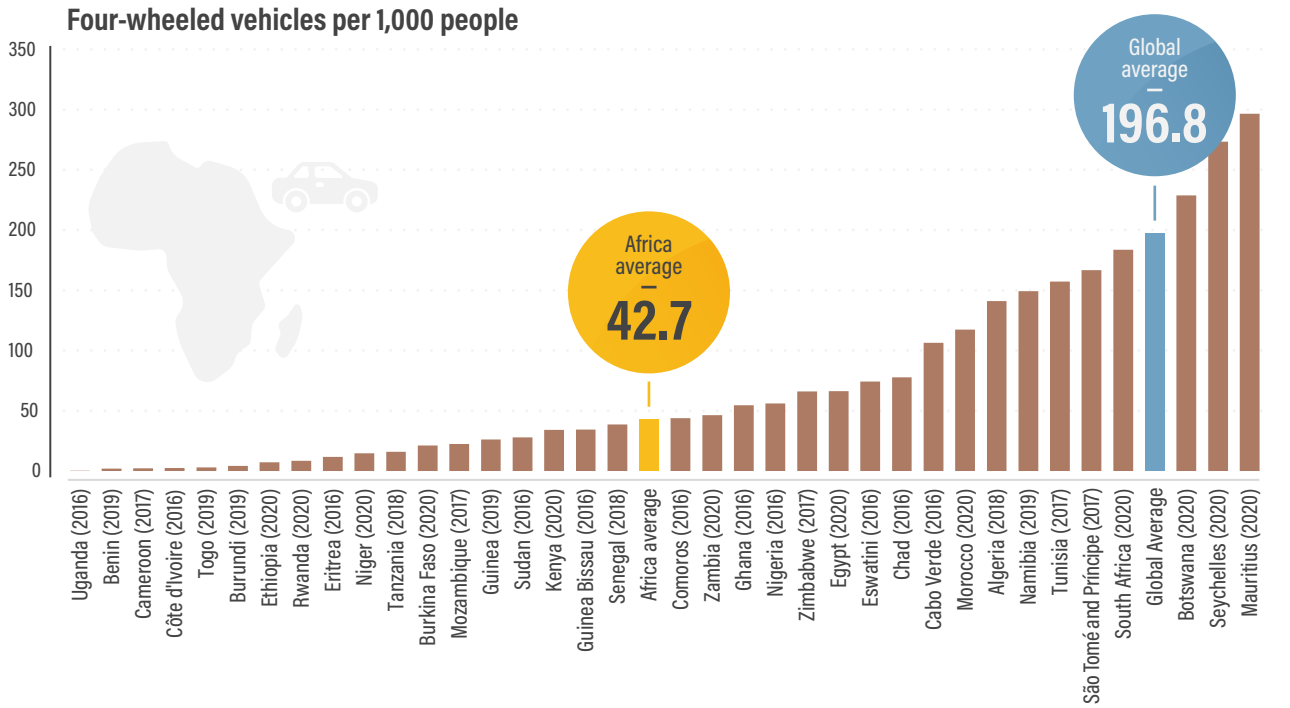
With the onset of the COVID-19 pandemic, most African cities experienced reductions in the supply of both formal and informal transport. In April and May 2020, several cities reduced their public transport passenger capacities by up to half, including Abidjan (Côte d'Ivoire), Accra (Ghana), Addis Ababa (Ethiopia), Cape Town (South Africa), Dakar (Senegal), Douala (Cameroon) and Nairobi (Kenya).[15]

Africa is regarded as the final frontier of automotive growth, largely because it is the second most populous continent, has the world's lowest motorisation rate and **accounts for less than 1% of global vehicle production**.[16] Outside of South Africa and Morocco, vehicle manufacturing is minimal.[17] Multinational vehicle manufacturers have begun setting up production plants in Angola, Ethiopia, Ghana, Kenya, Namibia, Nigeria and Rwanda.[18]

i The countries covered are Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, São Tomé and Príncipe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Togo, Tunisia, Uganda, United Republic of Tanzania, Zambia and Zimbabwe.

FIGURE 1. Motorisation rates per 1,000 people in Africa, 2016-2020

Source: See endnote 9 for this section.



- Sales of new light-duty vehicles in Africa have started to recover from the pandemic, with the number of units sold increasing 32% in 2021 (1,131,249 units) compared to 2020 (856,113 units).[19] However, sales of the vehicles in 2021 were still below 2019 levels (1,150,842 units).[20]
- In Sub-Saharan Africa, sales of new light-duty vehicles increased 15% in 2021 but were still down 10% compared to 2019 volumes.[21]
- Egypt, Morocco and Tunisia all increased their sales of new light-duty vehicles in 2021, compared to 2020 and 2019; however, other North African countries showed declines in sales volumes.[22]
- Sales of new commercial vehicles in Africa increased 3% in 2021 to reach 311,990, up from 302,000 vehicles sold in 2019.[23]

Africa is highly dependent on used vehicles. In most African countries, used light-duty vehicles comprise 85-100% of the total fleet.[24] The three largest exporters of these vehicles – the European Union (EU), Japan and the United States – exported 14 million used light-duty vehicles worldwide **between 2015 and 2018, with Africa importing the largest share among world regions, at 40%.**[25]

- On average, 60% of all annual vehicle registrations in Africa are for used light-duty vehicles.[26]
- More than 95% of additions to Kenya's growing fleet of light-duty vehicles are imported used vehicles, mostly from Japan.[27]
- In East Africa, fleets of used light-duty vehicles are much older in Rwanda (which has no age limit for used vehicle imports) and in Uganda (which has a 15-year age limit on used vehicles) than in Kenya, which imposed an age limit of 8 years on used vehicle imports.[28]
- The Netherlands exported 35,000 light-duty vehicles to West Africa during 2017-2018, most of which (80%) were between 16 and 20 years old and fell below the Euro 4[ii] vehicle emission standard.[29]
- Morocco has implemented Euro 4 emission standards, and Ghana has established age and fiscal policies to ensure that all imported light-duty vehicles meet Euro 4 standards.[30]
- In 2021, Mauritius introduced a set of policies and fiscal incentives to improve the quality of used vehicles; these include allowing used vehicles no older than three years, developing a CO_2-based vehicle taxation scheme, and creating an inspection and verification scheme for used vehicles.[31]

ii The Euro 4 emission standard was introduced on all new cars from January 2005 and all newly registered cars from January 2006. To pass the Euro 4 standard, petrol cars had to emit no more than 1.0 grams per kilometre (g/km) of carbon monoxide, no more than 0.10 g/km of total hydrocarbon and no more than 0.08 g/km of nitrogen oxides.

- In 2022, the East Africa sub-region adopted Euro 4/IV equivalent vehicle emission standards.[32]
- The Economic Community of West African States (ECOWAS) adopted and implemented cleaner fuels and vehicles standards in 2021.[33]

In Africa, up to 78% of people walk for transport purposes every day.[34] **In 2022, people in Africa spent an average of 56 minutes per day walking or cycling for transport, compared to the global average of 43.9 minutes per day.**[35] Low-income households are most dependent on walking and cycling, and their **urban transport expenditures represent up to 20% of the household income (10% in smaller cities).**[36] **Improving the mobility options of the urban poor is seen as key to their economic uplifting.**

- In Kinshasa (Democratic Republic of the Congo) and Dar es Salaam (Tanzania), walking accounts for two-thirds of total trips.[37]
- In Kenya's major cities, people use walking and cycling for a high share of daily trips, including 53% in Kisumu, 45% in Mombasa and 40% in Nairobi.[38] Across Kenya, an additional 41% of trips by *matatu* (privately owned mini-buses used as shared taxis) start and end with a walking journey.[39] In the country's rural areas, more than 90% of trips are by foot and 4% are by bicycle.[40]
- People in Niger spent on average 141.6 minutes per day walking and cycling for transport in 2022.[41]

Africa has the world's highest rate of fatalities related to road traffic, at 26.6 deaths per 100,000 people in 2016, compared to a global average of 17 deaths per 100,000 people.[42] This is despite having the lowest motorisation rate and being host to only 3% of all registered vehicles globally.[43] **As many as 95% of Africa's roads fail to provide an acceptable level of service for pedestrians, and 93% fail to provide an acceptable level of service for cyclists.**[44] An estimated 260,000 people were killed on African roads in 2019, **with 53% of this population considered "vulnerable" road users (40% pedestrians, 4% cyclists and 9% people using motorised two- and three-wheelers).** This share is 1.5 times above the global average of 26%.[45]

- On average, 261 pedestrians and 18 cyclists are killed every day in African cities.[46]
- Road traffic deaths due to drinking and driving account for the majority of road fatalities in Lesotho (60%) and South Africa (58%).[47]
- In 2016, the total cost of road crash fatalities and serious injuries in Africa was an estimated 9% of the continent's gross domestic product (GDP), the highest share among regions globally.[48]
- Fewer than 18% of African countries monitor key road safety performance indicators, such as helmet and seatbelt use.[49]
- Around 40% or more of African countries have not taken significant action to establish road safety data management systems.[50]
- African countries recorded significant reductions in road fatalities in 2020 due to COVID-19 lockdown measures – including in South Africa (78% fewer deaths), Morocco (65%) and Namibia (60%).[51]

Access to public transport in Africa is limited. In 2020, only 31.7% of the population was able to access either formal or informal public transport within a walking distance of 500-1,000 metres, well below the global average of 56%.[52] Public transport in African cities relies heavily on informal transport and in particular on the "target" system of operating. This involves the use of public transport (buses, mini-buses and ride-hailing services, mostly in Southern Africa) as well as taxi services (motorcycle taxis and tuk-tuks, mostly in East, West and Central Africa) operated by informal businesses.[53]

At least 105 million people living in African cities did not have reliable information on their collective transport systems as of 2021.[54] **This makes it difficult to achieve target 11.2 of Sustainable Development Goal 11, aimed at ensuring that all citizens have access to safe, affordable, accessible and sustainable transport systems by 2030.**[55] **In various cities across the region, informal transport accounts for between 40% and 98% of trips by public or shared transport.**[56]

- As of 2022, 15 African cities had mapped their public transport and mini-bus taxi networks in a standardised and open format (General Transit Feed Specification, or GTFS).[57]
- In South Africa's Gauteng Province (covering Ekurhuleni, Johannesburg and Tshwane), 70% of all trips were made using informal transport in 2007.[58]
- Motorcycle taxis were present in around 60% of cities in Africa as of 2016.[59]
- As of 2016, the share of cities with motorcycle taxis was 25% in Southern Africa, 46% in East Africa, 69% in West Africa and 74% in Central Africa.[60]
- In 2016, motorcycles and three-wheelers made up 59% of the total fleet in Uganda, 37% in Kenya, 34% in Tanzania and 23% in Ghana.[61]
- In Addis Ababa (Ethiopia), three-wheeler taxis (*bajaj*) transported an estimated 635,000 people per day in 2018.[62]

During the first year of the COVID-19 pandemic (2020), the number of public transport trips taken in African cities fell 40% on average compared to pre-COVID levels in 2019.[63] These reductions in public transport contributed to mobility disruptions, a decline in the supply of public transport, and to some extent a shift towards walking and cycling.[64]

- In Abidjan (Côte d'Ivoire), public transport ridership fell an estimated 50% at the peak of COVID-19 restrictions.[65]
- In South Africa and Zimbabwe, the number of trips declined 80% in 2020 due to COVID-19 restrictions.[66]
- Tanzania and Zambia experienced around 20% reductions in all trips during 2020.[67]
- Most African cities increased public transport fares in response to the pandemic: towns in Namibia increased fares 15%, while some routes in Johannesburg (South Africa) increased fares 10-25% due to reduced capacity (lockdown measures).[68]

Freight transport in Africa faces a multitude of infrastructure and social challenges. The African Continental Free Trade Area (AfCTA) agreement, which came into force in 2019, is projected to increase intra-Africa trade demand 28%, leading to the additional need by 2030 for 2 million trucks, 100,000 rail wagons, 250 aircraft and more than 100 vessels.[69] The region faces low inter-regional and intra-African trade, poor inland road quality, inadequate port and rail capacity, and slow development in transport technologies – all of which have been exacerbated by the pandemic and by the Russian Federation's war in Ukraine.[70]

- In 2020, transport costs along the Northern Corridor freight route from Mombasa to Kampala increased 48% due to pandemic-related delays.[71]
- Border-crossing times increased from less than 24 hours in the first quarter of 2020 (pre-pandemic), to more than five or six days during the pandemic.[72]
- In 2022, South Africa ranked highest in Africa on the Freight and Logistics Performance Index, due to the country's efficient, well-integrated and intermodal transport system.[73]
- The Liner Shipping Connectivity Index value for Africa declined from 18 in 2020 to 17.6 in 2021, as shipping lines and carriers re-assigned ships to Asia and North America due to port congestion and COVID-19 related restrictions on workforces.[74]

Roads are the predominant mode of transport in Africa, carrying at least 80% of goods and around 90% of passengers.[75] Limited rail transport and the high costs of air transport leave road transport as the only practicable alternative for freight in most countries in Sub-Saharan Africa. The immense pressure on road networks, coupled with poor maintenance cultures, has resulted in sub-standard road conditions across the region.[76]

- Cameroon has 10 times more unpaved roads (50,000 kilometres total) than paved roads (5,000 kilometres); the country's roads are poorly maintained, with routes unpassable during the rainy season, leading to high transport costs and to long delays of freight goods due to truck diversions.[77]
- In Ghana, more than 97% of passenger and freight transport is by road.[78]

The Russian Federation's war in Ukraine has had major short- and long-term implications for the transport landscape in Africa.[79] The conflict occurred at a time when African countries were still struggling to recover from the destabilising effects of the COVID-19 pandemic.[80]

- In 2022, transport costs doubled in some African countries, such as Namibia, Nigeria and South Africa.[81] This was due to a global mismatch in supply and demand in shipping, port and inland capacity caused by pandemic-related declines and the subsequent rapid recovery in trade volumes.[82]

Emission trends

Africa contributed the lowest share of global greenhouse gas emissions (3.9%) among world regions in 2021, despite being home to 18% of the world's population.[83] At the same time, the region is the most vulnerable to the effects of climate change and is already experiencing high temperature increases.[84]

Although Africa has the world's lowest motorisation rate, the region's emissions of particulate matter 2.5 (released mainly from road transport and power generation) averaged 97.4 micrograms per cubic metre in 2019, above the world average of 82.3 micrograms per cubic metre.[85] **Between 2020 and 2021, due to COVID-19-related travel restrictions, Africa's economy-wide CO_2 emissions fell 7.4% and transport CO_2 emissions fell 11%.**[86] However, the region's emissions returned to near pre-pandemic levels in 2021.[87]

Regional CO_2 trends

Total transport CO_2 emissions (2021):
348.4 million tonnes

Share of global transport CO_2 emissions (excluding international aviation and shipping) **(2021):**
5.4%

Per capita transport CO_2 emissions (2021):
0.25 tonnes

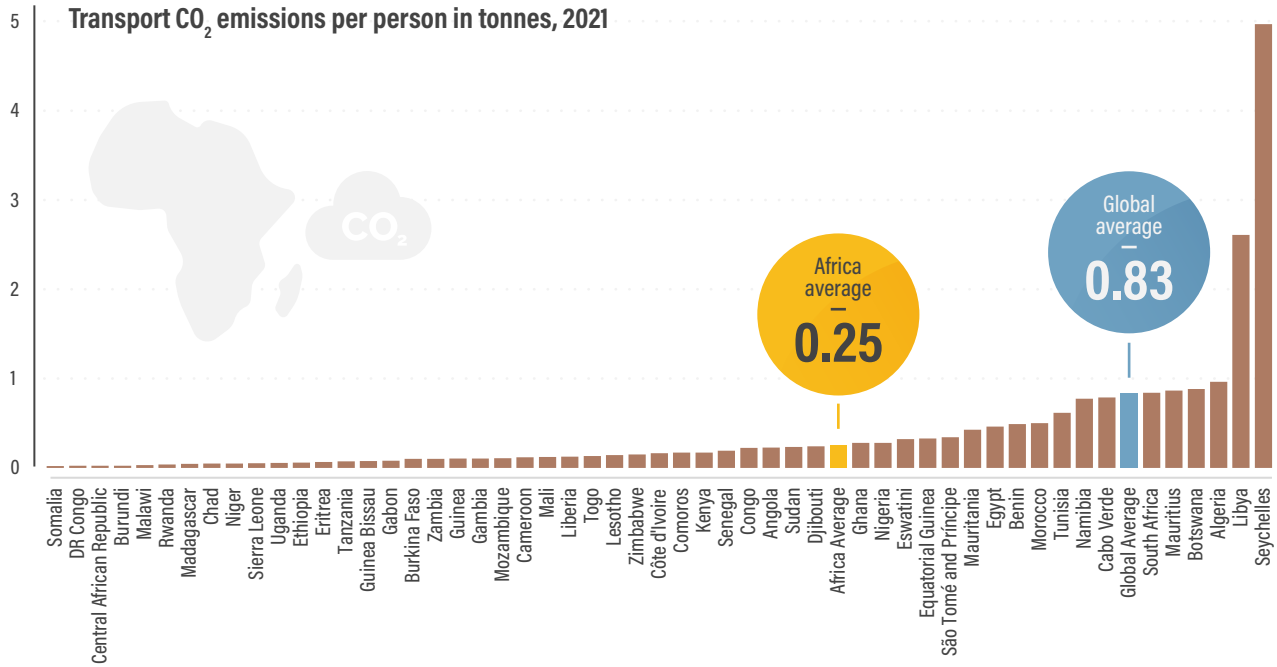
Transport CO_2 emissions per USD 10,000 GDP (2021):
1.29 tonnes

Source: See endnote 88 for this section.

Transport contributed nearly one-quarter (24%) of total CO_2 emissions in Africa in 2021.[89] The region's transport CO_2 emissions increased 34% between 2010 and 2021, the second highest regional growth rate after Asia (36%).[90] In 2021, around one-third of African countries reported per capita transport CO_2 emissions that were above the regional average (see Figure 2).[91] **However, the region's per capita transport CO_2 emissions overall are 3.4 times below the global average of 0.85 tonnes per capita.**[92] Africa's

FIGURE 2. Per capita transport CO_2 emissions in Africa, 2021

Source: See endnote 91 for this section.



transport emissions relative to economic output were the highest among world regions in 2021, at 1.29 tonnes of CO_2 per USD 10,000.[93]

- Nigeria has the highest transport CO_2 emissions in Africa (59.3 million tonnes of CO_2), even though South Africa has a higher motorisation rate and a larger vehicle fleet (12,027,860 units, compared to 11,760,871 units in Nigeria).[94] This is due mainly to Nigeria's lower-performing vehicle emission technologies.
- Around 26% of Egypt's vehicle fleet of 10,695,694 units is more than 27 years old, and 25% of the fleet is between 17 and 26 years old, resulting in lower combustion efficiency and high emissions.[95]
- Chad, Niger and the Central African Republic have some of the lowest CO_2 emissions per capita, measuring one-tenth below the regional average.[96]

Policy developments

Several countries in Africa have recognised that addressing the spiralling epidemic of road fatalities and serious injuries will require implementing effective road safety policies and action plans, with time-bound targets. **The African Road Safety Action Plan, the region's framework to implement the UN Road Safety Decade 2021-2030 and SDGs 3 and 11, recognises the dearth of road safety data in Africa and has requested the UN Economic Commission for Africa, the African Union Commission and the African Development Bank to develop mechanisms to strengthen data collection for effective policy intervention and analysis.**[97]

- In 2021, Namibia developed the 2nd Road Safety Decade of Action Strategic Plan for the period 2021-2030, which aims to reduce and eliminate latent gaps in the components of a safe road system.[98]
- Kampala (Uganda) developed and launched a Road Safety Strategy in 2021, which is aligned with target 3.6 of the SDGs to halve the number of fatalities and injuries from road crashes by 2023.[99]
- Since 2015, the World Resources Institute has worked with city governments in Accra and Kumasi (Ghana), Addis Ababa (Ethiopia) and Kampala (Uganda) to develop comprehensive speed management plans to reduce traffic speeds through evidence-based policy improvements.[100]
- Addis Ababa (Ethiopia) received the Vision Zero for Youth Award in 2021 for its efforts to prioritise pedestrians and safer speeds and to embrace the Safe System approach.[101]

Globally, disruptions related to the COVID-19 pandemic altered perceptions on the value of walking and cycling.[102] However, data for 2020 indicate that people in African cities changed

their mobility habits less than in other global regions, in part because walking (and to a much lesser extent cycling) is already the primary and dominant mode of transport across Africa.[103] Despite this, urban space in Africa is disproportionally allocated to the movement of motorised transport.

The pandemic underscored the need for improved walking and cycling infrastructure across Africa. The region is increasingly developing, adopting and implementing active mobility policies that advocate for safe, comfortable and convenient active transport. Such commitments to walking and cycling are expected to support the SDGs by reducing fatalities and improving well-being (SDG 3), leading to equitable mobility systems (SDG 10), improving infrastructure resilience (SDG 11), and reducing emissions and improving air quality (SDG 13).[104]

In African cities, many residents depend on walking and cycling as their primary means of transport. As of 2019, around 59% of people walking and cycling in Africa were supported by an active mobility policy, either stand-alone or as part of an integrated transport strategy.[105]

- Around 35% of countries in the region (19 out of 54) had a walking and cycling policy in 2019.[106]
- Ten African countries (Burundi, Cabo Verde, Ghana, Lesotho, Malawi, Rwanda, Seychelles, Sierra Leone, Tanzania and Togo) made commitments in 2020 to reduce their carbon emissions by encouraging walking and cycling in the wake of the pandemic.[107]
- Kampala (Uganda) and Nairobi (Kenya) – cities where 45% of residents use non-motorised transport as their primary mode – made major improvements to their non-motorised transport infrastructure during the pandemic.[108]
- Windhoek (Namibia) built 8 kilometres of cycling infrastructure along the non-motorised transport route from Khomasdal to Windhoek West, as part of the City of Windhoek's 2018 non-motorised transport strategy and the Transformative Urban Mobility Initiative (TUMI).[109]
- In 2020, Addis Ababa (Ethiopia) launched a 10-year Non-Motorised Transport (NMT) Strategy aimed at developing a comprehensive network of high-quality walking and cycling facilities to address the growing demand for better access to the city.[110] To realise the strategy, in 2021 the Addis Ababa Transport Bureau, supported by the Institute for Transportation and Development Policy (ITDP), developed a three-year

NMT Implementation Plan outlining immediate actions, key goals, indicators and targets to improve the active transport environment from 2022 to 2024.[111]

- Open street events held across Africa – including in Cape Town (South Africa), Kigali (Rwanda) and several Ethiopian cities – provided cities with an opportunity to reflect on and understand the benefits of people-centred development approaches.[112]

Public transport services in Africa range from completely unregulated mini-buses to sophisticated public service contracts with international companies. **To address challenges related to safety and the quality of service, initiatives have emerged to consolidate public transport operations.**

- Kigali (Rwanda) has consolidated operators, shifting from a "target" system to salaried employment and integrated fare collection systems.[113]
- Kenya has consolidated operators and provided regulations for improving operations, but a lack of regulatory compliance remains a challenge.[114]

Bus rapid transit (BRT) corridors and/or systems have been implemented or are being developed in Addis Ababa (Ethiopia), Cairo (Egypt), Dar es Salaam (Tanzania), Lagos (Nigeria), Nairobi (Kenya) and the cities of Cape Town, George, Johannesburg and Pretoria in South Africa. BRT is part of transit-oriented development approaches that offer a more equitable approach to land-use planning. In addition, several African cities have emphasised the importance of electric BRT buses in decarbonising their fleets and shifting towards sustainable public transport solutions. However, BRT system often face financial struggles in Sub-Saharan Africa due to inappropriate regulatory frameworks for system planning, inadequate risk allocation and competition from informal transport operators.[115]

- The Kampala Capital City Authority and development partners are creating a BRT implementation road map for Kampala (Uganda), with technical assistance from ITDP.[116]
- In Dar es Salaam (Tanzania), the operators of the Dar Rapid Transit (DART) BRT system, along with municipal governments and the Tanzania Ministry of Lands, are developing localised transit-oriented development policies, with ITDP support.[117]
- Passenger services on the nearly completed BRT system in Dakar (Senegal) – an 18.3 kilometre corridor with 23 stations – were expected to begin in mid-2023, carrying a projected 300,000 passengers daily.[118]
- Ethiopia has highlighted the importance of electric buses in its 10-year (2020-2030) transport policy, with a key goal to introduce 4,850 electric buses to decarbonise the country's fleet.[119]
- In 2023, Kenya and the European Commission signed a declaration of intention to finance the construction of an electric bus line in Nairobi, which is expected to be operational by 2030.[120]

The e-mobility landscape is evolving rapidly, pushed by the need to decarbonise economies by 2050.[121] Technological developments are enabling the shift from traditional internal combustion engines towards electric vehicles. **Several African governments have put in place policies and regulatory measures for the adoption and transition to e-mobility.**[122]

- In 2021, South Africa published a green paper on the advancement of new vehicles, emphasising the need to gradually convert the country's vehicle sector to battery electric vehicles.[123] However, in 2022 only 620 electric cars (battery electric and plug-in hybrid) were sold in South Africa, although this was nearly double the number sold in 2021 (271 units).[124]
- Rwanda's e-mobility programme plans for the phased adoption of electric buses, passenger vehicles, and motorcycles from 2020 onwards, with several incentives for operators in the sector.[125]

- In 2020, Egypt issued a decree to encourage local assembly of electric vehicles, with subsidies being considered for the first 100,000 of these locally produced vehicles.[126]
- Egypt's National Energy Efficiency and Conservation Strategy 2020 envisions meeting a target of a 5% electrified vehicle stock by 2025.[127]
- In 2023, Uganda began partnering with SPIRO, a vehicle and smart battery design company, to introduce electric motorbikes and charging and swapping stations across the country, with the goal of deploying 140,000 motorbikes and 3,000 recharging and swapping stations over five years.[128]
- In 2022, Ghana launched the Net Zero Advocacy Platform and tested five different e-cargo bike models for local functionality and real-world user preferences. By the end of 2022, the bikes, made of 100% recycled and local materials, had covered 45,000 kilometres, saving 3.6 tonnes of CO_2 emissions.[129]

Rapidly rising urbanisation and motorisation rates have prompted an urgent response to Africa's growing transport needs, including through the development of sustainable urban mobility plans (SUMPs) and national urban mobility plans (NUMPs). Such policies can unlock the benefits of a well-functioning urban transport sector, including connectivity, inclusion, safety and improved quality of life.[130]

- In 2021, Kisumu (Kenya) launched the Kisumu Sustainable Mobility Plan, a 10-year roadmap that aims to foster increased access for city residents by prioritising walking, cycling and public transport.[131]
- In Cameroon, MobiliseYourCity supported the cities of Yaounde and Douala in 2020 in preparing and adopting SUMPs.[132]
- ITDP, in partnership with the City of Kigali (Rwanda), is developing a Non-Motorised Transport Master Plan, slated for completion in mid-2023, that identifies priority corridors for greenways and active transport in the city.[133]
- The World Bank is providing financial and/or technical assistance to bus rapid transit projects in eight African cities as part of their SUMPs: Abidjan, Dakar, Dar es Salaam (phases 3 and 4), Douala, Kampala, Kumasi, Maputo (Mozambique) and Ouagadougou (Burkina Faso).[134] In Dakar, the introduction of low- or zero-emission vehicles in the BRT corridor could save an estimated 67,700 tonnes of CO_2 annually.[135]

An urgent priority both globally and in Africa is to reduce the impact of transport on climate change. Several African countries have developed policies and strategies with time-bound targets, which are central to achieving both the SDGs and climate ambitions.

- Ethiopia's Non-Motorised Transport Strategy targets building 430 kilometres of pedestrian infrastructure and more than 300 kilometres of cycling track in secondary cities, as well as 600 kilometres of walkways and 200 kilometres of cycling lanes in Addis Ababa, by the year 2029.[136]
- In Kenya, the Non Motorized Transport Policy of Nairobi City County allocates 20% of the existing and future transport budget to infrastructure and services for walking and cycling.[137]

As of the end of 2022, Africa accounted for 43% of the countries that included time-bound targets for reducing transport greenhouse gas emissions in their second-generation Nationally Determined Contributions (NDCs) under the Paris Agreement.[138] The African countries – representing 10 out of the 23 total countries – were Burkina Faso, Egypt, Gambia, Guinea, Liberia, Mauritania, Mauritius, Seychelles, South Sudan and Uganda.[139] Several African NDCs also included other types of transport targets, such as for vehicle efficiency, zero-emission vehicles, modal share, biofuels and transport infrastructure.

- Burkina Faso has targets to limit its transport CO_2 emissions to 1,210 gigagrams of CO_2-equivalent (unconditional) and 267 gigagrams of CO_2-equivalent (conditional) by 2025.[140]
- South Sudan targets a 44% reduction in transport emissions below the business-as-usual (BAU) level by 2030.[141]
- The Gambia targets reducing transport emissions 22.2% below the BAU level by 2030.[142]
- Seychelles targets reducing transport emissions 30% below the BAU level (to reach 169.1 kilotonnes of CO_2-equivalent or below) by 2030, with a focus on petrol vehicles.[143]
- Liberia has committed to reducing transport emissions 15.1% below the BAU level by 2030.[144]
- Among the long-term low greenhouse gas emission development (LTS) strategies under the Paris Agreement, only Gambia and Nigeria included a specific target to reduce transport emissions. Nigeria aims to reduce transport emissions by 4 million tonnes of CO_2-equivalent by 2030, or 14% below 2019 levels.[145]
- The NDCs of Burkina Faso, Morocco, Namibia, South Sudan and Tanzania directly link transport to renewable energy sources.[146] Cabo Verde includes a target to electrify at least 25% of its land transport fleet (new road vehicles) by 2030.[147]

The Avoid-Shift-Improve (ASI) framework is crucial to unlocking the benefits of sustainable, low-carbon transport.[iii] ASI actions provide a balanced approach that is key to providing integrated, inter-modal and equitable transport systems.

- ASI actions are slightly more balanced in African NDCs compared to other global regions, with 30% representing "Shift" actions (versus 25% at the global level).[148] In contrast, "Improve" actions (vehicle improvements) comprise 53% of ASI actions in Africa, the lowest share among all regions and slightly below the global level (58%).[149]

iii From the Avoid-Shift-Improve framework. See https://slocat.net/asi.

