Financing Climate Action in Transport

Not only is adequate financing required to achieve transport sustainability and climate objectives, but technical assistance and multi-stakeholder collaboration are also necessary (*see Focus Feature: Multi-stakeholder Mobilisation for Climate Action*).

This section provides an overview of the current state of investments in sustainable transport, including through official development assistance and support from multilateral development banks. It also looks at current and potential sources of transport finance and discusses the use of pricing mechanisms, such as congestion and carbon taxes, to help support the transition to low carbon mobility. Finally, current investment commitments, projected investment needs and funding gaps are discussed.

Key findings

Transport investment trends

- Nearly two-thirds of the investment in transport infrastructure in 2015 (USD 666 billion, or 66%) went to road transport, followed by rail (USD 231 billion; 23%) and airports and ports (around USD 55 billion, or 5%, each).
- In member countries of the Organisation for Economic Co-operation and Development (OECD), transport infrastructure spending grew 7% annually on average between 2010 and 2017, before falling nearly 5% in 2018 driven by reduced investment in rail and water transport.
- In 2019, an estimated USD 250 billion was invested in energy efficiency for buildings, industry and transport, but the transport sector received only 26% of this (USD 65 billion), and overall investment in transport has fallen dramatically since 2014.
- On a global basis, investments in walking and cycling infrastructure and in electric vehicle charging infrastructure hold the highest potential to multiply employment opportunities.

Estimated transport investment needs and gaps

- There remains an estimated annual financing gap of around USD 440 billion for transport infrastructure to meet the United Nations (UN) Sustainable Development Goals by 2030.
- Investments required to reduce urban emissions through low carbon urban mobility are projected to total USD 1.83 trillion (around 2% of global gross domestic product, GDP) annually, which would result in savings of USD 2.80 trillion in 2030 and USD 6.98 trillion in 2050.
- Globally, investments of USD 2.7 trillion per year from 2016 to 2030 (or USD 40.5 trillion in total) will be needed to achieve low carbon transport pathways, with 60-70% of these investments in emerging economies.
- Regional investment gaps for transport infrastructure by 2040 are significant, estimated at USD 0.8 trillion for Africa, USD 1.6 trillion for Asia and USD 6.0 trillion for the Americas.
- Globally, 88% of roadways do not meet minimum walking safety requirements, and 86% do not meet minimum cycling safety requirements. In Africa, more than 9 out of 10 streets do not meet minimum walking and cycling safety requirements.

Sources of transport infrastructure finance

- In 2019, 37% of infrastructure official development finance (including government aid to developing countries and grants/loans from multilateral financial institutions) was allocated to the transport and storage sectors, compared to 36% to energy and 20% to water and sanitation.
- In 2014-2015 (latest aggregated data), 75% of official development finance for climate objectives in transport was targeted for adaptation activities (mainly port and road transport) and 25% was targeted for mitigation activities (mainly air and rail transport).
- The Multilateral Development Bank (MDB) Working Group on Sustainable Transport reported nearly USD 22 billion of new funding for sustainable transport in 2017 and nearly USD 19 billion in 2018; the Working Group is on track to achieving its 2012 commitment of USD 175 billion over 10 years.
- Multilateral development banks set new climate change targets in 2020, to be achieved primarily by reducing funding for fossil fuels.
- Climate finance for sustainable transport continued a downward trend since 2012, with only 16 new transport projects added to climate finance instrument pipelines between 2018 and 2020.
- Transport represents 20% of green bond proceeds, making it the third largest sector after energy (32%) and buildings (30%). Green bonds for transport reached USD 52 billion in 2019, up 71% from 2018.
- In December 2020, Climate Bonds updated the transport criteria for green bonds to reflect a stricter threshold for passenger transport.
- The COVID-19 pandemic led to a low-yield environment in 2020, making transport infrastructure assets even more attractive to investors by offering predictable cash flows as well as consistent and reasonable returns.

Transport pricing mechanisms and subsidies

- In 2020, around 16% of global greenhouse gas emissions were covered by a carbon pricing mechanism (up from 5% in 2010). However, transport remains largely marginalised in discussions of carbon pricing and emission trading schemes, with few exceptions.
- Global energy subsidies reached an estimated USD 5.2 trillion (6.5% of GDP) in 2017. Despite repeated pledges to end subsidies, support for fossil fuels among G20 governments has declined only 9% since 2014-2016, totalling USD 584 billion annually during 2017-2020.
- Between 2015 and 2018, 50 countries enacted fossil fuel subsidy reforms focused on either consumption or production, or a combination of the two. Despite these and other efforts, global consumer subsidies for fossil fuels increased slightly in 2017.

COVID-19 pandemic recovery investment commitments

- Current COVID-19 recovery packages dwarf existing low carbon investments; only a fraction of the investment in these packages could put the world on track towards decarbonisation by 2050.
- Within recovery packages, only around a third of transport investments are associated with clean transport, which are outweighed by fossil fuel-focused investments.
- G20 countries have committed more than half of total tracked stimulus spending to transport projects (USD 276 of USD 506 billion as of December 2020), but only around one-third of this transport spending (USD 103 billion) targets green transport improvements.
- In September 2020, the mayors of 12 major cities (Berlin, Bristol, Cape Town, Durban, London, Los Angeles, Milan, New Orleans, New York City, Oslo, Pittsburgh and Vancouver) committed to divesting funding from fossil fuel companies and to shifting to a green and just recovery from COVID-19 and to tackling climate change (although the target dates were unspecified).

Overview

Adequate financing is critical to reaching the scale of decarbonisation of the transport sector necessary to achieve Paris Agreement targets. There is often a lack of government capacity to design transport climate change projects that are attractive to financial institutions and the private sector. Capacity building support is essential and can be leveraged by a wide range of stakeholders.

Transport investment trends

Transport infrastructure investments

Nearly two-thirds of the investment in transport infrastructure in 2015 (USD 666 billion, or 66%) went to road transport, followed by rail (USD 231 billion; 23%) and airports and ports (around USD 55 billion, or 5%, each).[1] Infrastructure investments across 50 countries reached an estimated USD 2.3 trillion, representing roughly 12% of total fixed investments that year.[2] Around USD 1 trillion of this was invested in transport infrastructure.[3] In **Africa**, the **Americas** and **Oceania**, road transport accounted for 75% of all transport infrastructure investments.[4] **Asia** and **Europe** are the only regions where rail infrastructure spending represented a quarter of transport investment volume.[5]

In member countries of the OECD, transport infrastructure spending grew 7% annually on average between 2010 and 2017, before falling nearly 5% in 2018 driven by reduced investment in rail and water transport.[6] OECD member countries greatly increased their investments in transport infrastructure between 2010 and 2018. After the financial crisis in 2007/08, the spending for road and aviation infrastructure in these countries nearly doubled within 10 years (*see Figure 1*).[7] On average, **OECD member countries** spent 1.17% of their GDP on transport infrastructure in 2018; roughly 0.9% of GDP was allocated to road infrastructure and only 0.2% to rail infrastructure.[8]

China spent 5.6% of its GDP on transport, while **Denmark**, **France**, **Germany**, **Mexico**, the **Russian Federation** and the **United Kingdom** (UK) spent around 0.7% to 0.9% each.[9] Notable examples include **Serbia**'s recent investment of more than EUR 3.5 billion (USD 4.2 billion) in railway projects (in addition to around EUR 5 billion (USD 6 billion) for road projects) as part of its EUR 14 billion (USD 17 billion) Serbia 2025 transport investment programme.[10]

In **Africa**, 41.7% of infrastructure finance commitments in 2017 went towards transport.[11] **Latin America and the Caribbean**, which has a similar density of paved roads as **Africa**, spent around 44% of its total infrastructure investments on transport between 2008 and 2015.[12] During 2015-2019, around 1.2% of public spending in the region on average went to transport infrastructure, with higher shares in countries such as **Belize** (5.4%), **Bolivia** (5.3%) and **Nicaragua** (3.9%).[13]

