3.4

Urban Passenger and Freight Transport

Key findings

Demand trends

- Public transport systems continued to grow between 2010 and 2020, led by strong growth in Asia (for bus rapid transit, light rail and metro) and Latin America (for bus rapid transit). The global rapid transit-to-resident ratio (a measure of these three urban services) increased 5% between 2017 and 2019, with a 25% increase in China and a 13% increase in India.
- While Europe accounts for the vast majority of urban rail systems, the largest growth from 2010 to 2020 took place in Africa (333%), Asia (69%) and Oceania (50%).
- Worldwide development of bus rapid transit systems has declined significantly since its peak in 2014, although a gradual increase has occurred since 2018, with nine new systems added during 2019-2020.
- Paratransit (sometimes called "informal transport") remains the main motorised urban transport option in Africa and across cities in the developing world.
- More than one-third of all urban trips globally are made on foot or by bicycle. As a large majority of trips in cities are less than 5 kilometres, walking and cycling can substitute more than 40% of short car trips.

Emission trends

- Transport emission shares from private passenger cars in urban areas ranged from less than 10% in Dar es Salaam, Tanzania to more than 80% in Vancouver, Canada. Globally, cities report widely varying shares of transport carbon dioxide (CO_2) emissions, depending on their public transport investments, land-use patterns and supportive policies.
- Urban rail, with an average energy consumption of 0.12 kilowatt-hours per passenger-kilometre, is seven times more energy efficient per passenger than urban car trips.

Policy measures

- Cities around the world set ambitious targets and made financial commitments during 2019-2020 to enhance sustainable urban mobility.
- Innovative pricing schemes for public transport, including free models, have been introduced to incentivise behavioural change.
- As an approach to reduce congestion, improve air quality and prioritise public transport, walking and

cycling, governments are exploring the use of low-emission zones (LEZs), ultra-low-emission zones (ULEZs) and zero-emission zones (ZEZs).

- As commercial operations in cities become major emitters of greenhouse gases and add to congestion, freight transport policies have received rising attention from both decision makers and practitioners.
- Freight policies aimed at improving the efficiency of last-mile delivery have increased in importance, given that one-third of urban truck traffic is engaged in the pick-up of goods.
- LEZs, ULEZs and ZEZs can also cover freight vehicles and can restrict the access of polluting vans and trucks to city centres. Freight vehicles represent 5% of road vehicles globally but contribute 27% of transport greenhouse gas emissions and 50% of toxic air pollutants from transport.
- The penetration of electric trucks in global markets for medium- and heavy-duty vehicles is projected to reach 9.4% by 2030.
- Many urban freight initiatives focus increasingly on delivery using (mostly electric-assist) cargo bikes, including initiatives in Rio de Janeiro, Brazil; Copenhagen, Denmark; Hamburg, Germany; Amsterdam, the Netherlands; Kigali, Rwanda and New York City, United States of America (USA).

Impacts of the COVID-19 pandemic

- Due to the pandemic, public transport ridership dropped 90% globally from March to August 2020. Meanwhile, pedestrian and cycling infrastructure expanded in more than 250 cities.
- The cost of allowing public transport ridership to collapse due to the pandemic – or reducing services to serve only those with no alternatives – is much greater than the cost of taking measures to make public transport safer for users and workers.
- Paratransit services have been impacted due to travel restrictions, reduced capacities and rising costs. Revenue losses of 50% to 70% and lack of government support brought many paratransit operators to the verge of bankruptcy.
- The COVID-19 pandemic resulted in an unprecedented preference for e-commerce and contactless deliveries (using either self-driving trucks or automated delivery robots), resulting in a re-invigoration of start-ups focused on driverless technologies.
- The pandemic disrupted road freight networks worldwide, although these were generally less affected than ocean and air freight.

Overview

Between 2018 and 2020, global efforts to introduce and increase the quality of urban public transport, such as urban rail and bus rapid transit, resulted in a substantial increase in the share of sustainable transport modes. Urban passenger and freight transport have focused not only on improving collective transport, but also on enhancing its accessibility, integrating different transport modes and improving road safety for other forms of urban transport such as walking and cycling. The intermodality of walking, cycling and public transport plays a major role in establishing efficient, clean and safe urban mobility.

With the majority of the world's people now living in cities, and this share projected to reach 68% by 2050, low carbon mobility options for urban dwellers are increasingly needed in order to manage the inherent pressures on transport demand. This includes increased provision and improvement of collective passenger transport services, including public buses and metro systems.

