3.3 Walking and Cycling



Q

Key findings

Demand trends

- More than one-third of all trips globally are made on foot or by bicycle. Walking is the principal transport mode in most of the Global South, accounting for up to 70% of trips in some cities.
- Modal shares for walking and cycling have declined in many parts of the world (with some exceptions), driven by rising car ownership, poor infrastructure and unsafe conditions.
- Pedestrians are the main victims of road crashes in lowincome countries, where they accounted for more than one-third of fatalities in 2016.
- In most areas of the world, male bicycle users greatly outnumber female users, whereas women walk for transport to a greater extent than men, due in part to gender differences in trip patterns.
- Cargo bicycles are enjoying a renaissance and recognition for being a cleaner, safer and more efficient means than trucks of transporting people and freight in cities.

Emission trends

- As nearly zero-emission modes of transport, walking and cycling contribute to Paris Agreement targets for reducing transport-related emissions, while moving 6-8 times more people per hour in the same space as automobiles.
- Walking and cycling are estimated to be feasible substitutes for more than 40% of short car trips; this could save nearly 5% of carbon dioxide (CO₂) equivalent emissions from car travel on top of the current estimated 5% of "avoided" emissions from walking and cycling trips.
- Recent growth in electric-assisted bicycles (e-bikes) is a positive trend for mobility, but it has a potentially negative impact on transport emissions if e-bikes replace zero-emission modes.

8 Policy measures

 Countries and cities are expanding integrated planning approaches that include walking and cycling as a central element and are setting targets for specified shares of these modes.

20

es, es

- Investments in walking and cycling infrastructure have gained momentum worldwide but remain far more limited than investments in traditional roadways.
- Many cities have restricted the flow and speed of motorised vehicles to improve the safety of pedestrians and cyclists, with some major cities reporting zero pedestrian and cycling deaths.
- An increasing number of global guidelines are specifying technical standards for creating humanscale street infrastructure to improve the safety, comfort and inclusion of all users.
- Increasing recognition of the value of walking and cycling has led to their inclusion in recent global policy frameworks, including the WHO Global Action Plan for Physical Activity 2018-2030 and the 2020 Stockholm Declaration on Road Safety.

Impacts of the COVID-19 pandemic

- During the pandemic, walking and cycling have demonstrated their potential as resilient transport modes with low contagion risks, endorsed by the World Health Organization.
- In 2020, more than 194 cities introduced dedicated space for pedestrians or temporary protected bike lanes, many of which are slated to become permanent.
- A change in travel preferences caused by the COVID-19 pandemic resulted in increased walking and cycling during the initial phase of the pandemic, which has been sustained in some places.

Overview

At little to no monetary cost, walking and cycling enable large segments of the world's population – including the poor, the young and the elderly – to independently fulfil their daily transport needs, while improving their personal health and posing little risk to other road users. Walking and cycling are ideal for short journeys, which comprise the majority of all journeys. Walking underpins all other modes of travel by providing "first- and last-mile" access, and walking and cycling have high potential for intermodal access to public transport, making them key to a sustainable modal shift.¹

Walking and cycling are particularly well-suited transport solutions for addressing the ongoing and interlinked crises of climate change, road deaths, physical inactivity and urban liveability. They have proven to be the most resilient forms of transport and have been integral to mobility responses in the face of natural disasters and health crises, including the COVID-19 pandemic (*see Box 1*).² However, pedestrians and cyclists remain among the most at risk in road environments, warranting additional investments in safer infrastructure. Although walking and cycling are both zero-emission, active modes of transport, significant differences exist between them in terms of speed, ability, usage rates, and infrastructure and policy needs. They are often grouped together in policy frameworks at the local, national and global levels, but deserve separate attention with different strategies and interventions.

Demand trends

More than one-third of all trips globally are made on foot or by bicycle.³ Walking is the principal mode of transport in most of the Global South, accounting for up to 70% of trips in some cities, particularly in Africa and Asia (*see Figure 1*).⁴ Virtually all trips include some degree of walking, which is not reflected in estimates of modal shares.⁵ For cycling, shares exceeding 15% are found in Denmark, the Netherlands, Japan and China.⁶ More than 1 billion bicycles are present worldwide, and recreational use is widespread, providing key building blocks for greater use.⁷

Across the Global South, high shares of walking (predominantly) and cycling largely reflect poverty or the lack of other transport options. World Health Organization (WHO) surveys between 2002 and 2016 found that people in low-income countries walk or cycle for transport 63 minutes per day on average, compared to 41 minutes for middle-income countries and only 25 minutes for high-income countries.⁸

Modal shares for walking and cycling have declined in many parts of the world (with some exceptions), driven by rising car ownership, poor infrastructure and unsafe conditions. The ongoing decline in walking and cycling rates in rapidly motorising and urbanising low- and middle-income countries in Africa, Asia and Latin America and the Caribbean makes retaining higher shares of these modes and preventing a high-carbon transport trajectory a key climate and public health priority.⁹ By contrast, in much of the industrialised world, rates of car ownership have slowed, and some cities have seen increases in cycling rates.¹⁰

- Walking's share of trips has declined since 2000 in a diverse set of countries (e.g., Austria, Germany, India and the UK) and cities (Almaty, Bogotá, Kathmandu, Rio de Janeiro and Tokyo), generally in favour of increased auto use.¹¹
- In Beijing, China the share of trips taken by bicycle fell from 58% in 1986 to 15% in 2011.¹²
- Bicycle use in Barcelona, Spain and Paris, France increased 150% and 135%, respectively, after these cities launched cycling programmes in 2007.¹³

Evidence from countries and cities where walking and cycling are prioritised and integrated into the transport system demonstrates that these declines can be reversed.¹⁴ High-density, mixed-use neighbourhoods and cities are particularly favourable for walking and cycling due to shorter trip distances, which also allows for more efficient and viable public transport provision and multimodal trips.



Figure 1. Share of trips by transport mode in selected cities, various years



Source: See endnote 4 for this section.

While density is important to walking and cycling potential, short trip distances alone are not sufficient to foster widespread use. Overwhelming evidence indicates that road design and the provision of high-quality infrastructure and public space is fundamental to stimulating walking and particularly cycling. The rise of electric bicycles also represents an opportunity to cover longer distances by cycling (see Section 3.8 on Electric Mobility).

Pedestrians are the main victims of road crashes in low-income countries, where they accounted for more than one-third of fatalities in 2016 (see *Figure 2*).¹⁵ Pedestrians and cyclists are

among the most vulnerable road users, and actions to improve safety conditions are needed. In low-income countries in particular, road fatality rates for pedestrians remain high compared to other transport modes. In 2019, pedestrians accounted for 93% of combined walking and cycling deaths in Africa, due in part to the higher share of walking trips relative to cycling, rather than to the safety characteristics of these modes.¹⁶

Efforts related to the United Nations' First Decade of Action for Road Safety (2011-2020) identified strong synergies between improved road safety and the promotion of walking and cycling.¹⁷ Safety



Figure 2. Road fatalities by group in low-, middle- and high-income countries, 2016

Source: See endnote 15 for this section.

strategies such as Vision Zero have focused on changing road designs and lowering vehicle speeds, which in turn improve the safety and comfort of pedestrians and cyclists.¹⁸

In most areas of the world, male bicycle users greatly outnumber female users, whereas women walk for transport to a greater extent than men, due in part to gender differences in trip patterns. A positive correlation exists between the share of trips by cycling, and female bicycle use.¹⁹ Low-stress, inclusive conditions for walkers and cyclists are essential to achieve equity in transport and to promote broader use of these two modes, particularly by women, youth and the elderly.