Partnership in action

SLOCAT partners engaged in dozens of actions during 2020-2022, including:

- In 2023, the **African Development Bank** and the **International Road Federation** jointly released a new training programme to improve safe and sustainable urban transport planning and project preparation for African cities.[150]
- During 2021-2022, **Changing Transport**, together with the SLOCAT Partnership and the **NDC Transport Initiative for Asia**, developed Climate Strategies for Transport in Africa.[151]
- Between 2019 and 2021, the **German Agency for International Cooperation (GIZ)** provided financial and capacity building support to 12 countries in Africa under the Sustainable Mobility 2.0 project, to implement and develop sustainable mobility systems and initiatives.[152]
- **MobiliseYourCity** has provided various levels of planning and policy support across Africa, including in Côte d'Ivoire, Ethiopia, Ghana, Madagascar, Morocco, Mozambique, Senegal and Tunisia.[153]
- In 2022, the SLOCAT Partnership, together with the **Volvo Research and Educational Foundations (VREF)**, launched the third round of the Young Leaders in Sustainable Transport programme.[154]
- In 2022, the **SLOCAT** African Voices towards COP 27 Series featured a wide range of African professionals, experts and change makers to elevate voices from the region in tackling transport and mobility challenges.[155]
- The **United Nations Conference on Trade and Development (UNCTAD)** is involved in various transport-focused training and capacity building initiatives towards improving trade in Africa.[156]
- The **VREF's** programme on Mobility and Access in African Cities (MAC) has been operating since 2019, with a second phase starting in 2023. The programme has initiated 30-plus research projects involving more than 100 researchers and doctoral students at universities in Sub-Saharan Africa.[157]
- In 2022, **Walk21**, together with the UN Environment Programme and the UN Human Settlements Programme (UN-Habitat), published the first report to present data on walking and cycling from all 54 African countries.[158]

MODULE 2 2.2

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Asia Regional Overview

Demographics

Population size:	Population growth:	Urban population share:	Urban population growth:	GDP per capita:	GDP growth:
4,676 million	+12%	52%	+31%	USD 6,802	+58%
(2022)	(2010-2020)	(2022)	(2010-2022)	(2021)	(2010-2021)

Source: See endnote 1 for this section.

SLOCAT Partnership on Sustainable, Low Carbon Transport

Transport, Climate and Sustainability
Global Status Report - 3rd edition

Key findings

Demand trends

- As their populations and economies expand, countries across Asia have recorded soaring motorisation growth (covering four-wheeled motorised vehicles) – with increases of more than 200% in some countries during 2010-2019 – as well as significant growth in two- and three-wheelers.
- Asian countries continued to be global leaders in electric vehicles. As of 2021, the region was home to 95% of the world's electric vehicles, with nearly 92% of the Asian fleet being two-wheelers.
- Cities in Asia have experienced a surge in public transport, led by a strong increase in metro rail.
- Between 2015 and 2021, the number of Asian cities with bus rapid transit systems increased 36%, while cities with metros and light-rail systems increased 49%.
- Informal transport through two-wheelers, three-wheelers, Jeepneys and other types of collective transport continue to play a significant role in many parts of Asia.
- The demand for bike sharing services in Asia has risen since 2020, making the region the world's largest bike sharing market. As of 2021, nearly 800 bike sharing schemes were operating across Asia.
- Passenger air travel in Asia had partially rebounded from the COVID-19 pandemic by late 2022 and showed stronger recovery than in other regions. Globally, passenger air travel increased 57% by September 2022 compared to 2021, whereas the Asia-Pacific region saw an increase of 465% (although global averages were still 74% below pre-pandemic levels).
- Decreased economic activity during the pandemic, followed by the Russian Federation's invasion of Ukraine, led to significant shifts in freight transport across Asia.
- The Asia-Pacific region has experienced the fastest uptake of renewable energy use in transport globally, with average annual growth of nearly 14% between 2010 and 2019 (although starting from a low baseline).

Emission trends

- Asia continued to have the highest transport-related carbon dioxide (CO_2) emissions among world regions, as well as the highest transport emissions growth, at 36% during 2010-2021.
- China remained the largest emitter of transport CO_2 in Asia and the second highest emitter globally as of 2021, followed by India, although Persian Gulf countries still dominated per capita transport emissions.
- China continued to see slight decreases in transport emissions in 2022 as lockdowns remained in place, whereas restrictions had been loosened in many other Asian countries. In countries such as India and Japan, transport emissions increased consistently, in part rebounding from lows during the pandemic.
- Air pollution contributed to 6.5 million deaths globally in 2019, with 70% of the deaths occurring in the Asia-Pacific region.
- Recent projections have shown that transport emissions in Asia deviated from pre-2015 projections, which had predicted a near-doubling in business-as-usual emissions between 2021 and 2050. Even so, at the growth rate of 2021, the region's transport emissions would not peak before 2050, whereas a net zero emissions pathway or a pathway consistent with keeping global temperature rise below 1.5 degrees Celsius would require emissions to peak by 2025.

Policy developments

- As both population and urbanisation increase in Asia, governments will need to boost efforts to achieve sustainable transport while meeting the rising demand for passenger and freight transport.
- As of 2022, at least 14 countries in the region had made economy-wide pledges towards net zero emissions, in addition to having transport-specific targets, mostly aimed at electric mobility.
- Several Asian countries and cities have prioritised electric mobility in their policy targets, with some adopting targets to reduce or ban sales of internal combustion engine vehicles.
- Some transport-specific targets are aimed specifically at improving the efficiency of the freight sector, ranging from reducing energy use to increasing efficiency and multi-modality.

- Specifically for shipping, some countries and ports in the region pledged to contribute to efforts to decarbonise the sector.
- Policies focused on sustainable mobility have continued to expand in Asia, as more countries develop policy frameworks supporting low-carbon urban mobility, as well as freight transport.
- Informal transport fleets in Asia are gradually electrifying, for example in the Philippines.
- Some Asian countries have adopted sweeping measures towards low-carbon mobility and reductions in vehicle travel, while cities have increasingly created sustainable urban mobility plans (SUMPs), often to decongest urban areas.
- Measures to support cycling are on the rise in Asian cities, with governments such as India, Indonesia and the Philippines launching initiatives since 2020 to support walking and cycling.
- A few Asian countries have long implemented fuel efficiency standards, including China, India, Japan and the Republic of Korea. As of 2022, only five countries globally had fuel economy standards for heavy-duty vehicles, among them China, India and Japan (along with Canada and the United States).
- Asia's global dominance in electric mobility has been driven by national efforts to implement specific policies and to remove barriers, as well as in some cases by initiatives to swap, recycle and re-use electric vehicle batteries.
- As countries in Asia have focused on increasing their renewable energy capacity, the most common policy measure aimed at the use of renewables in transport continued to be biofuel blending mandates, with three countries (India, Indonesia and the Republic of Korea) increasing their mandates in 2022.

Photo credits: Paul Starkey / Ashden

Overview

Despite setbacks, the Asia region[i] remained relatively economically resilient during the COVID-19 pandemic and had partially rebounded by late 2022. The Russian Federation's war in Ukraine, starting in February 2022, led to additional economic uncertainty as commodity prices rose and global demand weakened, exposing the higher risks of shocks in some Asian countries due to their economic structures.[2] The region also has experienced increasing climate-related disasters, highlighting the role that decarbonisation of the transport sector can play in contributing to greater resiliency.[3]

Asia has made advances towards several of the United Nations (UN) Sustainable Development Goals (SDGs), which would contribute to further resilience and improved equity and health, although overall progress has been slow.[4] At the pace of progress as of 2023, the region would achieve only 10% of the measurable SDG targets by 2030 (or 118 out of 169 targets).[5] The most progress has been seen on affordable and clean energy (SDG 7) and on industry, innovation and infrastructure (SDG 9), whereas progress on climate action (SDG 13) has continued to regress.[6]

Alongside several decades of economic growth, Asia has experienced rising demand for mobility and for diverse transport modes. This has led to increased motorisation as well as rising interest in electric vehicles, bike sharing systems and public transport in much of the region. Asia continued to have the highest share of electric vehicles globally in 2021, while also increasing its use of renewable energy in transport. Policy measures and targets for sustainable mobility have expanded in the region, with a growing number of policy frameworks supporting active travel and public transport.

However, absolute transport-related carbon dioxide (CO_2) emissions in Asia remained the highest among world regions in 2022, with most countries in the region experiencing increases since 2020.[7] With the rising demand for both passenger and freight transport, alongside growing populations and urbanisation, governments across Asia will need to boost their support for sustainable transport systems going forward.

Demand trends

In 2019, analysts proclaimed that the "Asian century" had begun, citing projections for robust economic growth across the region.[8] Despite some hardships from the COVID-19 pandemic in 2020 and 2021, most Asian countries remained relatively economically resilient in 2020 and beyond.[9] Growth in gross domestic product (GDP) continued to be mostly stable, and the Asian economy contracted only 1.5% in 2020, much less than the global economy at 3.2%, resulting in a more rapid rebound.[10]

Asia's population has continued to surge, and as of early 2023 the region was home to 11 of the top 20 countries globally with the largest populations.[11] As cities have expanded, an estimated 55% of the Asian population is projected to live in urban areas by 2030, up from 52% in 2022.[12]

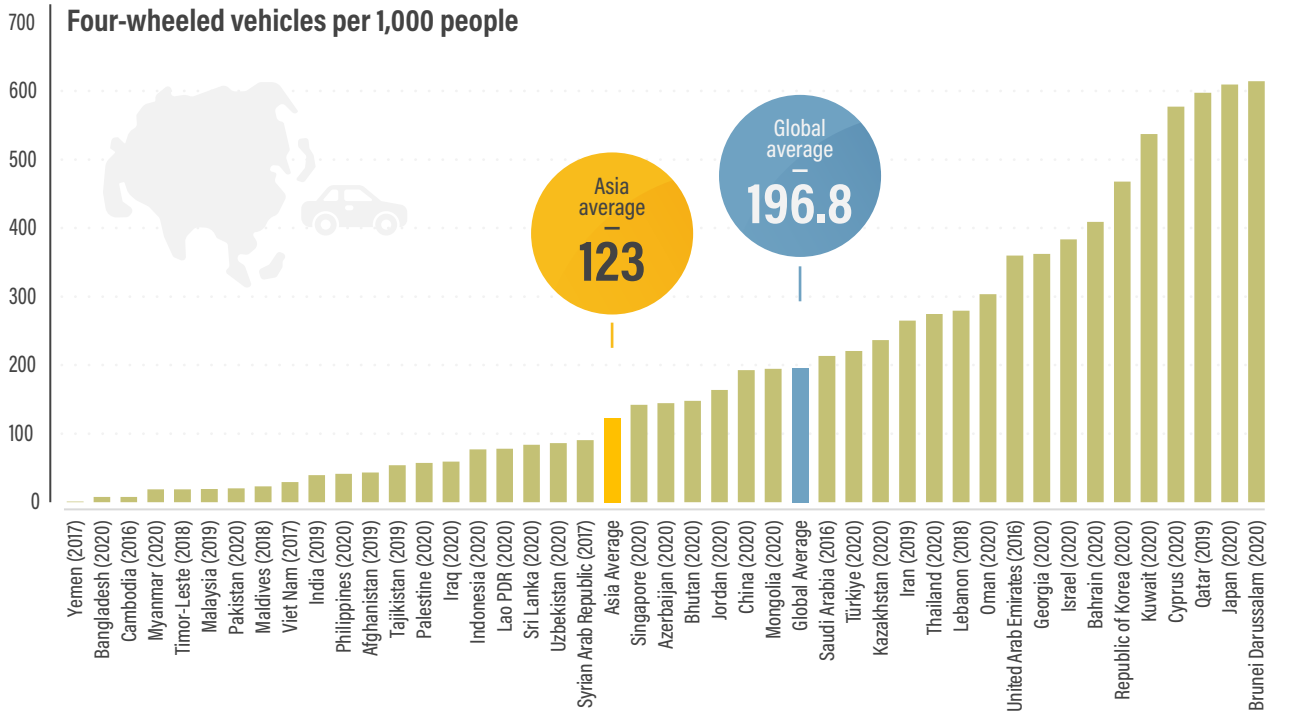
Many countries in Asia imposed strict lockdowns in response to the pandemic, restricting mobility. As in other regions, this led to a temporary plunge in all modes of passenger transport and to major shifts in freight.[13] Mobility to public transport stations in the region fell nearly 60% between January and April 2020, although it recovered to pre-pandemic levels by late 2021 as countries eased restrictions.[14] Traffic congestion levels also increased in 2021, although they were still 10% lower than in 2019.[15]

As their populations and economies expand, countries across Asia have recorded soaring motorisation growth (road motor vehicles except motorcycles) – with increases of more than 200% in some countries during 2010-2019 – as well as significant growth in two- and three-wheelers.[16] Private vehicle ownership in the region increased by nearly 1 billion vehicles between 2000 and 2020, with two- and three-wheelers taking the lead to represent more than 75% of the private vehicles owned in low- and lower middle-income countries in Asia.[17]

i SLOCAT includes in the Asia region a total of 48 countries, covering Western, Central, Eastern, Southern and South-Eastern Asia.

FIGURE 1. Motorisation levels per 1,000 people in Asia, 2016-2020

Source: See endnote 16 for this section.



- China had the region's highest growth in private motorisation during 2010-2019, at 212%, followed closely by Myanmar (209%) and Pakistan (207%), whereas Singapore's motorisation rate fell 9% during this period.[18]
- Brunei Darussalam led the region in per capita motorisation levels, at 614 vehicles per 1,000 people in 2020, followed by Japan (609 vehicles per 1,000 people) and Qatar (597 vehicles per 1,000 people); the lowest motorisation rates were in Yemen, at less than 1 vehicle per 1,000 people, followed by Cambodia and Bangladesh (both at 7 vehicles per 1,000 people) (see Figure 1).[19]
- Bangladesh experienced the fifth highest increase in motorisation rate in Asia, rising more than 150% between 2010 and 2019.[20]

Asian countries continued to be global leaders in electric vehicles. As of 2021, the region was home to 95% of the world's electric vehicles, with nearly 92% of the Asian fleet being two-wheelers.[21] Electric trucks also have increased in the region in recent years.[22] Asia's electric vehicle fleet (excluding two- and three-wheelers) grew 66% between 2020 and 2021, from 4.7 million vehicles to 7.8 million vehicles.[23]

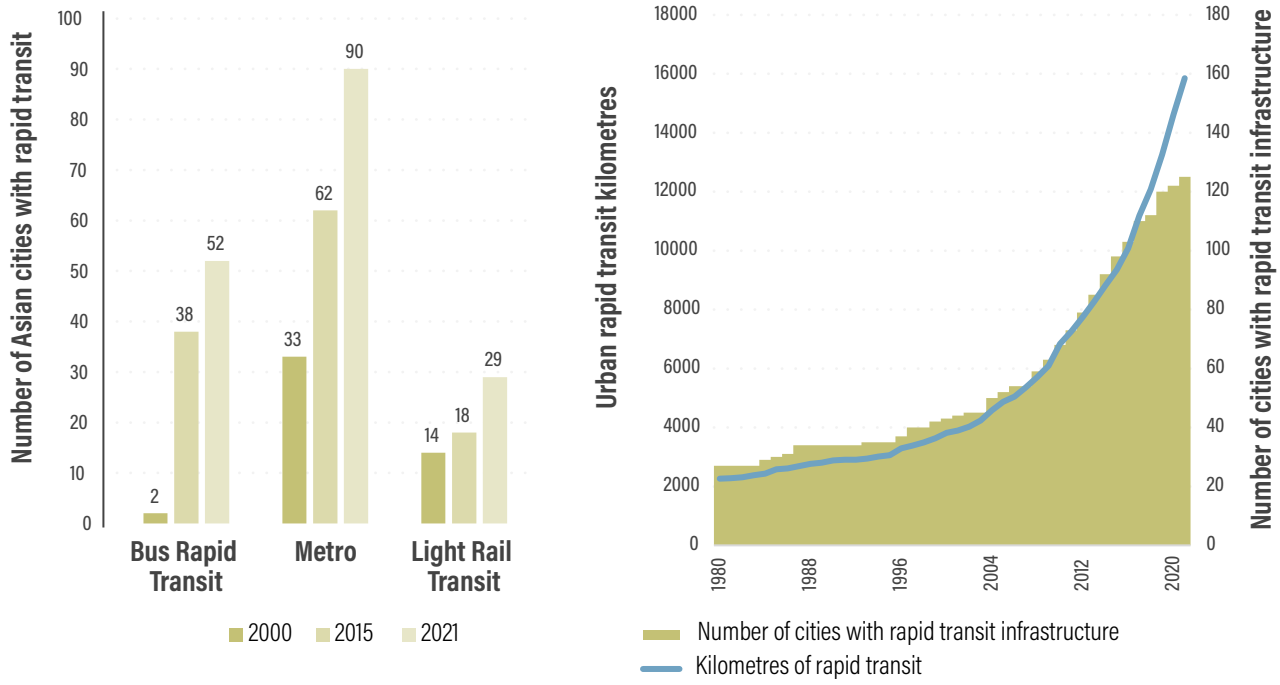
- As of 2022, China had the highest market share of electric vehicles in the region at 29%, followed distantly by the Republic of Korea (9.4%), Japan (3%) and India (1.5%).[24]
- The electric car market in China, with 14.1 million units in 2022, was more than two times larger than the market in the European Union (5.7 million) and nearly five times that in the United States (3 million).[25] Electric bus and truck registrations in China increased in 2021 after falling sharply in 2020, but did not quite return to 2019 pre-pandemic levels.[26] Price parity of battery electric trucks with diesel trucks in China is anticipated as early as 2025 for some truck types.[27]

Cities in Asia have experienced a surge in public transport services, led by a strong increase in metro rail (see Figure 2).[28] However, the modal split varies greatly across countries.[29] While the demand for high-quality public transport in cities has increased greatly, particularly since the early 2000s, as of 2021 only 125 out of 550 Asian cities with more than 500,000 people had rapid transit systems.[30]

- **Between 2015 and 2021, the number of cities in Asia with bus rapid transit systems increased 36%, while cities with metros and light-rail systems increased 49%.**[31]
- Singapore is a leader in public transport use, accounting for 83% of all trips in 2022.[32] The Philippines also had a relatively high share of public transport use, at 42%.[33] Conversely, high shares of private motorcycle use were seen in Viet Nam (82%), Cambodia (74%) and Indonesia (73%).[34]

FIGURE 2. Urban transport trends in Asia, 2000, 2015 and 2021

Source: ADB. See endnote 28 for this section.



- Several countries or cities installed their first metro lines in recent years. In 2020, Pakistan opened its first metro line in Lahore, serving 250,000 passengers along a 27-kilometre route.[35] In 2022, Bangladesh's capital Dhaka opened the country's first metro line, extending to 12 kilometres and expected to transport around 60,000 people an hour.[36] Hanoi (Viet Nam) also opened its first metro line in 2022, with nine more lines planned, although the project has been delayed by administrative and technical issues.[37]

Other places saw developments in high-speed rail, with the Lao People's Democratic Republic (PDR) and Indonesia working on their first high-speed rail services. In 2021, the first China-Lao PDR bullet train arrived in the Laotian capital of Vientiane, with the stated objective of faster connectivity between the two countries.[38] By late 2022, the Jakarta-Bandung high-speed rail line, the first high-speed rail in Indonesia, was estimated to be 88% complete and to start operating in June 2023.[39]

Informal transport through two-wheelers, three-wheelers, Jeepneys and other types of collective transport continue to play a significant role in many parts of Asia. These informal services are often connectors to major public transport services, provide access for women, children and the elderly, and are a source of employment for urban dwellers. As of 2022, there were an estimated 10 million rickshaw drivers in India and 2 million in Bangladesh.[40] Studies show that informal transport represents 38% of all commuting trips in Manila (Philippines), 40% in Kuala Lumpur (Malaysia), 50% in Jakarta (Indonesia) and 58% in Dhaka (Bangladesh).[41]

The demand for bike sharing services in Asia has risen since 2020, making the region the world's largest bike sharing market.[42] As of 2021, nearly 800 bike sharing schemes were operating across Asia.[43] (*See Section 3.3 Cycling.*)

- A 2020 study found that 360 Chinese cities were using dockless bike sharing in some capacity, with 54% of the users riding to make convenient connections to other transport modes, and nearly 36% using the bikes to commute to work.[44] The country's dockless bike sharing system has grown rapidly in response to rising traffic congestion from motorised vehicles for short-distance travel.[45] A 2022 study on shared mobility in China revealed knowledge gaps on topics such as the health impacts, life-cycle greenhouse gas emissions and equity implications of such systems.[46]
- A 2017 study reported that at least 18% of people in Beijing (China), Seoul (Republic of Korea) and Singapore were using bike sharing, often for last-mile trips in combination with public transport use.[47] Similar trends have been seen in Delhi (India), Penang (Malaysia) and Bandung and Yogjakarta (Indonesia).[48]

Some Asian countries have seen advances in **autonomous vehicles.**

- In 2022, China's largest artificial intelligence firm, Baidu, launched the country's first fully autonomous, driverless taxis in the cities of Chongqing and Wuhan.[49]
- Bayanat, a Saudi AI company, launched the United Arab Emirates' first fully autonomous taxis in Abu Dhabi in 2021.[50]

Passenger air travel in Asia had partially rebounded from the pandemic by late 2022 and showed stronger recovery than in other regions. Globally, passenger air travel increased 57% by September 2022 compared to 2021, whereas the Asia-Pacific region saw an increase of 465% (although global averages were still 74% below pre-pandemic levels).[51]

Decreased economic activity during the pandemic, followed by the Russian Federation's invasion of Ukraine, led to significant shifts in freight transport across Asia.[52] In some places, urban freight and logistics activity grew to take advantage of emerging trends, including increased online shopping and food deliveries.[53] Air cargo activity in the Asia-Pacific region fell 16% in March 2020 compared to March 2019, similar to declines seen in most world regions.[54] Air cargo volumes also fell nearly 16% in April 2022 compared to April 2021; the decline is attributed to the Russian invasion of Ukraine (as both countries have been key cargo handlers), to Chinese labour shortages, and to an overall reduction in export orders.[55]

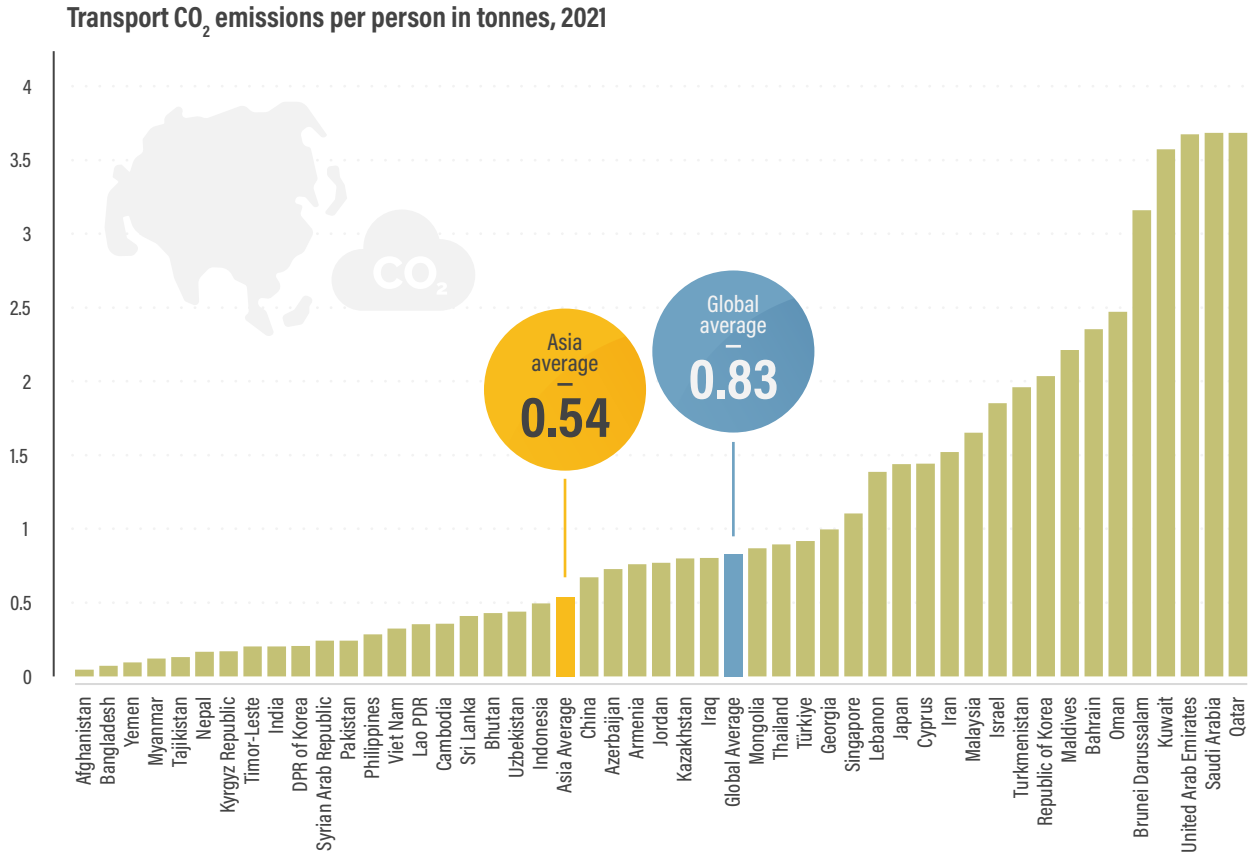
Still, the Asia-Pacific region had the highest share of the air cargo market globally in 2022, at 32.5%.[56]

- Port calls at the Chinese ports of Shanghai (the world's largest) and Yangshang fell 17% by January 2020 compared to one year earlier, which led to knock-on effects globally.[57] By May 2022, the port of Shanghai had rebounded to reach 95% of pre-pandemic activity.[58]
- Rail freight in Asia experienced mixed impacts during the pandemic, with China seeing a 24% increase in rail freight movement to Europe in the first quarter of 2020 compared to the first quarter of 2019, while India saw a 28% decline in domestic rail freight traffic in April-May 2020 compared to 2019.[59]
- Trade volumes between China and the Association of Southeast Asian Nations (ASEAN) region increased 28% in 2021, as the latter became China's biggest trading partner for the second year in a row.[60]

The Asia-Pacific region has experienced the fastest uptake of renewable energy use in transport globally, with average annual growth of nearly 14% between 2010 and 2019 (although starting from a low baseline).[61] The top renewable energy consumers for transport in the region in 2019 were Indonesia (0.17 exajoules of renewables) and China (0.12 exajoules).[62]

FIGURE 3. Per capita transport CO_2 emissions in Asia, by country, 2021

Source: See endnote 76 for this section.



Emission trends

Asia continued to have the highest transport-related CO_2 emissions among world regions – reaching 2,513 million tonnes in 2021 – as well as the highest transport emissions growth, at 36% during 2010-2021.[63] The region's share of global transport CO_2 emissions (excluding international aviation and shipping) was 39% in 2021.[64] Transport contributed the region's third highest emissions among all sectors, after the power sector and industrial combustion (and excluding other miscellaneous sectors).[65]

Per capita transport CO_2 emissions in Asia averaged 0.54 tonnes in 2021, the second lowest level after Africa.[66] Transport CO_2 emissions per USD 10,000 of GDP reached 0.80 tonnes, the third lowest level after Oceania and Europe.[67] Per capita transport CO_2 emissions increased 65% from 2010 to 2021, whereas emissions per unit of GDP fell 22%.[68]

Regional CO_2 trends

Total transport CO_2 emissions (2021):
2,512.9 million tonnes

Share of global transport CO_2 emissions (excluding international aviation and shipping) **(2021):**
39%

Per capita transport CO_2 emissions (2021):
0.54 tonnes

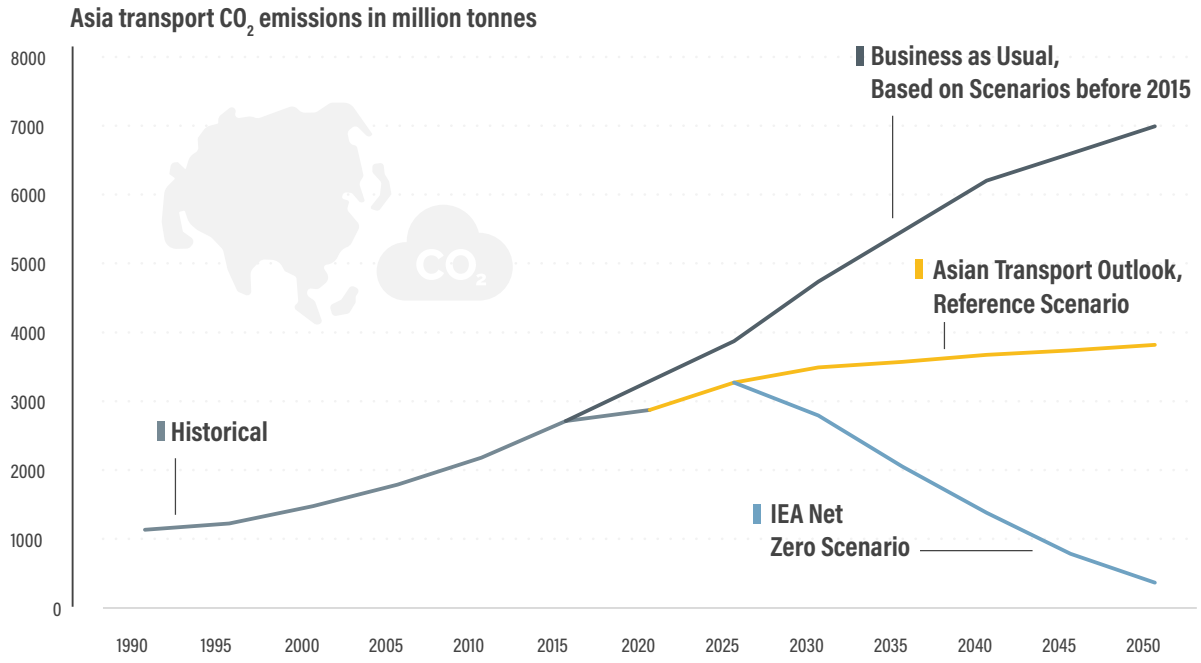
Transport CO_2 emissions per USD 10,000 GDP (2021):
0.79 tonnes

Source: See endnote 69 for this section.