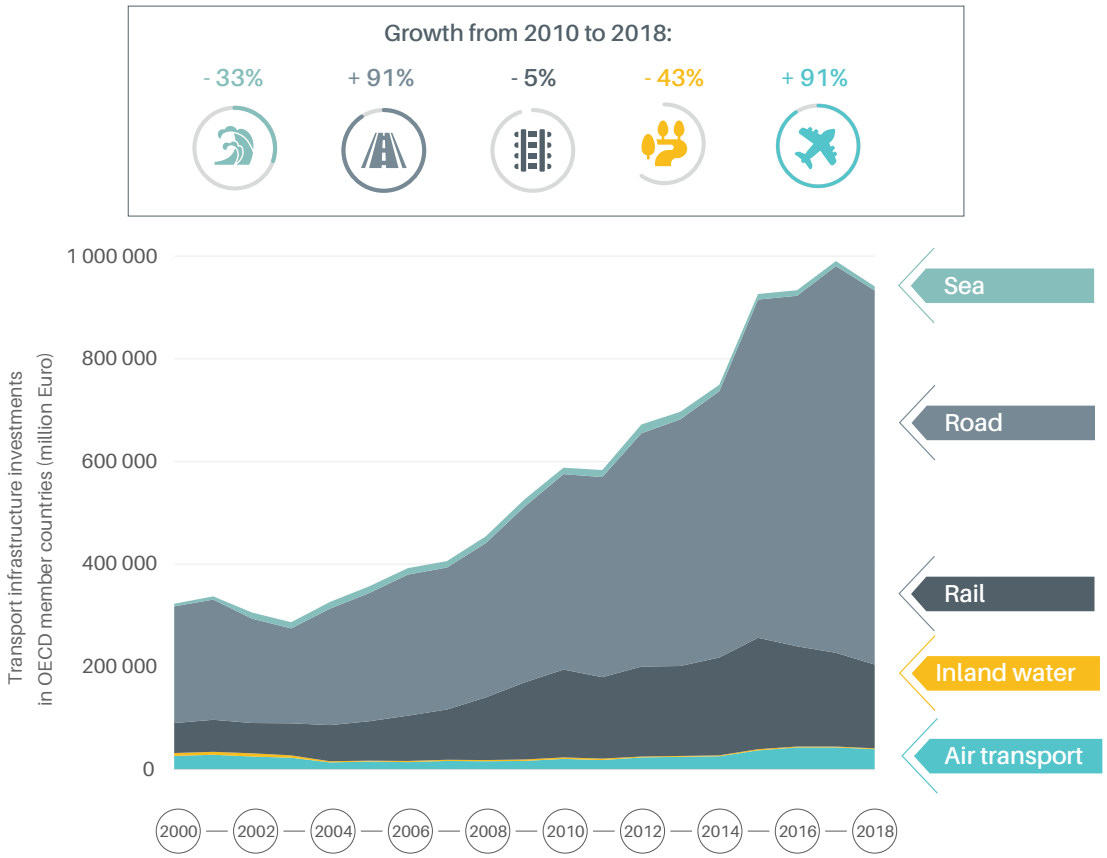
Investments in transport energy efficiency

In 2019, an estimated USD 250 billion was invested globally in energy efficiency for buildings, industry and transport, but the transport sector received only 26% of this (USD 65 billion), and overall investment in transport has fallen dramatically since 2014 (*see Figure 2*).[14] The transport sector has recorded major achievements in energy efficiency (e.g., through improved fuel economy, vehicle electrification and fleet renewal), although they remain insufficient to meet global sustainability goals. A key reason for the reduction in investments in energy efficiency in the sector is that transport demand is favouring larger vehicles such as sport utility vehicles (SUVs).[15]

Employment multipliers for investment in the transport sector

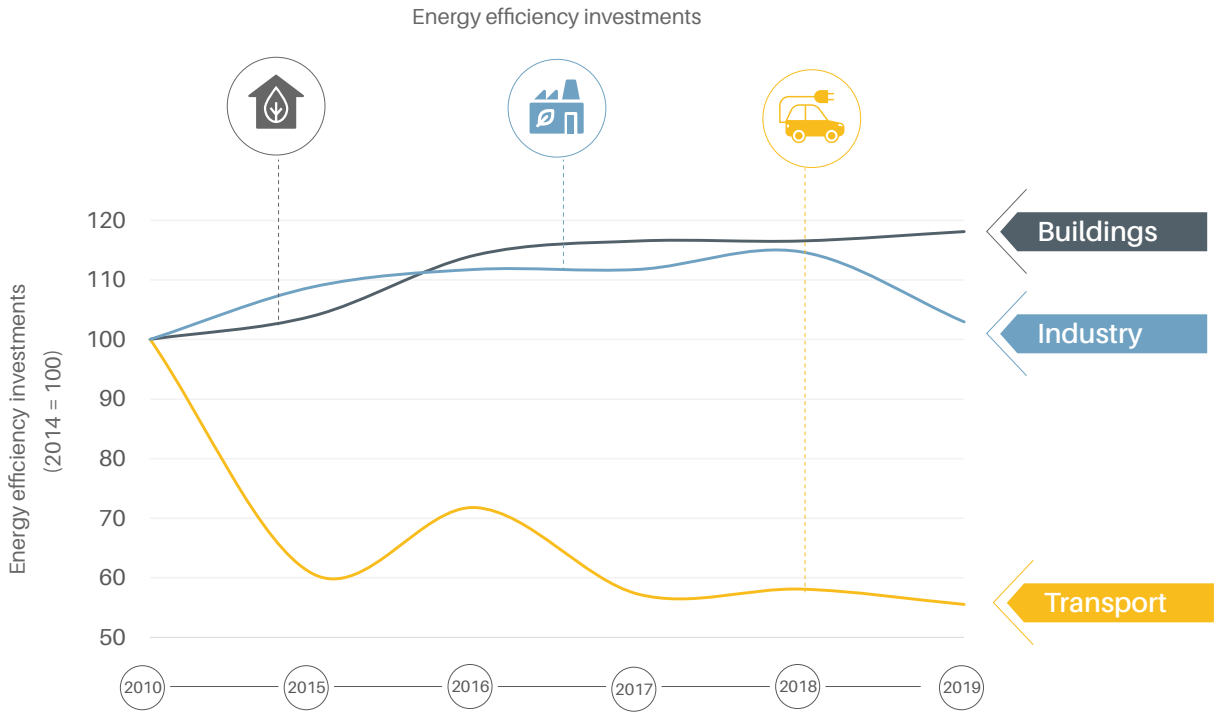
On a global basis, investments in walking and cycling infrastructure and in electric vehicle charging infrastructure hold the highest potential to multiply employment opportunities (*see Figure 3*).[16] Employment benefits of sustainable transport investments exceed those of other sectors (including building retrofits and solar/wind power conversion), and these benefits are likely even higher in developing regions. Job creation potential across 21 countries in developing regions in Africa, Asia, Eastern Europe and Latin America is estimated at more than 50 million jobs (in public transport and vehicle electrification) created by 2030.[17] A green recovery strategy could generate at least an estimated 10 million additional new jobs in low carbon transport compared to a business-as-usual strategy.[18]

Figure 1. Transport infrastructure investments in OECD countries, 2000-2018



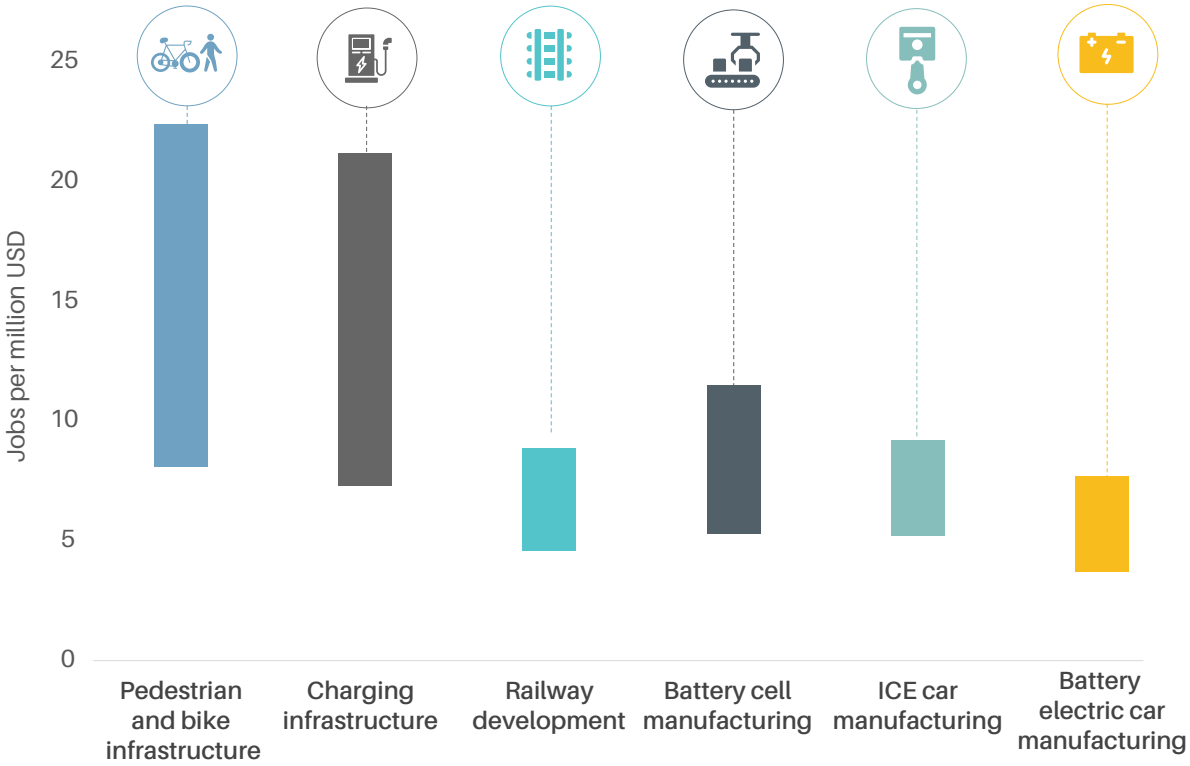
Source: See endnote 7 for this section.