Because women display different mobility patterns related to trip purpose, trip chains and travel distance, they may be more sensitive to the quality of infrastructure for walking and cycling.²⁰ Meanwhile, shorter travel distances, more local trips and/or trips combining walking, cycling and other modes, and higher public transport use would likely boost walking rates across genders.²¹

In research studies, women and men identify different challenges to walking. For example, 50% more women than men indicate personal safety challenges (such as harassment or assault), and 43% more women point to the difficulties of travelling with groceries and bags.²² In Singapore, 200% more women identify accompanying children or relatives as a challenge to walking.²³ Bogotá, Colombia, where women make up only 21% of daily cycling trips, has adopted the long-term goal of gender parity in cycling and launched the first international "50-50 More Women on Bikes!" congress.²⁴

In Denmark and the Netherlands, where cycling conditions are generally safe and comfortable, female cyclists slightly outnumber males, and high cycling rates also exist among adolescents and the elderly.²⁵

Cargo bicycles are enjoying a renaissance and recognition for being a cleaner, safer and more efficient means than trucks of transporting people and freight in cities.

- Around 40,000 cargo bikes are used daily In the metropolitan area of Copenhagen, Denmark, and more than 11,000 cargo bike deliveries occur every day in Rio de Janeiro, Brazil.²⁶
- In Lagos, Nigeria, cargo bikes are commonly used for waste collection.²⁷
- In Kigali, Rwanda, cargo bikes carry heavy goods loads and serve as bicycle taxis, providing a means of employment for thousands of young men.²⁸
- In Europe, 25% of all goods and 50% of all light urban deliveries could be serviced by cargo bikes.²⁹



Figure 3. Global capacity and CO₂ footprints for different transport modes and vehicles



Emission trends



As nearly zero-emission modes of transport, walking and cycling contribute to Paris Agreement targets for reducing transport-related emissions, while moving 6-8 times more people per hour in the same space as automobiles (*see Figure 3*).³⁰

Walking and cycling are estimated to be feasible substitutes for more than 40% of short car trips; this could save nearly 5% of CO_2 equivalent emissions from car travel on top of the current estimated 5% of "avoided" emissions from walking and cycling trips.³¹ Rates of walking and cycling vary widely depending on land use, density and infrastructure, as well as cultural and social factors. In some cities, walking and public transport account for up to 90% of trips, and cycling for nearly 50% of trips.³²

- Some high-density cities have high levels of walking and public transport, including Hong Kong (91%) and Singapore (66%) in Asia, and Vienna (68%) and Zurich (67%) in Europe.³³
- High cycling rates occur in certain compact, cycling-friendly cities such as Bordeaux, France (where cycling accounts for 13% of all trips) and Utrecht, the Netherlands (51% of all trips).³⁴

Recent growth in electric-assisted bicycles (e-bikes) is a positive trend for mobility, but it has a potentially negative impact on transport emissions if e-bikes replace zero-emission modes.³⁶ Sales of bicycles increased strongly in recent years through rising demand for e-bikes from both individual consumers and shared bike fleet operators.

- Overall e-bike sales increased 120% globally in 2019, and major bicycle brands doubled their e-bike sales that year.³⁶
- More than 300 million e-bikes are projected to be in use globally by 2023.³⁷
- The e-bike market share surpassed 50% in the Netherlands in 2019.³⁸
- Bicycle exports from Chinese Taipei included 410,000 e-bikes in 2020, a 21% increase from 2019.³⁹

Policy measures

%

Countries and cities are expanding integrated planning approaches that include walking and cycling as a central element and are setting targets for specified shares of these modes. Walking and cycling have strong synergies with public transport, which generates a large share of walking journeys for last-mile access. The integration of cycling and public transport has great potential to increase the catchment areas of public transport stations.⁴⁰

Walking and cycling infrastructure is generally relatively inexpensive and can be implemented rapidly, although it requires careful attention to detail and design standards for successful implementation. Prioritising walking and cycling contributes to physical and psychological health, access and safety.

- In 2019, the government, research institutions and social organisations in the Netherlands joined the National Platform for Walking, aiming to exchange knowledge and experiences to create more space for walking.⁴¹
- Queensland, Australia launched its first Walking Strategy and two-year Action Plan in 2019 with supporting investments.⁴²
- Germany's environment agency launched a Pedestrian Policy Framework ("Geht doch!") in 2018 that aims to increase the share of walking trips in big cities from 27% in 2011 to 41% by 2030, and the share in rural areas from 24% to 35%.⁴³
- The Tallinn region of Estonia aims to achieve 10% cycling and 15% walking modal shares by 2035.⁴⁴
- Promoting cycling is increasingly recognised as an urban transport strategy in Africa, with 35% of countries in the region having a walking and cycling policy as of March 2021.⁴⁵ Cape Town, South Africa launched a cycling strategy in 2017, and Kampala, Uganda opened its first dedicated cycling lane in 2018.⁴⁶
- Lagos, Nigeria intends to increase the share of walking and cycling to at least 50% of all trips and to maintain this level (or greater) over a 15-year period.⁴⁷
- In 2020, Peru adopted a new law for the promotion and regulation of cycling that includes provisions for education, infrastructure, parking, integration, bike-sharing and incentives for employees.⁴⁸
- 50% of vehicle taxes and the motor vehicle transfer fee collected in Cuenca, Ecuador are earmarked for cycling infrastructure and the promotion of tactical urbanism (local, short-term, lowcost activities that are city- and citizen-led).⁴⁹

Investments in walking and cycling infrastructure have gained momentum worldwide but remain far more limited than investments in traditional roadways.⁵⁰ National policies do not sufficiently enable safe and enjoyable walking and cycling, despite the sizable benefits of these modes. However, many cities have prioritised walking infrastructure both preceding and during the COVID-19 pandemic.

- Between 2018 and 2020, cities including Skopje, North Macedonia; Seattle, USA; Beijing, China; Jakarta, Indonesia and Singapore established new master plans to promote walking and cycling.⁵¹
- The transport department of Mombasa, Kenya completed 9 kilometres of wide footpaths on five streets in 2019.⁵² Tel Aviv, Israel added 11 new pedestrian streets in commercial areas in 2020.¹¹
- Munich, Germany has budgeted EUR 1.6 billion (USD 1.9 billion) to expand cycling infrastructure through 2025.⁵³ Ireland has committed to allocating 10% of its total transport capital budget to cycling projects and another 10% to pedestrian infrastructure, resulting in EUR 360 million (USD 428 million) for these modes every year.⁵⁴

Dedicated long-distance cycling "highways", originally launched in the **Netherlands**, now cover more than 18 inter-city routes in that country and are increasingly common worldwide.⁵⁵ **Beijing**, China

6

opened its first 6.5-kilometre route in 2019; Bogotá, Colombia is planning a cross-city 25-kilometre "cycling avenue"; and in Germany's Ruhrgebiet, 101 kilometres of bike freeways connecting Duisburg and Hamm are under construction.⁵⁶

Investment in bike lanes and pedestrian infrastructure yields greater positive job creation impacts than the manufacturing of cars and electric car batteries, creating between 8 and 23 jobs for every USD 1 million invested.⁵⁷ Cycling jobs (e.g., positions in bicycle manufacturing, repair, construction of cycling infrastructure, cycle tourism and bike sharing operations) are more geographically stable than other sectors, benefiting local economies and offering access to the labour market for less-gualified workers.⁵⁸