China remained the largest emitter of transport CO_2 in Asia – contributing 38% of the region's total in 2021 – and was the second highest emitter globally, followed by India, although Persian Gulf countries still dominated per capita transport emissions.[70] China contributed 955 million tonnes of transport

FIGURE 4. CO_2 emissions from transport in Asia, 1990-2050

Source: ADB. See endnote 87 for this section.



CO_2 in 2021 (distantly following the United States, at 1,647 million tonnes).[71] India was the third largest emitter of transport CO_2 globally but contributed only 11% of Asia's transport CO_2 emissions.[72]

Estimates for 2015 indicate that CO_2 emissions from freight transport are slightly larger (around 55%) than from passenger transport in Asia.[73] The rising demand for road freight movement in the region is expected to further drive emissions.[74]

- Countries in the Persian Gulf dominated per capita transport CO_2 emissions in Asia in 2021, with Qatar and Saudi Arabia each emitting 3.7 tonnes per person.[75] However, in 30 of the 47 Asian countries with emission data, per capita transport CO_2 emissions were less than 1 tonne (see Figure 3).[76]
- In two-thirds of Asian countries, transport emissions remained lower in 2021 compared to pre-pandemic levels, with some countries reporting far lower emissions, such as Viet Nam (down 24% between 2019 and 2021) and Qatar (down 19%).[77]

China continued to see slight decreases in transport emissions in 2022 as lockdowns remained in place, whereas restrictions had been loosened in many other Asian countries.[78] In countries such as India and Japan, transport emissions increased consistently, in part rebounding from lows during the pandemic.

- In China, emissions from ground transport decreased 3.6%, from domestic aviation decreased 40.1% , and from international aviation decreased 14.6% in 2022, compared to 2021.[79]
- In Japan, emissions from ground transport increased 4%, from domestic aviation grew 39.8%, and from international aviation rose 11.8% during the same period.[80]
- In India, emissions from ground transport increased 8.1%, in domestic aviation grew 24.3%, and from international aviation rose 73.4%.[81]

Air pollution caused 6.5 million deaths globally in 2019, with 70% of the fatalities occurring in the Asia-Pacific region.[82] Globally, the losses in economic welfare attributable to air pollution represented 6.1% of GDP in 2019, whereas in East Asia the share was 9.3% and in South Asia it reached 10.3%.[83] From 2000 to 2019, countries in South, East and South-East Asia had the strongest increase among sub-regions globally in deaths attributable to pollution, due mostly to increased ambient air pollution, rising chemical pollution and ageing populations.[84]

Recent projections have shown that transport emissions in Asia deviated from pre-2015 projections, which had predicted a near-doubling in business-as-usual emissions between 2021 and 2050.[85] On the contrary, emissions

were lower during the period 2015-2020 due to average fuel efficiency improvements, progress in electrification and other policies.[86] **Even so, at the growth rate of 2021, the region's transport emissions would not peak before 2050, whereas a net zero emissions pathway or a pathway consistent with keeping global temperature rise below 1.5 degrees Celsius would require emissions to peak by 2025** (see Figure 4).[87]

Policy developments

As both population and urbanisation increase in Asia, governments will need to boost efforts to achieve sustainable transport while meeting the rising demand for passenger and freight transport.

As of 2022, at least 14 countries in the region had made economy-wide pledges towards net zero emissions, in addition to having transport-specific targets, mostly aimed at electric mobility.[88] This included Bhutan, China, India, Japan, Kazakhstan, Lao PDR, Malaysia, Maldives, Nepal, the Republic of Korea, Singapore, Sri Lanka, Thailand and Viet Nam.[89] Many Asian countries also have **transport-specific targets**, with at least 19 countries having specific targets for electric mobility, 16 for rail, and 13 for modal share as of the end of 2022.[90]

The **Nationally Determined Contributions (NDCs)** of six Asian countries – Bangladesh, Georgia, Israel, Japan, Sri Lanka and the United Arab Emirates – are among the 23 second-generation NDCs submitted under the Paris Agreement that feature targets for transport greenhouse gas mitigation.[91] This is the second highest share by region after Africa.[92]

- Bangladesh set a target to reduce its transport CO_2 emissions 9.3% (unconditional contribution) and 27% (conditional) below projected business-as-usual (BAU) levels by 2030.[93]
- Israel aims to limit its increase in transport greenhouse gas emissions by 2030 and then reduce these emissions at least 96% below 2015 levels by 2050.[94]
- As in other regions, most of the transport-related measures included in the second-generation NDCs of Asian countries continued to be "Improve"[ii] measures, although both "Avoid" and "Shift" measures increased compared to the first generation of NDCs submitted.[95]
- Sri Lanka provides a comprehensive, well-balanced set of transport mitigation actions following the "Avoid-Shift-Improve" structure.[96]

Several Asian countries and cities have prioritised electric mobility in their policy targets, with some adopting targets to reduce or ban sales of internal combustion engine vehicles (whether economy-wide or for public vehicles only, and sometimes permitting hybrid vehicles).

- By 2023, countries with targets for full or partial sales bans on internal combustion engine vehicles included the Republic of Korea (with a target year of 2025), India (2030), China (2035), Japan (2035) the Philippines (2040) and Viet Nam (2050).[97]
- Israel's Ministry of Environmental Protection set a mandatory target to have only zero-emission public transport buses in operation by 2026.[98]
- Cambodia is aiming for 40% electric cars and buses and 70% electric motorbikes by 2050.[99]
- The state of Maharashtra (India) plans to add 1,900 electric buses to Mumbai's Brihanmumbai Electric Supply and Transport fleet (a public entity providing transport services and electricity).[100] Mumbai aims to have a 100% electric fleet by 2027, with an interim 50% target by 2023.[101]

Some transport-specific targets are aimed specifically at improving the efficiency of the freight sector, ranging from reducing energy use to increasing efficiency and multi-modality.

- Since 2017, Viet Nam has included targets for changing freight transport models in its NDC to address energy consumption.[102]
- In 2022, India launched its National Logistics Policy to improve the efficiency of the freight sector.[103]
- China issued a five-year work plan in 2022 to promote multi-modality in its freight sector.[104]

Specifically for shipping, some countries and ports in the region pledged to contribute to efforts to decarbonise the sector.

- At the 2021 United Nations Climate Change Conference in Glasgow, United Kingdom (COP 26), Japan joined 18 other countries in the Clydebank Declaration, aimed at creating at least six "green shipping corridors" by 2025.[105] In early 2022, Singapore announced that it would join the agreement.[106]
- The Port of Shanghai – along with the Port of Los Angeles and industry partners – announced in 2022 that it would deliver an implementation plan for a green shipping corridor to decarbonise shipping between China and the United States.[107]

Policies focused on sustainable mobility have continued to expand in Asia, as more countries develop policy frameworks supporting low-carbon urban mobility, as well as freight transport. Policies focused on electric mobility, urban rail and active mobility have received greater importance in the region in recent years. Due in large part to policy support, particularly in China and to a lesser extent in India, Asia has the highest share of electric vehicles globally.[108]

ii From the Avoid-Shift-Improve framework. See https://slocat.net/asi.

- In 2020, Malaysia released its Low Carbon Mobility Blueprint 2021-2030, which includes several measures for reducing emissions and energy consumption in transport, such as fuel economy, electric vehicles, alternative fuel adoption and modal shift.[109]

Informal transport fleets in Asia are gradually electrifying, for example in the Philippines, although informal transport operators are often neglected and do not receive support from the government.[110]

- The Philippines initiated a Jeepney electrification programme in 2017, but by early 2023 only 4% of the country's 158,000 jeepneys had been electrified.[111]

Some Asian countries have adopted sweeping measures towards low-carbon mobility and reductions in vehicle travel, while cities have increasingly created sustainable urban mobility plans (SUMPs), often to decongest urban areas. Some cities, such as in China and Singapore, also have adopted strict rules on vehicle permitting and licences in an effort to reduce the number of vehicles.[112]

- In 2022, the ASEAN region released guidelines for developing SUMPs in metropolitan areas.[113]
- The SUMP of Medan (Indonesia), completed in 2022, features USD 3.2 billion in investment to shift 15% of trips from private motorised vehicles to public transport, through the implementation of six bus rapid transit lines and a metro system, and by optimising existing public transport services.[114]
- Foshan was China's first city to introduce the SUMP concept (in 2021) and is considered a leader in sustainable transport in the country due to its well-developed public transport system – with one of the highest bus densities in China, a fully electrified bus network and a vast public bike sharing programme.[115]

Measures to support cycling are on the rise in Asian cities, with governments such as India, Indonesia and the Philippines launching initiatives since 2020 to support walking and cycling.

- India's Ministry of Housing and Urban Affairs launched its Cycles4Change and Streets4People challenges in 2020 to support active mobility.[116] By early 2023, more than 100 Indian cities had taken part in the initiatives, identifying a collective 400 kilometres of main roads and 3,500 kilometres of neighbourhood spaces that could be transformed for bike-friendly purposes.[117]
- In 2021, the Philippines' Department of Transport completed 500 kilometres of bike lanes along the metro routes of three cities: Manila (313 kilometres), Cebu (129 kilometres) and Davao (55 kilometres).[118]
- In 2022, Jakarta (Indonesia) completed 309 kilometres of bike lanes, out of a total 500 kilometres planned, with government data showing that the average number of cyclists daily in the city had surged from 47 in 2005 to 4,000 in 2022.[119]

A few Asian countries have long implemented fuel efficiency standards, including China, India, Japan and the Republic of Korea.[120] As of 2022, only five countries globally had fuel economy standards for heavy-duty vehicles, among them China, India and Japan (along with Canada and the United States).[121] Since 2021, ASEAN members have been introducing fuel efficiency standards in their respective countries.[122]

Asia's global dominance in electric mobility has been driven by national efforts to implement specific policies and to remove barriers, as well as in some cases by initiatives to swap, recycle and re-use electric vehicle batteries. Between 2018 and 2022, two-thirds of the global investment in electric vehicles and charging infrastructure was in Asia.[123] Some countries have invested in critical materials necessary for electric vehicle battery manufacturing, such as Indonesia (home to some 22% of global nickel reserves).[124]

- India doubled its investment in electric vehicles in 2022.[125] The government plans to introduce a battery swapping policy for electric buses to cater to the growing demand.[126] Some studies have explored the challenges and opportunities for battery re-use and recycling in India.[127] In 2022, the country released a tender for the procurement of 5,580 electric buses to be deployed across five major cities, which will induce a major shift to electric buses.[128]
- In addition to policy support, China has supported electric vehicles through targets for and investment in battery charging and swapping facilities, including for heavy-duty vehicles.[129] In 2021, China enacted several directives to promote the scaling of electric vehicle battery re-use and recycling.[130]
- Nepal lifted its import duty on electric vehicles in 2021, resulting in the import of 1,103 electric cars in the six months from July 2021 to January 2022 (up from just 51 during the same period a year prior) and 1,922 electric motorcycles (up from 695).[131]
- In 2022, Cambodia began rolling out charging stations and reduced the import duty for electric vehicles from 30% to 10%.[132]
- The Department of Transport of Hanoi (Viet Nam) approved a pilot phase for electric two-wheeler sharing, to facilitate easy travel to the city's bus rapid transit system.[133]

As countries in Asia have focused on increasing their renewable energy capacity, the most common policy measure aimed at the use of renewables in transport continued to be biofuel blending mandates.

- **Three countries in the region – India, Indonesia and the Republic of Korea – increased their biofuel blending mandates in 2022.**[134]

- Several Asian countries had biofuel blending mandates of 10% or above as of 2022, including China, India, Indonesia, and the Philippines, while other countries had lower blending mandates, such as Lao PDR, Thailand and Viet Nam.[135]

Partnership in action

SLOCAT partners engaged in dozens of actions during 2020-2022, including:

- The Asian Development Bank launched the **Asian Transport Outlook (ATO)** in 2021 to strengthen knowledge on transport in the Asia and Pacific region.[136]
- **Clean Air Asia** focuses on reducing air pollution and greenhouse gas emissions from transport and other sectors by translating research into policies and actions. Its projects and activities aim to strengthen regional and national policies and standards, enhance national and local frameworks for programmes and urban development, and increase access to information, tools and partners.[137]
- In 2022, the **Council for Decarbonising Transport in Asia** released a flagship report that advocates a vision for complete decarbonisation of transport in Asia by mid-century.[138]
- The **Global Climate Action Partnership (GCAP)** Asia regional platform – the Asia LEDS Partnership (ALP) – established a Leadership Group for Clean Transport in Asia (LG-CTA) in 2021. The membership-based group consists of policy and technical leads who are supported with multilateral activities, such as capacity building workshops, technical trainings, peer learning and study tours. The SLOCAT Partnership supports the Leadership Group as the strategic pillar of the implementing partners, along with the National Renewable Energy Laboratory and ICLEI–Local Governments for Sustainability South Asia. [139]
- The **NDC Transport Initiative for Asia** (NDC-TIA) aims to facilitate a paradigm shift to zero-emission transport across Asia, supporting China, India and Vietnam to develop comprehensive decarbonisation strategies and solutions to implement them.[140] The SLOCAT Partnership supports the NDC-TIA as a member of its consortium and steering committee.
- In 2023, the **United Nations Centre for Regional Development** led and published the first ever mapping and overview of thematic and geographic scope of transport policy support activities carried out by international organisations in participating countries of the Regional EST Forum Asia. Mapping and activities include contributions from across the SLOCAT Partnership including but not limited to France's Agence Française de Développement (AFD), Germany's Agency for International Cooperation (GIZ), Volvo Research and Educational Foundations (VREF), the World Resources Institute and the World Bank Group.[141]
- The **United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)** launched the Asia-Pacific Initiative on Electric Mobility in 2022 to accelerate the transition to electric mobility in public transport, with the aim of reducing greenhouse gas emissions from the transport sector and supporting implementation of the Paris Agreement.[142]

MODULE 2 2.3

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Europe Regional Overview

Demographics

Population size:	Population growth:	Urban population share:	Urban population growth:	GDP per capita:	GDP growth:
744 million	+1%	75%	+38%	USD 27,769	+14%
(2022)	(2010-2020)	(2022)	(2010-2022)	(2021)	(2010-2021)

Source: See endnote 1 for this section.

SLOCAT Partnership on Sustainable, Low Carbon Transport

Transport, Climate and Sustainability
Global Status Report - 3rd edition

Key findings

Demand trends

- Passenger cars continued to be the dominant transport mode in the European Union (EU), with an 86% share in 2020 (latest data available). The number of registered passenger cars in the EU reached 253 million in 2021, up 8.6% from 2016. Vehicle preferences across Europe vary by fuel type, but nearly all countries have maintained a heavy reliance on fossil-fuelled vehicles.
- The motorisation rate (covering four-wheeled motor vehicles) continued to vary greatly across Europe, growing around 20% regionwide and 18% in EU countries, on average, during 2010-2020.
- The COVID-19 pandemic resulted in key changes in Europe's urban areas, as public transport use fell sharply and remained below 2019 levels as of July 2022 in the United Kingdom, the Netherlands, Belgium, Italy and Spain. However, in some countries, such as France and Germany, public transport sectors rebounded to pre-pandemic levels or higher.
- As public transport use declined, active travel increased in many places. Several European cities reconfigured streets to enable greater walking and cycling. Cycling in particular boomed in the region, as many cities dramatically increased funding to support bike lanes and infrastructure. Several major cities continued to have high shares of active travel among all trips as of 2022.
- Europe is the second largest electric car market in the world after China; however, despite high uptake since 2020, only 2.4% of the region's passenger cars were electric as of 2022. Sales of battery electric and plug-in hybrid cars grew more than 15% in 2022, and over 1.6 million battery-only electric cars were sold, a more than four-fold increase from 2019.
- The electric bus market in Europe grew 26% in 2022, to more than 4,100 registered vehicles, and nearly one-third of the European public bus fleet was reported to be zero-emission vehicles.
- The EU announced in 2022 that it had achieved its 2020 target of 10% renewables in transport (up from just 1.6% in 2004), with 12 of the 27 Member States surpassing the target and Sweden leading at 31.9%.
- The Russian Federation's invasion of Ukraine in 2022 contributed to rising energy prices worldwide, but the European market was particularly hard hit as countries relied heavily on Russian energy imports. Between February and July 2022, natural gas wholesale prices in Europe rose 115% and electricity prices rose 237%. The Russian war in Ukraine also has resulted in other transport-related impacts, including damage to infrastructure and major disruptions in the sector.
- Air and rail transport in Europe were heavily impacted by the COVID-19 pandemic. Air passenger transport in EU Member States fell 73% in 2020 but rebounded slightly by 2021, growing nearly 40%. Rail transport fell 46% in 2020, following years of an upward trend.
- From 2011 to 2021, the modal split in freight transport remained relatively stable in the EU, with some minor fluctuations and changes shares of maritime, rail and inland waterway transport decreased, and this trend continued through 2022. Meanwhile, the share of road freight increased slightly as it rebounded from the pandemic, and air freight transport remained stable. Maritime transport accounted for more than two-thirds of freight tonne-kilometres in the EU during 2011-2021.

Emission trends

- The transport sector contributed 22% of economy-wide carbon dioxide (CO_2) emissions in Europe in 2021. The region's transport CO_2 emissions grew a moderate 2% between 2010 and 2019, then fell 12.6% in 2020; in 2021, they rebounded 5.9% but remained below pre-pandemic levels.
- Europe contributed 18% of the world's transport CO_2 emissions in 2021 (excluding international aviation and shipping), the third largest regional share after Asia and North America.
- Based on measures planned or in place as of October 2022, total transport emissions in the EU were projected to fall below 1990 levels by 2029. In this scenario, only road transport emissions, representing 77% of the EU's transport greenhouse gas emissions, would decline until 2030. Emissions from other modes would either remain stable or increase, particularly aviation.
- Transport CO_2 emissions vary greatly across the region, from 143 million tonnes in Germany to 0.68 million tonnes in Iceland in 2021. On a per capita basis, Luxembourg emitted by far the most CO_2 from transport in 2021, while Ukraine emitted the least.

Policy developments

- With the onset of the COVID-19 pandemic, countries enacted various policy measures to stimulate transport demand, including the European Year of Rail initiative, financial aid to airlines, and many measures supporting active travel, responding to the popularity of temporary cycling and pedestrian infrastructure.
- In 2020, the European Commission released its Sustainable and Smart Mobility Strategy, which lays the foundation towards a green and digital transformation and more resiliency to future crises.
- As part of the European Green Deal, the European Commission adopted four proposals in 2021 aimed at modernising the EU's transport system to support cleaner, smarter mobility.
- In December 2021, the European Commission presented a proposal for an updated regulation on EU guidelines for the development of the Trans-European Transport Network (TEN-T), following from several initiatives in support of rail in recent years.
- In early 2023, the European Commission proposed updating the 2010 Intelligent Transport System Directive to adapt to emerging road mobility options, apps, and connected and automated mobility.
- By 2022, several European countries had adopted policies and targets aimed at promoting or discouraging certain vehicle types or fuels, and many cities had designated low-emission zones to limit polluting vehicles and improve liveability. Almost all countries in the region had biofuel blending mandates and advanced biofuel targets, in addition to those set at the EU level.
- In early 2023, the EU almost unanimously approved a ban on sales of internal combustion engine vehicles (with an exception for CO_2-neutral e-fuels) as of 2035. By 2022, at least 9 European countries had adopted either a target for 100% electric vehicles or a ban on internal combustion engine vehicles, while 11 countries had announced or made plans for such a target.
- Active low-emission zones in the EU-27, the United Kingdom and Norway increased 40% between 2019 and 2022, with projections for an additional 58% growth by 2025, to reach a total of 507 zones.
- As part of the EU's Efficient and Green Mobility Package, the EU Urban Mobility Framework was released in December 2021 to guide cities to reduce emissions, improve public health, and make urban mobility smarter and more sustainable. The framework foresees that all major cities in the network develop a sustainable urban mobility plan (SUMP) by 2025.
- Across Europe, the number of SUMPs increased from 800 in 2013 to 1,000 in 2018, with several cities having updated their SUMPs at least once.
- With the Russian invasion of Ukraine and the subsequent spike in energy prices, countries across Europe offered relief to consumers by providing subsidies for fuel and public transport. The European Commission also enacted fuel subsidies, and in May 2022 it released the REPowerEU plan, which includes a strategy to shift to imports of non-Russian gas and oil alongside accelerated adoption of renewable energy and energy conservation efforts.
- Specifically for freight, the European Commission provisionally agreed in 2022 to include emissions from shipping in the EU Emissions Trading System, and in 2023 it adopted FuelEU Maritime, aimed at reducing the greenhouse gas emission intensity of shipping fuels 80% by 2050.

Overview

Countries in Europe[i] have shown broad diversity in both transport demand and associated emissions, with the COVID-19 pandemic bringing dramatic changes to urban areas and beyond.[2] The Russian Federation's invasion of Ukraine in 2022 had a large impact on the region, with far-reaching effects on energy prices in particular.[3] Governments have responded to these major events with several key developments.

Due largely to the effects of the pandemic, the region has seen striking shifts in the modal split since 2020. While the motorisation rate has increased greatly in some countries, it has declined in others.[4] Active travel has grown strongly in many cities, while the use of public transport has mostly decreased.[5] Overall, the number of registered passenger cars has continued to rise, maintaining a heavy reliance on fossil-fuelled vehicles in most places, although electric vehicles grew five-fold between 2018 and 2021.[6]

Concerted policy action in European countries and by the European Union (EU) has focused on decarbonising transport since 2020, as demonstrated by the European Green Deal, which targets a 90% reduction in EU transport sector emissions by 2050.[7] A number of policies have focused on making mobility smarter, more resilient, and more inclusive, while creating more liveable cities.

The region advanced efforts to achieve the United Nations (UN) Sustainable Development Goals, and the EU set the world's most ambitious regional climate targets for 2030, which will require far more rapid progress than occurred by 2023.[8] Emissions from road transport are projected to continue to decline to 2050, although emissions from other transport modes are expected to remain stable or increase without further measures.[9]

Demand trends

As in other world regions, the COVID-19 pandemic greatly affected both passenger and freight transport in Europe, with some countries and cities experiencing dramatic changes in their modal shares in 2020 and beyond. These included large increases in active travel and declines in public transport, which in many cases continued through 2022.[10]

Passenger cars continued to be the dominant transport mode in the EU, with an 86% share in 2020 (latest data available).[11] The number of registered passenger cars in the EU reached 253 million in 2021, up 8.6% from 2016.[12] Vehicle preferences across Europe vary by fuel type, but nearly all countries have maintained a heavy reliance on fossil-fuelled vehicles.

- Several EU Member States experienced particularly strong growth in passenger car registrations in 2021, including Greece, Ireland and Poland.[13]
- Germany had the highest total number of passenger cars in 2021, at almost 49 million, followed by Italy (40 million) and France (39 million).[14]
- In 2021, the European countries with the highest shares of petrol-powered cars among new registrations were Cyprus (85.5%), Malta (80.5%), Lithuania (77.6%), the Netherlands (77.4%) and Finland (77.3%).[15]
- The only country that had a higher share of diesel than petrol cars among new passenger car registrations was Greece (75.8%).[16]

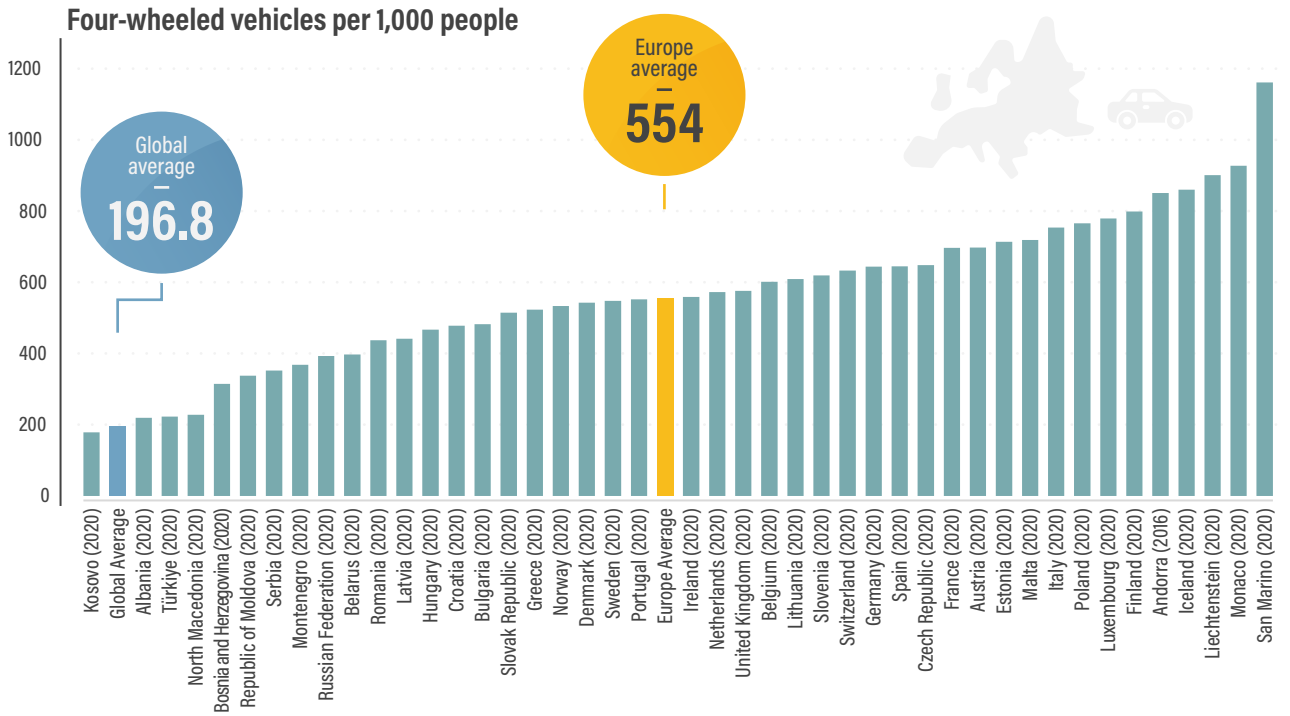
The motorisation rate (covering four-wheeled motor vehicles) continued to vary greatly across Europe, growing around 20% regionwide and 18% in EU countries, on average, during 2010-2020.[17] The average motorisation rate for the region was 554 vehicles per 1,000 people, well above the global average of 196 vehicles per 1,000 people (see Figure 1).[18] From 2010 to 2020, motorisation growth ranged from an increase of 76% in Romania to a decline of 12% in Greece (due to ongoing effects of the economic crisis).[19]

- San Marino and Monaco topped the list for motorisation in the region, with 1,161 and 927 vehicles per 1,000 people, respectively, in 2020, followed by Liechtenstein (902) and Iceland (860).[20] The lowest motorisation rate was in Kosovo (178), followed by Albania (219) and Türkiye (223).[21]
- Finland, with 798 passenger cars per 1,000 people, topped the motorisation list in EU Member States in 2020, followed closely by Luxembourg, with 779 cars per 1,000 people.[22]
- Luxembourg had the highest share of vehicles no older than two years in the EU in 2021 (19.2% of vehicles), followed by Germany (17.8%) and Sweden (15.8%), while Poland had the highest share of passenger cars older than 20 years (41.3% of vehicles), followed by Estonia (33.2%) and Finland (29.2%).[23] Eastern European countries are a large market for

i In this section, "Europe" includes 27 Member States of the European Union (EU), four Member States of the European Free Trade Association (EFTA), as well as Albania, Andorra, Belarus, Bosnia and Herzegovina, Kosovo, Monaco, Montenegro, the Republic of North Macedonia, the Republic of Moldova, the Russian Federation, San Marino, Serbia, Ukraine and the United Kingdom. When the text refers specifically to "the EU", only EU Member States are concerned.

FIGURE 1. Motorisation rates per 1,000 people in Europe, 2016-2020

Source: See endnote 18 for this section.



imported second-hand vehicles, with Serbia and Bosnia and Herzegovina among the world's top 10 importing countries for used light-duty vehicles.[24]

- The motorisation rate in the six EU candidate countries and potential candidates for which data are available – Albania, Kosovo, Montenegro, the Republic of North Macedonia, Serbia and Türkiye – is much lower than in the EU Member States.[25]

The COVID-19 pandemic resulted in key changes in Europe's urban areas, as public transport use fell sharply and remained below 2019 levels in several countries as of July 2022.[26] However, in some countries public transport sectors rebounded to pre-pandemic levels or higher.