Figure 2. Global investment in energy efficiency by sector, 2014-2019



Source: See endnote 14 for this section.

Figure 3. Potential jobs created through transport investments



Source: See endnote 16 for this section.

Projected transport investment needs and gaps

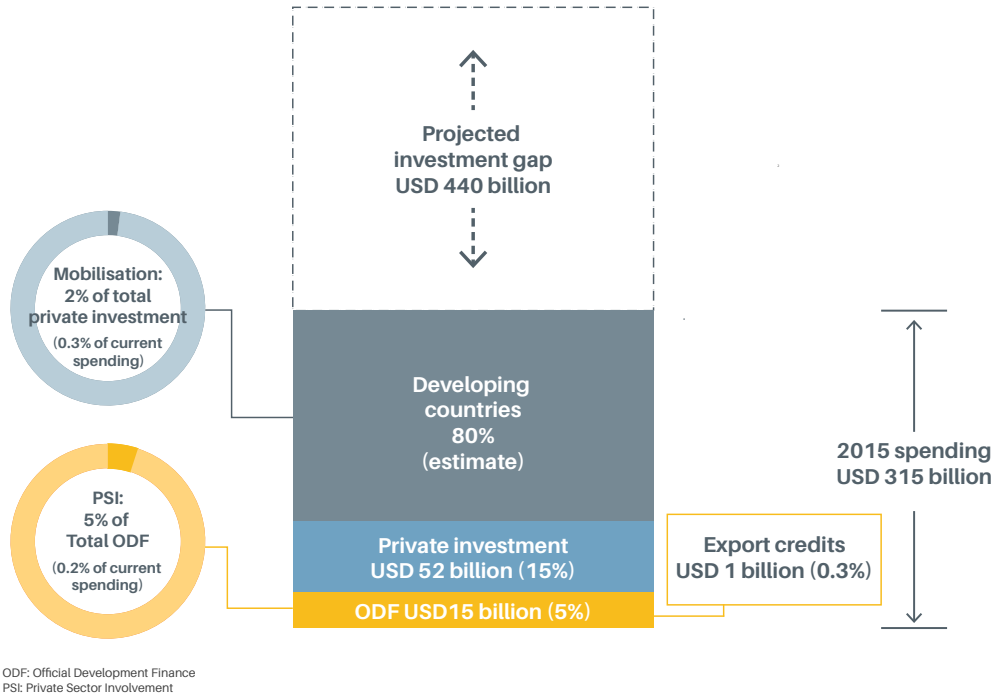
There remains an estimated annual financing gap of around USD 440 billion for transport infrastructure to meet the UN Sustainable Development Goals by 2030 (*see Figure 4*).[19] In 2015, the annual spending for transport infrastructure totalled roughly USD 315 billion.[20] Of this amount, developing country governments financed around 80%, the private sector around 15% and development partners around 5% through official development finance.[21]

Investments required to reduce urban emissions through low carbon urban mobility are projected to total USD 1.83 trillion (around 2% of global GDP) annually, which would result in savings of USD 2.80 trillion in 2030 and USD 6.98 trillion in 2050.[22] Global investment needs for transport infrastructure are estimated to be USD 50 trillion through 2050.[23]

Globally, investments of USD 2.7 trillion per year from 2016 to 2030 (or USD 40.5 trillion in total) will be needed to achieve low carbon transport pathways, with 60-70% of these investments in emerging economies.[24] Low carbon transport pathways entail an integrated approach of *Avoid*, *Shift* and *Improve* measures that have to be implemented quickly to avoid lock-in effects of carbon-intensive and cost-intensive infrastructure and behaviour.[25] **However, regional investment gaps for transport infrastructure by 2040 are significant, estimated at USD 0.8 trillion for Africa, USD 1.6 trillion for Asia and USD 6.0 trillion for the Americas.**[26]

In **Africa** and in the **Americas**, 95% and 88% respectively of the investment gap is associated with road transport, whereas in Oceania the gap for road infrastructure is the smallest concern.[27] **Globally, 88% of roadways do not meet minimum walking safety requirements, and 86% do not meet minimum cycling safety requirements.**[28] **In Africa, more than 9 out of 10 streets do not meet minimum walking and cycling safety requirements.**[29] The Rural Access Index, measuring the proportion of people with access to an all-season road within walking distance of 2 kilometres, shows that African countries have the lowest access: for example, in 2017 rural access was estimated at 11.4% of the population in **Malawi** and 22.3% in **Mali**.[30]

Figure 4. Spending for transport connectivity by financier in 2015 and the annual investment gap to 2030



Source: See endnote 19 for this section.

Sources of transport infrastructure finance

Transport infrastructure (especially road transport) is traditionally financed by taxpayers and/or by the users of this infrastructure, while in some cases (e.g., railways and airports) it is built by private stakeholders and financed through bond issuance. Given the need to continuously maintain, expand and update transport infrastructure, public revenue sources are often insufficient to meet rising demand.[31] Additional private investment and international development finance is often required, including loans, grants and loan guarantees.[32]

Blended finance schemes, which use some combination of domestic resources, development aid and private finance (including public-private partnerships), also have proven effective in financing transport. The COVID-19 pandemic led to an increased attractiveness of transport infrastructure investments as an emerging investment trend (*see Box 1*).[33]

Investment mechanisms

Pension funds are a potential source of transport finance, as these funds typically have longer timelines and an interest in stable returns. Some of the largest pension funds in **Canada** now own major transport facilities worldwide, including the UK's lone high-speed rail line; airports in **Brussels, Copenhagen** and **Sydney**; toll roads in **Melbourne, Santiago** and **Toronto**; and seaports in **New Jersey, New York** and **Vancouver.**[34]

In 2020, New York State's USD 226 billion pension fund committed to divest from many of its fossil fuel stocks by 2025 and to sell (by 2040) its shares in other companies that contribute to global warming, "because investing for the low carbon future is essential to protect the fund's long-term value."[35] This decision highlights a growing trend in climate-conscious pension funds, with increasing opportunities to finance the decarbonisation of transport.[36] However, legal changes are often necessary to unlock such funds.[37]

Public procurement mechanisms provide another opportunity for financing sustainable transport. Almost all publicly procured services have an impact on transport, and thus can contribute greatly to making the sector more sustainable.[38] For public procurement to regularly support sustainable transport, necessary factors include frameworks and regulations that take a lifetime approach to cost analysis, and the use of multi-criteria cost-benefit analyses that assess the full environmental, social and economic costs and benefits of purchasing decisions.[39] For urban transport infrastructure, other potential sources of revenue include **land**

value capture tools, which generate funds for transport projects based on the increase in the value of land and real estate adjacent to new subway lines, roads and other public works.[40]

"Green" taxonomies are also increasing opportunities for financial institutions to support sustainable transport investments. According to the World Bank, "a green taxonomy identifies the activities or investments that deliver on environmental objectives, helping drive capital more efficiently toward priority environmentally sustainable projects."[41] Such guidance can help financial institutions originate and structure green banking products such as loans, credits and guarantees, and it can help investors identify opportunities for impact investments that comply with sustainability criteria.[42]

In July 2020, the **EU** established a region-wide classification framework to enable investors to identify which economic activities and investments can be treated as "environmentally sustainable".[43] However, there has been some debate over the inclusion of specific transport standards in this taxonomy, with some calling for stricter environmental standards for the shipping industry, for example.[44]