Many cities have restricted the flow and speed of motorised vehicles to improve the safety of pedestrians and cyclists, with some major cities reporting zero pedestrian and cycling deaths.⁵⁹ Walking and cycling rates are likely to accelerate when safe, dedicated infrastructure is provided, supporting the growth in women's cycling in particular.⁶⁰ In August 2020, the UN General Assembly proclaimed 2021-2030 the Decade of Action for Road Safety 2021-2030, aiming to prevent at least 50% of road traffic deaths and injuries by 2030.⁶¹

- In Africa, more than 9 out of 10 walked and cycled streets are below the minimum level of service.⁶²
- Oslo, Norway and Helsinki, Finland recorded zero pedestrian deaths during 2019, with Oslo also recording zero cycling deaths; this achievement is the result of decades of progress on road safety along the lines of Vision Zero, including by reducing speed limits, disincentivising automobile use and implementing safe infrastructure.⁶³
- Campaigns to dismantle pedestrian bridges on urban streets and implement safe and level crossings have succeeded in various cities in Mexico as well as in Medellín, Colombia and San Francisco, USA.⁶⁴
- Ciclovias (bikeways), car-free streets and "open streets" programmes continue to expand across cities around the world, creating safer and more equitable conditions for pedestrians. Several cities held their first ever open streets events between 2018 and 2020, including Abuja, Nigeria; Temuco, Chile; and Shah Alam, Malaysia.⁶⁵ Since 2018, Ethiopia has held the Menged Le Sew car-free day in up to 20 cities every month.⁶⁶

An increasing number of global guidelines are specifying technical standards for creating human-scale street infrastructure to improve the safety, comfort and inclusion of all users. They include the *Global Street Design Guide* (2017), *Designing Streets* for *Kids* (2020) and *Pedestrians First: A Tool for Walkable Cities* (2018), which has been applied in a growing number of countries, including Ethiopia and Zambia.⁶⁷

- Walking and cycling guidelines have been formulated for cities such as Lagos, Nigeria (2018); Lima, Peru (2017); and Pune, India (2016).⁶⁸
- In 2019, Austroads updated the Pedestrian Planning and Design Guidance for Australia and New Zealand to align with national and international good practices.⁶⁹
- Technical guidelines for cycling infrastructure were adopted in Colombia in 2016.⁷⁰ At a sub-national level in 2019, British Columbia, Canada adopted an active transport design guide, and Queensland, Australia planned a state cycling network.⁷¹
- A guidebook for tactical urbanism in Indian cities, released in 2020, provides case studies from recent developments in Coimbatore, Mumbai, Ranchi, Rohtak and Udaipur.⁷²

Increasing recognition of the value of walking and cycling has led to their inclusion in recent global policy frameworks, including the WHO Global Action Plan for Physical Activity 2018-2030 and the 2020 Stockholm Declaration on Road Safety.⁷³ There is clear evidence that density and mixed land-use patterns are key to maintaining and increasing the modal share for walking and cycling. Efforts to improve the safety of road environments also help to ensure more widespread use, particularly by women, youth and the elderly.

- The WHO's Global Action Plan on Physical Activity 2018-2030 ("More active people for a healthier world") aims to provide policy recommendations for walking and cycling to contribute to achieving the UN Sustainable Development Goals (SDGs). The plan targets a 15% relative reduction in the global prevalence of physical inactivity in adults and adolescents by 2030.⁷⁴
- The majority of the UN SDGs can benefit from more (and safer) walking and cycling.⁷⁵ However, the UN's 2030 Agenda for Sustainable Development does not mention these modes specifically, and walking and cycling were included in only 2 of the 47 Voluntary National Reviews of the SDGs submitted by UN Member States in 2020.⁷⁶
- The UN's New Urban Agenda adopted in 2016 sets a path to guide urbanisation over the next 20 years. In the area of mobility, it focuses on the availability of public spaces and the promotion of safe walkability and cycling, aimed at improving health and well-being.⁷⁷
- The 2020 Stockholm Declaration on Road Safety explicitly recognises that improvements in road safety outcomes require a "shift toward more walking and cycling as well as integrating these modes with the use of public transport" and also need to include "land-use, street design, transport system planning and governance, especially for vulnerable road users and in urban areas".⁷⁸

sponses to Address Climate Change in the Transport Sector

26

Box 1. Impacts of the COVID-19 pandemic on walking and cycling

During the COVID-19 pandemic, walking and cycling have demonstrated their potential as resilient transport modes with low contagion risks, as endorsed by the World Health Organization. Walking and cycling have proven their fundamental importance to human mobility and their value for generating positive externalities and societal gains. Walking and cycling are therefore key elements for building socio-economic resilience in sustainable transport systems, which can be expanded to prepare for future shocks.

In 2020, more than 194 cities introduced dedicated space for pedestrians or temporary protected bike lanes, many of which are slated to become permanent. A preliminary assessment of measures taken indicates positive results and potential for longer-term change in cities around the world. Examples include the following:

- A number of cities have widened footpaths and sidewalks to promote walking, including London, Milan and Nairobi. Israel's Tel Aviv-Yafo municipality implemented a policy to prioritise pedestrian and cycling zones, including 11 new pedestrian streets and 20 kilometres of new bicycle lanes, increasing attractiveness for active transport. Cape Town, South Africa constructed 17 kilometres of new walkways for pedestrians and cyclists to facilitate commuting while enabling social distancing. Mobility grids in Barcelona, Spain are creating more walkable neighbourhoods with minimal infrastructure needs.
- In Latin American cities, temporary cycling infrastructure was implemented in 2020 to provide a safe mobility alternative. European cities announced more than 2,000 kilometres of temporary infrastructure and implemented over 1,000 kilometres. In India, the Cycles4Change Challenge and the Streets for People Challenge sought to support cities in implementing cycling-friendly actions and creating safe, healthy and happy streets through rapid low-cost measures.
- In North America, streets were opened for pedestrians and cyclists, for recreation, and in some cases for outdoor dining. A major road in Mombasa, Kenya was converted into a pedestrian zone. In Turin, Italy, public space near a school garden was transformed into learning space to guarantee social distance. Cities such as Edmonton in Canada, Charleston and Los Angeles in the USA, and Adelaide and Sydney in Australia disabled pedestrian push buttons and automated pedestrian phases.

- A study of infrastructure measures adopted in the wake of COVID-19 in 110 European cities showed a 7% increase in cycling on average, with estimated health benefits of EUR 3 billion (USD 4.3 billion) per year. In London, the implementation of low-traffic neighbourhoods showed an increase in walking, with a potential for sustained growth at low cost. Also in the UK, a GBP 250 million (USD 350 million) emergency active mobility fund facilitated pop-up bike lanes, wider pavements and safer crossings as the first stage of a GBP 2 billion (USD 2.8 billion) investment in improved walking and cycling infrastructure.
- Temporary measures can be converted into permanent infrastructure, as demonstrated in Bogotá, Colombia and Paris, France, where large sections of initial temporary networks were implemented permanently. Lima, Peru implemented more than 470 kilometres of new temporary and permanent infrastructure. In Mexico, "emergent" infrastructure was being expanded in various cities, including along main thoroughfares in Guadalajara, León and Mexico City. Some cities elected to fast-track existing plans, such as Melbourne, Australia, which is realising 40 kilometres of cycling lanes.

A change in travel preferences caused by the COVID-19 pandemic resulted in increased walking and cycling during the initial phase of the pandemic, which has been sustained in some places. In April 2020, the UK, the USA and other countries registered the highest retail sales volumes of bicycles on record. As of June 2020, the UK reported sales of 1.3 million bicycles as a direct result of COVID-19, and Google reported a two-fold increase in searches related to e-bikes between March and October 2020.