- Between 2019 and 2022, public transport use in the region decreased the most in the United Kingdom (down 21%), followed by the Netherlands, Belgium, Italy and Spain.[27]
- Conversely, France reported a 9% increase in public transport use in 2022 compared to 2019, while use increased 8% in Germany.[28]

As public transport use declined, active travel increased in many places.[29] Several European cities reconfigured streets to enable greater walking and cycling.[30] Cycling in particular boomed in the region, as many cities dramatically increased funding to support bike lanes and infrastructure.[31] Several major cities continued to have high shares of active travel among all trips as of 2022.[32]

- Countries with the largest additional cycling funding per capita during 2020 were Finland (USD 8.3 per person), followed by Italy (USD 5.4), France (USD 5.2) and the United Kingdom (USD 5.1).[33]
- Cities with high shares of walking among all trips included Paris (France) and London (UK) at 47%, and Stockholm (Sweden) and Oslo (Norway) at 42% each in 2022.[34] Cities with high cycling shares included Copenhagen (Denmark) and Amsterdam (Netherlands) at 19% in the same year.[35]

Europe is the second largest electric car market in the world after China; however, despite high uptake since 2020, only 2.4% of the region's passenger cars were electric as of 2022.[36] Sales of battery electric and plug-in hybrid cars grew more than 15% in 2022, meaning that every fifth car sold in Europe was electric.[37] Over 1.6 million battery-only electric cars were sold in 2022 in Europe, a more than four-fold increase from the 360,000 sold in 2019.[38]

The electric bus market in Europe grew 26% in 2022, to more than 4,100 registered vehicles, and nearly one-third of the European public bus fleet was reported to be zero emission vehicles.[39]

For its transport energy mix, **the EU announced in 2022 that it had achieved its 2020 target of 10% renewables in transport (up from just 1.6% in 2004), with nearly half (12) of the 27 EU Member States surpassing the target.**[40] By 2019, Europe as a whole accounted for 18% of the global demand for renewable fuels for transport.[41]

- Sweden had the EU's highest renewable energy share in transport in 2020, at 31.9% (due in large part to its relatively high use of biofuels in the sector), followed by Finland (13.4%), the Netherlands and Luxembourg (both 12.6%).[42] The lowest shares were in Greece (5.3%) and Lithuania (5.5%).[43]
- France, Germany and Spain together represented 44% of renewable energy use for transport in Europe.[44]

Despite significant growth in recent years, passenger cars powered by so-called alternative fuels comprised only a small share of Europe's total passenger car fleet in 2021 and remained low in most EU Member States.[45] As defined by the European Commission, alternative fuels refer to fuels other than petrol or diesel but can include other fossil fuels, so they are not always necessarily "clean" or "sustainable".[46] They can include electricity, liquefied petroleum gas (LPG), fossil natural gas, alcohols and mixtures of alcohols with other fuels, hydrogen, and biofuels, among others.[47]

In some European countries, new passenger cars powered by alternative fuels are mostly or nearly entirely battery electric, but the share varies greatly, with countries in Eastern and Southern Europe having a much smaller share of electric "alternative fuel" vehicles.[48] This variation is due in part to differing government incentives and their timing, including tax reductions, subsidies, access to lanes reserved for public transport, and free parking.[49] Other reasons for the diversity in alternative fuel car registrations include the number, variety and price of such models.[50]

The Russian Federation's invasion of Ukraine in 2022 contributed to rising energy prices worldwide, but the European market was particularly hard hit as countries relied heavily on Russian energy imports.[51] **Between February and July 2022, natural gas wholesale prices in Europe rose 115% and electricity prices rose 237%.**[52] In 2020, the EU relied on the Russian Federation for 29% of its crude oil imports and 43% of its natural gas imports.[53] With the rise in global oil prices due to the conflict and other factors, fuel prices for transport have surged since 2020. (*See Section 3.1 Integrated Transport Planning and Section 3.6 Road Transport.*)

The Russian war in Ukraine also has resulted in other transport-related impacts, including damage to infrastructure and major disruptions in the sector (see Box 1).[54]

BOX 1. The Russian Federation's war in Ukraine and impacts on transport

In 2021, prior to the Russian invasion of Ukraine, the EU had confirmed a plan to strengthen transport links with Eastern Partnership countries, including Ukraine, where 39 projects were planned to improve all modes of transport, for a total of EUR 4.5 billion (USD 4.8 billion). Ukraine was already connected to all 27 EU Member States through bilateral air services agreements, and in October 2021 a common aviation area agreement was signed to permit direct flights between Ukraine and any airport in the EU.

However, as a result of the Russian invasion in 2022, transport infrastructure in Ukraine has been greatly compromised. By June 2022, up to an estimated 30% of Ukraine's transport infrastructure had been damaged and major disruptions occurred in the sector, representing costs of up to EUR 92.6 billion (USD 98.8 billion). Meanwhile, the flows of refugees from Ukraine have needed transport to the EU. By the end of 2022, nearly 8 million people had fled Ukraine to other countries across Europe.

In a statement issued on 25 February 2022, the day after the invasion, the International Road Transport Union estimated that at least 12,000 truck drivers from across Europe and elsewhere remained stuck in Ukraine. In addition, the increase in fuel prices had negative impacts on commercial transport operators and supply chains, especially for road and maritime transport.

In response to the invasion, the EU adopted several sanctions linked to the transport sector, including bans on:

- sales of aircraft and related parts and equipment to Russian companies;
- Russian aircraft of any kind from entering EU airspace;
- Russian-flagged vessels from entering EU ports, with the exception of deliveries for medical, food, energy or humanitarian purposes;
- road transport businesses that were established in the Russian Federation from transporting goods into the EU, including those in public transport to other destinations; and
- the import of Russian seaborne crude oil and petroleum products, which represents 90% of previous oil imports from the Russian Federation.

In reaction to the sanctions, the Russian Federation banned from its airspace all EU airlines, as well as airlines from 36 other countries that support sanctions against the country. This resulted in reduced flight capacity by western companies, as well as higher flight costs for travellers and air cargo. (*See Section 3.7 Aviation.*)

Source: See endnote 54 for this section.

As with other regions, air transport in Europe was heavily impacted by the COVID-19 pandemic. Air passenger transport in EU Member States fell 73% in 2020 but rebounded slightly by 2021, growing nearly 40%.[55] Total air passenger transport among all European countries was expected to surpass 2019 levels (pre-pandemic) by 2024.[56]

Rail transport was also severely affected by the pandemic, falling 46% in 2020 in EU Member States following years of an upward trend.[57] By 2021, EU rail transport had partially recovered, rising 16.5%, with France and Germany showing particularly strong recoveries.[58] Night trains also resurged across the region by 2022, and rail carriers increasingly offered new routes and services to attract more customers.[59]

From 2011 to 2021, the modal split in freight transport remained relatively stable in the EU, with some minor fluctuations and changes shares of maritime, rail and inland waterway transport decreased, and this trend continued through 2022.[60] The decline was due to factors including effects from the pandemic, shrinking demand for goods, changes in port congestion, higher freight costs, supply chain disruptions, increasingly competitive truck transport, and the decline in traditional customer industries for rail freight (such as coal and petrol).[61] **Meanwhile, the share of road freight increased slightly as it rebounded from the pandemic (with strong increases in 2021), and air freight transport remained stable.**[62]

The effects of the pandemic led to a 5% decline in containerised freight transport across Europe in 2020, following continuous increases over the previous decade.[63] In 2021, inland freight grew 15% in the region.[64] However, the market for new commercial road vehicles in the EU fell nearly 15% between 2020 and 2022 due to supply chain issues limiting the availability of vehicles.[65]

Maritime transport accounted for more than two-thirds (67.9%) of freight tonne-kilometres in the EU during 2011-2021.[66]

- Latvia registered the highest growth in maritime transport during this period (up 8.5 percentage points) followed by Estonia (up 6.0), while Sweden recorded the largest drop (down 5.9).[67]
- From 2011 to 2021, the share of inland waterways in total freight transport decreased in 11 of the 17 EU Member States for which this mode of transport is applicable.[68] The largest drop in the inland waterway transport share was in Luxembourg (down 3.2 percentage points), while slight increases were seen in the Slovak Republic (up 0.7 percentage points) and Finland (up 0.1).[69]
- The share of road transport in total EU freight transport peaked at nearly 25% in 2021, after rising by 0.6 percentage points from the previous year.[70] In 2021, the share increased the most in Romania (up 3.7 percentage points), while the largest decrease was in the Slovak Republic (down 3.4).[71]
- The share of rail in total freight transport dropped in Switzerland and in 16 of the 25 EU Member States that have railways during 2011-2021.[72] Latvia had the largest fall in rail's share during the decade (down 22.9 percentage points), followed by Lithuania (down 10.8).[73]
- The share of air transport in total freight transport remained relatively stable in all EU countries during 2011-2021.[74] The highest increases in the share of air in total freight transport were in Latvia (up 0.9 percentage points) and Luxembourg (up 0.6).[75]

Emission trends

The transport sector contributed 22% of economy-wide CO_2 emissions in Europe in 2021.[76] **The region's transport CO_2 emissions grew a moderate 2% between 2010 and 2019, then fell 12.6% in 2020 with the onset of the COVID-19 pandemic; in 2021, they rebounded 5.9% but remained below pre-pandemic levels.**[77]

Regional CO_2 trends

Total transport CO_2 emissions (2021):
1,177.6 million tonnes

Share of global transport CO_2 emissions (excluding international aviation and shipping) (2021):
18%

Per capita transport CO_2 emissions (2021):
1.58 tonnes

Transport CO_2 emissions per USD 10,000 GDP (2021):
0.57 tonnes

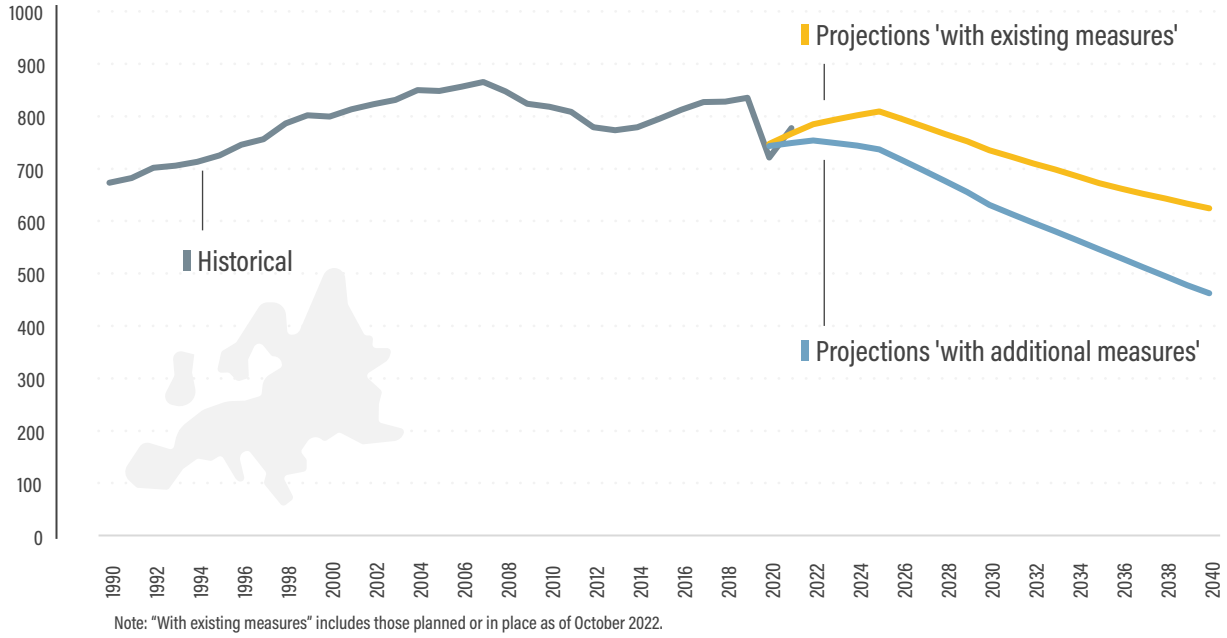
Source: See endnote 78 for this section.

Europe contributed 18% of the world's transport CO_2 emissions in 2021 (excluding international aviation and shipping), the third largest regional share after Asia and North America.[79] **Based on measures planned or in place as of October 2022, total transport emissions in the EU were projected to fall below 1990 levels by 2029** (see Figure 2).[80] **In this scenario, only road transport emissions, representing 77% of the EU's transport greenhouse gas emissions, would decline until 2030.**[81] **Emissions from other modes would either remain stable or increase, particularly aviation** (see Figure 3).[82]

Transport CO_2 emissions vary greatly across the region, from 143 million tonnes in Germany to 0.68 million tonnes in Iceland in 2021.[83] **On a per capita basis, Luxembourg emitted**

FIGURE 2. Greenhouse gas emissions from transport in the EU, 1990-2020, with projections to 2040

Source: See endnote 80 for this section.



Note: "With existing measures" includes those planned or in place as of October 2022.

FIGURE 3. Change in greenhouse gas emission levels from transport in the EU, by mode, 1990-2020, with projections to 2040

Source: See endnote 82 for this section.

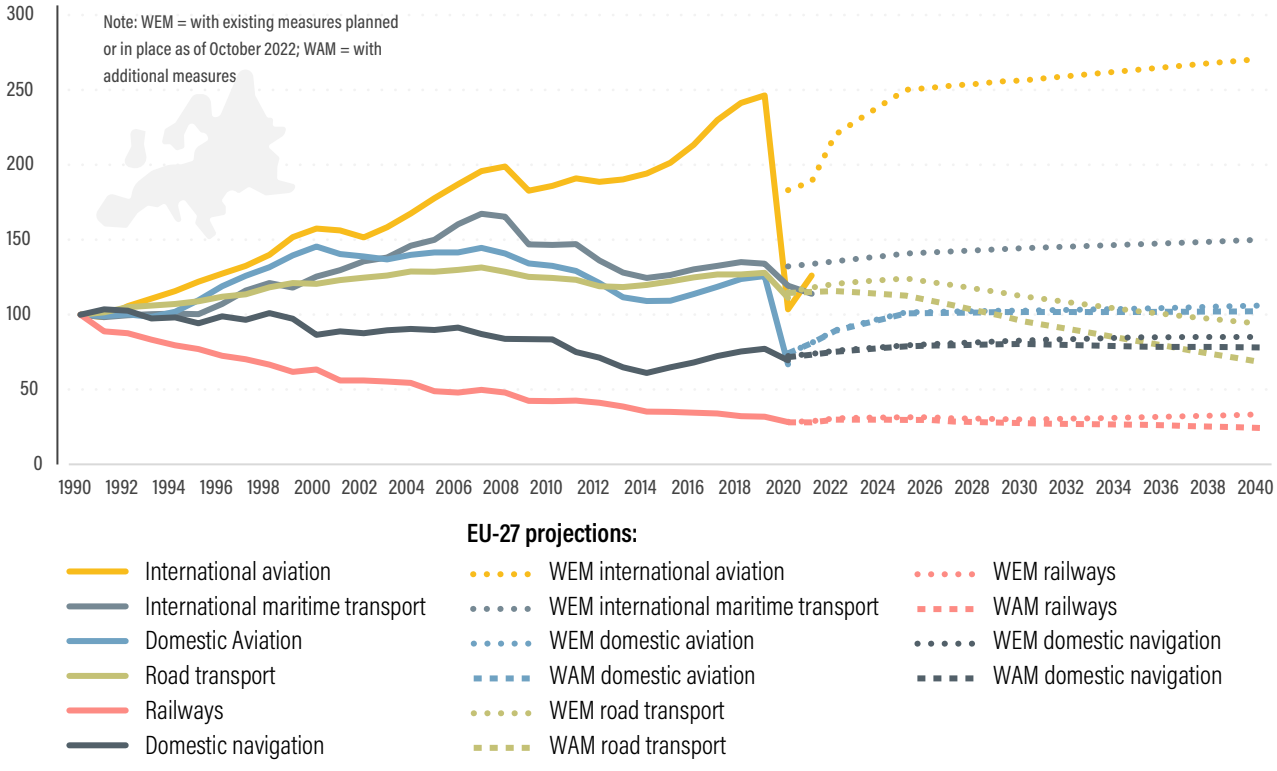
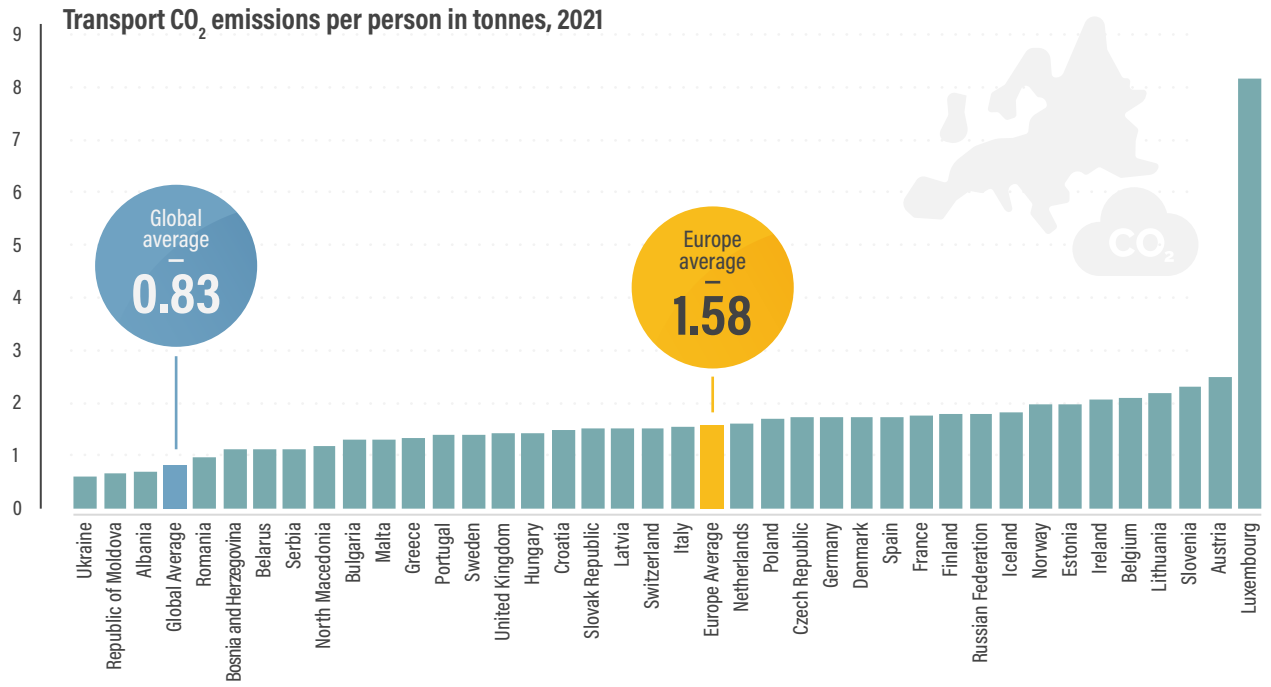


FIGURE 4. Per capita transport CO_2 emissions in Europe, by country, 2021

Source: See endnote 85 for this section.



by far the most CO_2 from transport in 2021, while Ukraine emitted the least.[84] Luxembourg has exceptionally high per capita emissions because calculations of CO_2 emissions include fossil fuel sales, and many citizens from neighbouring countries take advantage of lower diesel and petrol prices in Luxembourg (see Figure 4).[85]

- The European countries with the highest transport CO_2 emissions in 2021 were Germany, France, the United Kingdom, Italy, Spain, and Poland, while those with the lowest emissions were Iceland, Malta, Moldova, Albania, the Republic of North Macedonia and Estonia.[86]
- On a per capita basis, the highest-emitting European countries in 2021, after Luxembourg, were Austria, Slovenia, Lithuania and Belgium.[87] The countries with the lowest emissions per capita were Ukraine, Moldova, Albania, Romania, and Bosnia and Herzegovina.[88]

Policy developments

With the onset of the COVID-19 pandemic, countries enacted various policy measures to stimulate transport demand starting in 2020. Following the steep decline in rail usage, the EU declared 2021 the "European Year of Rail" in an attempt to increase rail transport.[89] With the similarly sharp decrease in air travel, European governments agreed to nearly EUR 38 billion (USD 40.5 billion) in financial aid for airlines by mid-2021.[90] Many national and sub-national jurisdictions increasingly supported active travel in 2020 and beyond, responding to the popularity of temporary cycling and pedestrian infrastructure installed during the pandemic. Micro-mobility[ii] also benefited from such changes but saw setbacks in some markets.

- In 2020, France introduced a USD 22 million programme to support cycling, including subsidising parking and repairs, with a goal of increasing the share of bike commuting from 3% in 2020 to 9% by 2024.[91]
- London (UK) adopted a Streetspace Plan in 2020 to support the target of a ten-fold increase in cycling and a five-fold increase in walking.[92]
- Brussels (Belgium) adopted legislation in 2022 that removes certain permitting requirements for building new bike lanes, in response to the increase in cycling use since the pandemic.[93]
- In April 2023, Paris (France) became the only European capital to ban shared electric scooters following a referendum in which just 8% of registered voters cast ballots.[94]

ii Micro-mobility refers to small, lightweight mobility devices typically operating at low to moderate speeds, such as electric scooters and bicycles. See https://www.itdp.org/multimedia/defining-micromobility.

In more sweeping action at the EU level, **in 2020, the European Commission released its Sustainable and Smart Mobility Strategy, which lays the foundation towards a green and digital transformation and more resiliency to future crises.**[95] The major targets are as follows.[96]

By 2030:

- At least 30 million zero-emission vehicles will be in operation on European roads.
- 100 European cities will be climate neutral.
- High-speed rail traffic will double.
- Scheduled collective travel of under 500 kilometres should be carbon neutral within the EU.
- Automated mobility will be deployed at large scale.
- Zero-emission vessels will become ready for market.

By 2035:

- Zero-emission large aircraft will become ready for market.

By 2050:

- Nearly all cars, vans, buses as well as new heavy-duty vehicles will be zero-emission.
- Rail freight traffic will double.
- High-speed rail traffic will triple.
- The multimodal Trans-European Transport Network (TEN-T), equipped for sustainable and smart transport with high-speed connectivity, will be operational for the comprehensive network.

As part of the European Green Deal, the European Commission adopted four proposals in 2021 aimed at modernising the EU's transport system to support cleaner, smarter mobility.[97] Such proposals would put the transport sector on track to cut its emissions 90% by 2050, with plans to:

- increase connectivity and shift more passengers and freight away from road transport to rail and inland waterways;
- support the increased installation of charging points, infrastructure for "alternative fuels", as well as new digital technology;
- increase the focus on sustainable mobility in urban areas; and
- facilitate the choice between different transport options in an efficient multi-modal transport system.[98]

As part of both the European Green Deal and the Sustainable and Smart Mobility Strategy, **in December 2021 the European Commission presented a proposal for an updated regulation on EU guidelines for the development of the Trans-European Transport Network (TEN-T), following from several initiatives in support of rail in recent years.** The EU aims to develop a region-wide network of roads, rail, inland waterways, and short-sea shipping routes, while increasing gross domestic product by an estimated 2.4% between 2021 and 2050, reducing greenhouse gas emissions 0.4% by 2050, creating 840,000 new jobs and mobilising funds for regional infrastructure.[99] In response to the Russian invasion of Ukraine , the proposal was amended in July 2022 to extend four corridors to Ukraine and Moldova and to accelerate a shift towards the European standard railway gauge.[100]

To help the EU meet its target of doubling high-speed rail traffic by 2030, the TEN-T proposal contained an action plan to remove barriers to cross-border and long-distance travel and to make rail travel more attractive for passengers.[101] Several developments supporting rail in the region have taken place in recent years in line with these goals.

- In early 2023, plans were announced for major rail projects in the "Three Seas Region" covering 12 EU Member States adjacent to the Baltic, Adriatic and Black seas.[102] In Poland, nearly 4,500 kilometres of high-speed rail were planned to be deployed as early as 2028.[103] By 2030, the entire cross-border rail corridor of the Rail Baltica project is to be completed in Estonia, Latvia, and Lithuania running to the Polish border, with possible lines to major cities in other countries.[104]
- To support domestic rail, France enacted a ban on domestic flights in May 2023 on routes where trains can transport passengers instead in less than 2.5 hours; however, the ban affected only three routes, or 1 in 40 flights.[105]
- Overnight direct train services began operating between Brussels (Belgium) and Berlin (Germany) in May 2023, reflecting efforts and demand in the region to provide passengers alternatives to air travel.[106]

In early 2023, the European Commission proposed updating the 2010 Intelligent Transport System Directive to adapt to emerging road mobility options, apps, and connected and automated mobility.[107] To stimulate faster deployment of new and intelligent services, certain data on roads, travel and traffic related to the TEN-T will be made available in digital format.[108]

Notable developments supporting sustainable transport systems also occurred outside the EU since 2020. In 2021, the UK government published its Transport Decarbonisation Plan, which includes a proposed target to ban the sale of heavy goods vehicles fuelled by diesel and petrol by 2040, with a similar target for light-duty vehicles by 2035.[109] The plan also sets goals for improving public transport and promoting active travel, building on a pledged GBP 2 billion (USD 2.4 billion) to support active travel and GBP 2.8 billion (USD 3.4 billion) to support the switch to cleaner vehicles, as well as commitments to a net zero rail network by 2050 and net zero domestic aviation by 2040.[110]

By 2022, several European countries had adopted policies and targets aimed at promoting or discouraging certain vehicle types or fuels, and many cities had designated low-emission zones to limit polluting vehicles and improve liveability. Almost all countries in the region had biofuel blending mandates and advanced biofuel targets, in addition to those set at the EU level.[111] (*See Section 4.1 Transport Energy Sources.*)

- The EU's Fit for 55 package, introduced in 2021, targets reducing the region's greenhouse gas emissions 55% by 2030 and reaching climate neutrality by 2050; for the transport sector, this would mean that CO_2 emissions from new cars would need to reach zero by 2035.[112]
- Building on this, **in early 2023 the EU almost unanimously approved a ban on sales of internal combustion engine vehicles (with an exception for CO_2-neutral e-fuels) as of 2035**, with only Bulgaria, Italy, Poland and Romania voting against the regulation.[113]
- **By 2022, at least 9 European countries had adopted either a target for 100% electric vehicles or a ban on internal combustion engine vehicles (typically targeting sales), while 11 countries had announced or made plans for such a target.**[114] A 2021 survey found that a majority of Europeans living in cities support these bans going into effect by 2030.[115] Only three countries – Denmark, Sweden and the United Kingdom – had both a 100% electric vehicle target or a 100% ban on internal combustion engine vehicles *and* a target for 100% renewable power.[116]
- Many cities have enacted partial bans on diesel vehicles, in most cases banning the vehicles during specific times of day rather than outright.[117] In 2022, Madrid became the first major European capital to eliminate diesel-fuelled buses from its public fleet; however, most of the fleet continues to be fuelled by compressed natural gas, which studies have shown is not a "clean" solution for transport.[118]
- An increasing number of European cities have adopted low-emission zones, ultra-low emission zones, or zero-emission zones, including those targeting freight vehicles. **Active low-emission zones in the EU-27, the United Kingdom and Norway increased 40% between 2019 and 2022, with projections for an additional 58% growth by 2025, to reach a total of 507 zones** (particularly as related laws come into force in France, Poland and Spain).[119] (*See Section 3.1 Integrated Transport Planning.*)

As part of the EU's Efficient and Green Mobility Package, the EU Urban Mobility Framework was released in December 2021 to guide cities to reduce emissions, improve public health, and make urban mobility smarter and more sustainable.[120] **The framework foresees that all major cities in the network develop a sustainable urban mobility plan (SUMP) by 2025**, with the primary objectives of 1) contributing to EU greenhouse gas reduction targets; 2) improving transport and mobility to, in and around cities; and 3) improving the efficiency of deliveries.[121] **Across Europe, the number of SUMPs increased from 800 in 2013 to 1,000 in 2018, with several cities having updated their SUMPs at least once.**[122]

With the Russian invasion of Ukraine and the subsequent spike in energy prices, countries across Europe offered relief to consumers by providing subsidies for fuel and public transport. France offered a fuel rebate of EUR 0.15 (USD 0.16) per litre for motorists, while Belgium, Germany, the Netherlands

and Sweden also provided fuel subsidies to help people cope with the crisis.[123] Some countries, such as Germany and Spain, provided support to public transport to reduce costs for users and to encourage a shift away from driving.[124] **The European Commission also enacted fuel subsidies, and in May 2022 it released the REPowerEU plan, which includes a strategy to shift to imports of non-Russian gas and oil alongside accelerated adoption of renewable energy and energy conservation efforts.**[125]

Specifically for freight, the European Commission provisionally agreed in 2022 to include emissions from shipping in the EU Emissions Trading System.[126] **In early 2023, it adopted FuelEU Maritime, aimed at reducing the greenhouse gas emission intensity of shipping fuels 2% by 2025 and 80% by 2050.**[127]

Partnership in action

SLOCAT partners engaged in dozens of actions during 2020-2022, including:

- The **ESCALATE** project brings together a diverse and committed consortium focused on escalating zero-emission heavy-duty vehicles and logistic intelligence to power the EU's net zero future.[128]
- At the 2021 United Nations Climate Change Conference in Glasgow, United Kingdom (COP 26), the **European Cyclists' Federation** and a global coalition of pro-cycling organisations issued an open letter calling on governments to commit to greatly increase the number of people who cycle in their countries in order to reach climate goals quickly and effectively. More than 350 civil society organisations signed the letter in November 2021.[129]
- In 2020, the **European Rail Research Advisory Council (ERRAC)** launched the Strategic Research and Innovation Agenda, which outlines to the European Commission how the railway sector can use research and innovation to deliver the vibrant, efficient and customer-friendly railway of the future.[130]
- After analysing Google's Environmental Insights Explorer (EIE) since 2021, **ICLEI–Local Governments for Sustainability** developed a handbook describing key steps to access and assess EIE transport data as well as how data sets could be used for sustainable urban mobility planning in Germen cities, including Cologne, Hamburg, Ludwigsburg and Ravensburg.[131]
- In 2023, the **POLIS Network** launched the GREEN-LOG programme to accelerate systemic changes to create last-mile delivery ecosystems that are socially, economically and ecologically sustainable; the programme will test the transferability of the proposed innovations through Urban Living Labs in five initial European cities or regions (Athens, Barcelona, Flanders, Oxfordshire and Ispra) and three follower cities (Arad, Helsinborg and Valga).[132]
- **The Future Is Public Transport**, a campaign that unites mayors, workers, union leaders, activists and city residents, called on world leaders at COP 26 in 2021 to make the investments needed to drive a green and just economic recovery and to transform cities for the better.[133]

Photo credits: Miguel Discart

MODULE 2 2.4

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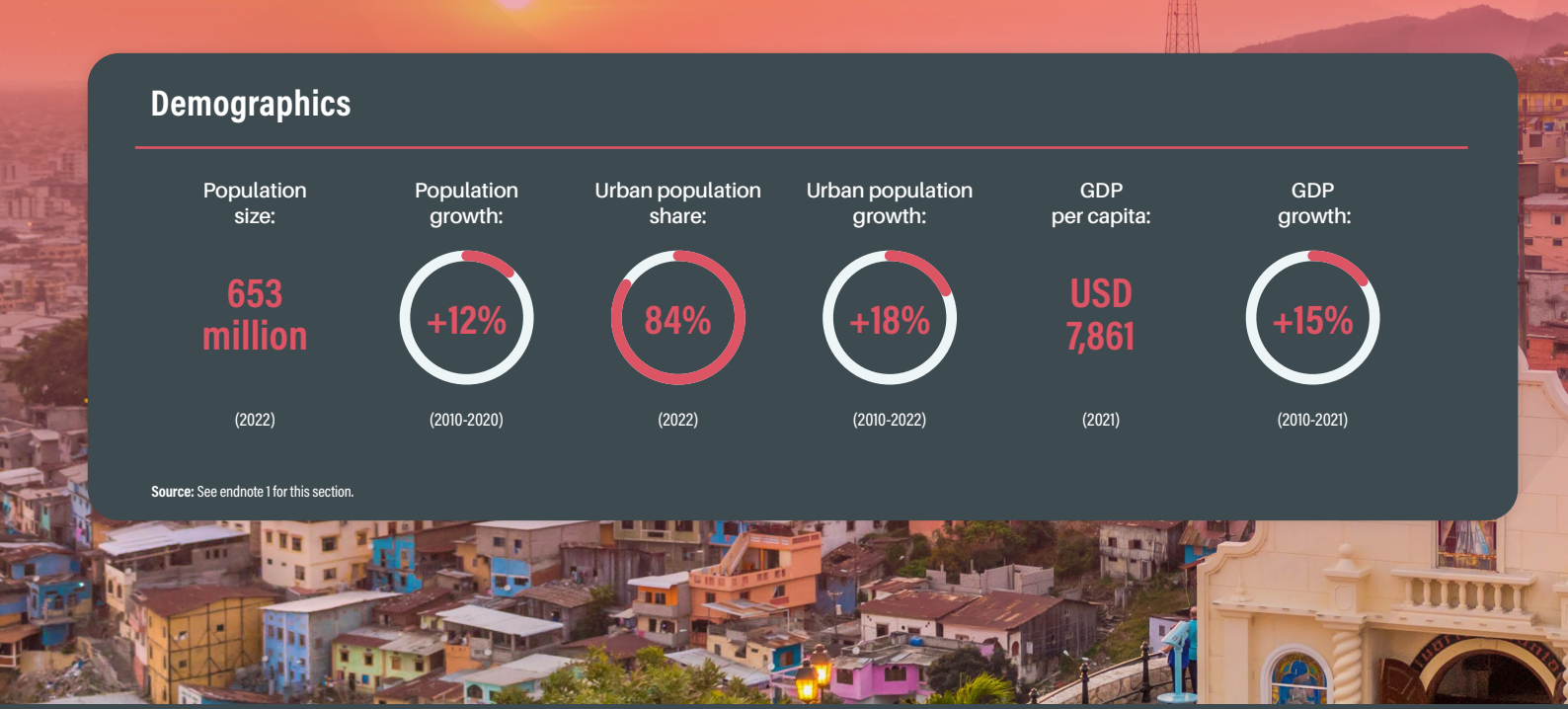
Latin America and the Caribbean Regional Overview

Demographics

Population size:	Population growth:	Urban population share:	Urban population growth:	GDP per capita:	GDP growth:
653 million	+12%	84%	+18%	USD 7,861	+15%
(2022)	(2010-2020)	(2022)	(2010-2022)	(2021)	(2010-2021)

Source: See endnote 1 for this section.