Official development assistance for transport

The OECD Development Assistance Committee tracks flows of official development finance – including both government aid to developing countries and other official transactions such as export credits and funds supporting private investment – for infrastructure across sectors.[45]

In 2019, 37% of infrastructure official development finance (including government aid to developing countries and grants/ loans from multilateral financial institutions) was allocated to the transport and storage sectors, compared to 39% for energy and 20% for water and sanitation.[46] This included allocations of 18% to road transport, 11% to rail transport, and less than 2% each to air transport, water transport, and general education and training for the transport and storage sectors.[47]

In 2014-2015 (latest aggregated data), roughly 75% of official development finance for climate objectives in transport was targeted for adaptation activities (mainly port and road transport) and 25% was targeted for mitigation activities (mainly air and rail transport).[48] Official development finance for transport connectivity allocated from development partners averaged USD 15 billion annually (compared to an average of USD 52 billion from the private sector).[49] Among the USD 15 billion, only a third was directly connected to meeting climate objectives.[50]

Of the USD 15 billion financed by development partners, 25% was financed by bilateral partners, and 75% was financed by multilateral development banks and other international organisations.[51] In 2019, of the total official development assistance to transport from the top 10 of 27 development partners, 62% went to road transport, followed by 22% for transport policy and administrative management (*see Figure 5*).[52]

Multilateral development bank investments in sustainable transport

The MDB Working Group on Sustainable Transport reported nearly USD 22 billion of new funding for sustainable transport in 2017 and nearly USD 19 billion in 2018; the Working Group is on track to achieving its 2012 commitment of USD 175 billion over 10 years.[53] As part of the 2012 Rio+20 Commitment for Sustainable Transport, this working group of eight multilateral development banks committed to investing USD 175 billion in loans and grants for sustainable transport in developing countries from 2012 to 2022.[54] As of 2018, the banks had provided nearly 85% of their pledged finding, with three years left to reach the target (*see Figure 6*).[55]

Multilateral development banks also have independently invested in sustainable transport. In 2019, the **European Investment Bank (EIB)** had 81 new transport projects inside the **EU** with a volume of EUR 10.5 billion (USD 12.5 billion), enabling sustainable mobility services for 630 million additional passengers.[56] From 2017 to 2020, the **Asian Development Bank** invested USD 1 billion in transport projects in the **Pacific**.[57]

Multilateral development banks are important sources for climate change mitigation and adaptation finance in transport and other sectors. In 2019, multilateral development banks financed USD 46.6 billion for climate change mitigation (with around 30% allocated to transport) and USD 14.9 billion for climate adaptation (with around 25% allocated to energy, transport and other infrastructure).[58] In low- and middle-income economies, funding for mitigation accounted

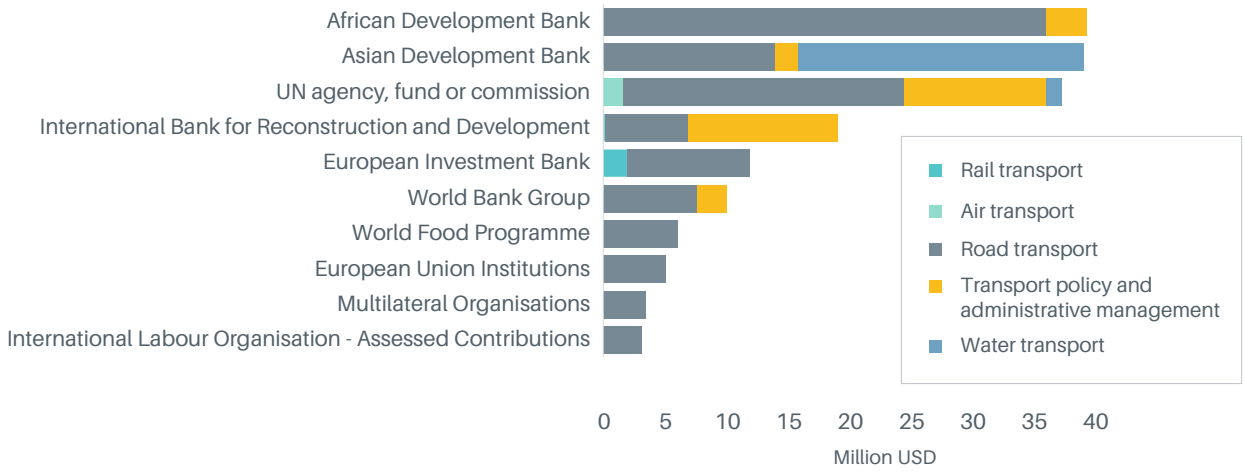
Box 1. Emerging transport investment trends

The COVID-19 pandemic led to a low-yield environment in 2020, making transport infrastructure assets even more attractive to investors by offering predictable cash flows as well as consistent and reasonable returns. The year marked an important and growing interest in sustainable investing, with global "environmental, social and corporate governance" (ESG) assets tripling to USD 40.5 trillion during the year.

Additional factors leading to a more supportive environment for investments in sustainable transport include increased national commitments to achieve net zero emissions by a specified year (including from China, the European Union (EU), Japan and the UK); a new USA administration that has rejoined the Paris Agreement; new climate-related financial reporting requirements; and increased media coverage and public understanding of climate issues.

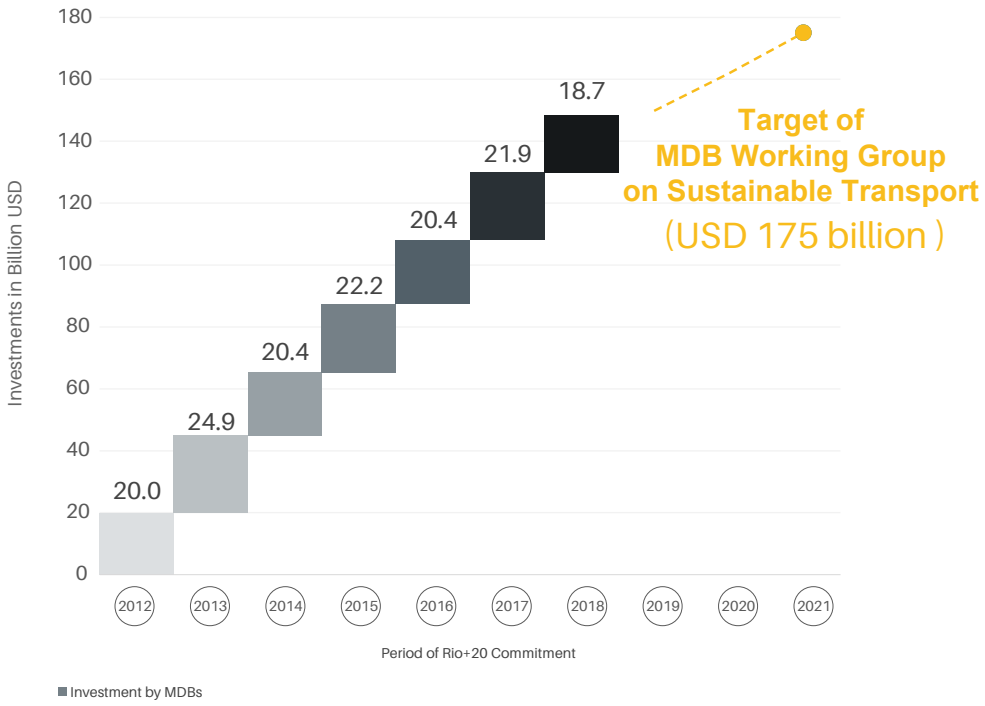
Source: See endnote 33 for this section.

Figure 5. Official development assistance to transport from the top 10 development partners, by sub-sector, 2019



Source: See endnote 52 for this section.