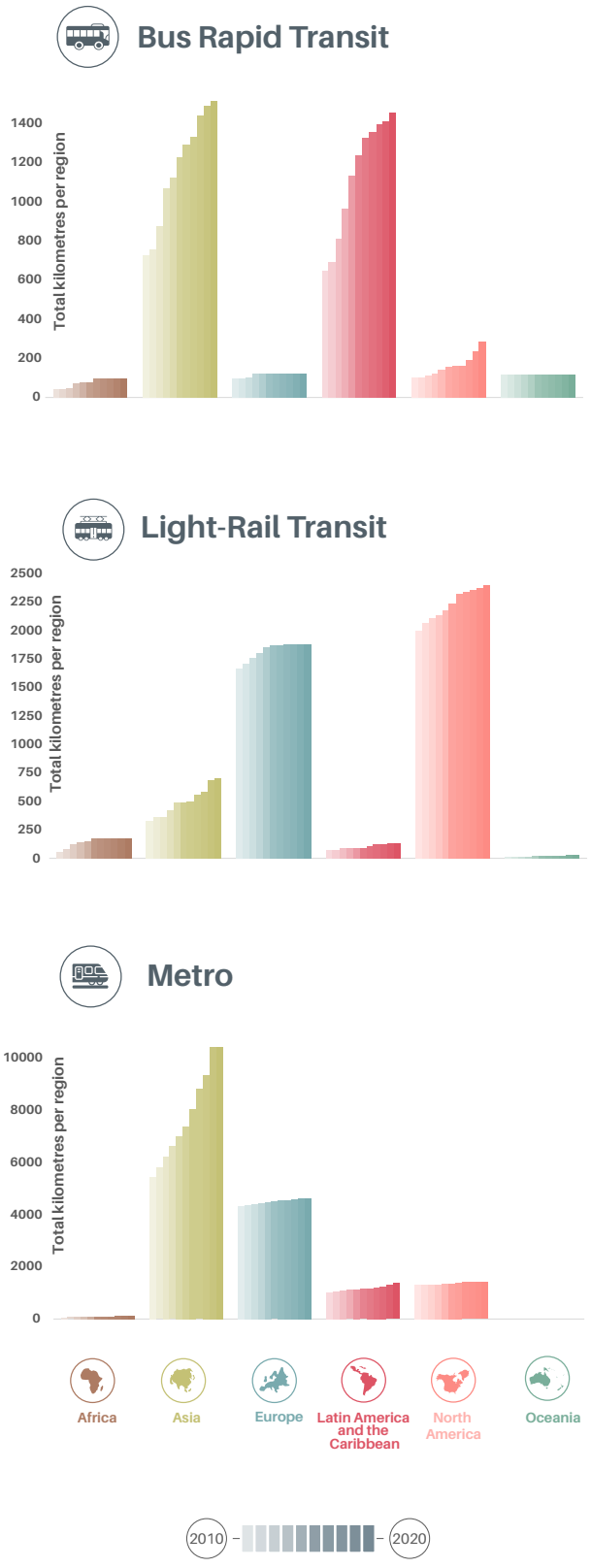
Public transport was hit the hardest (among all transport modes) by the COVID-19 pandemic, with ridership and revenues falling to unprecedented levels (*see Box 1*).[1] Cities around the world have responded in various ways to ensure the safety and operation of services. Many used the interruptions as a time to accelerate modernisation of payment systems, install temporary bicycle lanes and open up streets. Freight transport, after several years of constant growth in e-commerce, experienced a steep increase in grocery, food and retail deliveries. The demand for last-mile deliveries grew during pandemic-related lockdowns.

Demand trends

Public transport systems continued to grow between 2010 and 2020, led by strong growth in Asia (for bus rapid transit, light rail and metro) and Latin America (for bus rapid transit).[2] **The global rapid transit-to-resident ratio (a measure of these three urban services) increased 5% between 2017 and 2019,** with a 25% increase in **China** and a 13% increase in **India.**[3] **Asia** continued to dominate the metro rail market, while **North America** had the greatest total length of light rail systems, and bus rapid transit was divided equally between **Asia** and **Latin America** (*see Figure 1*).[4]

While Europe accounts for the vast majority of urban rail systems, the largest growth from 2010 to 2020 took place in Africa (333%), Asia (69%) and Oceania (50%) (*see Figure 2*).[5] Urban rail systems in Asia surpass many European urban rail systems in the number of passengers transported and lines in operation.[6] Africa's sharp increase in urban rail reflects growth starting from a low baseline, with new services inaugurated in **Algeria, Ethiopia, Morocco** and **Nigeria** between 2015 and 2020.[7]

Figure 1. Growth in major public transport systems (bus rapid transit, light rail and metro) by region, 2010-2020



Source: See endnote 4 for this section.

- Several cities in Asia continued to expand their metro systems between 2018 and 2020, including **Bangkok**, Thailand; **Delhi** and **Hyderabad**, India; **Manila**, the Philippines; and cities in **China**, **Japan** and the **Republic of Korea**.[8]
- Rapid expansion of urban rail systems also occurred in several Latin American cities. In 2019, **Panama City**, Panama inaugurated its second metro line (it aims to expand the network to five lines by 2040), and Brazil saw subway expansions in **Rio de Janeiro** and **São Paulo**.[9]

Worldwide development of bus rapid transit systems has declined significantly since its peak in 2014, although a gradual increase has occurred since 2018, with nine new systems added during 2019-2020 (*see Figure 3*).[10]