Rising bicycle sales in places that had seen declining interest in previous decades (such as India and the Philippines), combined with factory closures, led to shortages of bicycles and parts. In Kampala, Uganda, bicycle mechanics reported a boom in customers following restrictions on public transport. In Scotland, walking extensively gained popularity during both lockdown and post-lockdown periods, with the potential to maintain this trend after the COVID-19 pandemic.

Source: See endnote 2 for this section.

Initiatives supporting walking and cycling

- A group of non-profit organisations dedicated to resilient, inclusive and sustainable mobility created the COVID Mobility Works platform to collect initiatives by local governments and non-governmental organisations to help policy makers, innovators, researchers and advocates around the world.⁷⁹ As of October 2020, the database included more than 500 initiatives in 245 cities.⁸⁰ Additional resources on the rapid implementation of sustainable mobility measures during COVID-19 include TUMI's Corona Transport Knowledge Platform and the Pedestrian and Bicycle Information Center at the University of North Carolina, USA.⁸¹
- Despacio is a non-profit organisation that conducts research to promote quality of life and to improve the welfare of communities.⁸² It develops and implements projects to make people feel good, generally based on the "slow movement" philosophy in every aspect of life: from the individual and family level to more collective topics such as planning and managing slow, humane and sustainable urban and regional spaces.
- Based on a systematic review of EU cycling policies, the European Cyclists' Federation developed the EU Cycling Strategy: Recommendations for Delivering Green Growth and an Effective Mobility in 2030, which seeks to inspire the European Commission to develop its own cycling strategy to avoid policy fragmentation across different institutions.⁸³
- The EcoMobility initiative of ICLEI-Local Governments for Sustainability supports cities across the world to prioritise walking and cycling in the mobility pyramid.⁸⁴ Through the CitiesSHIFT project and the EcoMobility SHIFT+ performance measurement tool, ICLEI supported cities in China, India and Uganda to measure ecomobility and create an ecomobility pathway for long-term transformation.⁸⁵
- The International Federation of Pedestrians advocates for walking and public space enhancement, especially safety, on behalf of its 48 member organisations from around the world.⁸⁶
- The Share the Road Programme, jointly led by the UN Environment Programme and the FIA Foundation for the Automobile and Society, focuses on best practices and works with governments around the world to prioritise the needs of pedestrians and cyclists.⁸⁷ The programme supports developing countries to shift their priorities away from the cardriving minority and towards investing in infrastructure for the walking and cycling majority.⁸⁸
- Velo-city, the premier international planning conference on cycling, brings together knowledge and information to encourage cycling as part of daily transport and recreation, and seeks to leave all participants as well as other target groups enriched and inspired. Velo-city conferences attract around 1,400 delegates from more than 60 countries.⁸⁹
- Walk21, an international charity dedicated to ensuring the right to walk and the opportunity to enjoy it for everyone worldwide, convenes the largest international conference on

walking each year.⁹⁰ Walk21's Global Sidewalk Challenge aims to build or rehabilitate 100,000 kilometres of additional dedicated, safe, barrier-free sidewalks in the proximity of public transport hubs; in 2019 projects to deliver new sidewalks were undertaken in Lagos, Nigeria and Medellín, Colombia, and additional projects will be realised in other low- and middle-income countries by 2030.⁹¹ Walk21 is also launching the Pathways to Walkable Cities campaign to promote good governance for walkability and Global Walking Indicators to empower national agencies to generate data, report on and inform action, and accelerate progress towards a more walkable world.⁹²

- The United Nations has declared June 3rd World Bicycle Day and encourages Member States to devote attention to the bicycle in cross-cutting development strategies and to include the bicycle in international, regional, national and sub-national development policies and programmes.⁹³
- The World Bicycle Forum has been held yearly since 2012, and the 2020 event was held virtually in Kathmandu, Nepal, the first country outside of South America to host the forum.⁹⁴
- The World Cycling Alliance is an advocacy network aimed at sharing best practices, research and statistics to improve cycling around the world. Its main objective is to promote bicycles as a mode of transport, including leisure and touristic cycling, for the benefit of people worldwide.⁹⁵



8

Key indicators

Reliable data on walking and cycling are generally lacking, as the existing data often are not disaggregated, are not counted at all or are grossly undercounted due to an exclusive focus in travel surveys on the principal commuting mode. Data collection at the city and country level is critical to improve policy making and infrastructure prioritisation, and a global data collection programme is needed urgently.

Reporting gaps on walking and cycling correspond with a wider lack of data collection and a disregard for these modes in transport policy and planning, particularly in low- and middle-income countries undergoing rapid growth in car ownership. Because walking and cycling trips historically have not been measured via adequate tools, and limited efforts have been put in place to account for their performance, a lack of reliable data at all scales leads to undervaluation of these modes and makes targeting policies more difficult.

More recent use of mobile devices and digital applications, such as the Pedestrian First tool developed by the Institute for Transportation and Development Policy, makes it possible to track and gather information on walking and cycling to fill in some of the data gaps.⁹⁶

	2017*	2019*	% change
Policy Landscape Indicators			
Countries with national walking and cycling plans (number of countries)	N/A	103	N/A
Market Development Indicators			
Modal share of walking	N/A	N/A	N/A
Modal share of cycling	N/A	N/A	N/A
Mean minutes walked by day	N/A	N/A	N/A
Mean minutes cycled by day	N/A	N/A	N/A
Bicycle ownership (bicycles per 1,000 people)	N/A	N/A	N/A
Cycling infrastructure (dedicated protected cycling lanes per capita)	N/A	N/A	N/A
Cycling fatalities in low-/middle-/high-income countries (percentage of all fatalities)		4% / 2% / 5% (2016)	
Walking fatalities in low-/middle-/high-income countries (percentage of all fatalities)		37% / 18% / 20% (2016)	

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

Source: See endnote 97 for this section.

In Practice: Additional Policy Measures

Policy targets set

A key promise of Paris Mayor Anne Hidalgo's successful 2020 re-election campaign was to create a "15-minute city" oriented around walking and cycling.⁹⁸ Paris has accomplished most of the aims of its Plan Vélo (2015-2020) scheme and now boasts more than 1,000 kilometres of cycling infrastructure and is expanding the network into surrounding areas.⁹⁹

Restricting or banning cars in key streets or city centres is an effective strategy to improve walking and cycling, and such measures were recently adopted in **Belgrade**, Serbia; **Edinburgh**, Scotland, UK; and **Melbourne**, Australia.¹⁰⁰ In **Leuven**, Belgium, the elimination of through-traffic in the city centre has boosted cycling rates 32%.¹⁰¹ Setting a new standard for bike-train integration, the new bicycle parking garage at the Central Station in **Utrecht**, the Netherlands accommodates 12,500 bicycles, with a plan to house 22,000.¹⁰² Various public transport hubs in the country have integrated bicycle garages in recent years.¹⁰³

In the UK, Sheffield City Region announced plans in 2020 for 1,000 kilometres of walking and cycling routes, including 800 safe crossings.¹⁰⁴

In Houston, USA, where more than 90% of commuter trips are by car, a 1,000 kilometre on-street cycling network is being created.¹⁰⁵

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 tccgsr@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 CO₂ 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 CO₂ emissions emitted by the power sector (i.e., power and heat generiton 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_{2eqr} are provided in metric tonnes.

Methodological Note

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

3.3 Walking and Cycling

 R. Kager and L. Harms (2017), Synergies from Improved Cycling-Transit Integration: Towards an Integrated Urban Mobility System, International Transport Forum (ITF), Tokyo, https://www.itf-oecd.org/sites/default/files/docs/improved-cycling-transit-integration-synergies.pdf.

