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Public Transport

SLOCAT Partnership on Sustainable, Low Carbon Transport

Transport, Climate and Sustainability
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Note: This section *3.4.1 Public Transport* covers any collective transport services in cities operated and regulated by public authorities. Informal transport is covered in *3.4.2 Informal Transport*, and any other shared services are covered in *3.4.3 App-Driven Shared Transport*.

Key findings

- The COVID-19 pandemic has had ongoing detrimental impacts on both mobility and public transport systems globally, with particularly severe impacts in low-income countries.
- As cities and countries opened up to travel and daily commuting, some public transport agencies piloted reduced fares and/or free service to incentivise ridership while maintaining safe and clean conditions.

Demand trends

- Ridership on public transport worldwide dropped 90% between March and August 2020 due to the COVID-19 pandemic but recovered gradually by late 2021.
- In many cases, the initial drop in ridership was not associated with infection rates but rather with people's fears of infection, as well as government stay-at-home orders. Subsequent declines in ridership were more often linked to infection rates, but as the pandemic persisted the correlation between infection rates and ridership decreased as people returned to regular mobility patterns.
- Many changes in working habits related to the COVID-19 pandemic have become permanent, affecting people's travel patterns and threatening funding for public transport.
- Among the major public transport modes (bus rapid transit, metro and light rail), metro systems showed the strongest growth between 2015 and 2021. Despite budget cuts, delays, and low ridership, public transport expansion projects continued during 2020-2021 in all major regions, with the opening of dozens of new train, bus, light rail and tram lines.
- Global bus rapid transit networks expanded modestly between 2020 and 2022, with operations starting in six new cities in Brazil, India, Kenya, and the United States, adding nearly 90 kilometres of corridors.

Emission trends

- Passenger emissions from both public transport and private motorised transport decreased dramatically in 2020 due to pandemic-related lockdowns. Commuting and the use of transport fell sharply and urban air quality improved, although essential workers continued to rely on both public and private transport to commute to work.
- To reduce emissions, many cities have introduced electric buses to their transport fleets. However, the largest emission reductions will occur only if the e-buses are charged using renewable rather than fossil fuel-based electricity. In 2021, electric bus sales grew 40% and an estimated 670,000 e-buses were in circulation worldwide, representing around 4% of the global bus fleet.
- China has dominated the e-bus market, hosting around 99% of the global stock in 2017 and expanding its fleet by nearly 100,000 e-buses annually. As of 2021, China remained home to more than 90% of the global fleet and accounted for 91.6% of global electric heavy-duty vehicle sales.

Policy developments

- Early in the COVID-19 pandemic, concerns about high transmission rates on public transport led to strict closures, severe policies, reduced services and social distancing protocols; however, as experts studied the mechanisms of transmission, and as public transport was considered safe, most countries loosened restrictions.
- As travel restrictions eased and as countries enacted economic recovery policies, many governments provided strong subsidies for public transport. Between March 2020 and February 2021, USD 130 billion in stimulus funding was leveraged globally to support green transport, with 30% going towards stabilising public transport and 26% towards rail construction and services.
- Some governments reduced transport fares to combat low ridership rates and to assist low-income populations and those most reliant on public transport.
- Although free access to public transport addresses equity concerns by eliminating the cost barrier, it may not be enough to encourage private vehicle users to shift towards more sustainable urban mobility options.
- As countries recognise the benefits of leveraging public transport as a climate tool, many have included public transport improvement plans in their Nationally Determined Contributions (NDCs) towards reducing emissions under the Paris Agreement.
- In low- to middle-income countries, where most people do not own private vehicles, enhancing public transport is crucial for economic growth and improving living standards, although funding is challenging.

Overview

The COVID-19 pandemic has had ongoing detrimental impacts on both mobility and public transport systems globally, with particularly severe impacts in low-income countries. Even before governments intervened to restrict or modify public transport services to prevent transmission of the virus, ridership was down sharply as people feared close contact with others and high risk of infection.

During 2020-2022, public transport ridership recovered relatively quickly in some parts of Asia, South America, and Africa, even surpassing pre-pandemic levels (for example, in Colombia, India and Kenya).[1] However, public transport systems in North America and Europe continued to suffer from decreased ridership, lower revenue and difficulty maintaining the same level of reliable services for essential workers and those who rely on public transport for daily mobility. The pandemic revealed that public transport is a necessity in cities, not only for mobility and equity but also to reduce emissions and to prevent a shift to private vehicles.

As cities and countries opened up to travel and daily commuting, some public transport agencies piloted reduced fares and/or free service to incentivise ridership while maintaining safe and clean conditions. This led to innovations in monitoring, data collection and transport apps that allow riders to stay informed about schedules and crowds. Meanwhile, public transport networks – including bus routes, bus rapid transit corridors and light rail lines – resumed their expansions to reach more residents. Strategic investments in public transport can kickstart local economies by providing mobility and connecting people to economic and social opportunities that are beyond walking or biking distance.

In 2022, global markets were further hit by the Russian Federation's invasion of Ukraine, with rippling impacts on human lives, businesses and the global economy. Fuel prices rose sharply, with particularly heavy impacts across Europe, the largest market for Russian oil and gas. Many countries responded by reassessing their energy security policies and supply mixes, sparking investments in domestic renewable energy sources as well as greater support for electric vehicles.

The electrification of public transport and the development of charging infrastructure is a critical tool not only for reducing urban emissions and improving air quality, but also for improving the quality of public transport systems and preventing growth in private vehicle use. In 2022, the United States, a predominantly car-centric nation, committed unprecedented funding for climate change mitigation and transport infrastructure, including USD 40 billion for public transport through 2026, setting an example for federal investment in equity in mobility.[2]

As the urban population continues to expand globally, public transport improvements in low- and middle-income countries are critical. By establishing policies for clean transport, governments can help advance many of the United Nations Sustainable Development Goals (SDGs), improving air quality and equity while also providing economic opportunity and incentives to invest in clean energy solutions.

Demand trends

Ridership on public transport worldwide dropped 90% between March and August 2020 due to the COVID-19 pandemic but had recovered gradually by late 2021.[3] Global metro use fell 40% in 2020 compared to the previous year, with the highest decline in North America at 63%.[4] However, the resilience of public transport to rising infection rates, and the recovery time of ridership, have varied widely by country and region (see Figure 1).[5] In 2022, public transport levels remained below pre-COVID-19 levels in Japan, Sweden, the United Kingdom and the United States, among other countries.[6]

- In Europe, operators sought to maintain public transport services at 70% of pre-pandemic levels in 2020 to guarantee reliable access; however, fare revenue still fell 90% due to low ridership.[7] Passenger capacity in Italy remained at 50% in 2021, requiring government subsidies to support public transport.[8]
- In Singapore, public transport ridership recovered to around 75% of the 2019 level by January 2022, and taxi and private-hire cars experienced even quicker recovery.[9]

- In the United States, public transport ridership is projected to rebound only gradually in the short term, to achieve 75% recovery by the end of 2025.[10]
- In regions where a large share of the population relies on public transport for daily mobility – such as Latin America and Africa – ridership recovered relatively quickly and was more resilient to further spikes in infection rates.[11]

In many cases, the initial drop in public transport ridership was not associated with infection rates but rather with people's fears of infection (see Box 1), **as well as government stay-at-home orders** (see Figure 1).[12] **Subsequent declines in ridership were more often linked to infection rates, but as the pandemic persisted the correlation between infection rates and ridership decreased as people returned to regular mobility patterns.**