New bus rapid transit systems

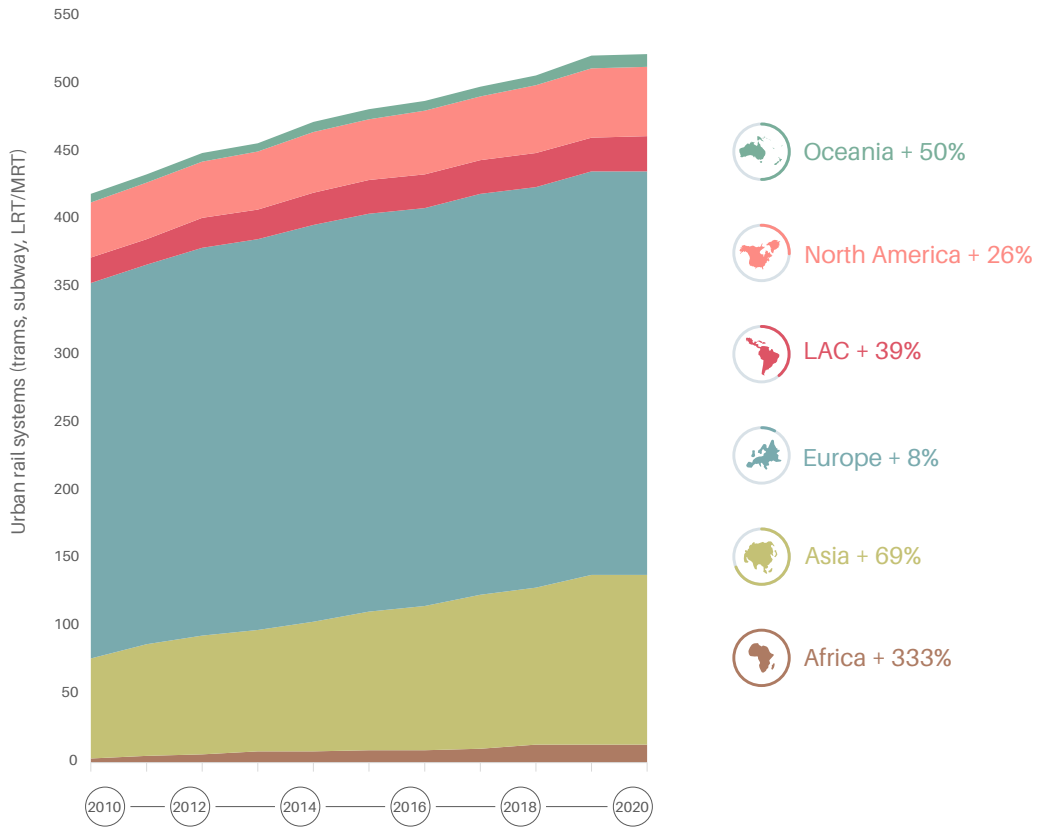
- The first 2.9 kilometres of bus rapid transit lanes were introduced in **Salvador**, Brazil in 2020, as part of a planned 32-kilometre network along 3 lines and 10 stations.[11]
- At least two cities in China – **Fuzhou** in Jiangxi Province and **Yongzhou** in Hunan Province – opened bus rapid transit systems in 2019 and 2020.[12]
- **Peshawar**, Pakistan opened a bus rapid transit system in August 2020 with 28 kilometres of lanes (50% of them elevated).[13]
- In the **USA**, bus rapid transit systems were opened in **Albuquerque**, New Mexico and **Oakland**, California in 2020.[14]

Expansion of bus rapid transit systems

- Several cities in Brazil expanded their existing bus rapid transit systems: **Campinas** developed a new 36-kilometre corridor that opened in 2020, and **Rio de Janeiro** extended the TransOceânica corridor in **Niterói** by 9.3 kilometres and 13 stations.[15]
- In 2019, new additions in bus rapid transit occurred in **Amritsar**, India and in **Nouméa**, New Caledonia (which added 22 electric buses).[16]
- The Chinese cities **Nanchang City** and **Shanghai** expanded their bus rapid transit networks between 2019 and 2020.[17]
- **Warsaw**, Poland added five dedicated bus lanes in 2020 (although these do not officially count as a bus rapid transit system by definition).[18]
- Additional exclusive bus lanes were added to the bus rapid transit network in **San Pedro**, Costa Rica.[19]
- Work on the Beirut Public Transport Project in **Greater Beirut Public Transport in Lebanon**, which includes a bus rapid transit system and 250 buses, was initiated in 2019.[20]