SLOCAT Partnership on Sustainable, Low Carbon Transport

Transport, Climate and Sustainability
Global Status Report - 3rd edition

Key findings

Demand trends

- From 2016 to 2020, the average motorisation rate (covering four-wheeled motor vehicles) in Latin America and the Caribbean was 267 vehicles per 1,000 people, or 1.35 times higher than the global average of 197 vehicles per 1,000 people. Nearly half of all countries in the region had motorisation rates above the global average during this period.
- Personal use of private cars and motorcycles continued to grow, as people perceived a lower risk of contagion from COVID-19 compared to public transport, and driven by other factors such as convenience, accessibility and safety.
- In two-thirds of 218 cities surveyed in Latin America and the Caribbean, just half or less of the population had convenient access to public transport in 2021. Public transport was heavily impacted by the pandemic and has taken longer to recover in the region than driving and walking.
- Because of the limited supply of adequate public transport, especially in peripheral low-income areas, the majority of public transport trips in the region are served by semi-formal and informal transport, which provides a flexible and demand-responsive service.
- Walking remained a major mode of transport in Latin American cities in 2021 and 2022. Cycling was less prevalent, but countries and cities continued to expand their cycling infrastructure.
- The uptake of micromobility (bike sharing and e-scooters) has faced challenges in the region, affected by the COVID-19 pandemic, regulatory restrictions and higher-than-expected operational costs. In April 2019 an estimated 73 systems were operating in 31 cities (mostly in Brazil), but by June 2020 these numbers had dwindled to 14 systems in 12 cities. A few new and expanding bike sharing services aim to increase access and promote social inclusion.
- Road transport dominates freight transport in the region. A 2021 study found that in South America trucks account for around 85% of national and 30% of regional freight transport and logistics, and in Central America road transport accounts for nearly 100% of freight transport.
- River and maritime transport represent 95% of international trade in Latin America and the Caribbean, although inland waterways are poorly developed.
- Cycling for first- and last-mile deliveries has increased in the region.

Emission trends

- Carbon dioxide (CO_2) emissions from transport in Latin America and the Caribbean grew nearly 11.6% between 2010 and 2019, then fell 15.6% in 2020 as a result of the COVID-19 pandemic. In 2021, the resumption in transport activity led to a 9.1% increase in transport CO_2 emissions, although they were still 7.9% below the 2019 level.
- In 2021, transport CO_2 emissions in the region contributed around 33% of overall regional CO_2 emissions and 8.5% of global transport emissions (excluding international aviation and shipping).
- Transport emissions relative to economic output were higher in Latin America and the Caribbean than in any other region except Africa in 2021, at 1.07 tonnes of CO_2 per USD 10,000, and were above the global average of 0.77 tonnes of CO_2 per USD 10,000 in 2021.
- Most countries in the region continued to subsidise fossil fuels through methods such as direct subsidies, stabilisation funds, tax reductions and exemptions, and control through state companies, thereby working against decarbonisation of the sector. Efforts to reduce these subsidies remain unsuccessful and have led to street protests and strikes.
- Although Latin America and the Caribbean remains an emerging market for electric cars (battery electric cars and plug-in hybrids), sales rose sharply from around 6,500 units in 2020 to 20,970 units in 2021 and 28,400 units in 2022. However, electric vehicles still made up only small shares of regional (less than 0.1%) and global fleets (2.1%) as of 2021.
- The number of electric public buses in the region grew more than 100% between 2020 and April 2023 (from 1,959 to 4,133 units), operating in 30 cities across 11 countries and accounting for nearly 4.7% of the combined bus fleets of major cities (around 88,364 buses).

Policy developments

- National governments in Latin America and the Caribbean have increasingly recognised the need to support city and local governments in planning and implementing sustainable urban mobility strategies – including through the development of national plans, policies and guidelines.
- Local sustainable urban mobility plans (SUMPS) continued to expand in the region – including in Brazil, Chile, Cuba, Ecuador and Peru – highlighting the role of cities as climate action leaders.
- As low-emission zones emerge in the region, two cities (Medellín and Rio de Janeiro) were beginning processes for their implementation as of early 2023. Additionally, some countries have developed vehicle efficiency labels to encourage the purchase and use of less-polluting vehicles or to regulate the circulation of certain vehicle types.
- Countries such as Chile and Mexico, and cities such as Bogotá (Colombia), Buenos Aires (Argentina), Lima (Peru) and Rio de Janeiro (Brazil), continued to expand their cycling infrastructure, boosted by measures taken during the pandemic.
- Strategic plans, financial incentives and regulatory elements have emerged to promote the electrification of road transport, many to facilitate the acquisition or operation of electric vehicles. Countries and cities in the region have set targets to electrify vehicle fleets, although electric cars still made up less than 0.1% of the total vehicle stock as of 2021. Electrified public transport modes that began operations included buses, a cable car, light rail systems and tuk-tuks.
- After economic and political delays reinforced by the pandemic, and despite ridership losses, public transport systems expanded in 2022 and 2023, including in Ecuador, Mexico and Panama. Existing metro systems added new lines, and new public transport systems began operations, including bus rapid transit, metro, cable car and light rail systems.
- Argentina, Brazil, Chile and Mexico all have programmes to improve the energy efficiency of freight transport and reduce its emissions, with a focus on innovative technologies and cutting fuel use.
- As of the end of 2022, more than 90% of Latin American and Caribbean countries had submitted a second-generation Nationally Determined Contribution (NDC) towards reducing emissions under the Paris Agreement. However, only 20% of countries had submitted Long-Term Strategies.

Photo credit: Carlos Felipe Pardo

Overview

Latin America and the Caribbean[i] is the second most urbanised region in the world after North America, with 84% of the population living in cities in 2022.[2] In 2020, as a consequence of the COVID-19 pandemic, extreme poverty in the region was the highest in two decades, reaching 13.1% of the population.[3] As economic activity recovered, the overall poverty rate fell slightly from 32.8% in 2020 to 32.3% in 2021, while the extreme poverty rate barely changed (12.9%).[4] Poverty levels in 2021 remained above 2019 levels.[5] Latin America and the Caribbean remains the second most unequal region globally (in terms of income, gender, ethnicity, etc.) after Sub-Saharan Africa and has seen very low economic growth.[6]

The effects of pandemic-related lockdowns on transport have persisted in the region, with public transport ridership in 2022 still below pre-pandemic levels despite the resumption of activities. The use of private cars and motorcycles continued to grow due to perceptions of lower contagion risk as well as factors such as convenience and accessibility. Although carbon dioxide (CO_2) emissions from transport fell sharply in 2020, they rose again as pandemic restrictions were lifted and activities resumed. The Russian Federation's invasion of Ukraine and higher energy prices led many countries in the region to provide additional fuel subsidies to alleviate the effects of inflation, impeding the decarbonisation of transport.

Despite the ongoing growth in transport emissions, promising developments in the region included the adoption of policy frameworks to promote sustainable urban mobility, the expansion of public transport systems and cycling infrastructure, and a growing focus on gender and inclusion in mobility planning. The most prominent approaches to transport decarbonisation are policies to promote the electrification of road transport and the adoption of electric buses. Many of these policy measures have clear linkages with achievement of the United Nations Sustainable Development Goals (SDGs) for 2030, such as SDG 3 (good health and well-being) through the improvement of road safety, air quality and active mobility; SDG 5 (gender equality) through the adoption of gender approaches in transport planning, and SDG 11 (sustainable cities and communities).

Demand trends

Cities in Latin America and the Caribbean have grown in both population and geographic size, often in the absence of integrated planning. As in other parts of the world, the region has prioritised planning for automobiles over other modes of transport.[7]

From 2016 to 2020 (latest data available), the average motorisation rate (covering four-wheeled motor vehicles) in Latin America and the Caribbean was 267 vehicles per 1,000 people, or 1.35 times higher than the global average of 197 vehicles per 1,000 people.[8] Nearly half of all countries in the region had motorisation rates above the global average during this period (see Figure 1).[9] Motorcycles comprised an estimated 29% of the region's vehicle fleet in 2021.[10]

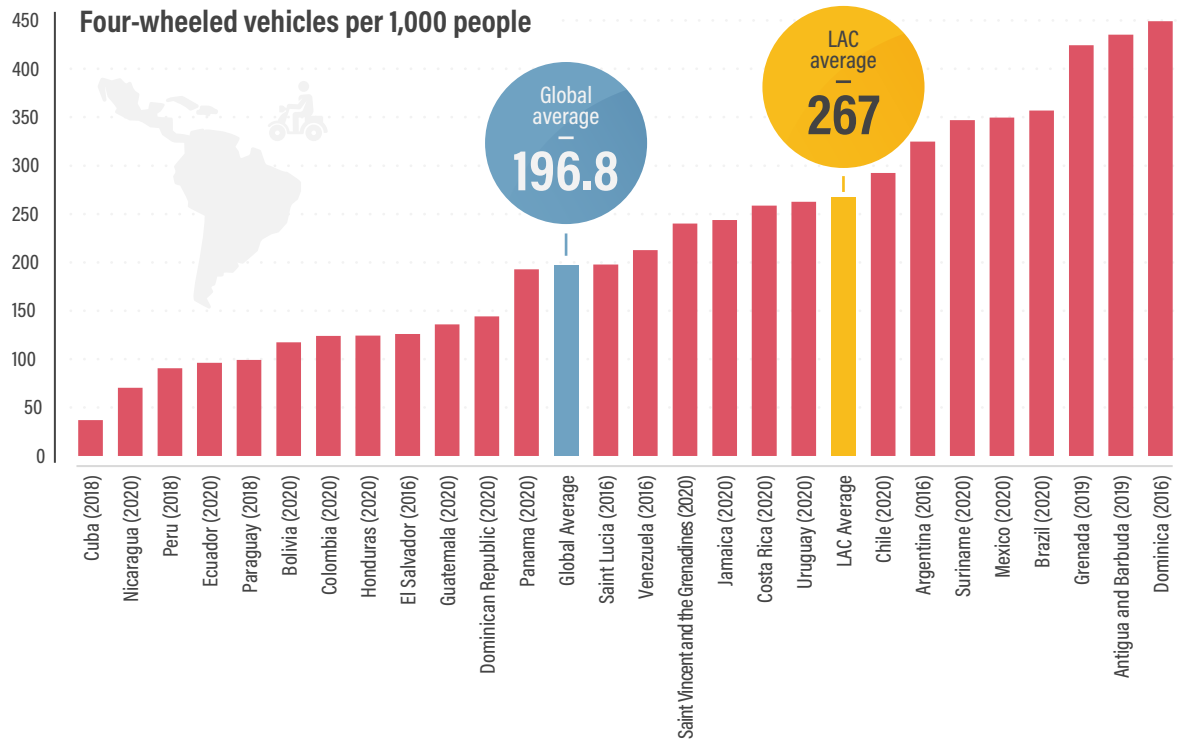
The COVID-19 pandemic profoundly impacted transport in Latin America and the Caribbean, and the region has been slow to recover. **Personal use of private cars and motorcycles continued to grow, as people perceived a lower risk of contagion from COVID-19 compared to public transport, and driven by other factors such as convenience, accessibility and safety.** These factors, as well as the lower cost of motorcycles relative to cars and the higher demand (and hence job opportunities) for delivery services, may have pushed lower-income groups to purchase motorcycles.[11]

- In Chile, sales of light- and medium-duty vehicles fell nearly 31% in 2020.[12] As the economy recovered, sales grew around 61% in 2021 and nearly 3% in 2022, the years with the highest sales in the history of the country's automotive sector (along with 2018).[13]
- In Peru, sales of new light vehicles increased 40% in 2021 and nearly 2% in 2022.[14]
- Data from 14 manufacturers in Brazil indicate that motorcycle sales increased around 26% between 2020 and 2021, from 915,157 to 1,156,776 units, their highest value since 2016.[15] Other sources show that sales of new cars grew only 3% in the same period, from 2,058,437 to 2,119,851 units.[16]
- In Colombia, the registration of new motorcycles increased nearly 41% from 2020 to 2021.[17]

i Here, Latin America and the Caribbean comprises countries of South America (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Uruguay and Venezuela), Central America (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua and Panama) and the Caribbean (Antigua and Barbuda, Bahamas, Barbados, Cuba, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago).

FIGURE 1. Motorisation rates per 1,000 people in Latin America and the Caribbean, 2016-2020

Source: See endnote 9 for this section.



- In Buenos Aires (Argentina), motorcycle trips grew from 3.7% of all trips in 2019 to 5.8% in 2021.[18] Motorcycle trips in Mexico City grew from 4.7% of all trips in 2019 to 6.4% in 2021.[19]

According to UN-Habitat, **in two-thirds (144) of 218 cities surveyed in Latin America and the Caribbean, just half or less of the population had convenient access to public transport in 2021.**[20] Across the region, 43% of the urban population had convenient access to public transport, the third lowest regional average (after Asia at 38% and Africa at 32%) and below the global average of 56%.[21] **Public transport was heavily impacted by the pandemic and has taken longer to recover in the region than driving and walking.** In some countries, ridership remained below pre-pandemic levels in 2021 and 2022. Nevertheless, several new public transport systems began operations in 2022.

Ridership on the region's metro systems fell 50% between 2019 and 2020, from 6,245 million passengers to 3,116 million passengers.[22] Queries in Apple's mapping service for directions related to driving, public transport and walking in Latin America were lowest in late March to early April 2020, with public transport recovering more slowly than driving and walking (see Figure 2).[23] Although driving and walking queries recovered by July 2021, surpassing the pre-pandemic baseline of mid-January 2020, queries for public transport remained below pre-pandemic levels for seven more months and only surpassed them in February 2022.[24]

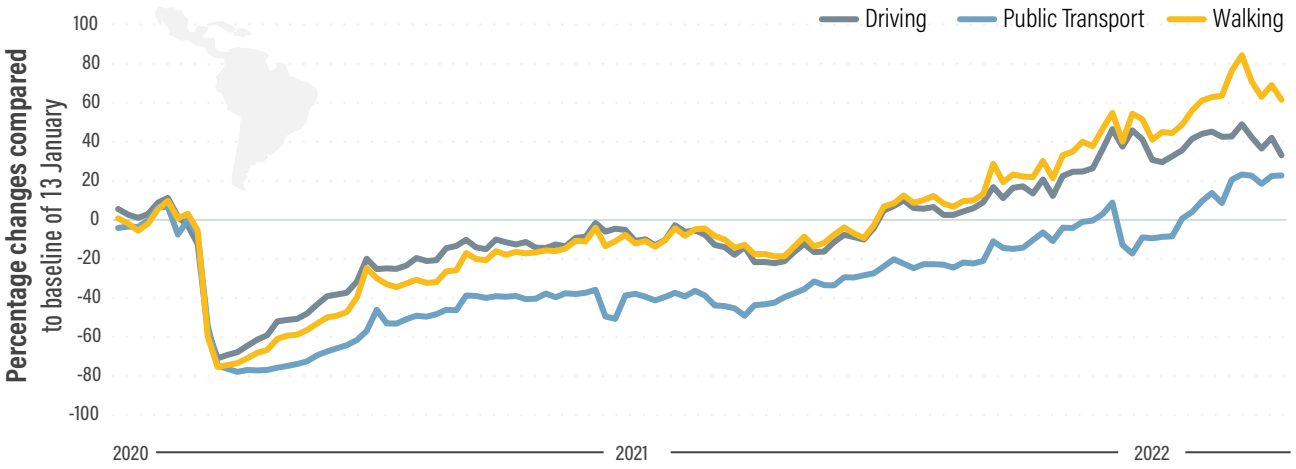
- In Buenos Aires (Argentina), the total number of trips by metro fell nearly 80% in 2020.[25] In 2021, despite the recovery, total trip numbers were still 68% lower than in 2019.[26]
- In Mexico, the number of passenger-kilometres travelled by buses and coaches fell around 39% in 2020.[27] Although the number increased in 2021, it was still 16% below 2019 levels.[28]
- In Brazil, around 1,800 urban bus companies were operating before the pandemic, and an estimated 200 operators ceased operations because of pandemic-related economic losses.[29] Following an 80% drop during the first three months of the pandemic, bus ridership in the country recovered slowly to reach around 70% of the pre-pandemic volume in 2022.[30]

After economic and political delays reinforced by the pandemic and two years of pandemic recovery, several new public transport systems started operating in the region in 2022 and early 2023, including a bus rapid transit system in Guadalajara (Mexico); the first line of the metro system in Quito (Ecuador); additional lines of Panama City's metro system and Mexico City's cable car system; and Bolivia's first electric light rail system in Cochabamba.[31]

Because of the limited supply of adequate public transport,

FIGURE 2. Navigation requests for driving, public transport and walking in Latin America, January 2020 to April 2022

Source: See endnote 23 for this section.



especially in peripheral low-income areas, the majority of public transport trips in the region are served by semi-formal and informal transport, which provides a flexible and demand-responsive service.[32] Often, the distinction between formal and informal public transport services is not clear.[33] Consolidated, robust and updated data on the use of these services is limited, corresponding with the nature of these services and with a widespread disregard for this mode in transport policy despite its immense contributions. This prevents its proper consideration in transport planning (*see Section 3.4.2 Informal Transport*) as well as in improving negative impacts – such as pollution, congestion, and reduced road and personal safety – as a result of competition for passengers and limited government oversight of vehicle maintenance and service quality.[34]

- In Mexico City, small, privately operated mini-buses are among the most prevalent modes of informal transport, accounting for 74% of all public transport trips.[35] When pandemic-related mobility restrictions were in place and metro and bus rapid transit stations were closed, informal transport provided services for essential workers and low-income residents who could not work from home.[36]
- A 2021 analysis of informal transport in Central American countries identified at least seven different types of informal transport services operating in Guatemala: informal taxis, motorcycle taxis, tuk-tuks, pick-up trucks, buses, bicycle taxis, and unregulated app-based mobility services.[37]

Walking remained a major mode of transport in Latin American cities in 2021 and 2022. Cycling was less prevalent, but countries and cities continued to expand their cycling infrastructure (*see Policy Developments section*).

- In large cities such as Buenos Aires (Argentina), São Paulo (Brazil) and Mexico City, walking accounted for nearly 30-40% of all trips in 2021, whereas cycling accounted for only 2-4% of trips.[38]
- In 2020 and 2021, bicycle sales in Brazil grew 50% compared to pre-pandemic levels, from around 4 million units in 2019 to nearly 6 million units in each of the following two years.[39] In 2022, bicycle sales fell 35% to 3.8 million.[40] However, the electric bike segment grew 9.6% in 2022, with nearly 45,000 e-bikes produced and imported, continuing a five-year growth streak.[41]

The uptake of micromobility (bike sharing and e-scooters) has faced challenges in the region, affected by the COVID-19 pandemic, regulatory restrictions and higher-than-expected operational costs.[42] **In April 2019, an estimated 73 systems were operating in 31 cities (mostly in Brazil), but by June 2020 these numbers had dwindled to 14 systems in 12 cities.**[43] **A few new and expanding bike**

sharing services in the region aim to increase access and promote social inclusion.

- The bike sharing system in Brasilia (Brazil), launched in 2014, ceased operations in 2020 due to financial difficulties aggravated by the pandemic.[44] In 2021, after a 1.5 year gap, the city launched a new bike sharing system with 500 bikes and 70 stations.[45] The system allows for easy integration with public transport, as users can use the same ticketing system to pay for both services.[46]
- In Bogotá (Colombia), the city's first shared bicycle system, Tembici, began operating in 2022 with 3,300 bikes distributed along 300 stations, with the goal of offering sustainable, gender-sensitive and inclusive mobility.[47] The fleet includes 1,500 mechanical bikes, 1,500 e-bikes, 150 hand-pedal bikes for wheelchair users, 150 cargo bikes to transport goods and 150 attachable child seats.[48] The system offers a 20% discount for lower-income users, as well as 1,600 free bike parking spots in public spaces.[49]
- In 2022, Mexico City began expanding its shared bicycle system, Ecobici, with the goal of extending coverage from three city zones to six and adding 2,980 bikes for a total of 9,480.[50]
- To promote bike use from early ages, Rosario (Argentina) added bicycles for kids at two stations of its shared bicycle system Mi Bici Tu Bici in April 2023.[51] The bikes can only be used in nearby parks, and the city aims to progressively add more bikes for kids at stations close to recreational venues.[52]

Road transport dominates freight transport in the region. A 2021 study found that in South America trucks account for around 85% of national and 30% of regional freight transport and logistics, and in Central America road transport accounts for nearly 100% of freight transport.[53] Data on performance are scarce due to the high diversity of operators, from a large number of small and informal enterprises to few large companies with a high degree of specialisation.[54] Heavy vehicles in the region have an average age of 15 years, and in several countries a large share of trucks are more than 20 years old.[55] Rail freight represents less than 3% of the region's overall freight transport.[56] **River and maritime transport account for 95% of international trade in the region, although inland waterways are poorly developed.**[57]

Cycling for first- and last-mile deliveries has increased in the region. Although this practice is deeply rooted in low-income segments as a source of informal employment, newer initiatives using cargo bikes or tricycles aim to reduce pollution and road congestion caused by freight transport and urban waste collection efforts, and to improve social inclusion.[58]

- In 2021, with support from the Development Bank of Latin America (CAF) and Germany's Agency for International Cooperation (GIZ), Fortaleza (Brazil) launched the Re-ciclo project, which donates electric tricycles to wastepicker associations to replace their heavy carts and to test the tricycles for urban logistics purposes.[59]
- Between December 2020 and May 2022, with the support of the World Bank, Bogotá (Colombia) carried out the BiciCarga project with businesses of different sectors, which implemented a distribution scheme using electric cargo bikes. The project aimed to assess the necessary requirements for the sustainability of this distribution model.[60]
- With support from ICLEI-Local Governments for Sustainability, Rosario (Argentina) added 20 cargo bikes to its public bike sharing scheme in 2022, targeting merchants, entrepreneurs and workers in the city centre.[61]

Emission trends

CO_2 emissions from transport in Latin America and the Caribbean grew nearly 11.6% between 2010 and 2019, then fell 15.6% in 2020 as a result of the COVID-19 pandemic.[62] **In 2021, the resumption in transport activity led to a 9.1% increase in transport CO_2 emissions, although they were still 7.9% below the 2019 level.**[63] Peru, Mexico and Ecuador experienced the region's highest drops in transport CO_2 emissions in 2020 (down 20% or more).[64] As transport resumed in 2021, the highest increases in emissions were in Ecuador, Colombia and Peru.[65]

In 2021, transport CO_2 emissions in Latin America and the Caribbean contributed around 33% of overall regional CO_2 emissions and 8.5% of global transport emissions (excluding international aviation and shipping).[66] Average per capita transport CO_2 emissions in the region were 0.85 tonnes, close to the global average of 0.83 tonnes.[67] The highest per capita transport emissions were in the Caribbean countries of the Bahamas and Antigua and Barbuda (close to 3 tonnes), and the lowest were in Haiti, Cuba, Nicaragua and Honduras (below 0.5 tonnes) (see Figure 3).[68]

Regional CO_2 trends

Total transport CO_2 emissions (2021):
550 million tonnes

Share of global transport CO_2 emissions (excluding international aviation and shipping) **(2021):**
8.5%

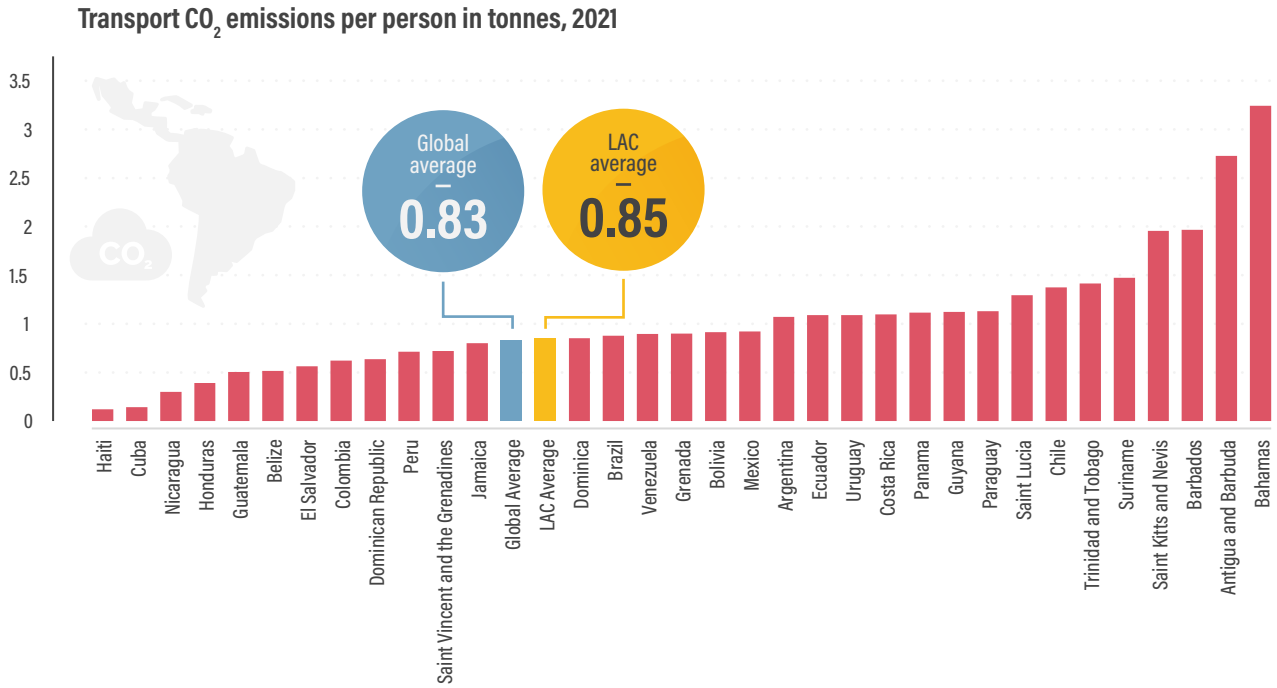
Per capita transport CO_2 emissions (2021):
0.85 tonnes

Transport CO_2 emissions per USD 10,000 GDP (2021):
1.07 tonnes

Source: See endnote 69 for this section.

FIGURE 3. Per capita transport CO_2 emissions in Latin America and the Caribbean, 2021

Source: See endnote 68 for this section.