- In 2020, metro ridership globally fell 40% on average compared to 2019, with declines ranging from 32% in the Asia-Pacific region to 63% in North America.[13]
- New York City, with the largest metro system in the United States, experienced one of the sharpest declines in ridership in 2020, losing nearly two-thirds of passenger volume.[14] Ridership on the city's metro is projected to reach 69% of pre-COVID-19 levels in 2023 and 80% by 2026, with a structural deficit of USD 2.5 billion by 2025.[15]
- Among cities studied, Delhi (India) had the greatest loss in metro ridership in 2020, due to a five-month closure.[16]
- Of the top 15 cities for pre-pandemic metro ridership (Tokyo, Moscow, Shanghai, Beijing, Seoul, Guangzhou, Delhi, New York City, Mexico City, Hong Kong, London, Paris, São Paulo, Shenzhen and Singapore), all of them experienced a decline in ridership of 27% or more, except Shenzhen, China, where ridership fell only 13%, likely due to the expansion of the city's network by around one-third during this period.[17]
- In China, bus ridership was on the decline even before the pandemic, notably in Guangzhou, where ridership fell from 7.1 million in 2015 to 3.7 million in 2020.[18] This was likely due to the rise of alternative mobility options such as expanded metro access and shared mobility services. Guangzhou's metro lines exceeded 600 kilometres in 2022, with the partial opening of Line 22 and additional construction under way.[19]

Many changes in working habits related to the COVID-19 pandemic have become permanent, affecting people's travel patterns and threatening funding for public transport. As flexible and hybrid working schemes have been adopted, many workers are continuing to work remotely some days of the week even after the lifting of pandemic-related restrictions.[20] Remote working, initially widely adopted for public health reasons, is increasingly becoming a combination of personal choice and business need.[21] The increase in remote work also has affected residential choices, leading more people to relocate outside of cities to smaller towns or to areas without good public transport.[22]

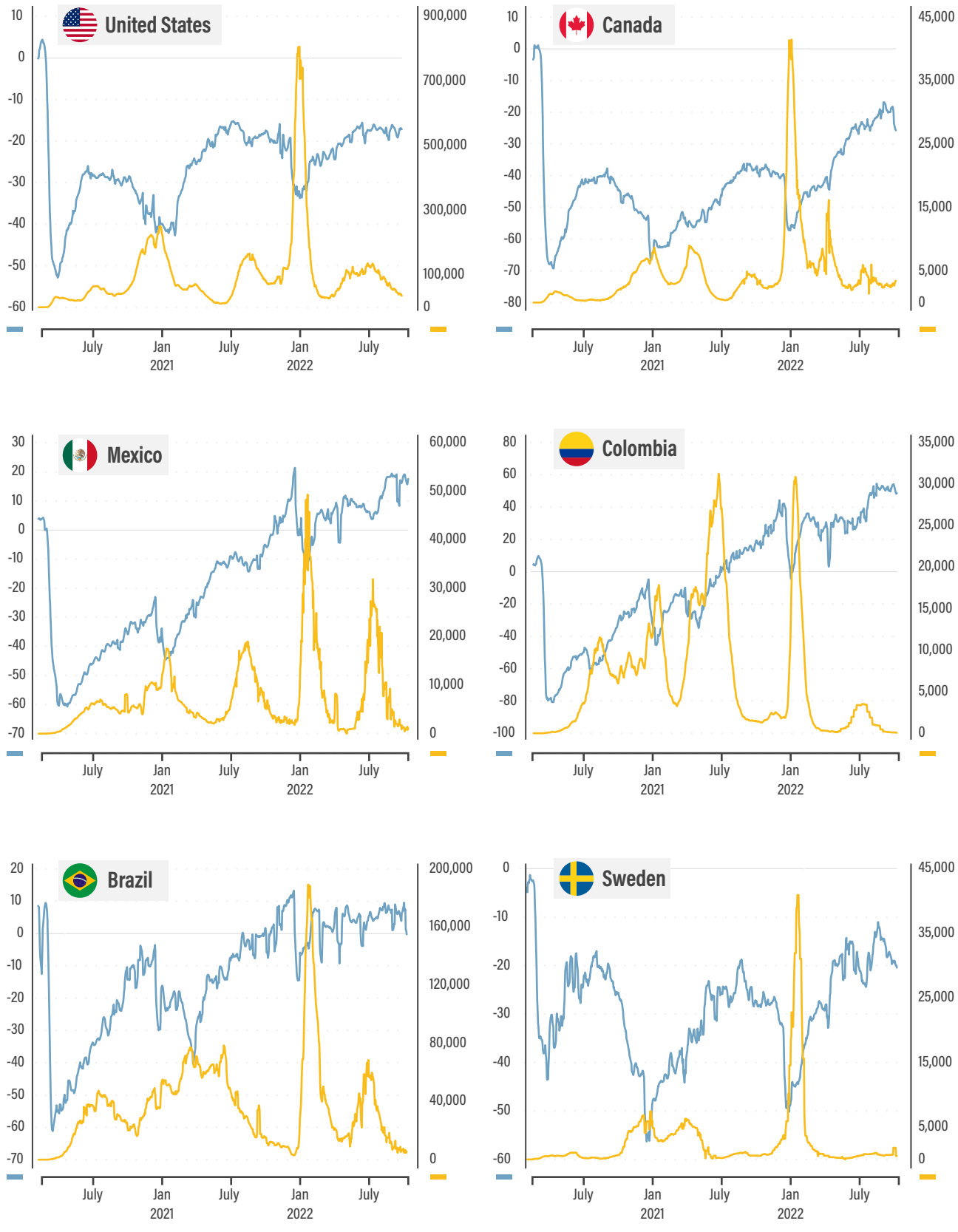
These trends contribute to lower levels of public transport use, particularly during rush hours, compared to pre-pandemic values.[23] The resulting reduced revenue from fares, complemented with reduced government subsidies and a lack of proper funding, can lead to budget deficits and quality of service deterioration, making public transport services less attractive and leading to greater private car use.[24]

In February 2022, the Russian Federation's invasion of Ukraine sparked new travel restrictions and economic sanctions.[25] A subsequent US ban on imports of Russian oil, natural gas, and coal, as well as the European Union's pledge to cut imports of Russian oil by two-thirds, led to a surge in energy prices globally.[26] The price of crude oil increased 45% between January and March 2022, raising the cost of global commerce and travel.[27] The energy crisis led many countries, mainly in Europe, to introduce energy-saving policies.

- In 2021, Austria introduced the KlimaTicket, which offers almost unlimited use of public transport country-wide for an adult fare of EUR 1,095 (USD 1,169) annually or EUR 3 (USD 3-20) per day.[28]
- Between June and August 2022, Germany introduced the EUR 9 (USD 9.61) public transport ticket – covering all rides on a public bus, rail, tram or metro during the month of purchase – to maintain affordability and save fuel by encouraging a shift from cars to public transport.[29] In August 2022, the government announced the successor EUR 49 (USD 52.31) Deutschlandticket to start in 2023.[30]
- In April 2022, Chile's president announced Chile Apoya, an economic recovery package of 21 measures that included freezing public transport fares for the year in response to rising global oil prices.[31]
- In the Philippines, the rise in transport costs has contributed greatly to inflation. Transport inflation in the country averaged 3.84% annually between 2013 and 2022 but hit 9.7% in 2021 and 12.9% in 2022.[32] Without government intervention, collective transport in the Philippines (and several other countries) could collapse in the face of rising oil prices related to the Russian invasion of Ukraine.[33].
- In December 2022, the United Kingdom announced a GBP 60 million (USD 72 million) investment to cap single bus fares at GBP 2 (USD 2.4) from January to March 2023 (later extended through June 2023), allowing passengers to save nearly a third of the ticket price on average.[34] As part of the government's Help for Households campaign, the scheme was adopted by 130 bus operators nationwide and aimed to alleviate the rising costs of living, reduce emissions and congestion, and help the bus industry recover from the pandemic.[35]

FIGURE 1. Public transport ridership in selected countries as a percentage of pre-COVID-19 levels, and the number of infected individuals from February 15, 2020 to October 15, 2022

Source: See endnote 5 for this section.