Box based on the following sources: World Health Organization (WHO) (2020), "Moving Around During the COVID-19 Outbreak", Geneva, https://www.euro during-the-covid-19-outbreak; more than 194 cities from T. Combs, "Local actions to support walking and cycling during social distancing dataset", Pedestrian and Bicycle Information Center, http://p m?id=5209 (accessed 29 September 2020); Transport for London, "Streetspace for London", https://tfl.gov.ul etspace-for-london (accessed 27 May 2021); L. Laker (2020), "Milan announces ambitious scheme to reduce car use after lockdown", The Guardian (UK), 21 April, https://www.theguardian.co post-crisis-return-of-traffic-pollution; Tel Aviv-Yafo, Cape Town and Barcelona from Global Transport Knowledge Partnership (gTKP), International Road Federatio 27 May 2021); European Cyclists' Federation (ECF), "COVID-19 Cycling Measures Tracker", https://ecf.com/dashboard (accessed 27 May 2021); Ministry of Housing and Urban Affairs, Government of India, "India Cycles4Change Challenge", http niua.org/indiacyclechallenge (accessed 27 May 2021); A. Subramanian, "Prioritising streets for people: Reimagining Indian cities", Institute for Transportation and Development Policy (ITDP) India, http:// -reimagining-indian-cities (accessed 25 May 2021); Covid Mobility Works (2020), "Conversion of a street section into a temporary pedestrian zone in Mombasa", 1 December, https://www.covidmobilityworks.org/re Turin from National Association of City Transportation Officials (NACTO), "Streets for pandemic response & recovery", https://nacto.org/publication/s rging-street-strategies/school-streets (accessed 25 May 2021); C. Ramsay (2020), "Edmonton adusts roads, pedestrian call buttons to promote physical distancing", Global News, 8 April, https://globalnews.ca al-distance; Los Angeles Department of Transport, "Additional neighborhoods see pedestrian crossing signals converted to touch-free activation", https an-crossing-signals-converted-touch-free (accessed 25 May 2021); POLIS (2020), "Australia launches automated pedestrian crossings to reduce virus spread", 4 January, https://www.polisnetwork.eu/article/australia-la -crossings-to-reduce-virus-spread; 7% increase from S. Kraus and N. Koch (2020), "Effects of pop-up bike lanes on cycling in European cities", Berlin and Potsdam, https://arxiv.org/pdf/2008.05883.pdf; Greater London Authority (2020), "Mayor's bold new Streetspace plan will overhaul London's streets", Mayor of London, 6 May, https://www.london.go will-overhaul-capitals-streets: A. Alfred and A. Goodman (2021), "The impact of low traffic neighbourhoods on active travels, car use, and perceptions of local environment during the COVID-19 pandemic", Findings, 17 March, https:// demic; Department for Transport, Office for Zero Emission Vehicles, Office for Low Emission Vehicles, and the Tr Hon Grant Shapps MP (2020), "€2 billion package to create new era for cycling and walking", 9 May, https://www.gov.uk/g e-new-era-for-cycling-and-walking: A. Puentes (2020), "Ciclovías temporales llegaron para quedarse, aún después de cuarentena", El Tiempo, 20 May, https://www.eltiempo.com/bogota/coronaviru se-quedaran-despues-de-la-cuarentena-497782; M. Woods (2020), "Paris's temporary bike lanes to become permanent after Hidalgo's re-election", RFI France, 7 January, https://www.rfi.fr/en/france/20200701-par en-pollution-cars; Bicentario Perú (2020), "Executive Presidency Resolution No. 065-2020-ATU-PE", 19 May, https:// 2020-atu-pe; H. Zamarrón (2020), "El auge de las ciclovías emergentes en México", Milenio, 27 August, https://www.milenio.com/opini City of Melbourne (2020), "Fast-tracking 40 kilometres of new bike lanes in Melbourne", 15 June, https://www.melbourne.vic.gov.au/news-and etres-of-new-bike-lanes-in-Melbourne.aspx; retail sales from J. Van Schaik (2020), "Corona brings extraordinary sales growth in US", Bike-EU, 23 June, https://www.bike-eu.com y-sales-growth-in-us- 10138119; R. Morley (2020), "1.3 million UK consumers 'bought a bike during COVID-19'", Bikebiz, 22 June, https://www.bikebiz.com/1-3-million-uk-consumers-have-bought-a-bike-since-covid-19-hit; Google (2021), "Best electric bike", http OBike (accessed 27 May 2021); for a thorough review of the situation of bike sales in several geographies, see T. Ricker and A. J. Hawkins (2020), "Cities are transforming as electric bike sales skyrocket", The Verge, 14 May, https:/ sales-bicyclist-pedestrian; S. Roy (2020), "Why India is turning to bicycles again", Times of India, 15 June, https://timesofindia.indiatime articleshow/76380819.cms; Philippines from South China Morning Post (2020), "More people take up cycling because of the coronavirus pandemic, and bicycle sales go through the roof", 6 July, https://www.scmp.com

amid-coronavirus; Indian Express (2020), "Pandemic leads to a bicycle boom, and shortage, around the world", 15 June, https://indianexpress.com/article/world/ bicycle-cycle-sales-world-corona-pandemic-6459485; The Independent (2020), "Bicycle mechanics register boom in number of clients", 13 April, https://www.independent.co.ug/bicycle-mechanics-register-boom-in-number-of-clients; Glasgow Centre of Population Health (2020), "Walking during the lockdown in Scotland", 9 July 2020, https://www.gcph.co.uk/latest/news/946_walking_during_the_lockdown in scotland.