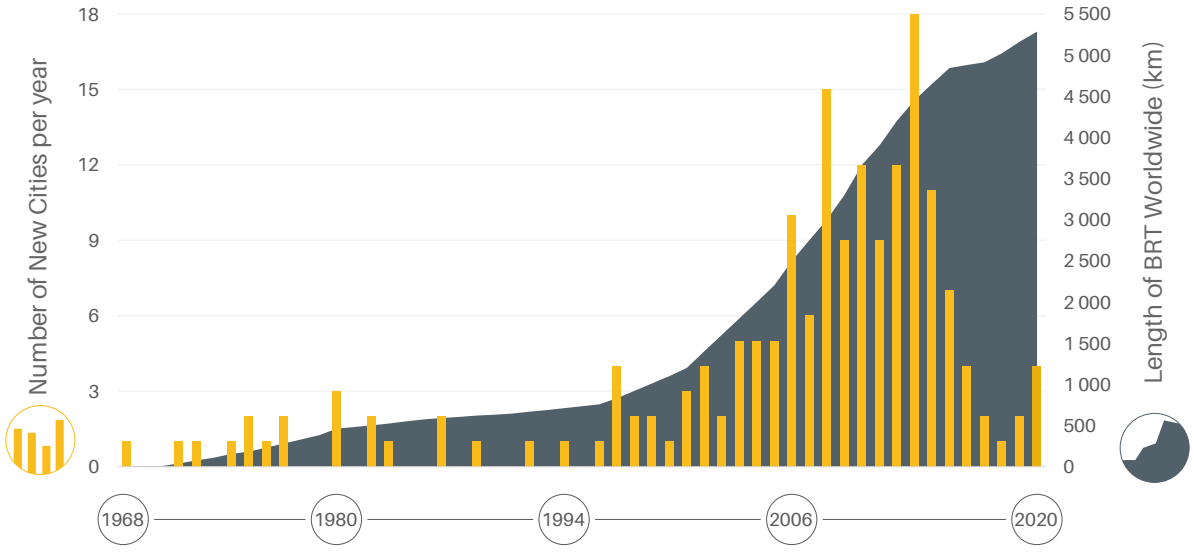
Paratransit (sometimes called "informal transport") remains the main motorised urban transport option in Africa and across cities in the Global South. It fills the gap left by limited public transport options, especially in African cities.[21] In recent years, slight enhancements to paratransit services – including mapping, fleet renewal and regulations – have been achieved that can help to later transition paratransit into more formal services. *(See In Focus: Paratransit.)*

Figure 2. Development of new urban rail systems, by region, 2010-2020



Source: See endnote 5 for this section.

Figure 3. Evolution of bus rapid transit systems in cities worldwide, 1968-2020



Source: See endnote 10 for this section.

- Between 2018 and 2020, mapping of paratransit services was implemented in more than a dozen African cities (e.g., **Accra**, **Addis Ababa**, **Djibouti**, **Kampala**, **Kisumu**, **Lusaka** and **Mombasa**).[22] By the end of 2019, the Digital Matatus project had mapped 140 routes for paratransit in **Nairobi**, Kenya, covering more than 3,000 kilometres and 4,000 stops.[23]
- **Burkina Faso** plans to regulate paratransit taxi services by 2025 by renewing fleets, increasing the share of drivers with health insurance and implementing a fare collection system in all vehicles.[24]
- **Kampala**, Uganda launched a licencing programme for minibus taxis in June 2020 in an effort to better regulate the network and routes.[25]
- The paratransit share is high in many Asian cities – reaching 58% in **Khulna**, Bangladesh; 54% in **Dhaka**, Bangladesh; and 50% in **Jakarta**, Indonesia – contributing to increased mobility but also rising congestion.[26]

More than one-third of all urban trips globally are made on foot or by bicycle.[27] **As a large majority of trips in cities are less than 5 kilometres, walking and cycling can substitute more than 40% of short car trips.**[28] Public transport, walking and cycling are more efficient and can move more people within a shorter time and with far fewer CO_2 emissions than private or shared cars (*see Section 3.3 on Walking and Cycling*).

Emission trends

Transport emission shares from private passenger cars in urban areas ranged from less than 10% in Dar es Salaam, Tanzania to more than 80% in Vancouver, Canada.[29] **Globally, cities report widely varying shares of transport CO_2 emissions, depending on their public transport investments, land-use patterns and supportive policies** (*see Figure 4*).[30]

- In **Addis Ababa**, Ethiopia and **Paris**, France, freight transport accounts for more than 80% of transport emissions, well above the shares in other cities and likely because fewer solutions for clean freight transport are being implemented.[31]
- In Kaohsiung, **Chinese Taipei**, two- and three-wheelers contribute 40% of emissions, roughly equal to the share from passenger cars.[32]
- **Dar es Salaam**, Tanzania is unique in having public buses account for 80% of transport emissions.[33] This may be because of the city's low levels of private vehicle ownership (with motorcycles dominating cars) as well as the lack of data on transport activity, which result in low estimates of emissions from motorcycles and private cars.[34]

Urban rail, with an average energy consumption of 0.12 kilowatt-hours per passenger-kilometre, is seven times more energy efficient per passenger than urban car trips.[35] The implementation of bus and rail systems is helping to decrease transport emissions in cities. Since 2019, electric buses have experienced a steep increase in Asia, Europe, and Latin America and the Caribbean (*see Section 3.8 on Electric Mobility*).

- **Cuenca**, Ecuador launched its first light rail service in 2020 to help reduce congestion and transport emissions, which account for 57% of the city's total greenhouse gas emissions.[36]
- In 2019, **Nairobi** was the first city in Kenya (and the eighth in Africa) to roll out a bus rapid transit system, which is expected to save 2 million tonnes of CO_2 equivalent by 2030.[37]
- In 2019, the Green Line in **Karachi**, Pakistan became the world's first zero-emission bus rapid transit system, running on biogas produced from organic waste and avoiding 2.7 million tonnes of CO_2 throughout the life cycle of the project.[38]
- **Doha**, Qatar opened a metro system in 2019 that is expected to reduce traffic by 190,000 private automobiles per day and to decrease CO_2 emissions by around 19,000 tonnes annually.[39]