Figure 6. Contributions by the Multilateral Development Bank Working Group on Sustainable Transport, 2012-2018



Source: See endnote 55 for this section.

for 66% of total climate finance from multilateral development banks, and adaptation finance accounted for 34%.[59] In high-income economies, mitigation finance exceeded adaptation finance by a ratio of nearly 20:1.[60]

Multilateral development banks set new climate change targets in 2020, to be achieved primarily by reducing funding for fossil fuels. The **EIB** aimed to become the first multilateral development bank to align all financing activities with the Paris Agreement by the end of 2020 and to end financing for fossil fuel energy projects by the end of 2021.[61] The **Asian Infrastructure Investment Bank** announced that it would end funding for coal but has not specified a date.[62] The bank aims for 50% of investments to be linked to climate change mitigation by 2025, and by 2019 it had already achieved nearly 40%.[63]

The **European Bank for Reconstruction and Development** published a Transport Strategy for 2019-2024 with the goal of closing the infrastructure gap with more green economy, climate resilience and private sector involvement.[64] The **Islamic Development Bank** released a new Climate Action Plan in 2020 that sets a much more ambitious target for climate finance to account for 35% of overall annual lending (by finance volume) by 2025 (it represented only 18.7% of projects in 2013-2017).[65]

Climate finance for sustainable transport

Climate finance for sustainable transport continued a downward trend since 2012, with only 16 new transport projects added to climate finance instrument pipelines between 2018 and 2020.[66] SLOCAT's climate finance instrument database included 300 sustainable transport projects, covering mechanisms such as the Clean Development Mechanism, the Clean Technology Fund, the Green Climate Fund (GCF), the Global Environment Facility (GEF), the International Climate Initiative (IKI), the Joint Crediting Mechanism, Joint Implementation, Nationally Appropriate Mitigation Actions (NAMAs) and the Nordic Development Fund (*see Figure 7*).[67]

The GEF supported four transport projects during 2018-2020: electric public buses in **Mauritius**, sustainable low-emission transport systems in **Lebanon**, the low-emission transport strategy in **Chile** and a global programme for a shift towards electric mobility.[68] Of the 143 climate projects financed by the GCF as of August 2020, only 4 are focused on transport, and the only new transport project since 2018 is the USD 583 million bus rapid transit project in **Karachi**, Pakistan, which aims to avoid 2.6 million tonnes of carbon dioxide (CO_2).[69]

In 2019 and 2020, the IKI kickstarted three major projects: the NDC Transport Initiative for **Asia**, Growing Smarter: Sustainable Mobility in **East Africa** and Decarbonising Transport in Emerging Economies.[70] IKI also supported a NAMA initiated in 2020 on the promotion of electric vehicles in **Cabo Verde**.[71] In 2018, the Nordic Development Fund co-financed with EUR 8 million (USD 9.6 million) a 58-kilometre climate-resilient National Road in **Lao People's Democratic Republic**.[72]

Other funding mechanisms are emerging to help address the gap in climate finance for sustainable urban mobility. The City Climate Finance Gap Fund was established to support cities and local governments in developing countries in prioritising climate-smart investments. The goal of the fund is to attract support for turning low carbon, climate-resilient investment priorities into finance-ready, implementable projects.[73]

Green bonds

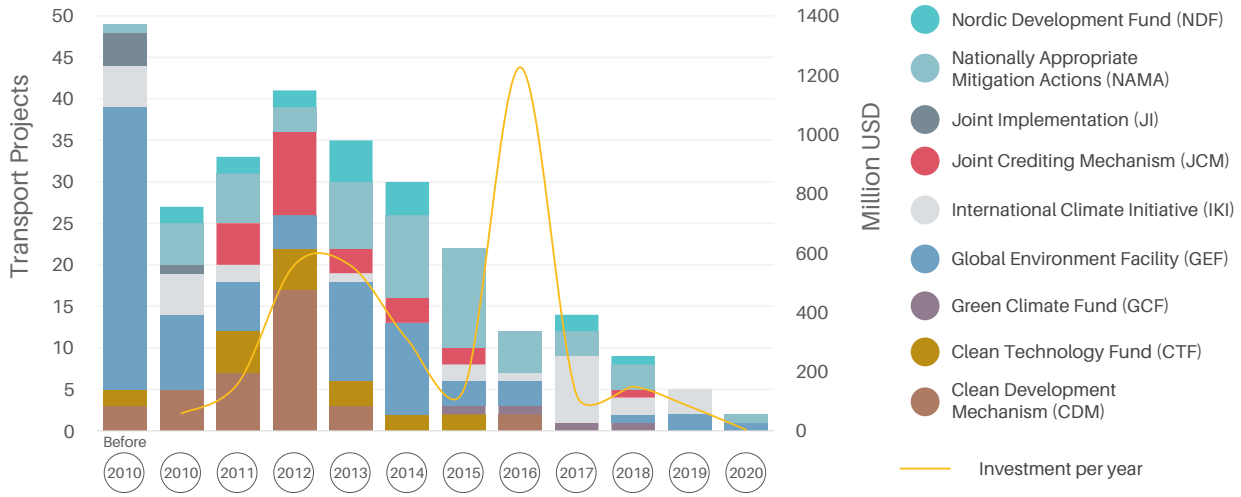
Transport represents 20% of green bond proceeds, making it the third largest sector after energy (32%) and buildings (30%).[74] **Green bonds for transport reached USD 52 billion in 2019, up 71% from 2018** (*see Figure 8*).[75] Transport is gaining prominence in "green" and other climate-themed bonds, in which the proceeds are earmarked for projects with environmental or climate benefits. Green bonds help attract investor demand for climate-aligned investments, reduce market friction and facilitate financial flows.[76] The green bond market totalled USD 258.9 billion in 2019, up 51% from 2018.[77]

Government-backed entities have been the driving force of green bond transport activities. Between 2018 and 2020, **France** certified 10 bonds worth over USD 9 billion, more than any other issuer, to finance the expansion of metro lines in Paris.[78] **Thailand** issued a THB 30 billion (USD 1 billion) Sustainability Bond in August 2020, with a third of the sum allocated for construction of the Bangkok Mass Rapid Transit Orange line.[79] Automobile companies certified green bonds to support their electric vehicle programmes, such as **Porsche** (USD 1.2 billion in August 2019) and **Volkswagen Group** (USD 2.34 billion in September 2020).[80]

Certified Climate Bonds – based on criteria consistent with the Paris Agreement's target to keep global temperature rise this century below 2 degrees Celsius – passed the USD 100 billion mark in 2019.[81]

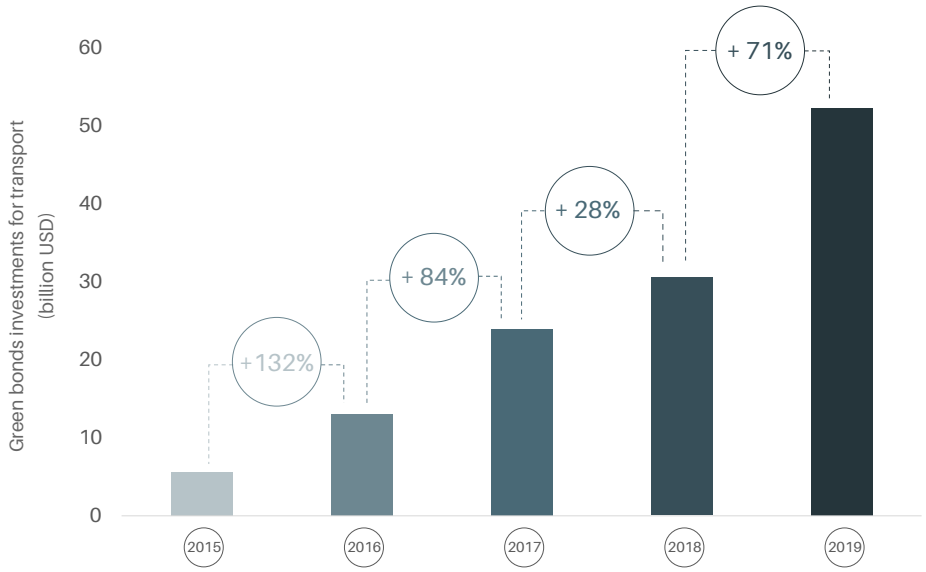
In December 2020, Climate Bonds updated the transport criteria for green bonds to reflect a stricter threshold for passenger transport. To qualify, a passenger transport project cannot exceed 50 grams of direct CO_2 emissions per passenger-kilometre for 2020-2024 and must be zero emissions from 2025.[82] New inter-urban rail projects need to prove a 25% emission reduction in the corridor, and for freight, fossil fuel transport is allowed to represent only 25% of the freight rail cargo (down from 50% previously).[83]

Figure 7. Climate finance projects and investment volume by year



Source: See endnote 67 for this section.

Figure 8. Total proceeds of green bonds for transport, 2015-2019



Source: See endnote 75 for this section.