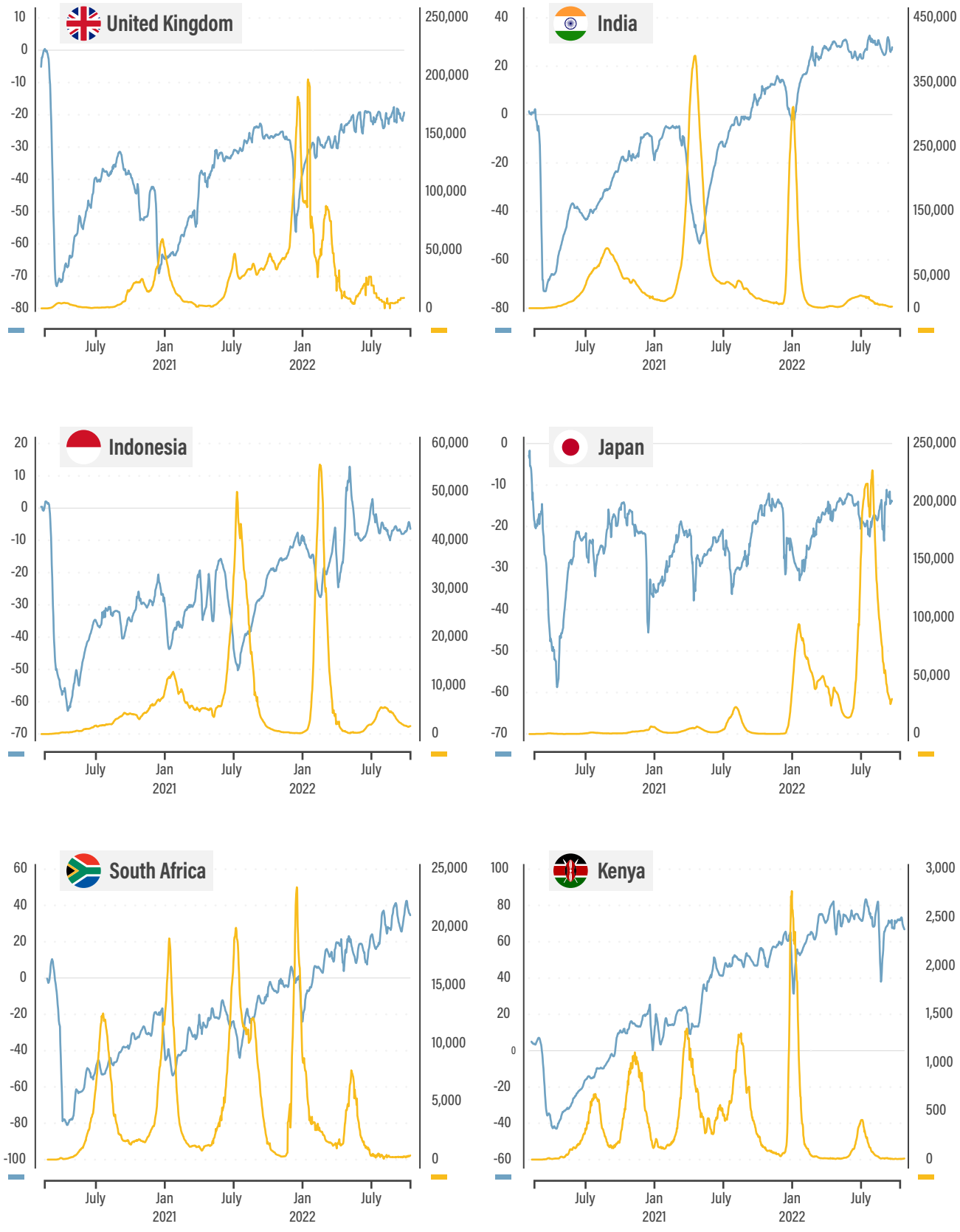
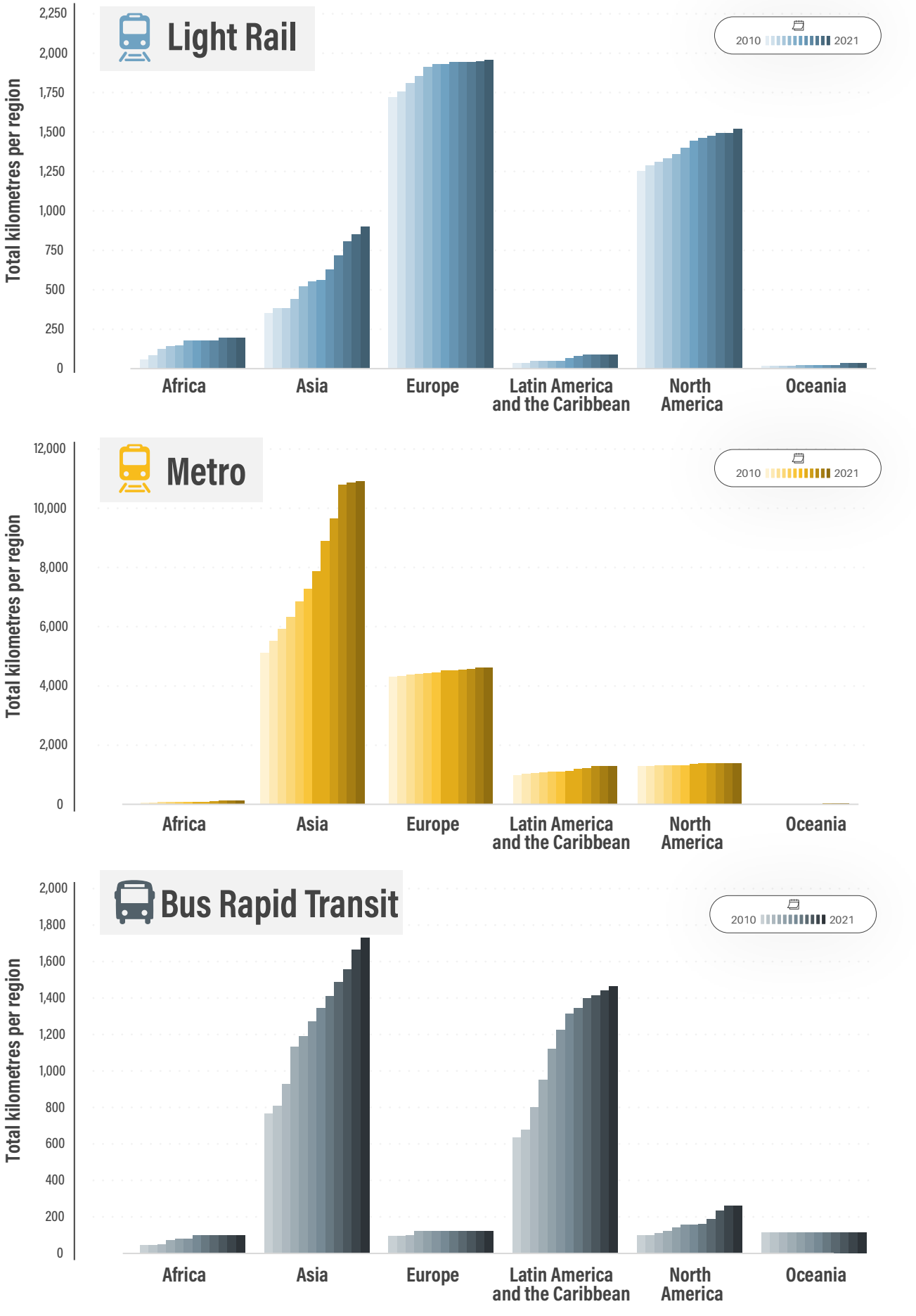