Transport emissions relative to economic output were higher in Latin America and the Caribbean than in any other region except Africa in 2021, at 1.07 tonnes of CO_2 per USD 10,000, and were above the global average of 0.77 tonnes of CO_2 per USD 10,000 in 2021.[70] This may be due to the dominance of road freight transport and to the absence of more cost-effective and energy-efficient modes such as rail and shipping across the region.[71]

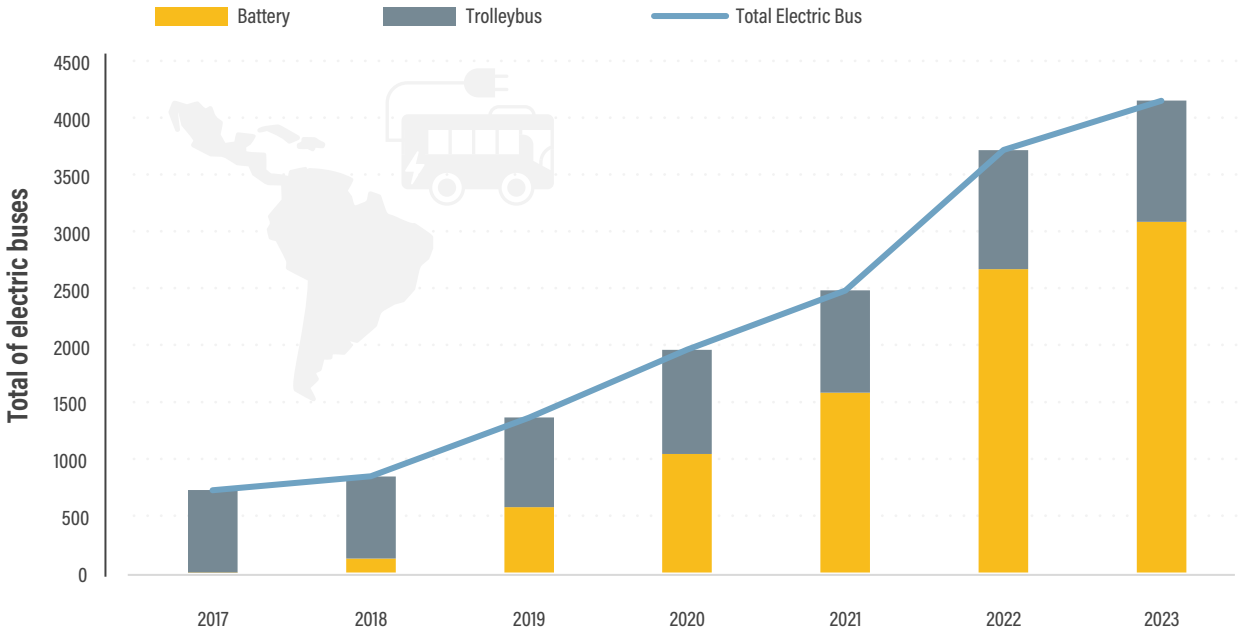
Most countries in the region continued to subsidise fossil fuels through methods such as direct subsidies, stabilisation funds, tax reductions and exemptions, and control through state companies, thereby working against decarbonisation of the sector. Efforts to reduce these subsidies remain largely unsuccessful and have led to street protests and strikes, as nearly a third of the region's population lives in poverty, and such reductions would affect consumer purchasing power.[72] The challenge has been intensified by global events such the Russian Federation's invasion of Ukraine, which caused a slowdown in economic growth and led many countries to adopt additional fuel subsidies to alleviate the impacts of higher food and energy prices on vulnerable households.[73]

- As of February 2023, Venezuela, Bolivia, Ecuador and Colombia had the lowest petrol and diesel prices in the region, ranging from USD 0.016 to USD 0.634 per litre, whereas Chile, Uruguay, Belize and Barbados had the highest prices, ranging from USD 1.47 to USD 1.95 per litre.[74]
- In April 2022, Chile adopted the inclusive recovery plan Chile Apoya to support residents facing rising living costs, including for fuel. A key measure increases the allocation of economic resources to smooth the effects of higher international oil prices on the cost of petrol for vehicle use.[75]
- Peru adopted tax exemptions and measures in March and April 2022 to stabilise the prices of petrol, liquefied petroleum gas (LPG) and diesel.[76] These measures resulted in reductions in the fuel prices for vehicle use of around 28% for diesel and 17% for petrol.[77]
- Brazil approved a regulation in June 2022 to reduce taxes on petrol and energy, leading to a decrease in prices and in the inflation rate, which reached its lowest value since 1980.[78] The regulation reduced the average price per litre of petrol nearly 29%.[79]
- Also in June 2022, Ecuador experienced violent country-wide protests following increases in the prices of fuel, food and other basic necessities.[80] Similar protests took place in Panama in July 2022.[81] In both cases, governments responded by reducing or freezing fossil fuel prices.[82]

Although Latin America and the Caribbean remains an emerging market for electric cars (battery electric cars and plug-in hybrids), sales rose sharply from around 8,000 units in 2020 to 27,000 units in 2021 and 37,000 units in 2022.[83] **However, electric vehicles still made up only small shares of regional (less than 0.1%) and global fleets (2.1%) as of 2021.**[84]

FIGURE 4. Electric buses in Latin America and the Caribbean, by type, 2017-2023

Source: See endnote 90 for this section.



- In 2021, Colombia, Mexico and Costa Rica led in the commercialisation of light-duty battery electric vehicles in the region, with between 1,000 and 1,500 units registered in each country.[85]
- Costa Rica's electric car fleet grew around 70% between 2020 and 2021 (from 1,484 to 2,529 vehicles) and around 60% in 2022, to reach a total of 4,128 units.[86] Considering also electric motorcycles (1,077 units) and special equipment (1,335 units), Costa Rica had a combined 6,540 electric vehicles in 2022, accounting for 4% of all new vehicles registered that year.[87]
- In 2022, fully electric vehicles in Colombia made up an estimated 0.12% of the total vehicle fleet.[88]

The number of electric public buses in the region grew more than 100% between 2020 and April 2023 (from 1,959 to 4,133 units), operating in 30 cities across 11 countries and accounting for nearly 4.7% of the combined bus fleets of major cities (around 88,364 buses).[89] The total number of electric buses in the region's public transport fleets grew more than 110% between 2020 and April 2023 (see Figure 4).[90]

- As of April 2023, the countries with the highest numbers of e-buses in the region were Colombia (1,589 units) and Chile (1,223 units), followed by Mexico (556 units), Brazil (376 units) and Ecuador (106 units).[91] The leading cities were Bogotá (1,485 units), Santiago (1,180 units) and Mexico City (493 units).[92]
- Barbados has the largest e-bus fleet in the Caribbean, rising from an initial 33 units in 2020 to 49 units in 2022 across the island of 300,000 inhabitants.[93]
- In 2020, 32 e-buses began operating in Uruguay, and by July 2022 the buses had travelled some 3.6 million kilometres, avoiding around 1.5 million litres of fuel consumption and 3,900 tonnes of CO_2 emissions.[94]

Policy developments

National governments in Latin America and the Caribbean have increasingly recognised the need to support city and local governments in planning and implementing sustainable urban mobility strategies – including through the development of national plans, policies and guidelines. These frameworks seek to facilitate efficient co-ordination across jurisdictional levels, providing effective support and ensuring coherence across national-level objectives and sub-national transport planning.

- In 2020, a constitutional amendment in Mexico declared the universal right to safe, accessible, efficient, sustainable, inclusive and equitable mobility, leading to the adoption in 2021 of the General Law of Mobility and Road Safety. The law aims to reduce road crashes, promote equitable and sustainable access to transport services, and harmonise sub-national actions.[95]
- Chile launched its National Sustainable Mobility Strategy in 2021, establishing a vision and objectives for urban mobility by 2050 and recommending measures for cities to generate their own locally aligned strategies.[96]
- In 2022, Uruguay launched the Guide for Sustainable Urban Mobility Planning to provide sub-national governments with tools for planning and implementing sustainable urban mobility strategies.[97]
- In 2022, Colombia developed the National Strategy of Active Mobility with a Gender and Differential Approach, which provides guidelines for local governments to promote walking and cycling, consider the needs of people with reduced mobility and disabilities, and promote gender equality.[98] The complementary Guide for Shared Bicycle Systems helps local governments evaluate the technical, regulatory and financial aspects of implementing bike sharing systems in large and small cities.[99]

Local sustainable urban mobility plans (SUMPs) continued to expand in the region – including in Brazil, Chile, Cuba, Ecuador and Peru – highlighting the role of cities as climate action leaders. During 2021-2022, Ambato (Ecuador), Antofagasta (Chile), Baixada Santista (Brazil), Havana (Cuba) and Trujillo (Peru) finalised their SUMPs (with support from the EUROCLIMA+ programme) as cornerstones of their contributions to address climate change, including goals to develop high-quality public transport, promote walking and cycling, and improve road safety.[100] Cities expected to complete SUMPs in the coming years include Arequipa (Peru), Córdoba (Argentina), La Paz (Bolivia) and Lima (Peru).[101]

- In 2020, Brazil added to its National Urban Mobility Policy that cities with more than 20,000 inhabitants, cities belonging to metropolitan regions, and cities in touristic areas must present SUMPs before April 2023 as a requirement to receive federal economic support for implementing urban mobility measures.[102] As of December 2022, 343 municipalities – around 17% of the cities covered in the scope of the mandate – had finalised SUMPs, and 90 of these cities have more 250,000 inhabitants.[103]
- In October 2020, Colombia's Ministry of Transport approved a resolution requiring municipalities, districts and metropolitan areas with populations of more than 100,000 inhabitants to prepare or adjust Sustainable and Safe Mobility Plans that prioritise active mobility and low- or zero-emission public transport.[104]
- In April 2021, Costa Rica adopted a Pedestrian Mobility Law that aims to guarantee the right to inclusive mobility in all physical environments; regulate the planning, maintenance and financing of sidewalks; and require districts to develop SUMPs.[105]

As low-emission zones emerge in the region, two cities (Medellín and Rio de Janeiro) had begun processes for their implementation as of early 2023.[106] Additionally, some countries have developed vehicle efficiency labels to encourage the purchase and use of less-polluting vehicles or to regulate the circulation of certain vehicle types.

- In 2021, Medellín became the first city in Colombia to establish a protected urban air zone in the city centre, with the goal of reducing transport emissions and improving air quality.[107]
- Rio de Janeiro (Brazil) approved the creation of a low-emission district In June 2022, with the goal of making the zone partially operational by 2024 and fully operational by 2030.[108]
- In May 2022, Argentina adopted a label that provides accurate data on vehicle fuel consumption and CO_2 emissions, enabling consumers to compare vehicles when making purchase decisions.[109]
- Bogotá (Colombia) began implementing a two-year voluntary environmental labelling pilot for cargo vehicles in the first quarter of 2023, with the aim of quantifying the emissions of various vehicle technologies as a basis for issuing future permits or restrictions on circulation to improve air quality.[110]

Countries such as Chile and Mexico, and cities such as Bogotá (Colombia), Buenos Aires (Argentina), Lima (Peru) and Rio de Janeiro (Brazil), continued to expand their cycling infrastructure, boosted by measures taken during the pandemic.

- Between 2015 and 2021, Bogotá (Colombia) expanded its bicycle infrastructure 33% (from 443 kilometres to 590 kilometres), and the city's 2020-24 Strategic Plan includes the goals of further expanding it to 830 kilometres by 2024 and increasing the number of cycle trips by 50%.[111]
- In 2021, Lima (Peru) reported 294.35 kilometres of bike paths, and in November the city signed an economic support agreement of EUR 20 million (USD 21.3) with the German Financial Cooperation to build an additional 114 kilometres of bicycle lanes and 12 bike parking lots in the city.[112]
- Between 2019 and 2022, Mexico City built 206 kilometres of protected cycling lanes, more than the amount built in the previous 14 years (174 kilometres) and bringing the total network to 381 kilometres.[113] The goal is to expand the network to 600 kilometres and to reach 510,000 daily bicycle trips by 2024 to reduce transport-related emissions.[114]
- In 2022, Buenos Aires (Argentina) met its goal of having 300 kilometres of protected cycling lanes (up from 267 kilometres in 2020), and the city is set to reach 1 million daily bicycle trips

by 2023, three times more than in 2019.[115]

- In March 2023, Rio de Janeiro (Brazil) launched its Cycling Expansion Plan CicloRio, which sets the targets of connecting all public transport stations of medium and high capacity (including bus rapid transit and metro) to the bicycle network by the end of 2024, and to expand the cycling infrastructure from 450 kilometres to 1,000 kilometres by 2033.[116]
- In April 2023, Chile reported having 2,072 kilometres of cycling infrastructure, up 11% from 2021 (1,866 kilometres) and up 35% from before 2018 (1,344 kilometres).[117] The Santiago metro region had 781.6 kilometres as of 2022, and another 115 kilometres was being built throughout the country.[118]

Strategic plans, financial incentives and regulatory elements have emerged to promote the electrification of road transport, many to facilitate the acquisition or operation of electric vehicles.

- In 2022, Chile passed a law promoting investment in energy storage and electric mobility as key elements to achieve the country's goal of carbon neutrality by 2050.[119] The law exempts electric vehicles from circulation taxes for two years and allows industries that generate renewable energy for productive purposes to feed excess electricity to (or withdraw energy from) the national grid.[120]
- Guatemala approved a law in 2022 on incentives for electric mobility, including exemptions from value-added tax and from taxes on the import of electrical equipment and devices used exclusively for electric vehicle charging.[121]
- In 2022, Costa Rica updated its law on incentives for the purchase of new and used electric vehicles during the next 12 years and increased the scope of incentives already established in 2018.[122]
- Panama passed a new electromobility law in 2022 that requires municipalities to exempt electric vehicles from circulation taxes for five years.[123.]
- In 2022, Paraguay presented its Master Plan for Multimodal Electric Mobility for Public and Logistic Transport, which lays out a roadmap to 2040 that includes quality criteria and programmes to introduce electric vehicles in public and freight transport.[124]
- Uruguay launched the Electric Urban Mobility Guide in 2022 to provide regional departmental governments with the tools to implement electric mobility.[125] In November 2022, the country announced subsidies of USD 5,000 each for purchases of electric taxis or electric vehicles used for ride hailing, to be available until December 2023 or until the total allocation of USD 500,000 is used up.[126]

Countries and cities in the region have set targets to electrify vehicle fleets, although electric cars still made up less than 0.1% of the total vehicle stock as of 2021, well below the global share of 2.1% electric cars in the total passenger car

vehicle fleet.[127]

- In October 2021, Chile launched its new National Electromobility Strategy, which calls for 100% of the sales of light, medium and public transport vehicles (buses, taxis and buses) to be zero emissions by 2035, and for 100% of the sales of cargo transport and inter-city buses to be zero emissions by 2045.[128]
- Panama's electro-mobility law of 2022 sets targets to electrify 10% of government vehicles and public transport by 2025, 25% by 2027 and 40% by 2030.[129]
- In Brazil, the city of Curitiba targets deploying around 150 articulated e-buses by 2024 and aims to operate 100% of its passenger vehicles with clean or renewable energy by 2050.[130] Rio de Janeiro targets 69 e-buses in operation by 2024 and the replacement of 20% of its public transport fleet with zero-emission buses by 2030.[131] São Paulo banned bus companies from purchasing new diesel buses as of 2022 and targets at least 2,600 e-buses by 2024, to represent around one-fifth of the fleet.[132]

Countries and cities in the region continued to invest in the use of e-buses for public transport.

- In 2022, Guatemala City carried out a 3.5-month pilot project to evaluate the efficiency and sustainability of 20 e-buses under normal operating conditions.[133]
- Work began in 2022 on the charging terminal that will enable the initial operation of 40 e-buses in Antofagasta (Chile) in mid-2023, the first such service outside the country's capital.[134]

Electrification in the region is also reaching other public transport modes besides buses.

- Mexico City inaugurated the first line of its Cablebús cable car system in 2021, and in 2022 a second line started operating, which transported more than 23 million people during the year and reduced the travel time from 1 hour and 15 minutes to only 36 minutes.[135] A third line is expected to be operational by the end of 2023.[136]
- Bolivia's first electric light rail system, Tren Metropolitano, started operating in September 2022 as one of the country's most modern public transport systems, linking the cities of Cochabamba, Colcapirhua, Quillacollo, Sacaba, Sipe Sipe and Vinto.[137]
- In 2022, Guadalajara (Mexico) began building the fourth line of its Mi Tren light rail network, which serves the municipalities of Guadalajara, Tlaquepaque and Zapopan in the Guadalajara metro area.[138]
- San Juan Comalapa (Guatemala) received nine electric tricycle "tuk-tuks" in May 2022 to provide public transport for elderly populations and people with disabilities, and to support the work of waste pickers.[139]

After economic and political delays reinforced by the pandemic, and despite ridership losses, public transport systems expanded in 2022 and 2023, including in Ecuador, Mexico and Panama. Existing metro systems added new lines, and new public transport systems began operations, including bus rapid transit, metro, cable car and light rail systems. As of March 2023, metro systems were operating in 10 countries (Argentina, Brazil, Chile, Colombia, the Dominican Republic, Ecuador, Mexico, Panama, Peru and Venezuela), and bus rapid transit systems were operating in 13 countries (Argentina, Brazil, Chile, Colombia, Ecuador, El Salvador, Guatemala, Mexico, Panama, Peru, Trinidad and Tobago, Uruguay and Venezuela).[140]

- The second corridor of the bus rapid transit system of Guadalajara (Mexico) started functioning in 2022, with 42 stations distributed along 41.5 kilometres.[141]
- The metro system in Quito (Ecuador) began trial operations in early 2023 and was the first in the country as well as the newest in the region.[142]
- In March 2023, a new metro branch connecting the city centre of Panama City with Tocumen International Airport started operations, making the city one of the few in the region to have metro service to the airport.[143]
- The Lima and Callao Metro, which serves the Lima (Peru) metropolitan area, had one line in operation and two more under construction as of early 2023.[144]
- Bogotá (Colombia) is building its first metro line, which is expected to be finished by 2028.[145]

Argentina, Brazil, Chile and Mexico all have programmes to improve the energy efficiency of freight transport and reduce its emissions, with a focus on innovative technologies and cutting fuel use.[146]

- In 2018, Chile implemented Giro Limpio, a voluntary programme that seeks to certify and recognise efforts by transport companies to improve their energy and environmental performance. As of July 2021, the programme involved 180 carriers accounting for 15% of Chile's transported cargo, 462 million litres of diesel consumption and 1,313,080 tonnes of CO_2-equivalent emissions.[147] The programme aims to reduce 32 million litres of diesel use and avoid 91,000 tonnes of CO_2-equivalent emissions, and seeks to reach 10% of the national truck fleet by early 2024.[148]
- In 2021, Chile and Argentina began harmonising the regulations of Giro Limpio and Transporte Inteligente, Argentina's own freight transport energy efficiency programme.[149]

Photo credit: Ashden

- Chile launched the programme Vuelo Limpio in November 2021 to improve the energy efficiency of air transport (goods and passengers), with the participation of three airlines and an air taxi company.[150]
- Mexico's voluntary programme for cargo transport companies, Programa Transporte Limpio, reported 718 participating companies as of December 2022 and a total of 7 million tonnes of avoided CO_2 in 2021.[151]

As of the end of 2022, more than 90% of Latin American and Caribbean countries had submitted a second-generation Nationally Determined Contribution (NDC) towards reducing emissions under the Paris Agreement.[152] However, only 20% of countries had submitted Long-Term Strategies.[153] Countries in the region show the strongest linkages to renewable energy in transport globally, with nearly 12% of their NDC actions associated with alternative fuels.[154] Four countries (Belize, Dominica, El Salvador and Grenada) included targets for reducing transport greenhouse gas emissions in their second-generation NDCs.[155]

- Belize aims to reduce its use of conventional transport fuels 15% by 2030, to avoid 117 kilotonnes of CO_2 annually.[156]
- Dominica targets reducing its overall transport CO_2 emissions 20% below 2014 levels and its shipping CO_2 emissions 100% below 2014 levels by 2030.[157]
- El Salvador aims to limit its transport emissions to 334 kilotonnes below business-as-usual growth by 2030.[158]
- Grenada repeated its transport greenhouse gas mitigation target from its first NDC, which aims to reduce transport CO_2 emissions 20% below 2010 levels by 2025, with further reductions by 2030.[159]
- Eight countries in the region (Antigua and Barbuda, Barbados, Bolivia, Chile, Colombia, Costa Rica, Dominica and Panama) included e-mobility targets in their second-generation NDCs. For example, Panama envisions that by 2030, electric vehicles will represent 10% of commercial vehicles, 25% of personal vehicles, 20% of public transport and 30% of government fleets.[160]
- A comparison of national strategies against the NDCs and Long-Term Strategies submitted by Latin American and Caribbean countries as of early February 2022 found that there is coherence between countries' climate strategies and their planning instruments at the national and sub-national levels. This consistency is found in framework strategies related to transport, energy, urban planning and environmental management, and climate change.[161]

Partnership in action

SLOCAT partners engaged in dozens of actions during 2020-2022, including:

- **Asociación Sustentar**, as part of its support to the EUROCLIMA+ programme, developed extensive mapping that provides easy-to-access and centralised information about organisations and initiatives working on advancing sustainable urban mobility in Latin America; this includes a mapping of regional needs, priorities, challenges, and interests in sustainable mobility, as well as an analysis of available online training on sustainable urban mobility in English and Spanish.[162]
- The C40 Cities Finance Facility (CFF) aims to facilitate access to finance for climate change mitigation and resilience projects in cities.[163] In the region, CFF is currently working with Lima (Peru) to leverage investment for cycling infrastructure and with Rio de Janeiro (Brazil) to develop a sustainable Electric Bus Depot powered with solar energy.[164]
- The urban mobility component of **EUROCLIMA+**, the European Union's flagship co-operation programme on sustainability and climate change with Latin America, supports the development of national policies, multi-modal integrated urban planning and innovative pilot projects in 12 countries.[165] Implemented by Germany's GIZ and France's AFD, it also hosts a community of practice to strengthen exchanges and capacities of cities and national governments in the region.[166]
- The **GEF-7 Global Electric Mobility Program** is an initiative financed by the Global Environment Facility that supports low and middle-income countries around the world with the shift to electric mobility. The Latin America and the Caribbean regional platform, led by Centro de Movilidad Sostenible, includes eight countries: Chile, Antigua and Barbuda, Costa Rica, Ecuador, Grenada, Jamaica, Peru and Saint Lucia.[167]
- The **ICLEI** project EcoLogistics aims to advance effective regulatory, planning and logistical instruments to support low-carbon urban freight.[168] It currently supports cities in Argentina and Colombia to develop urban freight strategies and viable alternatives to low-quality, diesel-powered freight vehicles, particularly for last-mile logistics.[169]
- The **MobiliseYourCity Partnership** fosters more comprehensive, integrated and participatory urban mobility planning at the local and national levels by providing methodological guidelines for developing sustainable urban mobility plans (SUMPs) and national urban mobility plans (NUMPs).[170] The Partnership's guidelines for developing and implementing SUMPs include regional insights and lessons learned, including for Latin America and the Caribbean.[171]
- **PLAMOBI** (Latin American Bicycle Mobility Platform), an initiative of the World Bank, seeks to strengthen the exchange of knowledge and experience to promote bicycle use in the region's cities.[172]
- The **Zero Emission Bus Rapid-deployment Accelerator (ZEBRA) Partnership** works with the cities of Medellín (Colombia), Mexico City, Santiago (Chile) and São Paulo (Brazil) to accelerate the deployment of zero-emission buses in the region.[173]

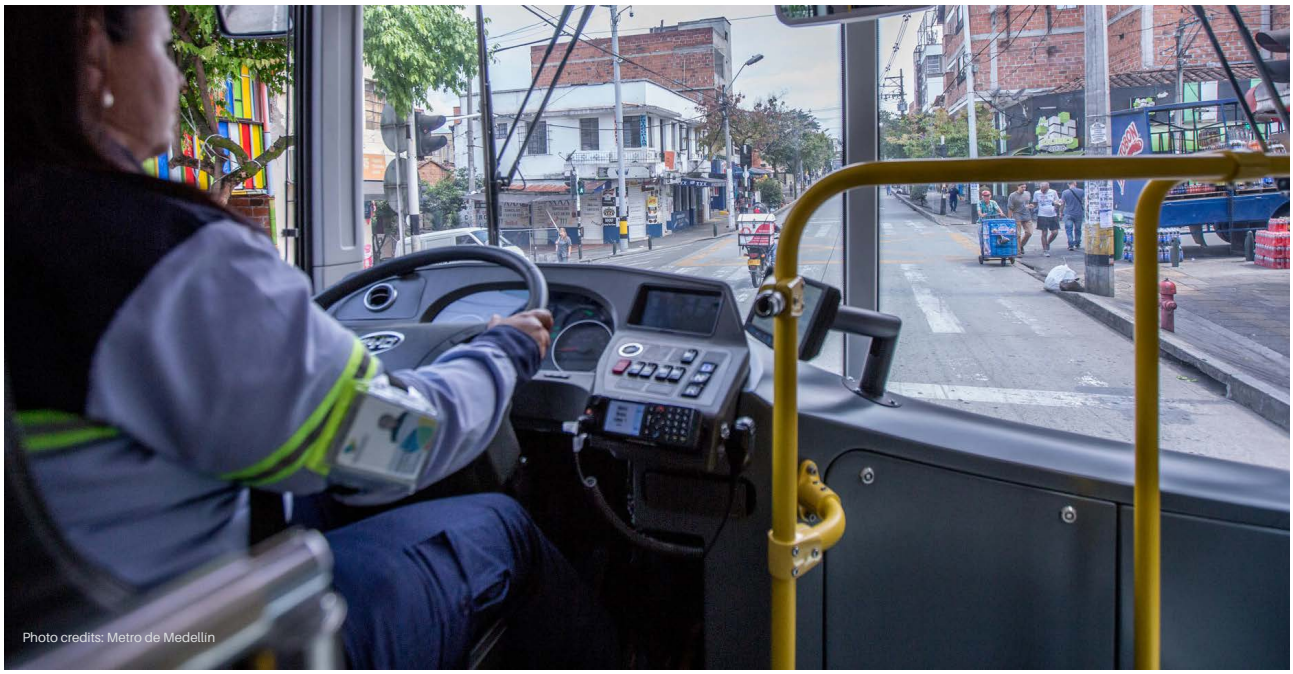


Photo credits: Metro de Medellin

MODULE 2 2.5

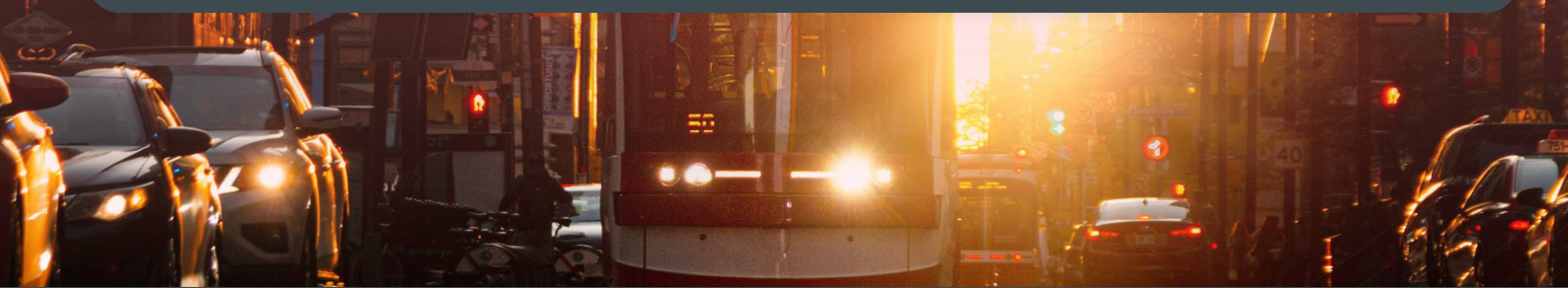
AUTHOR: *Nikola Medimorec, SLOCAT Secretariat*

North America Regional Overview

Demographics

Population size:	Population growth:	Urban population share:	Urban population growth:	GDP per capita:	GDP growth:
375 million	+9.4%	83%	+4.2%	USD 58,794	+24%
(2022)	(2010-2020)	(2022)	(2010-2022)	(2021)	(2010-2021)

Source: See endnote 1 for this section.



SLOCAT Partnership on Sustainable, Low Carbon Transport

Transport, Climate and Sustainability
Global Status Report - 3rd edition

Key findings

Demand trends

- Travel activity in North America dropped sharply in 2020 following the onset of the COVID-19 pandemic. In the United States, passenger activity was down 18% after a decade of constant 1.4% annual growth.
- The pandemic induced significant shifts in US commuting patterns, with the number of people working from home increasing three-fold between 2019 and 2021, and the use of public transport falling at least 30% nationwide in 2021.
- The region's motorisation levels (covering four-wheeled motor vehicles) have remained at an all-time high.
- In 2022, vehicle sales continued to decline in North America due to a combination of inflation, rising energy prices and lingering supply chain issues. However, the demand for electric vehicles increased, with the share of battery electric vehicle sales in Canada and the United States tripling to above 6% in the third quarter of 2022, up from slightly more than 2% two years prior.
- Despite less driving in 2020 due to the pandemic, total traffic deaths in the United States increased significantly from 2019 to 2021, and the rate of pedestrian fatalities reached an all-time high. Around 20% of the people killed in road traffic crashes in 2021 were pedestrians or cyclists.
- North America experienced the biggest drop in metro ridership among world regions in 2020 due to the pandemic, with the number of passengers falling 64%, from 3.7 billion to 1.3 billion.
- In 2022, ridership increased on several US public transport systems, although numbers remained well below pre-pandemic levels.
- The Russian Federation's invasion of Ukraine put additional pressure on global supply chains and increased inflation, creating major bottlenecks for key materials used in US industries, including transport.

Emission trends

- Carbon dioxide (CO_2) emissions from the transport sector in North America were greatly affected by the COVID-19 pandemic. The region's transport CO_2 emissions fell 7% between 2019 and 2021, changing their overall trajectory: transport CO_2 emissions rose 5% from 2010 to 2019 but declined 2% from 2010 to 2021.
- In 2021, North America contributed 28% of global transport CO_2 emissions (excluding international aviation and shipping), the second highest regional share after Asia.
- Among the 11 economies with preliminary emission estimates, the United States was one of 4 countries where transport emissions fell in 2022 (the others were China, the Russian Federation and Spain).
- US transport emissions have gradually shifted from passenger transport towards freight transport.

Policy developments

- Across North America, national and sub-national stakeholders raised their ambition on climate action during 2021 and 2022.
- Support for walking and cycling was strengthened in the region.
- The US Inflation Reduction Act of 2022 is aimed in part at helping the country achieve its climate target for 2030, with the goal of reducing emissions 31-44% below 2005 levels by 2030.
- The US Infrastructure Investment and Jobs Act of 2021 (also known as the Bipartisan Infrastructure Law) allocates USD 550 billion in new infrastructure investment from 2022 through 2026.
- Improvements to public transport were implemented in North America between 2020 and 2022, and more support was generated for introducing congestion charging.
- The region has prioritised the transition to electric road vehicle fleets, enabled by charging stations along highways and a Canadian ban on sales of internal combustion engine vehicles by 2035.
- New policies in the region are poised to lead to cleaner trucks and to improvements in long-distance rail.