Transport pricing mechanisms and subsidies

Pricing mechanisms can help account for negative externalities caused by transport – such as greenhouse gas emissions, congestion, road accidents and air pollution – and can support investors in further divesting from carbon-intensive mobility options. Pricing mechanisms include carbon pricing, taxes on fuels and vehicles, fossil fuel subsidy reforms, congestion charging and parking prices (*see Section 3.2 on Sustainable Mobility Planning and Transport Demand Management*).[84]

Carbon pricing

In 2020, around 16% of global greenhouse gas emissions were covered by a carbon pricing mechanism (up from 5% in 2010).[85] However, transport remains largely marginalised in discussions of carbon pricing and emission trading schemes, with few exceptions.[86]

In 2019, **South Africa** implemented a carbon tax covering transport, among other sectors.[87] **Canada** also implemented a carbon pricing scheme that year, and as of April 2020 the price was USD 30 per tonne of CO_2 equivalent in provinces that lacked their own carbon pricing systems, leading to an increase in fuel charges.[88] **Germany** and **Luxembourg** planned to launch national carbon markets in 2021 that would also cover transport, and **Austria** aimed to in 2022.[89] The **EU** has proposed extending its Emissions Trading System to the maritime sector and reducing the allowances allocated for free to airlines.[90] **China** plans to expand its Emission Trading System to cover domestic aviation.[91] In general, carbon pricing mechanisms are currently too low to be fully effective.[92]

Transport subsidies

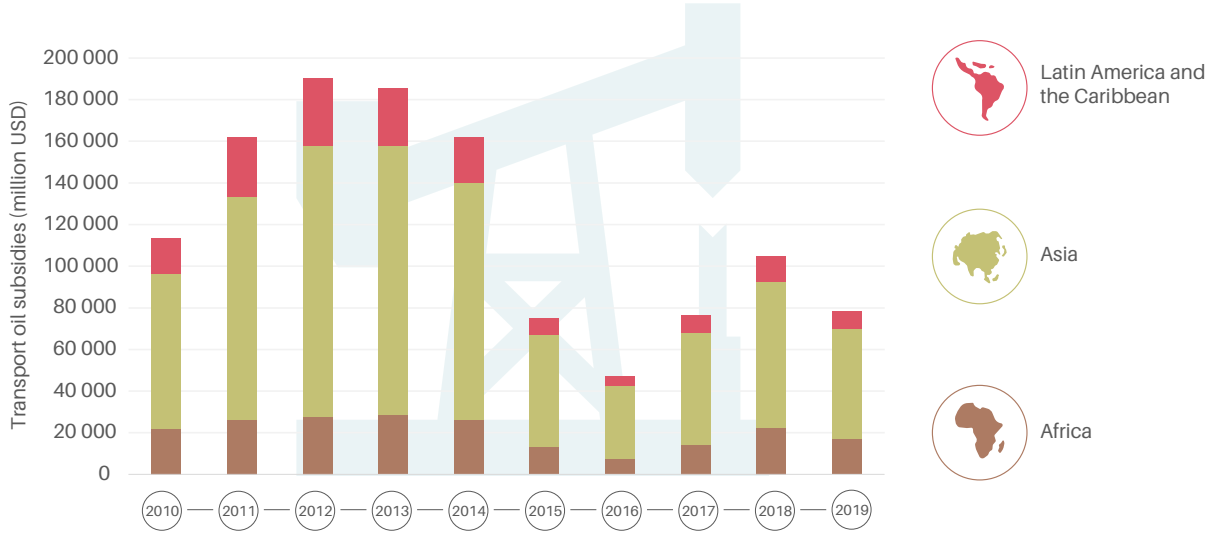
Public subsidies can reduce the cost of sustainable transport measures, including for low-emission transport modes and freight transport. This can help incentivise shifting trips from energy-intensive, higher-emitting modes to more sustainable modes. Although in some cases public subsidies target transport users (such as subsidising public transport fares for low-income populations), current subsidies do not always benefit those with the greatest need. Other subsidies target transport operators (such as increasing the supply of public transport services), although there is broad evidence that operating subsidies can lead to inefficiencies.[93]

Fossil fuel subsidies

Subsidies also may incentivise less-sustainable modes by reducing the cost of fossil fuel-based transport. Many governments maintain subsidies for fossil fuels or fail to adequately tax them, suppressing retail prices of petrol below the price of crude oil on the world market and continuing to undermine climate action.[94] Public subsidies lock society in to private road transport powered by petroleum or diesel fuels. The International Monetary Fund (IMF) estimates that the monetised impacts of externalities are 10 times the direct financial cost of subsidies.[95] While the distortionary effects of direct and indirect subsidies are well recognised, many governments find these policies difficult to abandon due to vested interests.

Global energy subsidies reached an estimated USD 5.2 trillion (6.5% of GDP) in 2017.[96] Despite repeated pledges to end subsidies, support for fossil fuels among G20 governments has declined

Figure 9. Transport oil subsidies, 2010-2019



Source: See endnote 100 for this section.

only 9% since 2014-2016, totalling USD 584 billion annually during 2017-2020.[97] The top five largest subsidies (in terms of total spending) are provided by **China**, the **United States of America** (USA), the **Russian Federation**, the **EU** and **India**.[98] The OECD and BRICS countries (**Brazil**, the **Russian Federation**, **India**, **Indonesia**, **China** and **South Africa**) collectively spend USD 41.6 billion a year subsidising fossil fuel use in urban areas.[99]

Global subsidies for transport oil dropped sharply in 2015 and 2016 but have risen in subsequent years (*see Figure 9*).[100] This trend may continue due to disproportionate funding committed to fossil fuels in COVID-19 recovery packages (*see Box 2*).[101]

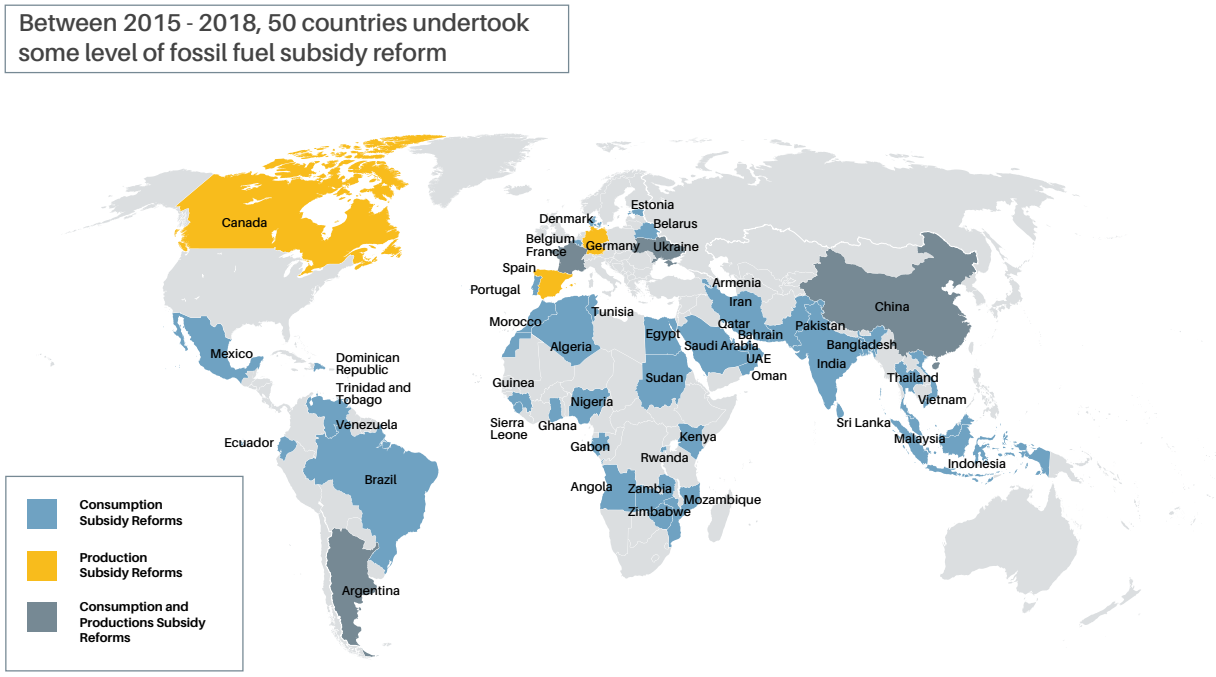
Fossil fuel subsidy reform can help accelerate a transition to a low carbon economy, as outlined in Sustainable Development Goal target 12.c on rationalising inefficient fossil fuel subsidies.[102] The IMF estimates that in 2015, more-efficient fuel prices would have reduced global CO_2 emissions 28%, avoided 46% of air pollution deaths, increased tax revenues by 3.8% of global GDP and added economic benefits worth 1.7% of global GDP.[103]