United Kingdom
India
Indonesia
Japan
South Africa
Kenya
July
Jan 2021
July
Jan 2022
July
Public transport ridership changes (%)
Infected (individuals)

FIGURE 2. Growth of major public transport systems by region, 2010-2021

Source: See endnote 44 for this section.



BOX 1. Perception of safety on public transport

A key factor shaping demand for public transport is passengers' perceptions of safety regarding public health and crime rates. The COVID-19 pandemic initially instilled fear and anxiety about increased risk of exposure to pathogens while on board, but extensive studies revealed that, with the right sanitation and safety measures in place, the risk of infection was low. Despite this, popular media contributed to people's fears and reluctance to return to public transport. A study from China found that anxious passengers tend to focus on sensational information and rumours, resulting in heightened anxiety about health safety. Access and exposure to reliable information can reduce anxiety, but this is dependent on timely information and details on the effective measures put in place to keep passengers safe.

Along with concerns about public health, in 2021 a rise in violent crime on public transport systems was noted in multiple US cities including Charlotte, Chicago, Seattle and New York, potentially deterring riders from returning to public transport. Women tend to be more impacted by personal safety concerns and use public transport for different purposes than men.

Estimates suggest that public transport is the second most common location where sexual harassment occurs, after public streets, although reliable data are lacking due to underreporting. Existing studies offer mixed and even contradictory information about conditions in which harassment is more likely to occur, as it can take place during any hour, during the day or at night, on crowded vehicles or in isolated locations, on board or waiting at stations. Globally, women represent the majority of public transport riders, and safety is a key factor influencing women's mobility decisions, but most existing infrastructure has not considered these needs.

Measures to improve accessibility and safety include providing stations with lifts, ensuring bright lighting at stations, minimising the gap between the ground or platform and vehicle, reserving seats for women near the driver, ensuring access to public restrooms with child-changing areas, and having an option for fixed-rate day passes to keep fares low for those who make multiple stops.

- Several countries – including Brazil, Egypt, Indonesia and Mexico – have addressed women's concerns for safety on board by reserving the front of buses or metro carriages for women and children, with the police responsible for enforcement.
- Studies show that men typically travel more directly from point A to point B than women do and are willing to travel farther (having on average a 14% longer commute than women). Women's travel patterns are more complex, as they are typically responsible for family care and are more likely to travel with small children or elderly individuals. Public transport stations and vehicles can address these challenges by accommodating wheelchairs and strollers and providing well-marked and accessible seating for diverse populations.
- Women are twice as likely as men to drop off or pick up children, which restricts the flexibility of their departure time. Having a child is correlated with a 23% increase in the number of women's trips, and mothers are also more likely to make multiple stops along their commute, or to "trip chain" for non-work-related purposes. Consequently, women are more impacted by environmental issues (weather and pollution) than men, particularly when waiting at unprotected or unsheltered stops.
- In Colombia, reductions in public transport services during the pandemic disproportionally affected women, who take more frequent and shorter trips than men. In terms of overall security, emptier streets with fewer bystanders increased concerns about safety.

Source: See endnote 12 for this section.

Photo: Ashden

Among the major public transport modes (bus rapid transit, metro and light rail), metro systems showed the strongest growth between 2015 and 2021.[36] Despite budget cuts, delays, and low ridership, public transport expansion projects continued during 2020-2021 in all major regions, with the opening of dozens of new train, bus, light rail and tram lines (see Figure 2).[37] Additional projects were completed in 2022 as economies recovered and as ridership returned to near pre-pandemic levels.

- The few expansion projects completed in 2021 included the opening of a regional commuter train in Dakar (Senegal); the launch of Tramway 9 in Paris (France) to link the city and suburbs; and the extension of the Northern Line in London (UK) to Battersea – London's first metro extension this century.[38]
- In China, metro expansions – including maglev trains – were completed in Beijing (56 kilometres), Guangzhou (90 kilometres), Shanghai (102 kilometres) and Shenzhen (107 kilometres) during 2020-2022.[39]
- In 2022, the extension of the 18.3-kilometre Silver Line metro in Washington, D.C. (USA) to Dulles Airport was completed, and four commuter rails opened in the US states of California, Florida and New York.[40]
- In Africa, metro lines were expanded in Algiers (Algeria), Cairo (Egypt) and Lagos (Nigeria) during 2022.[41]
- In Latin America, a new metro system started operating in Quito (Ecuador) in December 2022, the first in the country.[42]

Global bus rapid transit networks expanded modestly between 2020 and 2022, with operations starting in six new cities in Brazil, India, Kenya, and the United States, adding nearly 90 kilometres of corridors.[43] During 2020-2021, no apparent expansion of bus rapid transit occurred in Africa, Europe, North America or Oceania, whereas slight expansion occurred in Latin America and noticeable growth took place in Asia (see Figure 2).[44] As of March 2023, 186 cities had bus rapid transit systems in operation, 30 cities were expanding existing networks, and 52 cities were planning or starting construction.[45]

Emission trends

Passenger emissions from both public transport and private motorised transport (automobiles and motorcycles) decreased dramatically in 2020 due to COVID-19-related lockdowns.[46] Commuting and the use of transport fell sharply and urban air quality improved, although essential workers continued to rely on both public and private transport to commute to work. Research from this period found a positive correlation between public transport ridership and reduced pollution in selected countries.[47]

Overall, however, emissions continue to correlate with a country's per capita gross domestic product, meaning that high-income countries have higher transport-related carbon dioxide (CO_2) emissions (*see Section 1.1 Transforming Transport and Mobility to Achieve the Targets of the Paris Agreement and the Sustainable Development Goals*).[48] In 2021, transport CO_2 emissions increased but did not yet return to pre-pandemic levels, with most of the increase originating from private vehicles (see Figures 3 and 4).[49]

- A report on air quality found that 9 of 10 major cities observed lower levels of particulate matter ($PM_{2.5}$) pollution in 2020 compared to the same period in 2019.[50]
- With its first major lockdown in 2020, Los Angeles (USA), which historically has had very poor air quality, experienced clean air and blue skies.[51]
- Many cities that typically struggle with dangerously high levels of $PM_{2.5}$ pollution saw the greatest improvements during the early pandemic lockdowns – including Delhi (India), with reductions of 60%; Seoul (Republic of Korea) with reductions of 54%; and Wuhan (China) with reductions of 44%.[52]
- In some cities, CO_2 emissions from public transport continued to decline in 2021 – including in Sydney (Australia), Guadalajara (Mexico), Houston and San Francisco (USA), Montreal and Toronto (Canada), Osaka (Japan) and Porto Alegre (Brazil) (see Figure 3).[53]