Overview

North America – comprising the large economies of Canada and the United States as well as the territories of Bermuda (UK), Greenland (Denmark) and Saint Pierre and Miquelon (France) – has above-average motorisation rates and transport emissions. In 2021, the region contributed 28% of the world's carbon dioxide (CO_2) emissions from transport, the second highest regional share after Asia.[2]

Canada and the United States have enhanced their climate action plans since 2020. The US Biden administration introduced key changes to policies on climate change, transport and infrastructure. The United States rejoined the Paris Agreement in 2021, increased its climate ambition and set a goal to reach net zero greenhouse gas emissions by 2050.[3] The Inflation Reduction Act backs climate action with several activities on transport, and the Bipartisan Infrastructure Law supports infrastructure improvements. Canada also upgraded its emission reduction plan and set a target for net zero emissions by 2050.[4]

Nevertheless, current climate strategies are still not enough to meet the goals of the Paris Agreement in the region. The US efforts on climate change are regarded as "insufficient", because while the country's targets are "almost sufficient" to keep the average global temperature rise below 2 degrees Celsius (°C), envisioned policies and actions are still "insufficient".[5] Canada's climate strategies are "highly insufficient", as current policies are projected to lead to a 4°C warming pathway.[6]

Demand trends

Travel activity in North America dropped sharply in 2020 following the onset of the COVID-19 pandemic. In the United States, passenger activity was down 18% after a decade of constant 1.4% annual growth.[7] US domestic aviation, inter-city rail and public transport activity fell by half in 2020.[8] Meanwhile, freight activity in the country surpassed 5,250 billion tonne-miles for the year, declining only for railroads (down 11%) and water transport (down 5%).[9]

In Canada, rail passenger activity fell from 1,729 million passenger-kilometres in 2019 to 235 million passenger-kilometres in 2020 and only recovered to 542 million passenger-kilometres in 2021.[10] Available freight statistics for the country show that rail activity increased 2% during 2015-2020, but between 2019 and 2020 the number of tonne-kilometres travelled fell from 455 billion to 423 billion.[11]

The annual vehicle miles travelled in the United States recovered in 2022, rising from 2.84 trillion in the one-year period from February 2020 to January 2021, to more than 3.26 trillion during the period from February 2021 to January 2022 – to surpass the 2019 value of 3.25 trillion vehicle-miles.[12]

The pandemic induced significant shifts in US commuting patterns, with the number of people working from home increasing three-fold between 2019 and 2021, and the use of public transport falling at least 30% nationwide in 2021.[13] The share of US work commute trips taken in single-occupancy vehicles fell from 76% in 2019 to 68% in 2021.[14] However, this did not reflect a shift to public transport, which also fell from just under 5% of work commute trips in 2019 and 2020, to only 2.5% in 2021.[15] Rather, the main shift in 2021 was to working from home, as the share of people not commuting to work grew from 5% in 2019, to 7% in 2020, to 18% (27.6 million people) in 2021.[16]

The region's motorisation levels (covering four-wheeled motor vehicles) have remained at an all-time high. The motorisation rate of North America is 4 times the global average and 18 times higher than in Africa.[17] Canada had a motorisation rate of 656 vehicles per 1,000 people in 2019, whereas the US rate was even higher, at 807 vehicles per 1,000 people in 2020 (see Figure 1).[18] The motorisation rate grew 9% in Canada and 3% in the United States from 2010 to 2019.[19]

In 2022, vehicle sales continued to decline in North America due to a combination of inflation, rising energy prices and lingering supply chain issues. However, the demand for electric vehicles increased, with the share of battery electric vehicle sales in Canada and the United States tripling to above 6% in the third quarter of 2022, up from slightly more than 2% two years prior (see Figure 2).[20]

New passenger car sales in the United States fell 8% in 2022, totalling 13.8 million.[21] Continuing the trend since 2010, growth occurred only in commercial vehicle sales, although this too has slowed since 2015.[22] Larger passenger vehicles, specifically sport utility vehicles (SUVs), are a major contributor to US CO_2 emissions, as every second passenger car sold is an SUV.[23]

- In 2022, more than a third of all vehicle models available in the United States were electric light-duty vehicles (132 out of 325 total models), nearly twice as many as in 2019.[24]
- Battery electric vehicles represented 3.1% of all registered light-duty vehicles in the United States in 2021, and 5.6% in 2022.[25]
- Twice as many battery electric vehicles were sold in the United States in 2022 compared to the previous year, or around 750,000 units in total.[26]

FIGURE 1. Motorisation rates per 1,000 people in North America, 2019/2020

Source: See endnote 18 for this section.

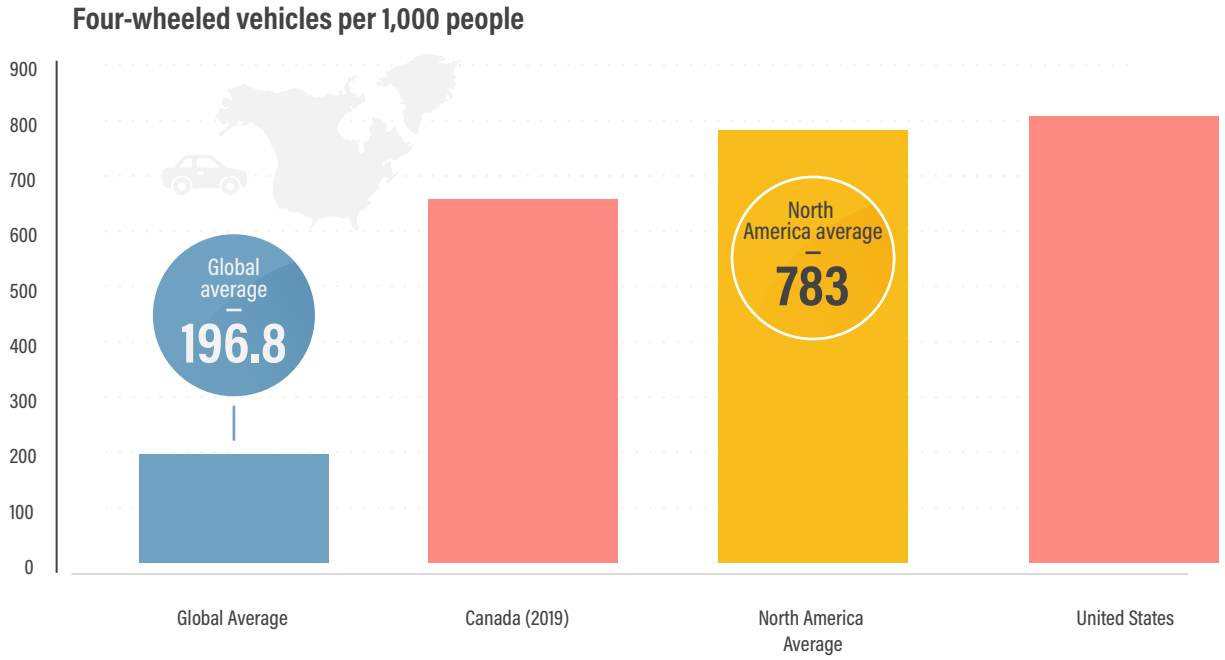
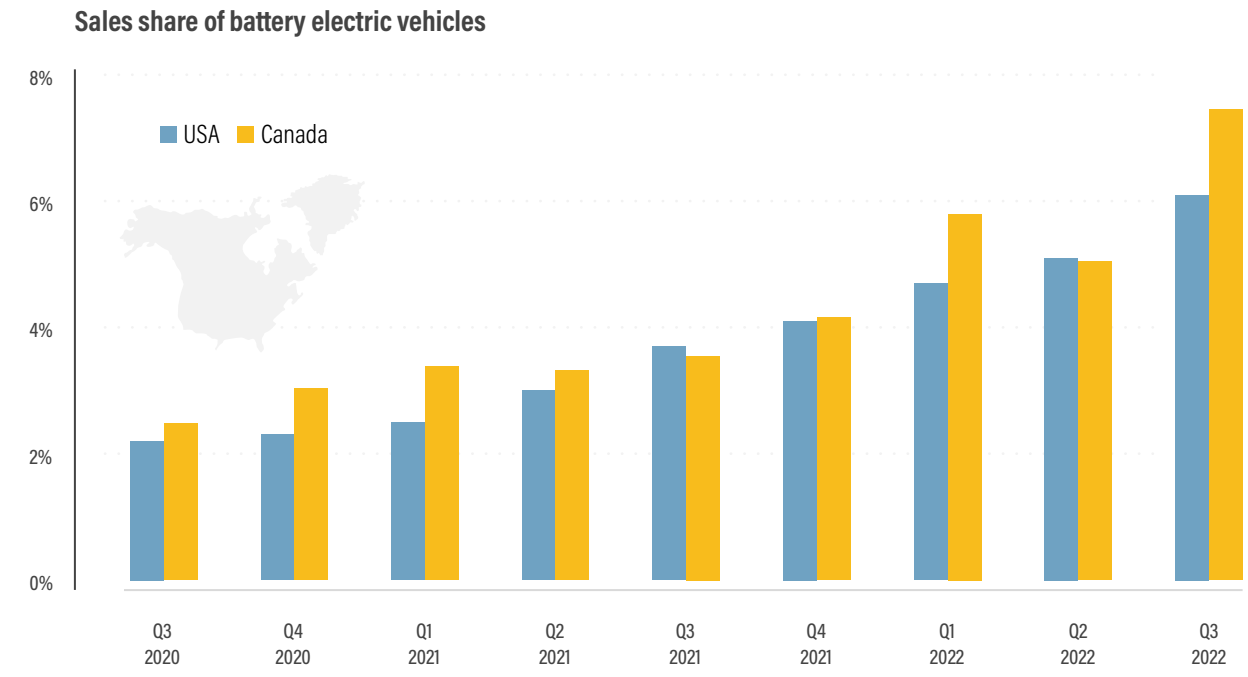


FIGURE 2. Shares of battery electric vehicles sold in Canada and the United States, 2020-2022

Source: See endnote 20 for this section.



- In Canada, battery electric vehicles accounted for 3.6% (58,700 vehicles) of total vehicle registrations in 2021, rising to 6.1% (70,800 vehicles) in the first three quarters of 2022.[27]

Despite the rising popularity of electric vehicles, the United States Energy Information Administration projected in 2023 that the share of battery electric vehicles in the US would reach only 16% in 2030 and 21% in 2050.[28] This is well below the pathway needed to achieve the goals of the Paris Agreement, which requires more than 60% of car sales globally to be electric by 2030 and no new cars with internal combustion engines to be sold after 2035.[29]

Projections of the future energy demand from light-duty vehicles indicate that the energy savings through more efficient electric vehicles and stricter US Corporate Average Fuel Economy standards will be between 3% and 28% by 2050 compared to 2022, despite continued growth in travel demand.[30]

Sales of electric bikes (e-bikes) continued to outpace electric car sales in the United States in 2021, with US e-bike imports reaching 790,000 units in 2021, while electric car sales totalled 650,000 units.[31] Surveys in the country show that e-bike use, especially by lower-income households, can replace 35-44% of a car's vehicle-miles travelled.[32]

Despite less driving in 2020 due to the pandemic, total traffic deaths in the United States increased significantly – rising from 36,355 in 2019 to 38,824 in 2020 and 42,939 in 2021 – and the rate of pedestrian fatalities reached an all-time high.[33] Around 20% of the people killed in road traffic crashes in 2021 were pedestrians or cyclists.[34] The number of pedestrian fatalities per vehicle-mile travelled in the United States increased 21% in 2020 compared to 2019, the highest growth ever recorded.[35] Studies from this period reveal a close correlation between larger personal vehicles and pedestrian deaths.[36]

North America experienced the biggest drop in metro ridership among world regions in 2020 due to the pandemic, with the number of passengers falling 64%, from 3.7 billion to 1.3 billion.[37] Ridership on New York City's metro system dropped 62% in 2020, the second biggest decline among the world's largest metro systems (after Delhi, India).[38]

In 2022, ridership increased on several US public transport systems, although numbers remained well below pre-pandemic levels.[39] The main reasons for the increase were more people returning to workplaces, and high petrol prices.[40] In June 2022, US petrol prices reached a record high of USD 4.93 per gallon.[41] Although US petrol prices previously reached USD 4 per gallon in mid-2008 during the financial crisis, they remained steady between 2015 and 2020 at around USD 2-3 per gallon.[42] Despite the recent increase, US petrol prices have continued to be the lowest among member countries of the Organisation for Economic Co-operation and Development (OECD).[43]

During the pandemic, many cities in North America implemented pedestrian and bicycling improvements, including "pop-up" bikeways. Bike sharing systems continued to grow in the United States, with 10 systems in 25 metropolitan areas expanding or releasing expansion plans during 2021-2022.[44] The main trend is towards electrification of bike sharing fleets. Meanwhile, the region's electric scooter fleets grew 14% in 2021 and held steady in 2022.[45]

- In Canada, during the height of the pandemic in 2020, cycling was up 48% in Vancouver and 26% in Victoria, based on usage of Strava, an exercise tracking app.[46]

The Russian Federation's invasion of Ukraine put additional pressure on global supply chains and increased inflation, creating major bottlenecks for key materials used in US industries, including transport. The most affected sectors have been energy, food and semiconductors. As of 2022, the United States obtained more than 90% of its semiconductor-grade neon from Ukraine, and 35% of its palladium and 20% of its nickel from the Russian Federation.[47] Nickel and other metals are required for electric vehicle batteries. In response to the invasion, and to increase resilience to shocks, US vehicle manufacturers aim to increase efforts to secure materials and to expand and diversify supply chains.[48]

Emission trends

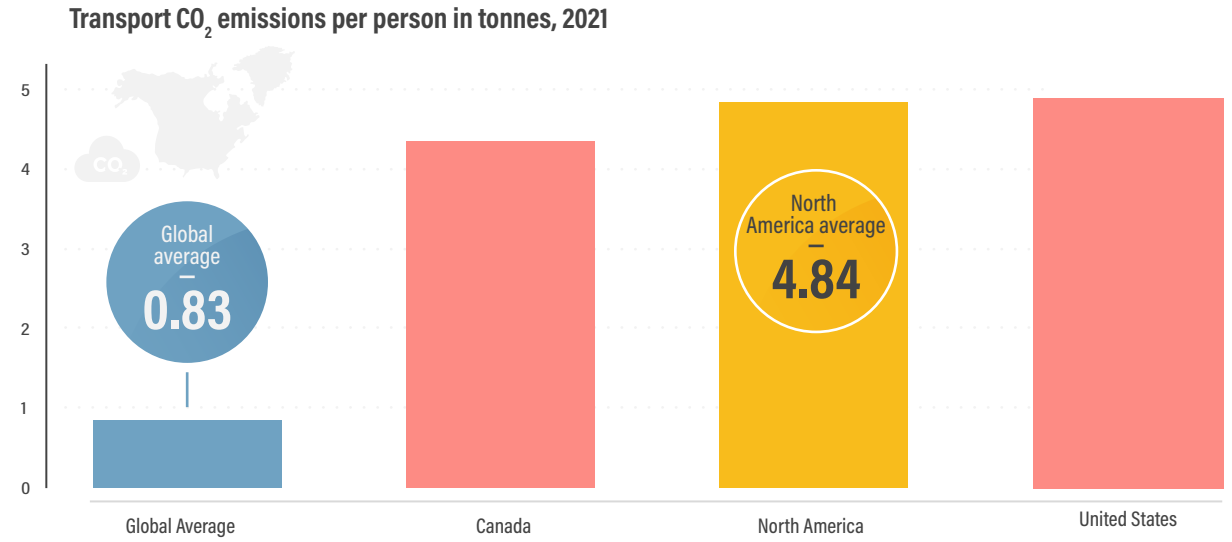
Carbon dioxide (CO_2) emissions from the transport sector in North America were greatly affected by the COVID-19 pandemic. The region's transport CO_2 emissions fell 7% between 2019 and 2021, changing their overall trajectory: transport CO_2 emissions rose 5% from 2010 to 2019 but declined 2% from 2010 to 2021.[49] Transport CO_2 emissions were close to exceeding 2 gigatonnes prior to the pandemic but fell to 1,813 million tonnes in 2021.[50] Per capita transport emissions in North America are six times the global average due to the higher rate of motor vehicle use in the region (see Figure 3).[51]

In 2021, North America contributed 28% of global transport CO_2 emissions (excluding international aviation and shipping), the second highest regional share after Asia.[52] Since 2019, transport has been the highest emitting sector in the United States, following large reductions in power sector emissions.[53] The vast majority of US transport CO_2 emissions are from road transport, with an 83% share in 2019 (58% from personal vehicles and 25% from commercial trucks and buses).[54] In Canada, transport contributed 165 million tonnes of CO_2 in 2021, or 29% of the country's total emissions, making it the second largest emitter after "other industrial combustion".[55]

Among the 11 economies with preliminary emission estimates, the United States was one of 4 countries where transport emissions fell in 2022 (the others were China, the

FIGURE 3. Per capita transport CO_2 emissions in North America, 2021

Source: See endnote 51 for this section.



Russian Federation and Spain).[56] The pandemic contributed to a 15% decline in North American transport emissions (down 14% in the United States and 16% in Canada) in 2020.[57] In 2021, the region's transport CO_2 emissions again increased, rising 9% (11% in the United States and 3% in Canada).[58] Preliminary estimates for 2022 show that US economy-wide CO_2 emissions grew 3.5%, with transport CO_2 emissions falling 0.9%.[59]

Regional CO_2 trends

Total transport CO_2 emissions (2021): 1,813 million tonnes

Share of global transport CO_2 emissions (excluding international aviation and shipping) **(2021):** 28%

Per capita transport CO_2 emissions (2021): 4.84 tonnes

Transport CO_2 emissions per USD 10,000 GDP (2021): 0.82 tonnes

Source: See endnote 60 for this section.

US transport emissions have gradually shifted from passenger transport towards freight transport. Between 2015 and 2020, the share of US transport sector emissions originating from light-duty vehicles fell from 60% to 57%, while the share from medium- and heavy-duty trucks grew from 23% to 26%.[61] In Canada, road transport (light-duty vehicles and trucks) was the major contributor to emission growth until 2019, but this sub-sector experienced the greatest decline in 2020.[62]

Policy developments

Across North America, national and sub-national stakeholders raised their ambition on climate action during 2021 and 2022. In 2022, Denver and Los Angeles (USA) cancelled freeway expansion plans due to concerns about equity and pollution.[63] Regional awareness has risen about induced demand and the need for alternatives to road expansions.[64]

- British Columbia (Canada) has targets to reduce light-duty vehicle travel 25% and to roughly double the number of walking, cycling and public transport trips by 2030.[65]
- In the United States, California has targets to reduce the number of light-duty vehicle miles travelled per capita 25% by 2030 and 30% by 2045 (compared with 1990) and has developed new tools for evaluating the travel and emission impacts of transport and land-use planning decisions.[66]
- The California Climate Commitment set targets to reduce air pollution 60%, refinery pollution 94%, state oil consumption 91%, and fossil fuel use in buildings and transport 92% by 2035, as well as to save USD 23 billion by avoiding the damages of pollution.[67]
- Minnesota (USA) has targets to reduce vehicle travel 14% by 2040 and 20% by 2050.[68]
- Washington state (USA) has targets to reduce per capita vehicle travel 30% by 2035 and 50% by 2050.[69]
- The US government set goals to reduce greenhouse gas emissions from US aviation 20% by 2030 and to achieve net zero emissions in the sector by 2050, including by scaling up sustainable aviation fuels.[70]

Support for walking and cycling was strengthened in the region during 2021 and 2022.

- In 2022, Boston (USA) set a goal to have 50% of the city's population be able to access a protected bike lane within a three-minute walk by 2025.[71] The plan involves building new cycling infrastructure, adding 100 new stations to the bike sharing system and installing more than 100 new speed humps or raised crosswalks to calm traffic on neighbourhood streets.[72]
- Canada released its first national active transport strategy in 2021 to provide CAD 400 million (USD 298.8 million) from 2021 to 2026.[73]
- In 2022, British Columbia (Canada) announced new funding of CAD 575,000 (USD 429,669) for Vision Zero, a strategy that supports climate goals by shifting people to walking, cycling and micromobility.[74]
- In California (USA), a bill to give every household that has zero registered vehicles a tax rebate of USD 1,000 passed the state senate in 2021 and is to be implemented in tax year 2023.[75]
- The highest court in New York (USA) confirmed in 2021 that it is a crime to drive with negligence and to injure somebody with a vehicle, thereby upholding the city's "right-of-way" law.[76]

The US Inflation Reduction Act of 2022 is aimed in part at helping the country achieve its climate target for 2030, with the goal of reducing emissions 31-44% below 2005 levels by 2030.[77] US energy-related CO_2 emissions could drop 25-38% during this period with increased electrification, equipment efficiency, and renewable technologies.[78] In its 2021 Nationally Determined Contribution (NDC) towards reducing emissions under the Paris Agreement, the United States targets cutting emissions 50-52% below 2005 levels by 2030.[79] The Inflation Reduction Act covers a variety of transport activities.[80]

- The Clean Vehicle Credit will maintain the existing consumer tax credit of USD 7,500 for the purchase of a clean vehicle.[81]
- The Neighborhood Access and Equity Grants of USD 3 billion will improve transport access and road safety as well as minimise other environmental impacts in underserved communities.[82]
- The Act provides USD 1 billion for grants and rebates to cover 100% of costs for clean heavy-duty vehicles (such as school buses and refuse trucks).[83]
- Further financial support and grants will go towards improving surface transport infrastructure, identifying low-carbon construction for highways and support for sustainable aviation fuels.[84]

However, the Inflation Reduction Act has been criticised for prioritising vehicle electrification and lacking support for sustainable transport.[85] Analysis identified that transport emissions will contribute the least to the envisioned emission reductions, as transport emissions are projected to stay steady even in the most ambitious scenario.[86]

The US Infrastructure Investment and Jobs Act of 2021 (also known as the Bipartisan Infrastructure Law) allocates USD 550 billion in new infrastructure investment from 2022 through 2026.[87] It represents the largest long-term investment in infrastructure in the United States and promises to provide significant improvements to transport.[88]

- USD 39 billion (7% of the total budget) will be invested in the improvement and expansion of public transport systems.[89]
- USD 7.5 billion (1.4% of the total budget) will be used to build 500,000 new electric vehicle charging stations by 2030.[90]
- USD 1 billion will be provided to the Safe Streets and Active Transportation programme, which covers the construction of bike lanes, pedestrian facilities and other infrastructure for walking and cycling.
- USD 1 billion will be used to develop clean energy technologies.[91]

The US Departments of Energy, Transportation, and Housing and Urban Development, together with the Environmental Protection Agency, signed a Memorandum of Understanding on transport decarbonisation in September 2022, followed by the release of the first US National Blueprint for Transportation Decarbonisation in January 2023.[92] The comprehensive strategy encompasses actions to increase convenience (through land use and planning), improve efficiency (through expanding public transport and rail and improving vehicle efficiency) and transition to clean vehicles (zero-emission vehicles).[93] It supports the target in the US Nationally Determined Contribution of reducing CO_2 emissions 50-52% below 2005 levels by 2030 and the target of net zero carbon emissions by 2050.[94]

The US Department of Transportation also published a notice for USD 1.5 billion in grant funding for the Rebuilding American Infrastructure with Sustainability and Equity (RAISE) programme through 2023, including both the regional and local scales.[95] In 2022, the RAISE programme funded 166 freight and passenger transport projects across 50 states, along with the District of Columbia, Puerto Rico, the Northern Mariana Islands and the US Virgin Islands.[96]

Improvements to public transport were implemented in North America between 2020 and 2022, and more support was generated for introducing congestion charging.

- Canada has allocated an additional CAD 14.9 billion (USD 11.1 billion) from 2021 to 2028 for public transport projects.[97]
- The public transport operator TransLink in Vancouver (Canada) released its 2050 Regional Transportation Strategy, with the main activities focused around building 300 kilometres of new lines by 2050.[98]
- Among major US locations that trialled free public transport fares in 2022, Boston implemented free public transport on three major bus routes, and Connecticut introduced a free bus

fare programme, resulting in public transport ridership levels higher than pre-pandemic.[99]

- Several US cities (foremost New York City, followed by Los Angeles and San Francisco) have worked on implementing congestion pricing schemes.[100] Los Angeles is moving ahead with plans for a congestion pricing pilot.[101]

The region has prioritised the transition to electric road vehicle fleets, enabled by charging stations along highways and a Canadian ban on sales of vehicles with internal combustion engines by 2035.

- In 2022, Canada announced its intention to ban sales of passenger cars with internal combustion engines by 2035 and to target higher sale shares of zero-emission cars [102]
- The United States has set an ambitious target of 50% electric vehicles in total vehicle sales by 2030.[103] A 2023 survey found that more than half of interviewed Americans intend to buy an electric vehicle within the next five years, with the main challenges being the price and the lack of public charging stations.[104]
- In 2022, California (USA) passed a bill banning new petrol car sales by 2035.[105] In addition, California will require that all autonomous vehicles deployed in the state as of 2030 be zero-emission vehicles.[106]
- The United States has approved plans for electric vehicle charging stations for all 50 states as well as Washington, D.C. and Puerto Rico, together covering around 120,700 kilometres of highways.[107]
- In 2021, Petaluma (California), home to 60,000 residents, became the first US city to ban new petrol stations.[108]
- In a first US attempt to deploy vehicle-to-grid technology, in summer 2022 General Motors and the Pacific Gas and Electric Company launched a pilot project in California to test the use of electric vehicles as a back-up power source for homes during grid outages.[109]

Electric bus fleets are also set to expand across North America in the coming decades.

- The US Department of Transportation plans to double the number of electric buses in operation, expanding its share of only around 2% of all buses as of 2022.[110]
- In Seattle (USA), King County Metro Transit Department is targeting a 100% zero-emission bus fleet powered by renewable energy by 2040.[111] In Washington, D.C., the Washington Metropolitan Area Transit Authority set a target in 2021 for a zero-emission bus fleet by 2045.[112]
- Ottawa (Canada) announced in 2021 that it would add 450 zero-emission buses to its public transport fleet by 2027 and transition the fleet to fully electric by 2036.[113]

New policies in the region are poised to lead to cleaner trucks and to improvements in long-distance rail.

- In 2022, the US Environmental Protection Agency announced new pollution standards for heavy-duty vehicles, the first such updates in 20 years; the goal is to improve standards 80%, with a focus on nitrogen oxides and the transition to a cleaner truck fleet.[114]
- The US Bipartisan Infrastructure Bill of 2021 includes USD 66 billion in funding for new rail infrastructure, the biggest investment in passenger rail transport in the history of the rail provider Amtrak.[115] The bill aims to greatly improve passenger rail, including by providing high-quality train service, modernising rail stations and boosting the resilience of the US Northeast Corridor.[116]

Partnership in action

SLOCAT partners engaged in dozens of actions during 2020-2022, including:

- **CALSTART**, a US-based non-profit organisation, is working with businesses and governments to develop clean, efficient transport solutions, focusing on cars, bus, trucks and fuels.[117]
- In 2021, the **Environmental Defense Fund** worked with automakers (such as General Motors and Ford), labour unions and regulators to build consensus for achieving the US goal of having half of new passenger vehicles sold in the country be zero emission by 2030.[118]
- The **Hewlett Foundation**, a non-partisan US charitable foundation, has a Climate Initiative Strategy (2018-2023) that is committed to assessing programmes in consideration of the need for deep decarbonisation by 2050 across major sectors.[119]
- The **Institute for Transportation and Development Policy (ITDP)** uses technical expertise, direct advocacy and policy guidance to mitigate the impacts of climate change, improve air quality, and support prosperous, sustainable and equitable cities. Its activities in North America highlight the power of high-quality bus rapid transit and safe cycling streets integrated with micromobility options, while shifting away from harmful tailpipe emissions towards clean transport and mobility freedom for all.
- The **Institute of Transportation Studies at the University of California at Davis (ITS-Davis)**, a leading university centre on sustainable transport, has hosted the National Center on Sustainable Transportation since 2013 (awarded by the US Department of Transportation) and manages large research initiatives on energy, environmental and social issues.[120]
- The **World Resources Institute (WRI)** provides leadership and support across its global network and its US and Energy programmes, which engage with federal, state and city governments and also work on urban mobility issues.[121]

MODULE 2 2.6

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CONTRIBUTORS: *Helen Rowe and Margot Delafoulhouze, Climateworks Australia*

Oceania Regional Overview

Demographics

Population size:	Population growth:	Urban population share:	Urban population growth:	GDP per capita:	GDP growth:
44 million	+22%	66%	+19%	USD 40,469	+29%
(2022)	(2010-2020)	(2022)	(2010-2022)	(2021)	(2010-2021)

Source: See endnote 1 for this section.

SLOCAT Partnership on Sustainable, Low Carbon Transport

Transport, Climate and Sustainability
Global Status Report - 3rd edition

Key findings

Demand trends

- In the larger economies of Oceania, private car use has continued to dominate passenger transport, even though the region has good access to public transport.
- In Australia, around 87% of work commutes in 2021 were by drivers or passengers of a car, motorcycle, or truck, while only 5% were by walking or cycling and 7% by public transport.
- Small-island countries have experienced rapid growth in motorisation (covering four-wheeled motor vehicles) as economies grow and urbanise. During 2010-2019, the region's largest growth was in Fiji and the Federated States of Micronesia, with increases near or above 40%. Australia and New Zealand had the highest overall motorisation levels in the region as of 2020.
- Oceania's electric vehicle uptake still lags behind other regions, as electric passenger cars in Australia and New Zealand comprise less than 1% of the global electric car stock.
- The COVID-19 pandemic and related border closures had profound effects on the Oceania region, resulting in high revenue losses in commodity exports and tourism. The Russian Federation's invasion of Ukraine further threatened the region's economic recovery, as disruptions affected shipping and freight corridors through the Pacific.
- Small-island countries in Oceania have major needs for sustainable, low-carbon transport.

Emission trends

- Oceania remained the lowest emitter of transport carbon dioxide (CO_2) emissions (excluding international aviation and shipping) among world regions in 2021, contributing less than 2% of transport emissions globally.
- Australia continued to be the largest emitter of transport CO_2 in the region and the 17th largest emitter globally in 2021, but it was surpassed by Cook Islands in emissions per capita.

Policy developments

- During 2021 and 2022, countries in Oceania, including small-island countries, enacted policy measures to enable and support electric vehicle uptake and to improve fuel efficiency standards.
- Recent investment projects have scaled up the ability of vulnerable small-island states to build resilient transport systems.
- Since 2019, Australia has increased its ambition on alternative fuels, such as hydrogen and sustainable aviation fuels.
- National and sub-national governments in Oceania have made net zero pledges in the transport sector, including for land, maritime and air transport.
- Climate action in New Zealand is being realised through comprehensive planning approaches, active mobility and support for public transport at the national and local levels.
- The Nationally Determined Contributions (NDCs) submitted by Oceania countries under the Paris Agreement as of 2022 offer a wide-ranging set of climate change mitigation and adaptation activities.