Policy measures

Urban passenger transport

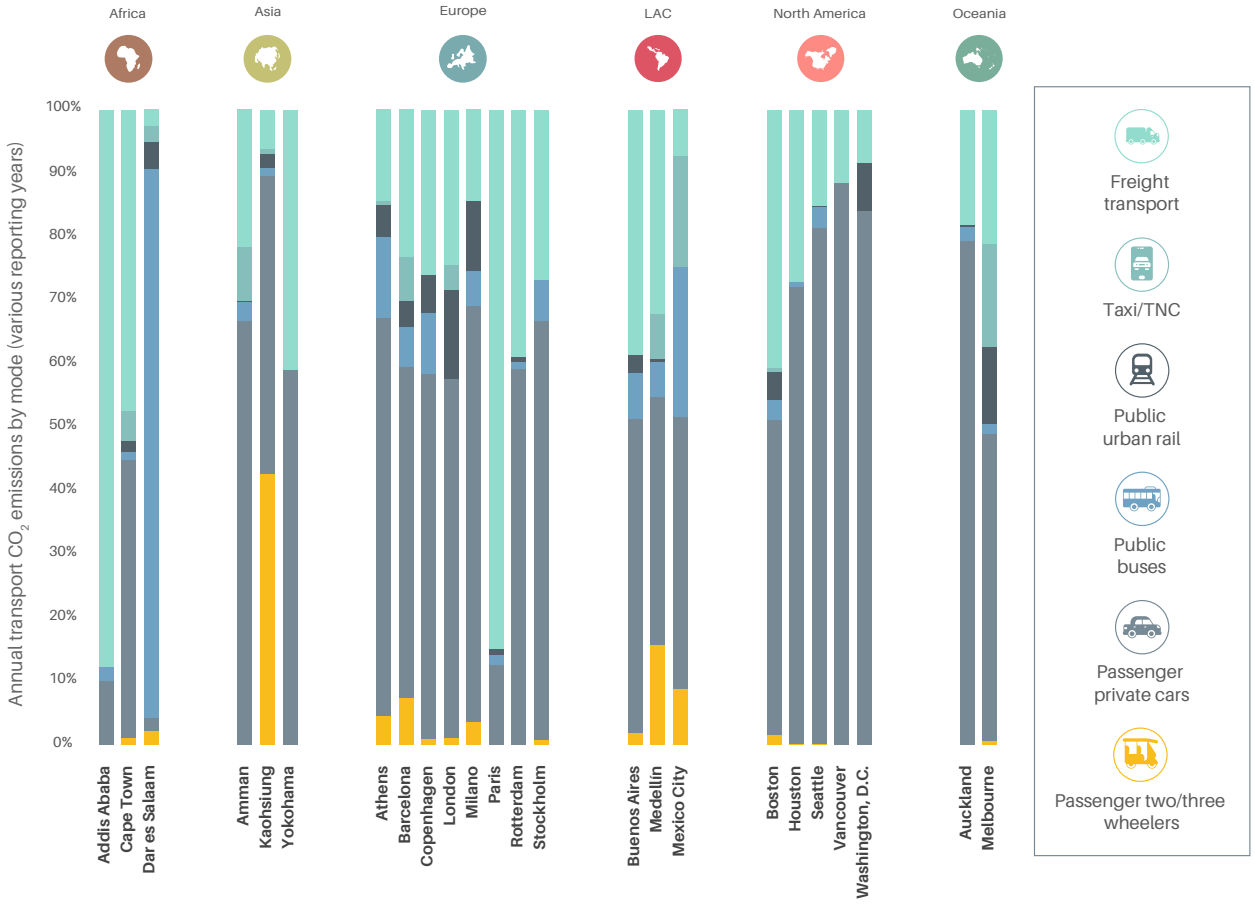
Cities around the world set ambitious targets and made financial commitments during 2019-2020 to enhance sustainable urban mobility. Investments in public transport have been enabled through national governments.

- **Jordan** increased the share of trips by public transport from 11% in 2016 to 15% by the end of 2020, and the bus rapid transit system in Amman is expected to boost this share to 40% by 2025.[40]
- In 2019, the government of **Malaysia** launched a USD 122 million fund to encourage the adoption of public transport while improving and enhancing transport-related infrastructure in the country.[41]
- In 2020, the **UK** government announced a GBP 5 billion (USD 6.7 billion) boost for sustainable transport, with a focus on improving bus services by introducing simpler fares, thousands of new buses, improved routes and higher frequencies.[42]

Innovative pricing schemes for public transport, including free models, have been introduced to incentivise behavioural change. Several countries have introduced and expanded free public transport, offering large potential for environmental and social benefits but also posing challenges for sustained funding, especially in a post-pandemic landscape. Funding streams can be secured through phasing out fossil fuel subsidies and dedicating revenues from congestion pricing and parking to public transport.

- In 2019, **Augsburg** introduced Germany's first "mobility flat rate", enabling users to enjoy bus, car-sharing, bicycles, and other participating modes for EUR 79 (USD 95) a month.[43]

Figure 4. Urban transport emissions by group in selected cities worldwide



Source: See endnote 30 for this section.