To reduce emissions, many cities have introduced electric buses to their transport fleets. However, the largest emission reductions will occur only if the e-buses are charged using renewable rather than fossil fuel-based electricity. In 2021, electric bus sales grew 40% and an estimated 670,000 e-buses were in circulation worldwide, representing around 4% of the global bus fleet.[54] With multiple manufacturers and different design needs for various regions (for example, smaller buses to navigate narrow streets in Europe and Japan compared to China and the United States), the availability of electric models continues to expand across leading markets.[55]

China has dominated the e-bus market, hosting around 99% of the global stock in 2017 and expanding its fleet by nearly 100,000 e-buses annually.[56] As of 2021, China remained home to more than 90% of the global fleet and accounted for 91.6% of global electric heavy-duty vehicle sales.[57] The Chinese government has provided significant subsidies for the rapid electrification of buses, although much of this support was set to expire in 2022. However, it has enabled Chinese manufacturers to

FIGURE 3. Emissions from public transport (including buses, rails, subways and trams) versus other modes (automobiles and motorcycles) in selected cities, 2018-2021

Source: See endnote 49 for this section.

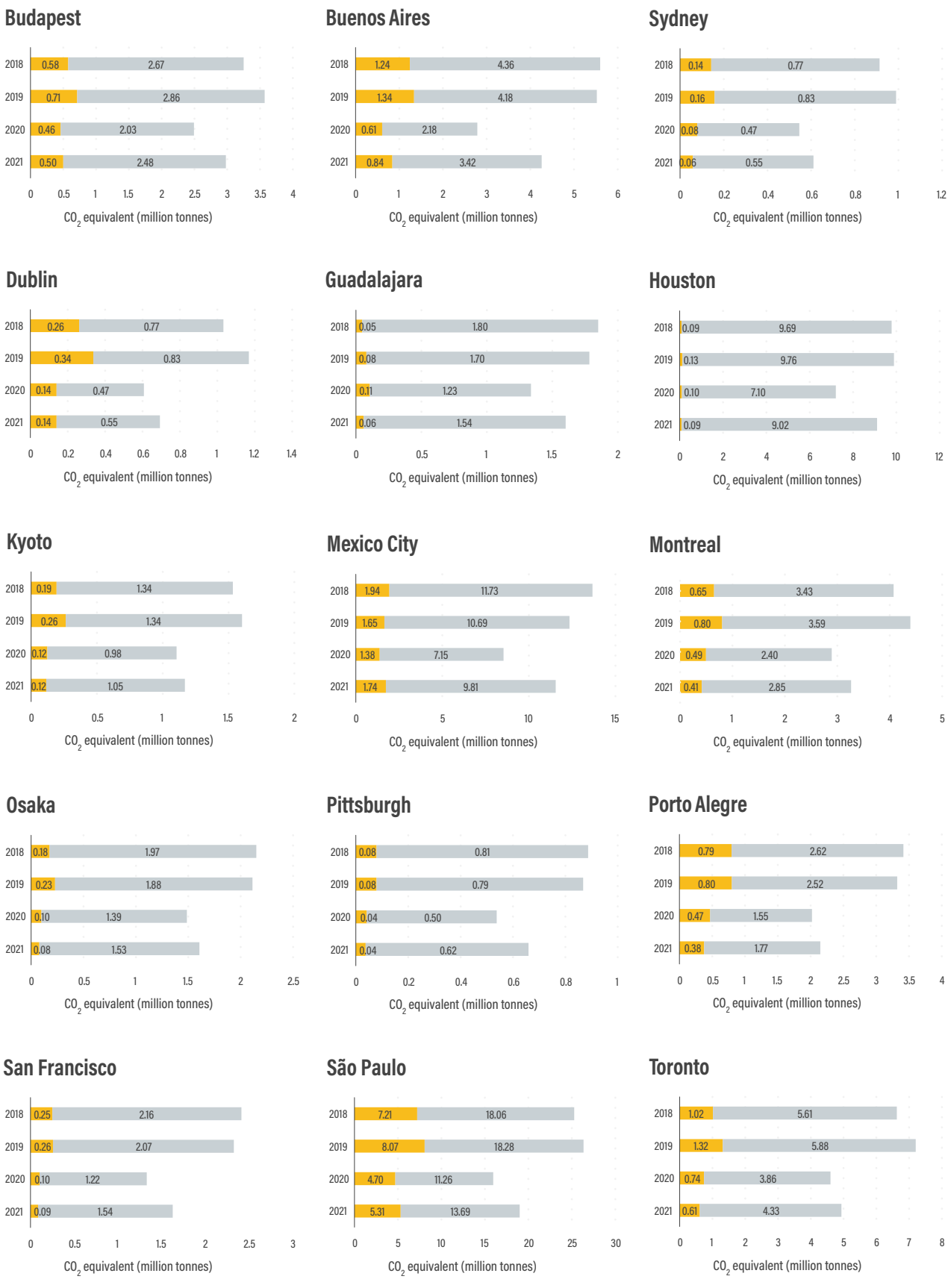
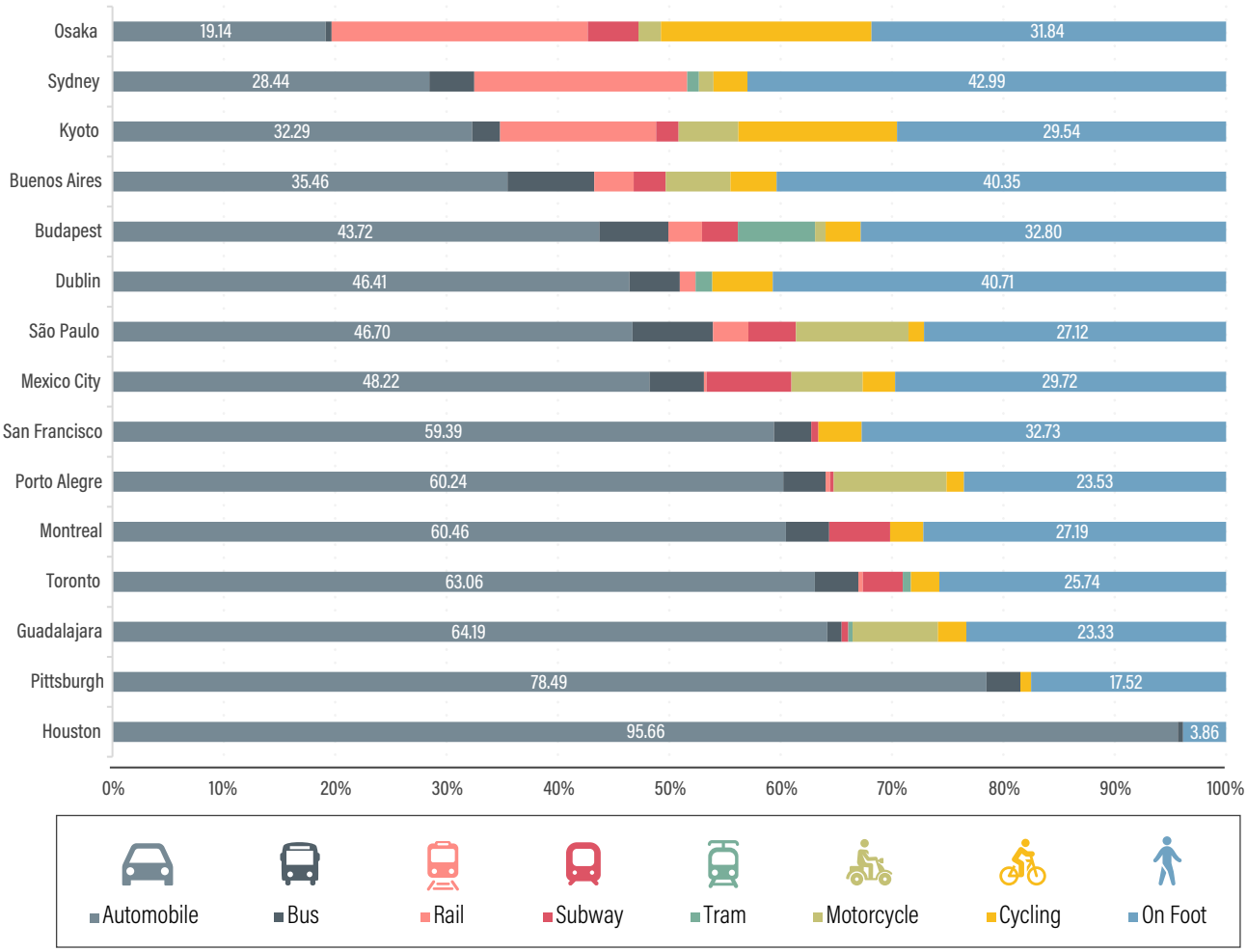