Overview

Oceania[i], which includes the large economies of Australia and New Zealand as well as a range of island countries in the Pacific Ocean, contributed the lowest share of global transport emissions in 2021. Aviation and shipping play a large role in the region due to the many small-island countries.[2] These island countries are among the most vulnerable to climate change from rising emissions and sea levels; however, regionally they are also the most dependent on fossil fuel imports, with the transport sector consuming the majority of imports.[3] This contributes to other unique regional challenges, including high transport costs, lack of opportunities to increase economies of scale, and a large need for climate finance, among others.[4]

Transport demand and emission trends were rising steadily in the region before being temporarily offset by mobility restrictions in 2020 related to the COVID-19 pandemic. Declines in air travel and tourism and associated disruptions severely constrained the region's economies, which rely heavily on tourism and maritime corridors.[5] After restrictions were lifted, regional transport demand and emissions returned to near or above pre-pandemic values. However, the Russian Federation's invasion of Ukraine in 2022 hampered recoveries and exacerbated supply chain disruptions and fossil fuel demand in the region.[6]

Transport decarbonisation strategies in Oceania are focused on transitioning to zero-emission vehicles and enabling electric vehicle uptake through infrastructure. Although many small-island countries have begun to use electric vehicles, in many cases local energy grids are not yet able to support high deployment of these fleets. Large opportunities exist to shift from car dependence to public transport as the main mode of transport and to improve road infrastructure to support and scale up resilient transport systems.

Recent policy measures in the region have linkages to several of the United Nations Sustainable Development Goals (SDGs), including SDG 9 (industry, innovation and infrastructure), SDG 11 (sustainable cities and communities) and SDG 13 (climate action), through measures adopting national strategies to support the decarbonisation of transport, committing to net zero pledges, and scaling up green and resilient investments.

Demand trends

In the larger economies of Oceania, private car use has continued to dominate passenger transport, even though the region has good access to public transport.

- **In Australia, around 87% of work commutes in 2021 were by drivers or passengers of a car, motorcycle, or truck, while only 5% were by walking or cycling and 7% by public transport.**[7] The number of people working from home in the country increased from 500,000 in 2016 to 2.5 million in 2021.[8]
- Private cars accounted for 70% of passenger activity in Australia in 2021, or 252 billion passenger-kilometres.[9] Overall passenger activity in the country in 2020 and 2021 was 18% below the all-time high of 2018 (443 billion passenger-kilometres).[10]
- In New Zealand in 2014 (latest data available), 79% of trips were by car drivers or passengers, while 18% were by walking or cycling and 3% by public transport.[11]
- Car trips dominated in Australia and New Zealand even though these countries had the world's highest share of the urban population with access to public transport in 2021, at 82.8%, compared to a global average of 56.2%.[12]

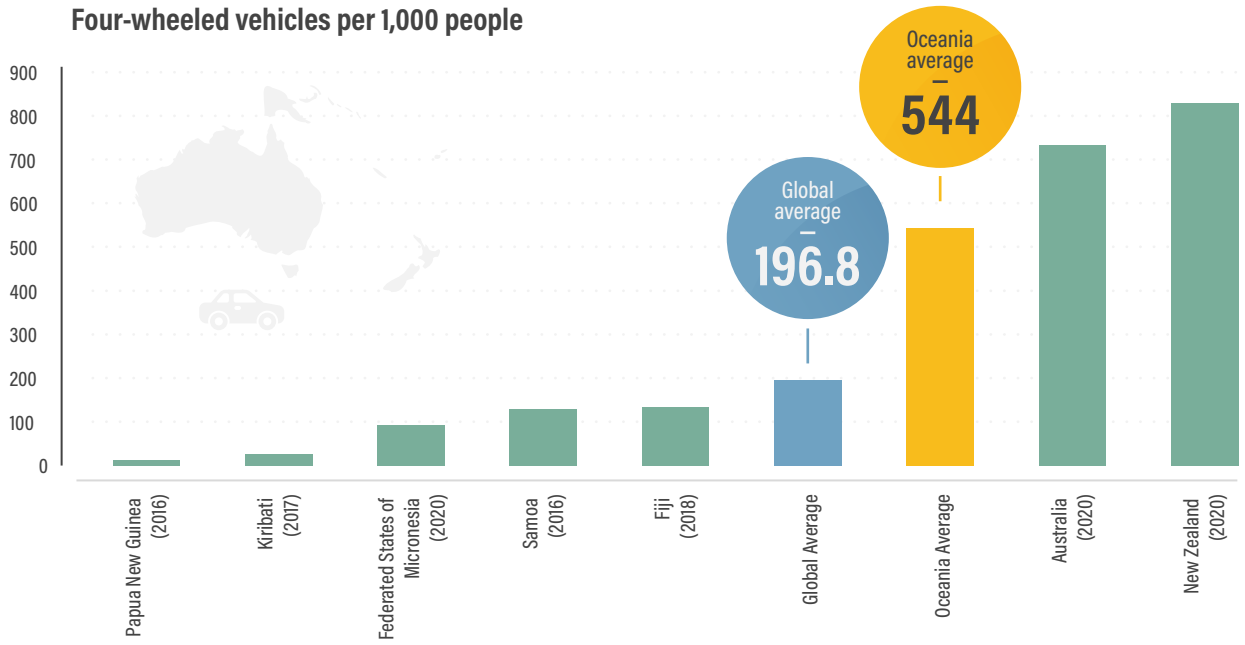
Small-island countries have experienced rapid growth in motorisation (covering four-wheeled motor vehicles) as economies grow and urbanise. During 2010-2019, the region's largest growth was in Fiji and the Federated States of Micronesia, with increases near or above 40% (much larger than in Australia and New Zealand).[13] Australia and New Zealand had the highest overall motorisation levels in the region as of 2020.[14]

- Fiji's motorisation rate grew from 95 registered road vehicles per 1,000 people in 2010 to 136 vehicles per 1,000 people in 2019 (latest data available), while motorisation in the Federated States of Micronesia increased from 74 vehicles per 1,000 people in 2010 to 104 vehicles per 1,000 people in 2019.[15]
- Australia and New Zealand maintained the region's highest motorisation levels overall (see Figure 1), at 733 and 829 vehicles per 1,000 people, respectively, in 2020, around four times the global average.[16]

i Here, the Oceania region covers Australia and New Zealand as well as the island countries of Cook Islands, Fiji, Kiribati, Marshall Islands, the Federated States of Micronesia, Nauru, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.

FIGURE 1. Motorisation rates per 1,000 people in Oceania, 2016-2020

Source: See endnote 16 for this section.



- The majority of countries in Oceania for which motorisation rates are available have levels below the global average. Car ownership and motorisation levels were smaller for Fiji and Samoa (at just over 100 vehicles per 1,000 people) and even lower for the Federated States of Micronesia, Kiribati, and Papua New Guinea, for various years.[17]

Oceania's electric vehicle uptake still lags behind other regions, as electric passenger cars in Australia and New Zealand comprise less than 1% of the global electric car stock.[18] Major opportunities exist to scale up national targets, energy supply and infrastructure.

- Electric vehicle sales have grown exponentially in Australia in recent years – from a 0.2% share in sales in 2018 to 3.8% in 2022 – but are still well below the global average of 14% in 2022.[19] Electric vehicle uptake in the country was projected to surpass 100,000 units in 2023.[20]
- Electric vehicle uptake in New Zealand grew from nearly 24,000 units in 2020 to just over 36,000 in 2021 but failed to meet the government's target of 64,000 electric vehicles by 2021, set in 2016.[21] Growth of electric vehicles in the country has been paralleled by rising sales of large utility coupes, trucks and sport utility vehicles (SUVs).[22]
- In general, the shift to larger vehicles in both Australia and New Zealand has undermined the emission gains from greater electric vehicle sales.[23]

Electric vehicle sales in small-island countries have been slower, although both Cook Islands and Fiji have in place policies to encourage their uptake (*see Policy Developments section*).[24]

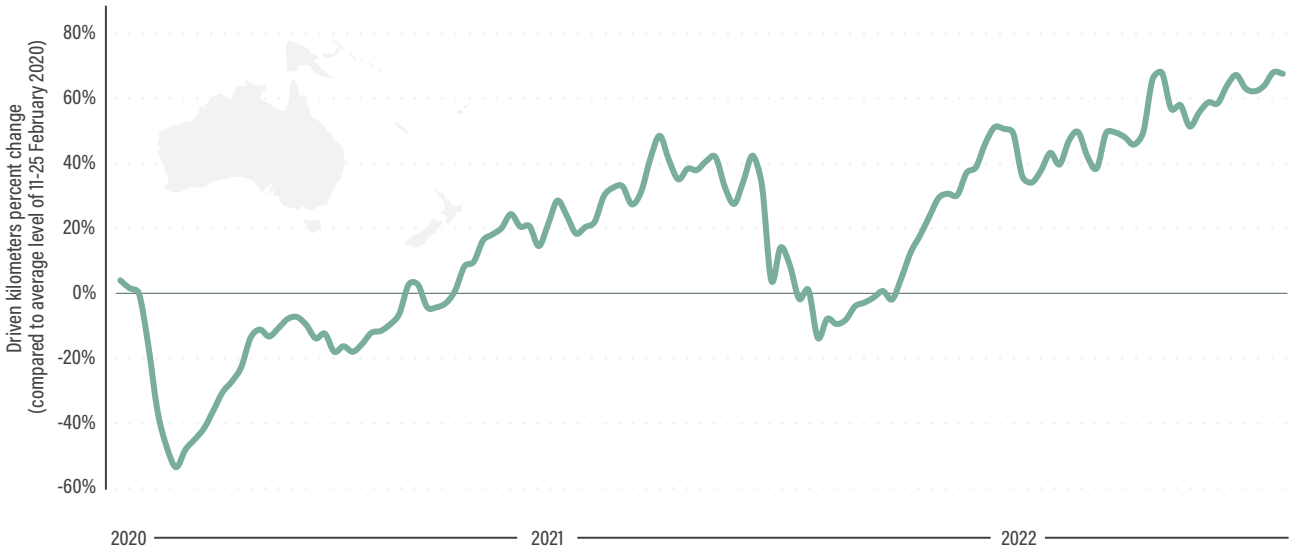
- In 2023, Cook Islands reported an electric vehicle stock of 46 electric cars, 3 electric pick-up trucks, 2 electric trucks, 24 electric two-wheelers and 4 electric scooters in operation.[25]
- Papua New Guinea imported 3 electric commercial vans in 2022, Samoa imported a battery electric SUV under a government pilot project in 2021, and Tuvalu was awaiting the arrival of 12 electric scooters from China as of 2023.[26]

The COVID-19 pandemic and related border closures had profound effects on the Oceania region, resulting in high revenue losses in commodity exports and tourism.[27] This led to large contractions in gross domestic product, surges in unemployment and increases in fiscal debts.[28] The collapse of tourism was especially devastating for already vulnerable island economies (such as Fiji, Palau, Samoa and Tonga) that rely heavily on tourism for economic activity and employment.[29] **The Russian Federation's invasion of Ukraine further threatened the region's economic recovery, as disruptions affected shipping and freight corridors through the Pacific.**[30]

- In the first 24 weeks of 2020, overall shipping activity in Oceania fell 12.3%, the second largest decline globally after Europe.[31] Passenger maritime transport fell 18% in the first half of the year.[32] Oceania also was among the most impacted

FIGURE 2. Changes in kilometres driven in Oceania, 2020-2022

Source: See endnote 34 for this section.



regions for maritime freight (along with Africa), as container ship calls fell 12.4% in the beginning of 2020.[33]

- Declines in transport activity in the region were most evident during the months corresponding to COVID-19 variant outbreaks and consequential lockdowns, as indicated by Waze's data on kilometres driven, which shows strong declines in March-May 2020 and August-September 2021 (see Figure 2).[34]
- International aviation to and from Oceania started to rebound in 2022, but as of the beginning of the year international flights were still 40% below pre-pandemic levels.[35]
- By 2022, Australia and New Zealand surpassed the average for the Asia-Pacific region in recovery rates for airline capacity for international travel compared to 2019.[36]
- Fiji led small-island countries in the return to near pre-pandemic aviation activity by 2022.[37]

Small-island countries in Oceania have major needs for sustainable, low-carbon transport. This applies across all transport modes, although no recent data on modal shares exist for countries such as Cook Islands, Kiribati, Papua New Guinea, Samoa, Tonga and Vanuatu.

- The majority (80%) of Vanuatu's population lives across 6 main islands, but the country has more than 45 islands with a population of less than 1,000.[38] Only 20 of these islands have airstrips, and some islands have no road network at all.[39]
- People in Greater Suva (Fiji) are high users of public buses.[40] More than 60% of Suva residents live within 500 metres of a bus route with 20-minute service frequency.[41] In 2015 (latest data available), the largest share of travel in the city was by bus (46%) followed by car (34%).[42] (Cycling data are not available.)

Emission trends

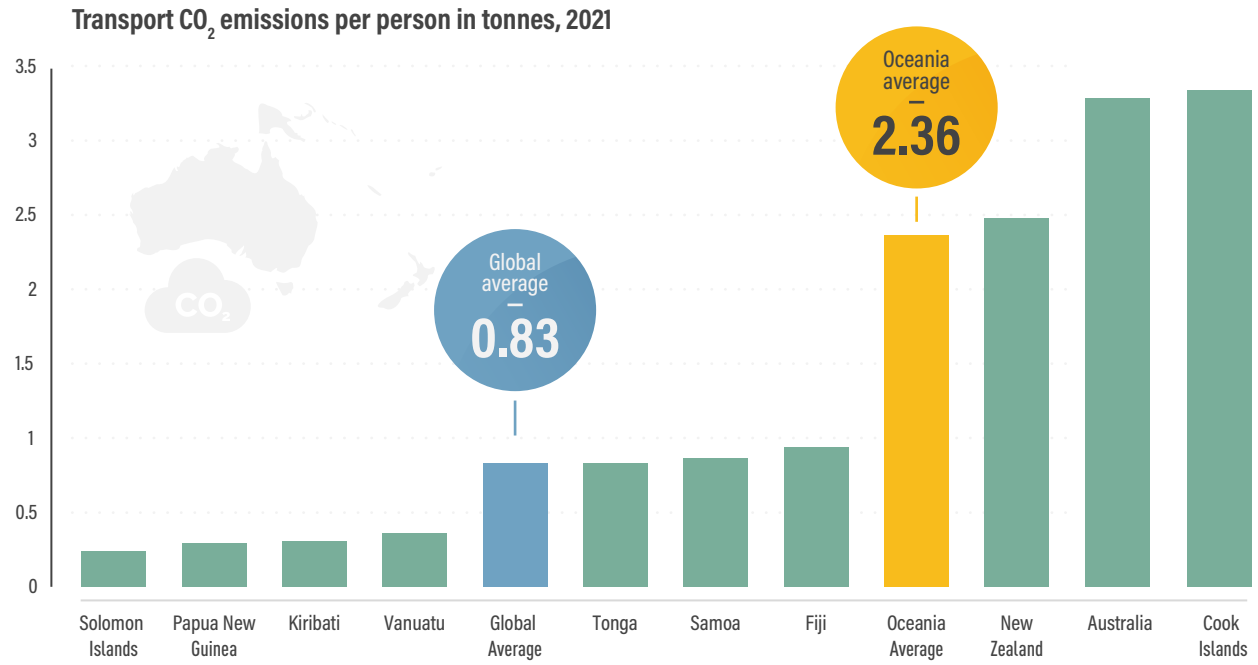
Oceania remained the lowest emitter of transport carbon dioxide (CO_2) emissions (excluding international aviation and shipping) among world regions in 2021, contributing less than 2% of transport emissions globally.[43] Transport CO_2 emissions in the region grew relatively steadily during 2010-2019, with 14% overall growth, then fell 16% in 2020 due to the decline in transport activity during the COVID-19 pandemic, before increasing slightly (1.4%) in 2021.[44]

Australia continued to be the largest emitter of transport CO_2 in the region and the 17th largest emitter globally in 2021, releasing more than 84 million tonnes.[45] This was due largely to the continued reliance on passenger vehicles with high fuel consumption, as well as energy-intensive road freight.[46]

- New Zealand came in a distant second in 2021 with just over 12 million tonnes of CO_2, followed by Papua New Guinea with nearly 3 million tonnes.[47]

FIGURE 3. Per capita transport CO_2 emissions in Oceania, 2021

Source: See endnote 49 for this section.



- The smaller island countries measured much lower transport CO_2 emissions, ranging from less than 1 million tonnes in Fiji to only 0.04 million tonnes in Kiribati.[48]
- **Cook Islands surpassed the larger Oceanic economies (Australia and New Zealand) in per capita transport CO_2 emissions** (see Figure 3), due to its heavy reliance on road and air transport, even though its overall transport emissions totalled just over 0.05 million tonnes in 2021.[49]
- Other island countries had smaller per capita transport CO_2 emissions, ranging from less than 1 tonne in Fiji to as low as 0.24 tonnes in Solomon Islands.[50]

Regional CO_2 trends

Total transport CO_2 emissions (2021):
102 million tonnes

Share of global transport CO_2 emissions (excluding international aviation and shipping) (2021):
1.6%

Per capita transport CO_2 emissions (2021):
2.36 tonnes

Transport CO_2 per USD 10,000 (2021):
0.58 tonnes

Source: See endnote 51 for this section.

Policy developments

During 2021 and 2022, countries in Oceania, including small-island states, enacted policy measures to enable and support electric vehicle uptake and to improve fuel efficiency standards.

- In 2021, Australia released its Future Fuels and Vehicles Strategy, backed by the AUD 250 million (USD 170 million) Future Fuel Funds to support charging infrastructure and commercial fleet transitions.[52] Australia's consultation for a National EV Strategy began in September 2022 to define goals, objectives and actions to enable Australians to access the best transport technologies and help meet emission reduction targets.[53]
- In 2022, the Australian government doubled the existing investment in the Driving the Nation Fund, allocating AUD 500 million (USD 340 million) to support electric vehicle charging infrastructure for highways, as well as hydrogen highways for key freight routes.[54] In 2022, Australia passed Electric Car Discount legislation that exempts eligible electric cars from the fringe benefits tax and import tariffs.[55]
- Australia announced in its 2022-23 Budget that it would co-invest AUD 146 million (USD 99 million) over five years in projects to reduce emissions from road transport through the Australian Renewable Energy Agency (ARENA).[56] The

funds will be used to expand electric vehicle charging points along highways, install smart charging, develop vehicle-to-grid charging projects and explore approaches to incentivise household smart charging.[57]

- Australia is among the few remaining countries in the Organisation for Economic Co-operation and Development (OECD) that lack mandatory fuel efficiency standards.[58] Consultations have occurred on implementing fuel efficiency standards for light and commercial vehicles, as well as on addressing heavy-vehicle emissions.[59] The International Council on Clean Transportation has shown that having world class fuel efficiency standards in Australia could reduce the well-to-wheel emissions of light-duty vehicles 95% below 2019 levels by 2050.[60]
- In 2022, a voluntary industry-led CO_2 emission standard was initiated in Australia, aimed at reducing CO_2 emissions 4% annually on average for passenger cars and light SUVs.[61]
- In 2022, Australia announced that it would phase in Euro VI (Stage C) requirements for new medium-and heavy-duty vehicle models (greater than 3.5 tonnes) starting in November 2024, and for existing heavy-vehicle models still being supplied to the Australian market on or after 1 November 2025.[62]
- In New Zealand, the Clean Vehicle Standard is aimed at increasing the quantity and variety of low- and zero-emission vehicles supplied; the standard sets specific greenhouse gas emission targets for transport at 65.9 million tonnes for 2022-2025, 76 million tonnes for 2026-2030 and 56.8 million tonnes for 2031-2035.[63]
- Also in 2022, New Zealand implemented the Clean Car Import Standard, with the target to lower the CO_2 emissions of imported vehicles from an average of 171 grams of CO_2 per kilometre in 2020 to 105 grams by 2025 for cars and 132 grams for vans by 2025.[64] In 2022, New Zealand's Clean Vehicle Discount scheme encouraged purchases of zero-emission vehicles.[65]
- Fiji raised its subsidy for capital investments for electric vehicle charging infrastructure from 5% to 10% in its 2022-23 budget.[66]

Recent investment projects have scaled up the ability of vulnerable small-island countries to build resilient transport systems.

- In 2019, the World Bank launched the Pacific Climate-Resilient Transport Program, with initial projects in Samoa, Tonga, Tuvalu and Vanuatu.[67] The programme has since expanded to include projects to build and strengthen roads in Marshall Islands and Micronesia.[68]
- The World Bank's Pacific Aviation Investment Program supports Samoa, Solomon Islands and Tuvalu in improving the safety and efficiency of aviation.[69]
- The Global Green Growth Institute has supported the small-island developing states within its membership – Fiji, Kiribati, Papua New Guinea, Tonga and Vanuatu – in pursuing a low-carbon development approach while also promoting increased resilience.[70]
- In March 2023, six Pacific Island countries – Fiji, Niue, Solomon Islands, Tonga, Tuvalu and Vanuatu – signed the Port Vila Call for a Just Transition to a Fossil Fuel Free Pacific, a call to action encompassing many measures to transition the region away

TABLE 1. Zero-emission bus fleet targets in Australia

Source: See endnote 86 for this section.

States	Zero-emission bus targets
Australian Capital Territory	100% zero-emission bus fleets by 2040
New South Wales	100% zero-emission bus fleets by 2030
Queensland	100% of translink-funded bus purchases to be zero-emission from 2025 in South-East Queensland and from 2025-2030 in all of Queensland
Victoria	100% zero-emission bus purchases from 2025

from fossil fuels, including reforms to international climate finance to help enable the transition.[71]

- To reduce its vulnerability, Samoa has pushed for a coherent and multi-pronged approach to systems planning, with the adoption of sectoral and spatial planning tools, investments in road network redundancy for critical infrastructure such as roads and bridges, the construction of pedestrian evacuation routes, and policies and planning that address disaster and climate risks.[72]

Freight system improvements are under way in Australia. Through the Inland Rail Project, a 1,600 kilometre freight rail project, was initiated in 2018 and is anticipated to be complete by 2027 to service the country's freight demands and to shift more goods to rail. This priority infrastructure project is supported by USD 14.5 billion in funding from the Australian government, with the rest from the Australian Rail Track Corporation (ARTC), grants and public-private partnerships.[73]

Since 2019, Australia has increased its ambition on alternative fuels, such as hydrogen and sustainable aviation fuels.

- Australia established a Sustainable Aviation Fuel (SAF) Council in October 2022, modelled on the United Kingdom's Jet Zero Council.[74] Australia's flag carrier, the Qantas Group, is committed to using 10% SAF by 2030 and achieving net zero emissions by 2050.[75]
- Australia's National Hydrogen Strategy 2019 sets out actions for building the hydrogen industry and considers transport as a key potential use sector.[76] The country's National Freight and Supply Chain Strategy 2019 sets an agenda for co-ordinated and well-planned government and industry action across all freight modes over the next 20 years and beyond.[77] The emphasis is on economic objectives and building Australian competitiveness; some decarbonisation could occur through operational efficiencies and inter-modality, but no targets for freight decarbonisation have been set.[78]

National and sub-national governments in Oceania have made net zero pledges in the transport sector, including for land, maritime and air transport.

- In 2019, the Pacific Blue Shipping Partnership was jointly launched by Fiji and the Marshall Islands – with partnerships with Samoa, Solomon Islands, Tuvalu and Vanuatu – to raise ambitions to decarbonise respective shipping sectors and achieve net zero carbon by 2050.[79]
- In 2020, Marshall Islands set the objectives of reducing domestic shipping emissions 40% by 2030 and fully decarbonising the sector by 2050.[80] Kiribati, Marshall Islands and Solomon Islands have been influential within the International Maritime Organization in advocating for scaled-up ambition in decarbonising shipping.[81]
- In 2022, members of the Pacific Islands Forum endorsed the 2050 Strategy for the Blue Pacific Continent with the key transport ambition to increase regional connectivity.[82]
- Australia legislated targets In 2022 to reduce emissions 43% below 2005 levels by 2030 and to achieve net zero emissions by 2050, which covered a broad range of climate and energy policy, funds and sectoral-focused policies including transport.[83]
- Most states and territories in Australia have set targets for the uptake of zero-emission vehicles, which taken together would be equivalent to a target for 46% new zero-emission car sales by 2030.[84] Most states and territories have adopted financial incentives for the purchase of zero-emission vehicles, such as waiving stamp duty and registration fees, as well as investments in electric vehicle charging infrastructure.[85]
- All states and territories in Australia are shifting to zero-emission bus fleets, with specific targets in the Australian Capital Territory, New South Wales, Queensland and Victoria (*see Table 1*).[86] Tasmania, Western Australia, South Australia and the Northern Territory have been undertaking trials and investigations.[87]

Climate action in New Zealand is being realised through comprehensive planning approaches, active mobility and support for public transport at the national and local levels.

- New Zealand's Decarbonising Transport Action Plan 2022-2025 sets out four transport targets to support the goal of reducing transport emissions 41% below 2019 levels by 2035: 1) reduce total kilometres travelled by the light fleet 20% by 2035 through improved urban form and providing better travel options, particularly in the largest cities; 2) increase zero-emission vehicles to 30% of the light fleet by 2035; 3) reduce emissions from freight transport 35% by 2035; and 4) reduce the emissions intensity of transport fuel 10%.[88]
- In 2022, Auckland Council's Environment and Climate Change Committee adopted the Transport Emissions Reduction Pathway, to support and enable Te Tāruke-ā-Tāwhiri's required 64% reduction in transport emissions.[89]
- In New Zealand in 2022, Wellington City Council approved a new long-term cycling plan, Paneke Pōneke Bike Network, aimed at expanding cycling networks to connect suburbs to the city centre.[90]
- New Zealand halved public transport fare rates for several months in 2022 in response to the soaring petrol prices resulting from the Russian invasion of Ukraine.[91]

The Nationally Determined Contributions (NDCs) submitted by Oceania countries under the Paris Agreement as of 2022 offer a wide-ranging set of climate change mitigation and adaptation activities. Only five countries in the region (Australia, Fiji, Marshall Islands, New Zealand and Tonga), or 33%, had submitted Long-Term Strategies under the Paris Agreement as of the end of 2022.[92]

- Samoa was the only country in the region with a target for transport greenhouse gas mitigation in its second-generation NDC.[93]
- The NDCs of Pacific islands target improvements in shipping. Kiribati intends to develop a national maritime action plan and to introduce small and efficient freight and passenger ships; the Federated States of Micronesia will update existing vessels with renewable energy power sources and secure additional vessels for transport between islands and for emergency response operations; and Solomon Islands will promote renewable and energy efficient technologies for water and land transport.[94]
- Germany's Agency for International Cooperation (GIZ) has administered the Regional Pacific NDC Hub to support Pacific Island countries in reviewing, enhancing and implementing their climate commitments, including identifying opportunities to bring the transport sector to the fore and to connect climate ambitions at the national and local levels.[95] The Hub – implemented in partnership with the Global Green Growth Institute, the Pacific Community and the Secretariat of the Pacific Regional Environment Programme – served 14 member countries as of early 2023: Cook Islands, Fiji, Kiribati, Marshall Islands, the Federated States of Micronesia, Palau, Papua New Guinea, Nauru, Niue, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.[96]

Partnership in action

SLOCAT partners engaged in dozens of actions during 2020-2022, including:

- The **Asia LEDS Partnership (ALP)** is a voluntary regional network comprising individuals and organisations from the public, private and non-governmental sectors that are active in designing, promoting and/or implementing Low Emission Development Strategies (LEDS) in the Asia-Pacific region (including Australia and New Zealand).[97]
- **Climateworks Centre** bridges research and action to achieve the system-level transitions required to reach net zero emissions across Australia, Southeast Asia and the Pacific. It was co-founded by the Myer Foundation and Monash University in 2009 and works within the non-profit Monash Sustainable Development Institute.[98]
- The **Pacific Islands Development Forum (PIDF)**, headquartered in Suva (Fiji), is a regional organisation aimed at supporting sustainable development in the Pacific Islands.[99] In 2019, the PIDF declared the "Pacific Decade for Sustainable Transport 2020-2030" to accelerate a transition to sustainable, low carbon transport in the region.[100]
- The **United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)** supports inclusive, resilient and sustainable development in Oceania by generating action-oriented knowledge, and by providing technical assistance and capacity building services in support of national development objectives, regional agreements and the implementation of the 2030 Agenda for Sustainable Development.[101] ESCAP Member States in the Pacific cover Australia, Fiji, Kiribati, Marshall Islands, the Federated States of Micronesia, Nauru, New Zealand, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu, as well as associate members American Samoa, Cook Islands, French Polynesia, Guam, New Caledonia, Niue and the Northern Mariana Islands.[102]
- **UITP Asia-Pacific** is the regional network of the International Association of Public Transport (UITP) in Asia and the Pacific, with more than 200 members from 14 different territories working together to foster knowledge and exchange insights between public transport practitioners for better transport developments.[103] In 2023, for example, a training on transit-oriented development with the Land Transport Authority Singapore educated authorities and planners about integrated urban mobility and land-use practices.[104]

- The **United Nations Centre for Regional Development (UNCRD**) strives to promote sustainable regional development in developing countries with a focus on development planning and management in the context of globalisation and decentralisation trends. UNCRD's Environment Unit is focusing on three urban priorities, including sustainable transport.[105]
- The **United Nations Conference on Trade and Development (UNCTAD**) helps emerging economies access the benefits of a globalised economy more fairly and effectively – through analysis, facilitating consensus building, and offering technical assistance – to help them use trade, investment, finance and technology as vehicles for inclusive and sustainable development.[106] UNCTAD has active projects in several small-island countries such as Fiji, Papua New Guinea, Solomon Islands and Vanuatu.[107]
- The **United Nations Development Programme's (UNDP) Pacific Office** in Fiji serves 14 countries to advance the Global 2030 Agenda and help countries meet the SDGs, including SDG 7 on affordable and clean energy. UNDP is guided by a Sub-regional Programme Document for the Pacific Island Countries and Territories 2018-2022, which in turn contributes to the achievement of an overarching UN system-wide Pacific Strategy.[108]

Endnotes

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2.4
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