- After **Dunkirk**, France tested free buses in 2018, it found that 48% of new transit users regularly used the buses instead of cars, and 5% had sold their cars or decided against buying second ones.[44]
- **New Delhi**, India has offered free public transport to women since 2019 to provide more affordable, safe travel options.[45]
- In 2019, **Surabaya**, Indonesia launched a programme enabling residents to pay for the bus by trading in used plastic.[46]
- **Estonia** became the first country to make all public transport free, in 2018, and this policy was replicated by **Luxembourg** in March 2020.[47] Schoolchildren in **Germany** have been able to use public transport for free since August 2019.[48] **Hwaseong City**, Republic of Korea implemented free public transport in mid-2020 as part of its climate change policies.[49]
- **Barcelona**, Spain introduced a new travel card in 2020 that offers unlimited journeys on public transport within the metropolitan area for EUR 40 (USD 48) a month.[50]

As an approach to reduce congestion, improve air quality and prioritise public transport, walking and cycling, governments are exploring the use of low-emission zones (LEZs), ultra-low-emission zones (ULEZs) and zero-emission zones (ZEZs). (*See Section 3.2 on Sustainable Mobility Planning and Transport Demand Management.*)

- These zones exist mostly in European cities, although in March 2019, **New York City** announced that it would be the first USA city to implement a ULEZ through congestion charging by 2021.[51]

Urban freight transport

As commercial operations in cities become major emitters of greenhouse gases and add to congestion, freight transport policies have received rising attention from both decision makers and practitioners. These policies are critical for mitigating

the negative environmental impacts of freight transport without hampering the role of goods movement in fuelling the economy and fulfilling the needs of urban residents.[52]

- In **India**, implementation of the Bharat Stage VI emission standards in 2020 aimed to restrict new registrations of large trucks after 2021 and to greatly reduce the negative impacts associated with freight trips in cities.[53]
- **New Delhi**, India implemented a pollution tax in 2018 to be paid at tolls by heavy-duty and light-duty vehicles to control the emissions that affect urban air quality.[54] (*For more on fuel efficiency and related topics, see Section 3.7 on Fuel Economy.*)

Freight policies aimed at improving the efficiency of last-mile delivery have increased in importance, given that one-third of urban truck traffic is engaged in the pick-up of goods.[55] Broader introduction of low-emission freight vehicles and operations, as well as low-emission zones and delivery hour schemes, are helping to accelerate the transition to low carbon logistics.[56]

- **Paris**, France implemented multiple LEZs in 2020 and prohibits older delivery vehicles from accessing these zones between 8 a.m. and 8 p.m.[57]
- **Nijmegen**, the Netherlands has successfully implemented urban consolidation programmes to facilitate the effective bundling of last-mile deliveries.[58]
- **New York City**, USA implemented an off-hour deliveries programme in 2018 to combat congestion and to improve the productivity of shippers.[59]

LEZs, ULEZs and ZEZs can also cover freight vehicles and can restrict the access of polluting vans and trucks to city centres. Freight vehicles represent 5% of road vehicles globally but contribute 27% of transport greenhouse gas emissions and 50% of toxic air pollutants from transport.[60] Such measures incentivise companies to renew their fleets and to introduce zero-emission commercial vehicles.

- In 2020, the **Netherlands** announced that starting in 2025 cities can introduce LEZs for freight vehicles, thus allowing only zero-emission freight vans or trucks to enter these areas.[61]
- Several cities in **China** (e.g., Beijing, Chengdu, Shanghai and Shenzhen) implemented zero-emission freight zones in 2018 and 2019, enabling an uptake of electric freight vehicles.[62]

The penetration of electric trucks in global markets for medium- and heavy-duty vehicles is projected to reach 9.4% by 2030.[63] While this offers hope for increasing the sustainability of long-distance trucking, it falls well short of needed reductions, and the market is still characterised by limited availability and high prices.

- In 2018, the Cleaner Trucks Initiative for updating nitrogen oxide emission standards for trucks was deployed in the **USA** to speed the adoption and use of low carbon trucks at trade nodes.[64]

Many urban freight initiatives focus increasingly on delivery using (mostly electric-assist) cargo bikes, including initiatives in Rio de Janeiro, Brazil; Copenhagen, Denmark; Hamburg, Germany; Amsterdam, the Netherlands; Kigali, Rwanda and New York City, USA.[65] Electric-assist cargo bicycles have emerged as an urban freight option to accommodate shifting consumer demand and an increase in in-home deliveries. The COVID-19 pandemic has highlighted the importance of improving last-mile delivery.

- A cycling company in **Scotland**, UK unveiled an integrated e-cargo bike delivery and food waste service in 2020.[66]
- In 2019, Royal Mail group in the **UK** experimented with and developed e-trikes, adding to its existing fleet of 100 electric vehicles that helped reduce the delivery company's carbon emissions 29% from previous estimates.[67]

Box 1. Impacts of the COVID-19 pandemic on urban passenger and freight transport

Due to the pandemic, public transport ridership dropped 90% globally from March to August 2020. Meanwhile, pedestrian and cycling infrastructure expanded in more than 250 cities. With 90% of the reported COVID-19 cases early in the pandemic occurring in high-density urban areas, cities faced many challenges to reduce the spread of the virus. Using public transport was initially perceived as a place for easy contagion, but sustained evidence from **Austria**, **France**, **Germany** and **Japan** has shown that public transport does not have to be associated with high infection rates if specific measures are adopted, such as the use of face masks, sufficient ventilation and surface cleaning.