- R. Cervero (2013), Transport Infrastructure and the Environment: Sustainable Mobility and Urbanism, University of California, Berkeley, https://iurd.berkeley.edu/ wp/2013-03.pdf.
- 4 UN-Habitat (2013), "Chapter 2: The State of Urban Transport", in Planning and Design for Sustainable Urban Mobility: Global Report on Human Settlements 2013, Routledge, New York, https://unhabitat.org/sites/default/files/download-manager-files/Planning%20and%20Design%20for%20Sustainable%20Urban%20Mobility pdf, Figure 1 based on various sources, summarised in SLOCAT Partnership on Sustainable, Low Carbon Transport (2021), "Transport Knowledge Base", https:// slocat.net/our-work/knowledge-and-research/trakb (accessed 12 May 2021).
- 5 R. S. Tolley (2003), Sustainable Transport: Planning for Walking and Cycling in Urban Environments, Woodhead Publishing, Cambridge, https://www.worldcat. org/title/sustainable-transport-planning-for-walking-and-cycling-in-urban-environments/oclc/58468250.
- 6 J. Pucher and R. Buehler (2008), "Making cycling irresistible: Lessons from the Netherlands, Denmark and Germany", *Transport Reviews*, Vol. 28/4, Routledge, pp. 495-528, https://doi.org/10.1080/01441640701806612; M. Suzuki and H. Nakamura (2017), *Bike Share Deployment and Strategies in Japan*, ITF, Tokyo, https://www.itf-oecd.org/sites/default/files/docs/bike-share-deployment-strategies-japan_0.pdf.
- 7 Worldometer, "Bicycles produced this year", https://www.worldometers.info/ bicycles (accessed 27 May 2021).
- 8 The 63 minutes in low-income countries can be regarded as mostly walking, but the survey did not differentiate between walking and cycling in the data collection. WHO calculations based on GPAQ, Survey data from 2002 to 2016.
- 9 R. Cervero (2013), "Linking urban transport and land use in developing countries", Journal of Transport and Land Use, Vol. 6/1, University of Minnesota, pp. 7-24, https://doi.org/10.5198/jtlu.v6i1.425.
- J. Oortwijn (2019), "World Cycling Index points to increasing bike use", Bike Europe, 18 June, https://www.bike-eu.com/home/nieuws/2019/07/worldwide-cycling-index-points-to-increasing-bike-use-10136185.
- 11 D. Sauter et al. (2018), "Walkability and the amount of walking", presentation at Walk21 conference in Bogotá, 17 October, https://files.designer.hoststar. ch/8f/45/8f453ff5-7bb9-47fb-ad9e-2095c1abce76.pdf.
- 12 G. Frame, A. Ardila-Gomez and Y. Chen (2017), "The kingdom of the bicycle: What Wuhan can learn from Amsterdam", *Transportation Research Procedia*, Vol. 25, Elsevier B.V., pp. 5040-58, https://doi.org/10.1016/j.trpro.2017.05.203.
- 13 Ibid.
- 14 E. A. Bouman et al. (2017), "State-of-the-art technologies, measures, and potential for reducing GHG emissions from shipping – a review", *Transportation Research Part D: Transport and Environment*, Elsevier Ltd, Vol. 52, pp. 408-21, https://doi. org/10.1016/j.trd.2017.03.022.
- 15 Figure 2 from WHO (2018), Global Status Report on Road Safety 2018, Geneva, https://www.who.int/publications/i/item/global-status-report-on-road-safety-2018.
- 16 UK Aid et al. (2021), "Valuing walking: Priorities for valuing and investing in African cities", High Volume Transport Applied Research.
- 17 WHO (2011), Decade of Action for Road Safety 2011-2020, Geneva, https://www. who.int/publications/m/item/decade-of-action-for-road-safety-2011-2020--globallaunch.
- 18 Action Vision Zero, https://actionvisionzero.org (accessed 25 May 2021).
- 19 R. Aldred, J. Woodcock and A. Goodman (2015), "Does more cycling mean more diversity in cycling?" *Transport Reviews*, 25 February, https://doi.org/10.1080/014 41647.2015.1014451.
- 20 J. Garrard, S. Handy and J. Dill (2012), "Women and cycling", in J. R. Pucher and R. Buehler, *City Cycling*, MIT Press, Cambridge, pp. 211-34, https://mitpress.mit.edu/books/city-cycling.
- 21 T. M. Pollard and J. M. Wagnild (2017), "Gender differences in walking (for leisure, transport and in total) across adult life: A systematic review", *BMC Public Health*, Vol. 17/1, BioMed Central Ltd., p. 341, https://doi.org/10.1186/s12889-017-4253-4.
- 22 Ramboll Smart Mobility (2021), Gender and (Smart) Mobility, Denmark, https:// ramboll.com/-/media/files/rgr/documents/markets/transport/g/gender-and-mobility_report.pdf.
- 23 Kollektivtrafikk-Foreningen (2021), "Gender and (Smart) Mobility Green Paper 2021", 12 March, https://kollektivtrafikk.no/publikasjoner/gender-and-smart-mobility-green-paper-2021 (accessed 27 May 2021).
- 24 Sustainable Urban Transport Project (2020), "Bicycles unite! How to strengthen and encourage women's daily bicycle mobility in Bogotá", 3 February, https:// www.sutp.org/bicycles-unite-how-to-strengthen-and-encourage-womens-daily-bicycle-mobility-in-bogota.
- 25 D. Hembrow (2011), "Who cycles in the Netherlands? Everyone cycles in the Netherlands!" A View from the Cycle Path, 13 February, http://www.aviewfromthecyclepath.com/2011/02/who-cycles-in-netherlands.html.

- 26 L. J. Sibilski and F. Targa (2020), "An old solution to new challenges: The rebirth of the cargo bike", World Bank, 16 January, https://blogs.worldbank.org/transport/ old-solution-new-challenges-rebirth-cargo-bike.
- 27 Ibid.
- 28 Ibid.
- 29 ECF (2012), "Cargo bike crazy: The potential of delivering goods by bike", 4 December, https://ecf.com/news-and-events/news/cargo-bike-crazy-potential-delivering-goods-bike-0.
- 30 R. Sims et al. (2014), "Transport", in Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge and New York, htt ipcc_wg3_ar5_chapter8.pdf. Figure 3 from SLOCAT calculations based on the following sources: TNMT (2021), "The environmental impact of today's transport types", https (accessed 25 May 2021); Asian Development Bank and Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH GIZ (2011), Changing Course in Urban Transport, https://www.sutp.org/files/contents/documents GIZ_SUTP_changing-course-urban-transport-illustrated-guide.pdf; H. Nguyen, F. Montgomery and P. Timms, "Should motorcycle be blamed for traffic congestion in Vietnamese cities?" CODATU, http://www.codatu.org/wp-content/uploads/ Should-motorcycle-be-blamed-for-traffic-congestion-in-vietnamese-cities-Hier NGUYEN-Franck-MONTGOMERY-Paul-TIMMS.pdf; TUMI, Passenger Capacity of Different Transport Modes, https://www.transformative-mobility.org/as acity-of-different-Transport-Modes.pdf.
- 31 A. Neves and C. Brand (2019), "Assessing the potential for carbon emissions savings from replacing short car trips with walking and cycling using a mixed GPS-travel diary approach", *Transportation Research Part A: Policy and Practice*, Vol. 123, Elsevier Ltd, pp. 130-46, https://doi.org/10.1016/j.tra.2018.08.022; D. P. Piatkowski, K. J. Krizek and S. L. Handy (2015), "Accounting for the short term substitution effects of walking and cycling in sustainable transportation", *Travel Behaviour and Society*, Vol. 2/1, Elsevier Ltd, pp. 32-41, https://doi.org/10.1016/j. tbs.2014.07.004.
- 32 CDP and ICLEI (2020), "2020 Full Cities Dataset", https://data.cdp.net/Gover nance/2020-Full-Cities-Dataset/eja6-zden (accessed 7 October 2020).
- 33 Deloitte (2018), "Deloitte City Mobility Index: Hong Kong", https://www2.deloitte. com/content/dam/insights/us/articles/4331_Deloitte-City-Mobility-Index/ HongKong_GlobalCityMobility_WEB.pdf; Deloitte (2018), "Deloitte City Mobility Index: Singapore", https://www2.deloitte.com/content/dam/insights/us/articles/4331_Deloitte-City-Mobility-Index/city-mobility/Index_SINGAPORE_FINAL. pdf; Mobilitätsagentur Wien (2020), *Vienna Mobility Report 2019*, Vienna, https:// www.fahrradwien.at/wp-content/uploads/sites/2/2020/04/Mob_Report_EN_2019_ RZscreen.pdf; L. Cavallasca (2019), "Indicators: Urban Traffic 2025 (2018)", City of Zurich, 3 July, https://www.stadt-zuerich.ch/ted/de/index/taz/verkehr/webartikel/ webartikel_stadtverkehr2025.html#modalsplit_von_oevvelo-undfussverkehrerhoehen.
- 34 Copenhagenize (2019), "06. Bordeaux", Copenhagenize Index 2019, https://copenhagenizeindex.eu/cities/bordeaux (accessed 1 June 2021); M. Sutton (2017), "Netherlands further builds on cycling's modal share, hitting 51% in Utrecht", Cycling Industry News, 26 October, https://cyclingindustry.news/netherlands-further-builds-on-cyclings-modal-share-hitting-51-in-utrecht.
- 35 J. E. Bourne et al. (2020), "The impact of e-cycling on travel behaviour: A scoping review", *Journal of Transport and Health*, Vol. 19, Elsevier Ltd, p. 100910, https:// doi.org/10.1016/j.jth.2020.100910.
- 36 J. Oortwijn (2019), "Giant to sell 600,000 e-bikes this year", Bike-EU, 17 October, https://www.bike-eu.com/home/nieuws/2019/10/giant-to-sell-600000-e-bikesthis-year-10136791; Bike-EU (2020), "Taiwan's 2019 e-bike exports exceeds all expectations", 3 June, https://www.bike-eu.com/sales-trends/nieuws/2020/06/ taiwans-2019-e-bike-exports-exceeds-all-expectations-10137981; P. Lee et al. (2019), Technology, Media, and Telecommunications Predictions 2020, Deloitte Development LLC, https://www2.deloitte.com/content/dam/insights/us/articles/722835_tmt-predictions-2020/DI_TMT-Prediction-2020.pdf.
- 37 Lee et al., op. cit. note 36.
- 38 J. Oortwijn (2020), "2019 brings undiminished high demand for e-bikes in Holland", Bike-EU, 21 January, https://www.bike-eu.com/market/nieuws/2020/01/2019-brings-undiminished-high-demand-for-e-bikes-In-holland-10137216.
- 39 Focus Taiwan (2020), "Taiwan records 21% increase in electric bike exports: Trade body", 15 September, https://focustaiwan.tw/business/202009150028.
- 40 Kager and Harms, op. cit. note 1.
- 41 Rotterdam Walks (2020), Rotterdam Walks 2025, City of Rotterdam, https:// www.rotterdam.nl/vrije-tijd/lopen/Rotterdam_Loopt_2025_Gemeente-Rotterdam-DEF-ENGELS-TOEGANKELIJK_DEF2.pdf.
- 42 Queensland Government (2019), Queensland Walking Strategy, State of Queensland, https://www.tmr.qld.gov.au/-/media/Travelandtransport/Pedestrians-and-walking/Queensland-Walking-Strategy-2019-2029.pdf.
- 43 U. Bauer (2018), Geht doch! Grundzüge einer bundersweiten FuBverkehrsstrategie, German Federal Environment Agency, https://www.umweltbundesamt.de/ publikationen/geht-doch; C. Adriazola-Steil and A. Schwedhelm (2020), "Walking the talk: What can we learn from Germany's new pedestrian policy framework?" CityFix, 20 February, https://thecityfix.com/blog/walking-talk-can-learn-germanys-new-pedestrian-policy-framework-2-claudia-adriazola-steil-alejandro-schwedhelm.