Between 2015 and 2018, 50 countries enacted fossil fuel subsidy reforms focused on either consumption or production, or a combination of the two (*see Figure 10*).[104] **Despite these and other efforts, global consumer subsidies for fossil fuels increased slightly in 2017.**[105] **Nigeria** reformed its fossil fuel subsidy framework, saving the government at least USD 2 billion a year.[106] **India** incrementally reduced oil and gas subsidies 75% from 2014 to 2017 – while increasing funding for renewable energy six-fold – and also implemented communication campaigns to assess consumer views to deliver successful reforms.[107]

Pricing reform for transport fuels remains a complicated issue in many countries. In 2019, **Ecuador** announced the removal of subsidies for petrol and diesel, causing petrol prices to increase by a quarter and diesel prices to roughly double.[108] The policy set off 12 days of violent protests, which led the government to ultimately re-install fossil fuel subsidies.[109] In 2015, **Indonesia** completed petrol and diesel subsidy reforms, saving up to USD 15.5 billion; however, it has not implemented fuel price changes in a regular manner, with gaps between price adjustments increasing over time.[110]

Aligning fossil fuel subsidy and finance reforms can create more efficient mechanisms for sustainable transport. Fossil fuel finance reform can help channel lending from development banks and other international financial institutions to more sustainable uses. In November 2020, the **EIB Group** released its Climate Bank 2021-2025 Roadmap, which considers as "ineligible transport uses" any vehicles that exceed minimum efficiency thresholds, road and rail vehicles and infrastructure dedicated to transporting fossil fuels, and airport expansion projects.[111] Also that November, the world's **450 public development banks** jointly committed to align their lending with Paris Agreement targets. The UN Secretary General has recurrently called for governments to develop concrete plans and targets to phase out fossil fuel subsidies and for development banks to phase out fossil fuel finance.[112]

Figure 10. Countries undertaking fossil fuel subsidy reforms, 2015-2018



Source: See endnote 104 for this section.

Box 2. Transport investment commitments in COVID-19 pandemic recovery packages

Current COVID-19 recovery packages dwarf existing low carbon investments; only a fraction of the investment in these packages could put the world on track towards decarbonisation by 2050. To address the economic and social impacts of the COVID-19 pandemic and set a course for the future, multiple countries have approved emergency recovery packages. Some of these packages include sustainable mobility measures, although many represent disproportionate investments in fossil fuels, further perpetuating lock-in effects.

Within recovery packages, only around a third of transport investments are associated with clean transport, which are outweighed by fossil fuel-focused investments. As of April 2021, the Global Recovery Observatory covered more than 3,700 investment responses to the COVID-19 pandemic; of these, around 115 belong to the category "clean transport", which equals more than USD 80 billion (or 29% of captured total transport investments). Another analysis on the environmental contribution of stimulus packages as of February 2021 concluded that in 23 out of 28 economies the packages supported transport developments that will result in negative impacts on the environment.

G20 countries have committed more than half of total tracked stimulus spending to transport projects (USD 276 of USD 506 billion as of December 2020), but only about one-third of this transport spending (USD 103 billion) targets green transport improvements (*see Figure 11*).

Examples of national recovery packages with sustainable transport investments include the following:

- **China** promoted two programmes for electric mobility; one extending an existing programme that provides subsidies and tax breaks for 2 million new electric vehicles annually until 2022, and the other to implement 600,000 electric vehicle charging points, with a USD 1.45 billion investment.
- The **EU** agreed to the Next Generation EU recovery fund of EUR 750 billion (USD 900 billion), which supports transport decarbonisation through investments in cleaner, healthier and more affordable active and public transport.
- **Finland** assigned USD 1.7 billion to help offset the loss of revenue in public transport, to advance projects to support walking and cycling, and to support new public transport investments.
- **France** created several programmes to encourage purchases of electric and plug-in hybrid vehicles, support research and development (R&D) in the automotive industry, provide relief during the pandemic, and advance charging infrastructure, totalling USD 8.72 billion, as well as USD 70 million to support bike repairs, installing temporary parking spaces for bikes and cycle training.
- **Germany** approved EUR 2.5 billion (USD 3 billion) to support local public transport during 2020 and a EUR 50 billion (USD 60 million) investment package to support electric vehicle purchases, charging infrastructure, R&D for electric mobility and battery cell production, innovation in the automotive industry and fleet renewal to promote electric vehicles. The package also plans tax changes to require higher-carbon emission vehicles to pay more.
- **Ireland** approved USD 136 million for active travel, public transport and renewal of transport infrastructure.
- **Italy** approved programmes to deduct taxes for electric vehicles and charging infrastructure (110% tax deductions), encourage bicycling (claim back 60% of investments up to USD 500 million per city), cover losses in revenue in public transport and subsidise new electric vehicles (EUR 6,000 or USD 7,300 per unit, up from EUR 4,000 or USD 4,800 previously).
- **New Zealand** approved USD 720 million to enhance the resiliency and reliability of national rail and ferry services.
- The **Republic of Korea** introduced a Green New Deal totalling USD 61 billion over five years, which includes plans to enhance the country's fleet to 1.33 million electric (including hydrogen-powered) vehicles.
- **Spain** advanced a USD 1.12 billion package for public transport and shared mobility, replacing government fleets with zero-emission vehicles, R&D in sustainable mobility and its associated industry and subsidising the replacement of old vehicles for zero- and low-emission ones.
- The **UK** approved a GBP 5 billion (USD 6.9 billion) package for buses, walking and cycling, with the first stage including GBP 250 million (USD 350 million) for pop-up bike lanes, wider pavements, safer junctions, and cycle- and bus-only corridors.
- In early 2021, the **USA** proposed USD 174 billion to build a national network of 500,000 electric vehicle chargers by 2030, to support manufacturing of batteries and electric vehicles, and to retool factories to compete globally. The plan would also replace 50,000 diesel transit vehicles, electrify at least 20% of the nation's school bus fleets, and electrify the federal fleet, including postal vehicles.

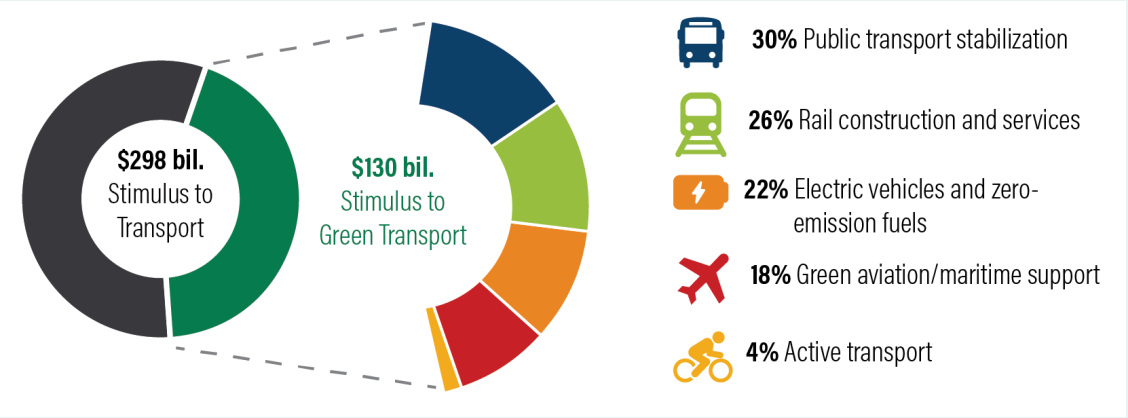
Cities around the world are leveraging the pandemic to advance investments in sustainable, low carbon transport. **In September 2020, the mayors of 12 major cities (Berlin, Bristol, Cape Town, Durban, London, Los Angeles, Milan, New Orleans, New York City, Oslo, Pittsburgh and Vancouver) committed to divesting funding from fossil fuel companies and to shifting to a green and just recovery from COVID-19 and to tackling climate change (although the target dates were unspecified).**

Examples of city recovery plans with sustainable transport investments include the following:

- **Bogotá**, Colombia announced implementation of a further 35 kilometres of cycleways, in addition to the city's existing 550-kilometre network.
- The government of **Mexico City**, Mexico will invest USD 1 billion to create 1 million new construction jobs, including efforts to fast-track a bus rapid transit line and two cableways planned before the pandemic.
- **Milan**, Italy launched an integrated strategy to reduce demand for travel, improve integration of public transport with other mobility systems, and promote shared vehicles, bicycles and scooters, among other measures.
- **Seoul**, the Republic of Korea plans to scale up goods delivery via robots and to accelerate implementation of a bicycle expressway network, with the aim of achieving a 15% cycling mode share by 2030.