The cost of allowing public transport ridership to collapse due to the pandemic – or reducing services to serve only those with no alternatives – is much greater than the cost of taking measures to make public transport safer for users and workers. Public transport operators worldwide have responded to the pandemic by adopting new safety measures, including reductions in rider capacity (for example, buses at only 75% capacity in **Quito**, Ecuador), more frequent service, enhanced cleaning, new infrastructure and streamlined ticketing/payment methods to reduce contact between staff and passengers, as well as social distancing and mandatory mask use.

Improvements to public transport during 2020 included new bus lanes to speed up transit and to increase the frequency (and thus capacity) of the existing fleet. For example, 109 kilometres of lanes were added in the **Metropolitan Region of Santiago**, Chile and 34 kilometres in **New York City**, USA. Several cities also enhanced their on-demand public transport services to provide mobility to essential workers, as in **Abu Dhabi**, United Arab Emirates; **Berlin**, Germany; **Columbus**, Ohio, USA; **Kent**, UK; and **Tel Aviv**, Israel.

Dubai, United Arab Emirates increased the number of subway trains and buses in operation in order to increase the frequency of service and to avoid overcrowding. Similar approaches were applied in **Bucharest**, Romania; **Hamburg**, Germany; and many other cities. Many cities enhanced the disinfection and cleaning of vehicles and public transport stations.

Paratransit services have been impacted due to travel restrictions, reduced capacities and rising costs. Revenue losses of 50% to 70% and lack of government support brought many paratransit operators to the verge of bankruptcy. In **Kampala**, Uganda, travel restrictions and lockdowns led to a temporary halt of all boda boda and minibus services, while in **Addis Ababa**, Ethiopia fares for minibuses doubled in early 2020 to recoup the lost revenues. In **Latin America and the Caribbean**, universities have conducted research to inform decision makers on how to support and formalise paratransit systems and how to best integrate them into climate change, energy and transport agendas at the city, regional and national levels, including as part of COVID-19 recovery measures.

The COVID-19 pandemic resulted in an unprecedented preference for e-commerce and contactless deliveries (using either self-driving trucks or automated delivery robots), resulting in a re-invigoration of start-ups focused on driverless technologies. E-commerce sales grew from between 15% (in **China**) and 70% (in **Canada**) within a single year, and in 2020 online sales represented 19% of all retail sales. The pandemic also accelerated existing trends in lower-carbon solutions, with crowd shipping services (e.g., Instacart, Postmates, etc.) emerging as a sustainable delivery alternative for congested megacities in **Asia**, and the wide-scale adoption of e-cargo bikes.

Expanded use of electric trucks, autonomous and connected trucks, and autonomous delivery robots in freight and logistics has occurred mainly in **Asia** and **North America**. For example, 13 locations in the **UK** and the **USA** began employing autonomous delivery robots, and 5G-powered autonomous food vehicles were launched in **China** in November 2020. Innovative freight delivery through alternative fuel vehicles, drones and autonomous robots is being tested. A McKinsey report projects that by 2030, 80% of items in **China**, **Germany** and the **USA** will be delivered by drones and autonomous robots with parcel lockers.

The pandemic disrupted road freight networks worldwide, although these were generally less affected than ocean and air freight. Europe and the **Americas** were the fastest to resume normal operations within their freight networks, whereas regions that experienced severe lockdown measures and border closures, such as the **Middle East** and **Africa**, experienced more prolonged and significant impacts.

Source: See endnote 1 for this section.

Initiatives supporting urban passenger and freight transport

Passenger transport

- The **C40 Green and Healthy Streets Declaration** highlights the growing demand for zero-emission products and services and aims to raise the level of ambition of cities to transition to zero-emission transport. Signatories commit to procuring only zero-emission buses from 2025 and to ensuring that major urban areas are zero emission by 2030.[68]
- The **MobiliseYourCity Partnership** supports local and national governments in emerging and developing countries in defining and implementing sustainable urban mobility policies and plans, in an effort to facilitate implementation of their Nationally Determined Contributions to reduce emissions under the Paris Agreement and to accomplish the United Nations Sustainable Development Goals.[69]
- The **Institute for Transportation and Development Policy** (**ITDP**) works to mitigate the impacts of climate change, improve air quality, and support prosperous, sustainable, and equitable cities.[70] ITDP's Rapid Transit to Resident Ratio tool tracks the growth of public transport in cities over time.[71]
- The **International Association of Public Transport** (**UITP**) represents public transport agencies and campaigns through its One Planet, One Plan climate action manifesto, a four-step plan to achieve zero-emission mobility and better public transport.[72]
- The **Transformative Urban Mobility Initiative** (**TUMI**) focuses on accelerating sustainable urban transport development and climate change mitigation by mobilising finance, capacity building and promoting innovative approaches.[73]