- 44 M. Jüssi (2017), Tallinn Region Sustainable Urban Mobility Plan 2035, Estonian Road Administration / Tallinn Transport Department, Tallinn, https://www.mnt.ee/ sites/default/files/content-editors/Failid/Yldine/tallinn_sump_june2017_fesmsteering.pdf.
- 45 UK Aid et al., op. cit. note 16.
- 46 I-CmiiST (2018), "First cycling lane in Kampala", 22 August 2018, https://cmiist. wordpress.com/2018/08/22/first-cycling-lane-in-kampala.
- 47 Lagos State Ministry of Transportation et al. (2018), Lagos Non-Motorised Transport Policy: Empowering Pedestrians and Cyclists for a Better City, Lagos, pp. 11, 12, http://wedocs.unep.org/bitstream/handle/20.500.11822/25415/Lagos_NMT-Policy.pdf.
- 48 Archydede (2020), "The 7 keys to the regulation of the Bicycle Use Law that you should know", 6 June 2020, https://web.archive.org/web/20201220100613/ https://www.archyde.com/clic-aqui-the-7-keys-to-the-regulation-of-the-bicycle-use law-that-you-should-know-bicycle-law-n-30936-peru-society.
- 49 Municipal Public Company of Mobility, Transit and Transportation of Cuenca, "Consejo Contonal aprueba Ordenanza para promoción y fortalecimiento de la movilidad activa en el cantón Cuenca", https://www.emov.gob.ec/concejo-cantonal-aprueba-ordenanza-para-promocion-y-fortalecimiento-de-la-movilidad-activa-en-el-canton-cuenca (accessed 27 May 2021).
- 50 P. Kim and E. Dumitrescu (2010), Share the Road: Investment in Walking and Cycling Road Infrastructure, United Nations Environment Programme (UNEP), Nairobi, https://wedocs.unep.org/bitstream/handle/20.500.11822/7890/-Investment%20in%20Walking%20and%20%20Cycling%20Road%20Infrastructure%20 %20Share%20the%20Road_-2010984,pdf.
- 51 City of Skopje (2019), Advancement Plan Bicycle Traffic 2019-2021, Skopje, https:// skopje.gov.mk/media/4370/predlog-plan-za-unapreduvanje-na-velosipedskl-soobrakaj-2019-2021.pdf; S. Zimbabwe, "Bicycle Master Plan", City of Seattle, https:// www.seattle.gov/transportation/document-library/citywide-plans/modal-plans/ bicycle-master-plan (accessed 27 May 2021).
- 52 ITDP Africa (2019), "Reclaiming pedestrian spaces on the streets of Mombasa", 3 April 2019, https://africa.itdp.org/along-kenyas-coast-streets-maneuver-to-accommodate-more-than-just-cars.
- 53 A. Schubert (2019), "1.6 billion euros for new cycle paths", Süddeutsche Zeitung, 11 December, https://www.sueddeutsche.de/muenchen/muenchen-radwege-1-6-milliarden-euro-buergerbegehren-1.4719690.
- 54 J. Bray (2020), "Cycling and pedestrian projects to get €360m, parties agree", Irish Times, 15 June, https://www.irishtimes.com/news/politics/cycling-and-pedestrianprojects-to-get-360m-parties-agree-1.4279850.
- 55 R. van der Zee (2016), "Could intercity cycle highways revolutionise the daily commute?" 20 June 2016, The Guardian (UK), https://www.theguardian.com/ cities/2016/jun/30/intercity-cycle-highways-revolutionise-daily-commute.
- 56 C. Horn (2016), "RS1 Bicycle Highway No 1 Germany", Urban Planet, 1 October 2016, http://urbanplanet.info/europe/bike-highway-n1-germany.
- 57 International Energy Agency (IEA) (2020), "Employment multipliers for investment in the transport sector", 17 June, https://www.iea.org/data-and-statistics/charts/ employment-multipliers-for-investment-in-the-transport-sector.
- 58 ECF, "Support the European Cyclists' Federation", https://ecf.com/what-we-do/cycling-economy/jobs-and-job-creation-european-cycling-sector (accessed 27 May 2021).
- 59 B. Welle et al. (2015), Cities Safer by Design, World Resources Institute, Washington, D.C., https://www.wri.org/publication/cities-safer-design.
- 60 J. Pucher and R. Buehler (2016), "Safer cycling through improved infrastructure", American Journal of Public Health, American Public Health Association Inc., https:// doi.org/10.2105/AJPH.2016.303507.
- 61 WHO (2021), "Decade of Action for Road Safety 2021-2030", https://www.who.int/ groups/united-nations-road-safety-collaboration/decade-of-action-for-road-safety-2021-2030 (accessed 27 May 2021).
- 62 UK Aid et al., op. cit. note 16.
- 63 J. Murray (2020), "How Helsinki and Oslo cut pedestrian deaths to zero", The Guardian (UK), 16 March, https://www.theguardian.com/world/2020/mar/16/howhelsinki-and-oslo-cut-pedestrian-deaths-to-zero.
- 64 Mapasin (2019), "Ciudades que han derribaron sus puentes peatonales", https:// mapasin.org/ciudades-que-han-derribaron-sus-puentes-peatonales; LA Network (2020), "Medellin returns value to pedestrians with bridge dismantling", 18 June, https://a.network/medellin-devuelve-et-valor-al-peaton-con-desmontede-puentes; B. Haagsman (2020), "Why the removal of pedestrian bridge on Geary is a step forward for safety", Walk San Francisco, 13 May, https://walksf. org/2020/05/13/why-the-removal-of-a-pedestrian-bridge-on-geary-is-a-step-forward-for-safety.
- 65 Ochenuel Mobility (2021), "OpenStreets Abuja", http://mobility.ochenuel.com. ng/openstreets (accessed 27 May 2021); Ciclo Recreovia (2019), "Streets to walk and recreate on Sundays", http://www.ciclorecreovia.cl/ciclorecreovia-temuco (accessed 27 May 2021).
- 66 BBC News (2019), "No traffic in Addis Ababa as Ethiopia marks Car Free Day", 3 February, https://www.bbc.com/news/world-africa-47107327; T. M. Tran (2019), "African Mobility Month: How cities are walking (and cycling) the talk", ICLEI-Sustainable Mobility, 25 November, https://sustainablemobility.iclei.org/african-mobility-month-how-cities-are-walking-and-cycling-the-talk.
- 67 Global Designing Cities Initiative (2016), *Global Street Design Guide*, Island Press, Washington, D.C., https://globaldesigningcities.org/publication/global-street-de-