FIGURE 4. Modal share of selected cities, by total number of trips, 2021

Source: See endnote 49 for this section.



expand into other markets, such as the Asia-Pacific region and Europe.[58] China's BYD, the largest electric vehicle manufacturer globally, has an advantage in both operating costs and technology, as its models have the longest ranges (up to 350 kilometres) and are customisable in size and range to different countries' needs.[59]

In many markets, the lower total cost of ownership of electric buses has made them more favourable economically.[60] Once the high purchase costs can be overcome, the operation and maintenance of electric buses is considerably lower than for diesel buses.

- In Indonesia, an electric bus travelling 80,000 kilometres a year will save an estimated 79% in fuel costs compared to a diesel bus covering the same distance.[61]
- Electric buses in India show a lower total cost of ownership, even without any subsidy schemes.[62]
- In 2022, Bogotá (Colombia) expanded its e-bus fleet and built the largest bus depot outside of China.[63] With all 1,485 of the city's e-buses in service, annual avoided CO_2 emissions are projected to reach 94,300 tonnes.[64] Elsewhere in Latin America, Chile had 1,223 e-buses, and Mexico had 606, as of 2022.[65]
- India's Grand Challenge, developed under the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) II scheme, introduced 5,450 e-buses across five cities in 2020.[66] Following the success of the initial project, the government plans to expand fleets by 50,000 e-buses through 2030, with 64 selected cities receiving at least 25 buses each.[67]
- For the 2022 FIFA World Cup, Qatar deployed 900 e-buses, the majority of which (741) were manufactured by China's Yutong.[68] The Swedish-Swiss company ABB provided more than 125 megawatts of charging capacity.[69] Although e-buses comprise 30% of Qatar's Mowasalat public transport fleet, 99%

of the country's energy comes from fossil gas (with a target for 20% solar by 2030), resulting in only limited emission reductions from the uptake of electric transport.[70]

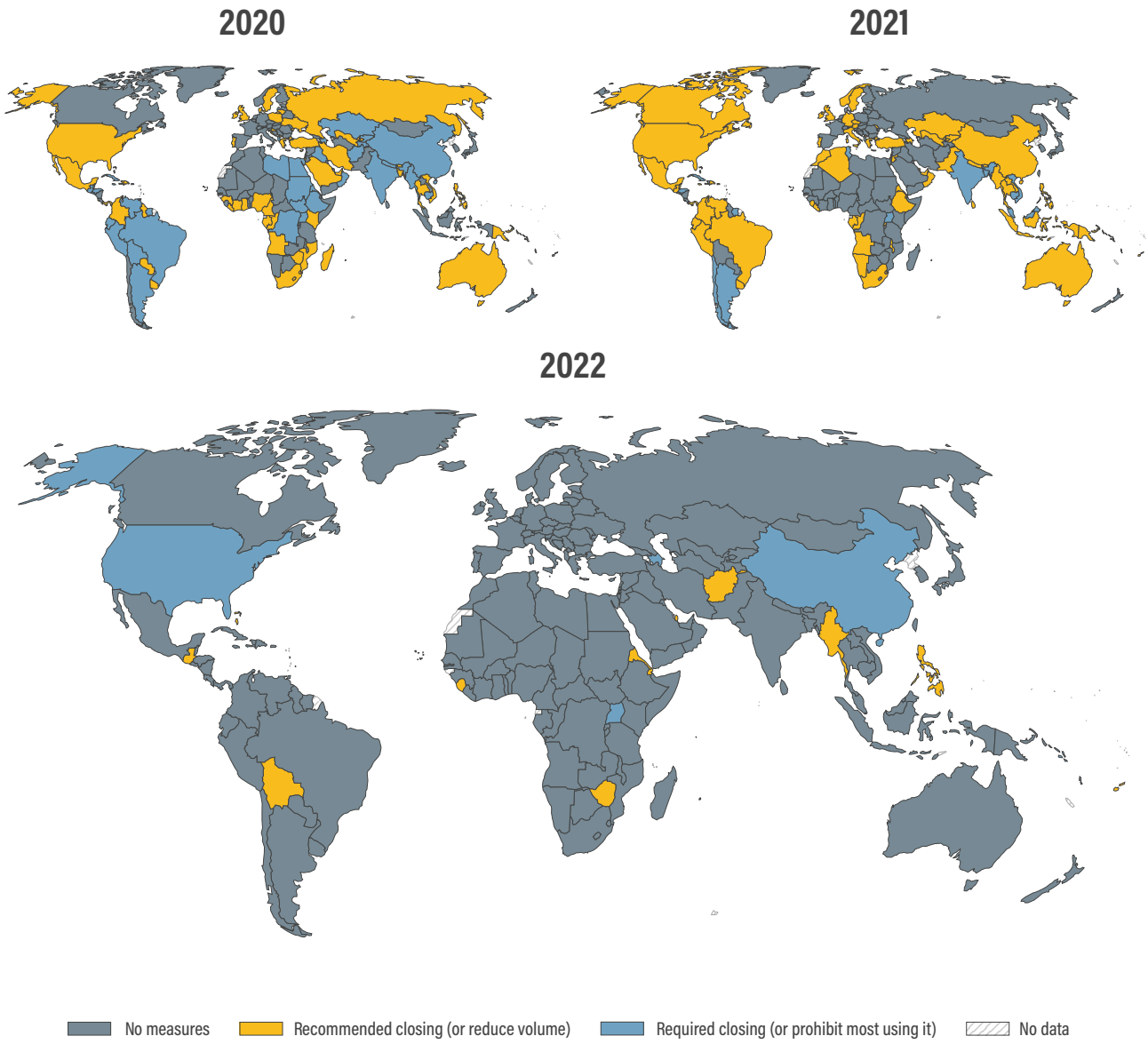
- In Europe, the increase in e-bus sales is attributed to national and city-level electrification targets, as well as the EU Clean Vehicles Directive, which mandates the procurement of zero-emission buses.[71] (*See Section 4.2 Vehicle Technologies.*)
- In 2021, three European countries registered more than 500 e-buses each: Germany (555), the United Kingdom (540) and France (512).[72] The United Kingdom's largest bus and coach operator, Stagecoach, planned to expand its e-bus fleet 80% in 2023 as part of its commitment to becoming a net zero business.[73]

Policy developments

Early in the COVID-19 pandemic, concerns about high transmission rates on public transport led to strict closures, severe policies, reduced services and social distancing protocols; however, as experts studied the mechanisms of transmission, and as public transport was considered safe, most countries loosened restrictions (see Figure 5).[74] Table 1 provides a summary of city-level public transport policy actions in response to the pandemic.[75]

FIGURE 5. Snapshots of public transport closure policies on June 30 of 2020, 2021 and 2022

Source: See endnote 74 for this section.