Freight transport

- **EcoLogistics by ICLEI** supports cities through a community network and projects that provide tools for self-monitoring of greenhouse gas emissions and for stakeholder mapping and engagement. It supports demonstration projects and planning for long-term sustainable urban logistics through action plans.[74]
- The **Global Green Freight Action Plan** focuses on facilitating collaboration among governments, the private sector, civil society and other actors, with the goal of aligning and enhancing existing green freight programmes, developing and supporting new programmes, and integrating black carbon reductions into these programmes.[75]
- The **Smart Freight Centre** works with industry and other stakeholders to remove market barriers and catalyse the uptake of solutions that improve fuel efficiency, reduce emissions and lower operating costs.[76]
- **VREF Center of Excellence for Sustainable Urban Freight Systems** investigates innovative ways to infuse sustainability and efficiency into the transport of goods, with a focus on activities such as the analysis of urban delivery trends and planning guides to improve freight system performance.[77]

Key indicators

	2017*	2020*	% change
Policy Landscape Indicators			
Countries with national urban mobility frameworks (# of countries)	N/A	44	–
Market Development Indicators			
Bus rapid transit (# of systems)	169	177	+5%
Urban rail (metro, tram and light rail) (# of systems)	478	502	+5%
Rapid transit-to-resident ratio (for cities of 500,000 people and more)	10.2	10.7 (2019)	+5%

(*) Data are for the indicated year unless noted otherwise.

Source: See endnote 1 for this section.

In Practice: Additional Policy Measures

Policy targets set

Investment commitments

- **Berlin**, Germany announced that it would spend EUR 28 billion (USD 34 billion) on improving public transport between 2019 and 2035.[78]
- In 2019, **India** received concessional loans from Germany of EUR 1 billion (USD 1.2 billion) until 2023 to improve urban mobility infrastructure and services.[79]
- **Indonesia** was preparing to spend around USD 40 billion in 2019 to extend the metro network in Jakarta.[80]
- **Turkey** plans to expand its urban rail length from 747 kilometres in 2019 to 1,154 kilometres by 2023.[81]
- In 2019, the Green New Deal of **Scotland**, UK included GBP 500 million (USD 670 million) for improved bus priority lanes to tackle congestion and increase usage.[82]
- Under the USA state of **Connecticut's** USD 21 million CT2030 investment to improve transport, adopted in 2019, mass transport is one of four key areas, and new corridors and e-buses are planned.[83]
- Sound Transit approved USD 60 million for the Pierce Transit bus rapid transit system in **Washington** state, USA.[84]

Policy measures implemented

Introduction of new urban rail systems

- The first light rail service started operation in the Waterloo region of **Ontario**, Canada in 2019, registering 1.2 million passengers between July and September 2019.[85]
- The first subway in **Jakarta**, Indonesia started operation in 2019, followed by a light rail line that same year.[86]

Expansion of urban rail systems

- In **Australia**, the cities of Canberra and Sydney both expanded their light rail systems in 2019.[87]
- Several European cities expanded their urban rail systems in 2019 and 2020, including **Nice**, France; **Budapest**, Hungary; and **Moscow**, Russian Federation.[88] The Cityring metro line opened in **Copenhagen**, Denmark in 2019, with 17 stations along a 17-kilometre line.[89]
- In 2020, several urban rail expansions were completed in **North America**, including (in the **USA**) the Southeast Rail Extension in Denver, Colorado and the Gilbert Road Extension in Phoenix, Arizona; and (in **Canada**) the Confederation Line in Ottawa and the Ion Light Rail in Waterloo.[90]
- Both light rail lines in **Minneapolis**, Minnesota, USA reportedly had their highest ever ridership in 2018, with more than 80 million rides.[91]

Autonomous freight vehicles

- In **Paris**, France, Nokia developed a last-mile autonomous delivery robot in 2019 that could deliver all small parcels within the Paris-Saclay campus.[92]
- In the **USA**, Plus.ai announced that a self-driving semi-truck packed with 20 tonnes of goods successfully made a cross-country trip from California to Pennsylvania in 2019 without having a single disengagement.[93] A robot food delivery service was launched in **Tempe**, Arizona, USA in 2020.[94]

Public bus fleet expansion

- In 2019, the **Congo** transport company TRANSCO renewed its rolling stock, adding 50 buses for inter-city travel services and 80 new buses for Kinshasa as part of the "Esprit de vie" programme that supports financing of local buses.[95]
- **Tehran**, Iran renewed its bus fleet in 2019 with 100 new buses.[96]
- **Gambia** added 20 new buses to an existing fleet of 50 buses in 2020.[97]
- In 2019, **Nigeria** added 820 medium- and high-capacity buses to its operations, and Google officially enabled its "Maps" feature for informal transport in Lagos.[98]

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.

Endnotes

3.4 Urban Passenger and Freight Transport

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1 If not stated otherwise, then the assessment of policy landscape indicators is based on desk research with a focus on the 31 country factsheets and information outlined in the section. More countries might have such policies in place or similar policies implemented. Bus rapid transit data from BRT+ Centre of Excellence and EMBARQ (2020), "Global BRTData." Version 3.50, last modified 9 June 2020, http://www.brtdata.org; urban rail data based on various sources summarised in SLOCAT (2020), "Transport Knowledge Base", https://slocat.net/our-work/knowledge-and-research/trakb; rapid transit-to-resident ratio based on ITDP, op. cit. note 3.

Annex: Methodological Note

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