Source: See endnote 101 for this section.

Figure 11. Stimulus spending for sustainable transport by transport mode, as of December 2020



Annex: Methodological Note

Data usage

Time period for data:
The report strives to utilise the most recent publicly available data and information just prior to the time of publication (as of 31 May 2021). The figures in the report were developed between September and December 2020 using the most recent data available.

Secondary data:
SLOCAT relies on secondary data and information collected and provided by SLOCAT partners and other entities and does not make use of any internal modelling tools.

Data on sustainable mobility: A call to action

The report benefits directly from data collected by a wide range of stakeholders working in different areas of transport.

Data are important for providing a comprehensive picture of the status of sustainable, low carbon transport and are essential for both policy and investment decision making. In these times of change, it is critical to upgrade data and policy collection and interpretation capacities to better understand progress and the hurdles that must be addressed.

The data limitations mentioned below are not new. Obtaining regular, reliable and public data across regions and transport modes remains an outstanding issue. When an increasing number of stakeholders are collecting data and policy information, more and better open-access data and capacity building efforts for data interpretation are supported by many multi-stakeholder partnerships in the sustainable, low carbon movement.

If you share our passion for open-access data and knowledge towards greater impact on policy and investment decision making worldwide and/or would like to contribute data or knowledge to our collective efforts on this report, **please reach out to the research team in the SLOCAT Secretariat at tcc-gsr@slocatpartnership.org**.

Specific data used in this report

Data on emissions

The data in this edition of the report point to the direct carbon emissions from transport activity; they do not cover the indirect emissions and land-use impacts associated with certain modes of transport. The report primarily utilises CO_2 emission data compiled in the Emissions Database for Global Atmospheric Research (EDGAR) from the Joint Research Centre of the European Commission, as this represents the most recent, comprehensive dataset on transport CO_2 emissions. However, this global dataset does not convey in full detail the unique situations of individual countries.

EDGAR provides estimates for fossil CO_2 emissions from all anthropogenic activities with the exception of land use, land-use change, forestry and the large-scale burning of biomass. The main activities covered are CO_2 emissions emitted by the power sector (i.e., power and heat genertion plants), by other industrial combustion (i.e., combustion for industrial manufacturing and fuel production) and by buildings and other activities such as industrial process emissions, agricultural soils and waste. Transport activities covered within EDGAR include road transport, non-road transport, domestic aviation, and inland waterways on a country level, as well as international aviation and shipping.[1]

For the world, regions and countries, the CO_2 emission data (provided by EDGAR) span through 2019. In a few places in the report, CO_2 data for 2020 are shown to illustrate the impact of the COVID-19 pandemic; however, these data are based on a different methodology than the EDGAR dataset and should not be compared directly with the data from previous years.

The latest CO_2 emission data for individual transport modes are for 2018 and have been compiled only at the global level. For passenger and freight transport, the data on global CO_2 emissions are for 2017, as this is the latest year with robust data. Data on passenger activity (passenger-kilometres) and freight activity (tonne-kilometres) – provided mainly in the country fact sheets – are based on the latest available year, as indicated in the report analysis.

Information on greenhouse gas emissions – provided in CO_2 equivalent (CO_{2eq}) – include not only CO_2 but also methane, nitrous oxide, and industrial gases such as hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride and nitrogen trifluoride.[2] These data are less up-to-date. As of 31 May 2021, data on greenhouse gas emissions were not readily available for the period 2019-2020. In some cases, additional data sources were used to provide detailed information about other climate pollutants besides CO_2.

All data on CO_2 and other greenhouse gas emissions, as well as CO_{2eq}, are provided in metric tonnes.

Data on car ownership

Information on car ownership rates is based on a global dataset from the International Organization of Motor Vehicle Manufacturers (OICA), with the latest release (as of 31 May 2021) dating from 2015.[3] Although newer information is available for some individual countries, using these data would hinder accurate global comparisons. Data on passenger and commercial vehicle sales were available only up to 2019.

Policy landscape data

The policy-related information presented in this report is not intended to be comprehensive. The data for the policy landscape indicators provided in Section 3 were gathered through desk research unless otherwise indicated. Barriers to accessing such information include language and limited availability of information through online media (e.g., websites, press releases and news articles).

Data in country fact sheets

Information in the fact sheets is based on desk research and on contributions from the national focal points. The data were collected to the best of the authors' knowledge and based on data availability, and thus may not be complete or show the most recent status. When no information was available for a given indicator, the term "Not available" is used.

Data gaps

Major data gaps exist in areas where there is no globally accepted data collection methodology. For example, the mapping of cycling and walking infrastructure is not currently done in all regions. Also, the modal share can be surveyed through different methods, leading to inconsistencies in available data. In addition, data on paratransit (informal transport), a predominant form of transport in many parts of the world, are largely lacking. This results in an incomplete picture of the impact of transport on climate change and sustainable development.

Methodological approach

Countries and regions

The report follows the M49 Standard of the United Nations Statistics Division.[4] In total, 196 countries have official United Nations membership and are also party to the United Nations Framework Convention on Climate Change. The available data have been put in a common structure for the United Nations member countries, regions and income groups to enable a consistent assessment. Income groups are based on the World Bank's classification of 2019.[5]

Economic calculations

The per capita and gross domestic product (GDP) calculations are based on the United Nations World Population Prospects 2019 and on World Bank GDP data using constant 2010 USD.[6]

Spatial and temporal scales

The geographic scale (global, national, city-level, etc.) as well as time scale (annual, monthly, daily) used in this report depends largely on the available dataset, as noted in the relevant figures and text. The detailed data forming the basis of the calculations and analysis are provided in the SLOCAT Transport Knowledge Base.[7]

Criteria for selection

The report covers policies, targets, emission reductions (achieved or envisioned) and market measures. To merit inclusion in the analysis, the policies, projects and trends must have been announced or completed between 2018 and 2020. Significant developments from January through May 2021 were included when deemed relevant, with the understanding that the next edition of the *Transport and Climate Change Global Status Report* will cover a period starting in 2021.

Pre- and post-COVID-19 pandemic trends

The year 2020 was pivotal for the world, and the COVID-19 pandemic has had substantial impacts on many of the transport trends monitored in this report. This edition attempts to differentiate between long-term trends and impacts due to the pandemic. To the extent possible, the analysis notes "pre-pandemic" (up to the end of 2019 or latest by February 2020) and "during pandemic" trends (starting in March 2020 until the end of 2020), as in some cases the pandemic led to reversals in long-term trends, at least for a specific period of time. In each section, a box describes the impacts that the pandemic has had on specific regions and sub-sectors.

Assembling the report

Global Strategy Team

This edition of the report was guided by a global strategy team consisting of 20 experts in the field who provided inputs over the span of six meetings between September 2019 and October 2020. Additionally, small group consultations were organised in February 2021, following the peer review process.

Authors and contributors

The report was collaboratively drafted by 22 authors and contributors from 16 organisations, led by the SLOCAT Secretariat. This includes additions and high-level inputs from the copy editor and from the special advisor who also co-authored the Executive Summary. Authors researched and compiled relevant facts and figures for the five sections of the report, including the Focus Features, with supporting review and inputs from several other organisations.

Peer review: A peer review process was carried out from 18 December 2020 to 20 January 2021 with 1,700 comments received from 74 reviewers. Each comment was individually reviewed by the SLOCAT Secretariat and considered in finalising the report.

National focal points: The report benefited from the contributions of voluntary national focal points, or experts from various regions and countries who have been essential to overcome language and information barriers. A public call for participation to provide information on policies and data resulted in several hundred initial registrations. Out of these registrations, 78 national focal points provided inputs through a first survey from 24 January to 3 February 2020; and through a second survey (focused on the country fact sheets) from 6 to 30 August 2020. All national focal points that contributed to the surveys are listed in the Acknowledgements.

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Annex: Methodological Note

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SLOCAT Transport and Climate Change Global Status Report 2nd Edition

This report should be cited as:

SLOCAT (2021), *Tracking Trends in a Time of Change: The Need for Radical Action Towards Sustainable Transport Decarbonisation*, Transport and Climate Change Global Status Report – 2nd edition, www.tcc-gsr.com.

Data access and licensing:

The development of this report was led by Maruxa Cardama, Angel Cortez, Nicolas Cruz, Angela Enriquez, Emily Hosek, Karl Peet, Nikola Medimorec, Arturo Steinvorth and Alice Yiu from the secretariat of the SLOCAT Partnership.

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