Note: The response level of the strictest sub-national level is shown if policies vary within a country.

TABLE 1. Transport policy responses to COVID-19 in selected cities, 2020

Source: See endnote 75 for this section.

Location	Initiative	Date	Description
Newport, UK	On-demand services (bus, ridehailing)	May 2020	Transport for Wales introduced the pilot programme fflecsi, run by local bus operators, to provide a safe and sustainable on-demand bus service for essential workers. As of 2022, it was still operating in addition to regular scheduled bus services.
Île-de-France, France	Alternative work sites to smooth transport demand	June 2020	The *Lissage des Heures de pointe @SmartWork* (Smoothing of Peak Hours @SmartWork) service provides educational materials and videos to inform residents about teleworking, alternative work sites away from home and active mobility options for commuting. The goal is to encourage citizens to rethink their transport habits and find collaborative teleworking space closer to home.
Singra, Bangladesh	Expanded e-rickshaw fleets for emergency services	April 2020	Singra Municipality, with support from TUMI, implemented 10 e-rickshaws for public transport and 2 emergency vehicles; constructed an e-rickshaw garage; and provided safety training for drivers. The vehicles are used for the "home delivery system" of food to the public, to collect samples for COVID-19 testing, and to extend emergency services to rural areas.
Kinshasa, Republic of the Congo	Contact tracing system for public transport users (bus)	April 2020	The programme uses an SMS system to trace the chain of contamination by identifying anyone who took the same public transport vehicle as a sick patient. This makes it possible to find potentially exposed people and to test them quickly, then to disinfect the vehicle in question. The system is completely accessible to all strata of the population.

As travel restrictions eased and as countries enacted economic recovery policies, many governments provided strong subsidies for public transport. Between March 2020 and February 2021, USD 130 billion in stimulus funding was leveraged globally to support green transport, with 30% going towards stabilising public transport and 26% towards rail construction and services (see Figure 6).[76]

Some governments reduced transport fares to combat low ridership rates and to assist low-income populations and those most reliant on public transport. Although free access to public transport addresses equity concerns by eliminating the cost barrier, it may not be enough to encourage private vehicle users to shift towards more sustainable urban mobility options.

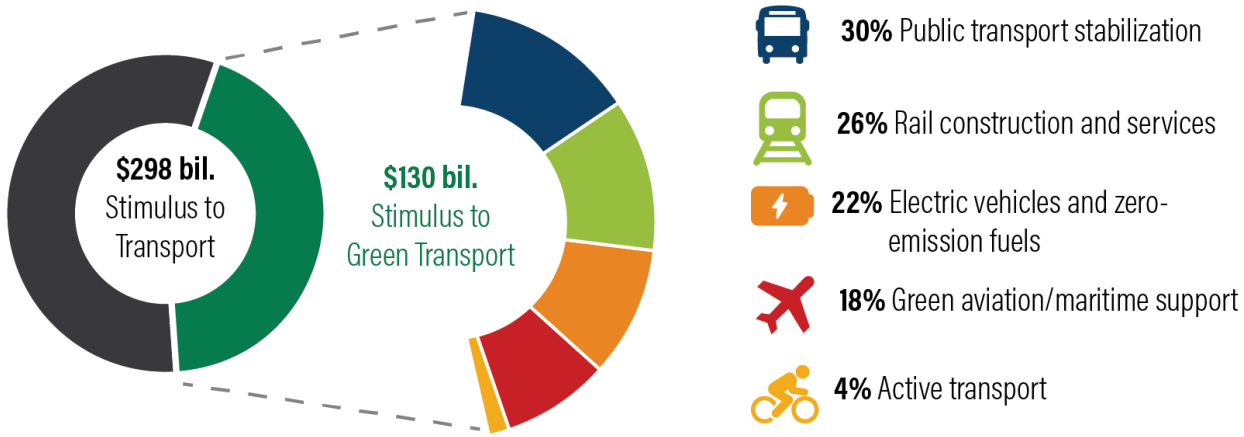
- In Brazil, where pandemic-related restrictions contributed to an estimated USD 188 million loss in daily fare revenues for bus operators, the government allocated 22% of subsidies to cover fare costs and to make public transport more accessible in over 150 cities as of June 2022.[77]
- Ireland, Italy, New Zealand and the US state of Utah were among the places that introduced reduced fares during 2021-2022.[78]
- Some cities, as well as the country of Luxembourg, have trialled and/or fully implemented free ticketing and fares for public transport.[79] All public transport is free in Morungaba (Brazil); in the United States, Albuquerque has implemented free buses, and both Washington, D.C. and Worcester intended to do so in 2023.[80]

In addition to municipal-level action, national governments have provided critical funding and policy support to increase the use of public transport. **As countries recognise the benefits of leveraging public transport as a climate tool, many have included public transport improvement plans in their Nationally Determined Contributions (NDCs) towards reducing emissions under the Paris Agreement**. One analysis found that 100 of the 142 first- and second-round NDC submissions as of the end of 2021 included measures pertaining to public transport.[81] However, only 26 of the NDCs established quantitative targets for measures such as electrification, shifting from private motor vehicles to public transport and expanding public transport infrastructure.[82]

Further analysis explored the increased ambition between the initial NDC submissions (2015) and the more recent (updated) submissions.[83] Overall, measures pertaining to

FIGURE 6. Allocation of green stimulus funding, March 2020 to February 2021

Source: See endnote 76 for this section.



public transport increased from 63 in the initial round to 65 in the updated NDCs.[84] However, these are net numbers: 25 initial NDC submissions that had included public transport removed the measures in the updated round, and 27 new NDCs included it in their updates, for a total of 90 NDCs that featured public transport measures in at least one edition of the document.[85] As electrification has gained attention, the number of NDCs including electrification (of both private and public transport) rose from 27 in the initial round (21 measures and 6 targets) to 68 in the updated round (44 measures and 24 targets) (see Figure 7).[86]

The NDCs mention various tools to harness public transport to positively impact the health, equity and economic development of cities. They include measures to improve affordable public transport, curtail motorised travel demand, decarbonise and electrify vehicles, improve the safety of road infrastructure, and promote more active lifestyles through cycling and walking the final leg of public transport journeys.

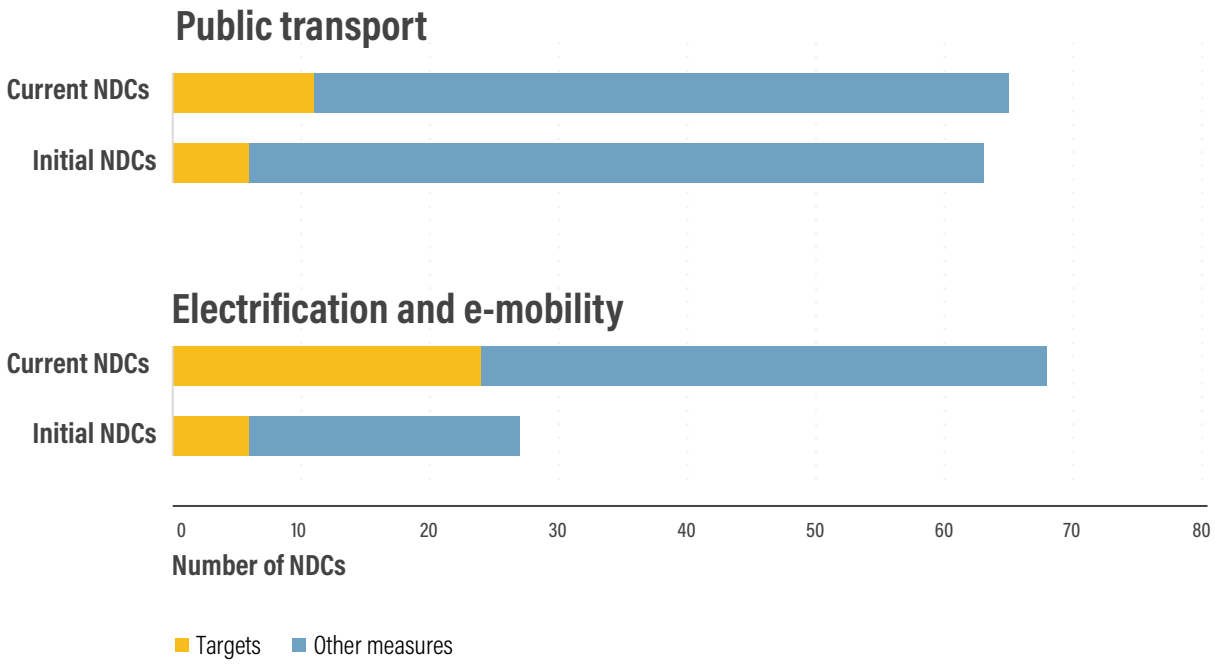
In addition, national governments and private enterprises have continued to invest in transport and public infrastructure. In the United States, the 2022 Inflation Reduction Act, coupled with investments provided through the bipartisan Infrastructure Investment and Jobs Act, allocate an unprecedented USD 3 trillion in funding for infrastructure, with a focus on justice and equity.[87] Over five years, public transport will receive nearly USD 40 billion to fund the backlog of system repairs and deficiencies, including adding around 24,000 buses and 5,000 rail cars, as well as expanding public transport networks and improving accessibility.[88] A further USD 66 billion will go to the repair and improvement of passenger and freight rail.[89]

In low- to middle-income countries, where most people do not own private vehicles, enhancing public transport is crucial for economic growth and improving living standards, although funding is challenging. Between 2007 and 2020, China's Belt and Road Initiative provided more than USD 19 billion to fund transport projects across Africa.[90] However, some countries – including the Democratic Republic of the Congo, Ghana and Kenya – have cancelled contracts over lack of transparency and inability to pay back loans.[91]

In Africa and other growing economies, it is critical that infrastructure expansion is guided by the United Nations Sustainable Development Goals to guarantee progress towards equity and justice, resulting in a sustainable system that considers the mobility needs of all residents, not just those who own private vehicles (see Box 2).[92]

FIGURE 7. Number of initial and updated Nationally Determined Contributions that included public transport, as of end-2022

Source: See endnote 86 for this section.



BOX 2. Public transport connects closely to the Sustainable Development Goals

Safe, convenient, reliable and affordable public transport is key to successful and thriving cities. It also enables progress towards many of the UN Sustainable Development Goals (SDGs). For example, access to public transport:

- provides access to education and economic opportunities, thereby reducing poverty (SDG 1);
- improves people's health (SDG 3) through better road safety, improved air quality, increased physical activity getting to and from fixed stations, and improved access to health centres; and
- empowers women and girls (SDG 5) and improves gender equity by providing safe and independent mobility to reach education and job opportunities.

In September 2020, the UN General Assembly passed a resolution on "Improving global road safety", which declared 2021-2030 the Decade of Action for Road Safety, striving to reduce injuries and fatalities from road accidents by at least 50%. This resolution acknowledges that ensuring safety on the roads involves addressing the larger issue of equal access to transport and that promoting modes of transport that are sustainable, such as safe public transport and safe walking and cycling, is essential.

Additional SDGs can be supported by connecting public transport development with climate goals through electrification, particularly rail and bus routes. For example, electrification of public transport fleets will not only increase overall efficiency but also create demand for clean and sustainable electricity (SDG 7).

Public transport creates jobs and connects people to opportunities, contributing to economic growth (SDG 8). Public transport also allows optimisation of investments in resilient infrastructure (SDG 9) as cities plan for a future with more extreme weather events and more dense populations residing in urban areas. As of the end of 2022, however, only 16 NDCs included adaptation and resilience measures for public transport.

Source: See endnote 92 for this section.

Partnership in action

A variety of international efforts have sought to accelerate both funding and policy support for public transport efforts globally.

- The **International Association of Public Transport (UITP)** is the only worldwide network to bring together all public transport stakeholders and all sustainable transport modes. UITP has over 1,900 members from more than 100 countries.[93] The Barcelona Declaration, which serves as a testament to the undeniable and indispensable role of public transport, was launched at the UITP Global Public Transport Summit 2023 and signed by 43 leaders of the global public transport sector.[94]
- The **International Union of Railways (UIC)** is an international rail transport industry body developing the overall coherence of the rail system at the world level.[95] In 2020, UIC launched RAILISA (RAIL Information System and Analyses), an online tool allowing users to visualise and download data provided by railway companies worldwide. Data indicators (length of lines and tracks on the infrastructure network, passenger and freight traffic) are available for more than 100 railway companies.[96]
- In 2022, the Egyptian Presidency of the UN Climate Conference in Sharm El-Sheikh, Egypt (COP 27) partnered with the global transport community to launch the **Low Carbon Transport for Urban Sustainability (LOTUS)** initiative to improve urban transport and mobility in the Global South.[97] The multi-stakeholder consultation process identified five systematic challenges in the urban mobility landscape, including financing gaps, weak policy making and implementation capacity, lack of clear targets, difficulty integrating informal transport and siloed thinking around an operator-centric approach to decarbonisation. LOTUS prioritises three areas of action: scaling up investment in electric vehicles, empowering and investing in informal transport to mobilise a just transition, and assisting the development of integrated policy for low- and middle-income countries.
- The **TUMI E-Bus Mission** aims to accelerate the dispersion of electric buses in the Global South and was funded by the German Ministry for Economic Cooperation and Development (BMZ), with a core group of organisations including C40 Cities, Germany's Agency for International Co-operation (GIZ), the International Council on Clean Transportation, the Institute for Transportation and Development Policy, ICLEI – Local Governments for Sustainability, UITP and the World Resources Institute.[98] By ensuring readiness for fleet electrification, the TUMI E-bus Mission works towards reducing air and noise pollution, as well as slashing urban CO_2 emissions from transport systems and serving as a model for successful e-bus implementation in cities around the world.[99]
- The **Zero-Emission Bus Resource Alliance** is a professional association that began in 2015 for transit agencies to come together and share lessons learned about zero-emission technologies.[100] Through the Alliance, more than 50 transit leaders share experiences and organise without manufacturers or outside groups.

Photo: Marc A. Hermann/MTA

3.4.1
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SLOCAT Partnership on Sustainable, Low Carbon Transport

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