Endnotes

sign-guide; NACTO (2020), "Street for Kids", https://nacto.org/program/streets-forkids (accessed 27 May 2021); Global Designing Cities Initiative, "Streets for Kids", https://globaldesigningcities.org/streets-for-kids (accessed 27 May 2021); ITDP (2018), "Pedestrians First: A Tool for Walkable Cities", 7 February, https://www.itdp. org/2018/02/07/pedestrians-first-walkability-tool.

- 68 Lagos State Ministry of Transportation et al., op. cit. note 47; Municipality of Lima (2017), Manual de Normal Técnias para la Construcción de Ciclovias y Guía De Circulación de Bicicletas, Lima, https://www.despacio.org/wp-content/uploads/2017/04/Manual-Lima20170421.pdf; Pune Municipal Corporation (2016), Urban Street Design Guidelines Pune, Pune, https://bicycleinfrastructuremanuals. com/manuals4/Pune-urban-street-design-guidelines.pdf.
- 69 J. Ward et al. (2020), Updating Austroads Pedestrian Planning and Design Guidance in Line with International Best Practices, Austroads Ltd, Sydney, https:// austroads.com.au/publications/active-travel/ap-r639-20/media/AP-R639-20_Updating_Austroads_Pedestrian_Planning_and_Design_Guidance_in_line_with_International_Best_Practice.pdf.
- 70 Ministry of Transport of Colombia (2018), "Resolución 3258 de agosto 3 de 2018", Red Jurista, 3 August, https://www.redjurista.com/Documents/resolucion_3258_ de_2018_ministerio_de_transporte.aspx; New Zealand Transport Agency, "Designing a cycling facility", https://www.nzta.govt.nz/walking-cycling-and-public-transport/cycling/cycling-standards-and-guidance/cycling-network-guidance/ designing-a-cycle-facility (accessed 27 May 2021).
- 71 Ministry of Transportation and Infrastructure of British Columbia (2019), British Columbia Active Transportation Design Guide, Vancouver, https://bicycleinfra-structuremanuals.com/manuals3/British%20Columbia%20Active%20Transportation%20Design%20Guide.pdf; Queensland Government, "Principal Cycle Network Plans", https://www.tmr.qld.gov.au/Travel-and-transport/Cycling/Principal-Cycle-Network-Plans (accessed 27 May 2021).
- 72 GIZ (2020), A Tactical Urbanism Guidebook, New Delhi, http://greenmobility-library.org/public/uploads/resource_attachments/1604921362_TU_Guidebook_ November_2020_Final_V2.pdf.
- 73 WHO (2020), Stockholm Declaration Third Global Ministerial Conference on Road Safety: Achieving Global Goals 2030, Geneva, https://www.roadsafetysweden. com/contentassets/b37f0951c837443eb9661668d5be439e/stockholm-declaration-english.pdf.
- 74 WHO (2018), Global Action Plan on Physical Activity 2018-2030: More Active People for a Healthier World, Geneva, https://apps.who.int/iris/bitstream/handle/10 665/272722/9789241514187-eng.pdf.
- 75 ECF (2016), Cycling Delivers on the Global Goals, Brussels, https://ecf.com/sites/ ecf.com/files/The%20Global%20Goals_internet.pdf; T. Litman (2013), Evaluating Active Transport Benefits and Costs: Guide to Valuing Walking and Cycling Improvements and Encouragement Programs, Victoria Transport Policy Institute, https://trld.trb.org/view/1262285.
- 76 SLOCAT (2020), Transport and Voluntary National Reviews 2020: Action for Achieving the Sustainable Development Goals, http://slocat.net/wp-content/uploads/2021/02/SLOCAT-2020-VNR-Analysis.pdf.
- 77 UN-Habitat (2017), New Urban Agenda, Nairobi, https://uploads.habitat3.org/hb3/ NUA-English.pdf.
- 78 WHO, op. cit. note 73.
- 79 COVID Mobility Works (2021), https://www.covidmobilityworks.org (accessed 27 May 2021).
- 80 Ibid.
- 81 TUMI, "Corona Transport Knowledge Platform", https://www.transformative-mobility.org/corona (accessed 20 April 2021); Pedbikeinfo, "Local Actions to Support Walking and Cycling During Social Distancing Dataset", US Department of Transportation, http://pedbikeinfo.org/resources/resources_details.cfm?id=5209 (accessed 27 May 2021).
- 82 Despacio, "Retamos lo intuitivo en las ciudades y en la vida", https://www.despacio.org (accessed 27 May 2021).
- 83 ECF (2017), EU Cycling Strategy, Brussels, https://ecf.com/system/files/EUCS_full_ doc_small_file_0.pdf.
- 84 ICLEI-Sustainable Mobility, "EcoMobility initiative", https://sustainablemobility. iclel.org/ecomobility-initiative (accessed 1 June 2021).
- 85 ICLEI-Sustainable Mobility, "Cities SHIFT", https://sustainablemobility.iclei.org/ cities-shift (accessed 27 May 2021).
- 86 International Federation of Pedestrians (2019), Annual Report 2019, Brussels, https://www.pedestrians-int.org/images/IFP/pdf/MinutesAndReports/IFP-Annual-Report-2019.pdf.
- 87 UNEP, "Share the road", https://www.unep.org/explore-topics/transport/what-wedo/share-road (accessed 1 June 2021).
- 88 UNEP, "Why does sharing the road matter?" https://www.unep.org/explore-topics/ transport/what-we-do/share-road/why-does-sharing-road-matter (accessed 27 May 2021).
- ECF, "Velo-city: The Global Cycling Summit", https://ecf.com/projects/velo-city (accessed 27 May 2021).
- 90 Walk21 (2021), "About", https://web.archive.org/web/20210308224732/https:// www.walk21.com/about (accessed 27 May 2021).
- 91 Walk21 (2021), "Global Sidewalk Challenge", https://web.archive.org/ web/20210123175120/https://www.walk21.com/sidewalks (accessed 27 May 2021).

- 92 Measuring Walking (2019), "Walking Data Standard", https://www.measuring-walking.org/international-walking-data-standard (accessed 27 May 2021).
- 93 UN, "World Bicycle Day 3 June", https://www.un.org/en/observances/bicycle-day (accessed 27 May 2021).
- 94 S. Dongol (2018), "World Bicycle Forum 2020 to be held in Nepal", Cycle City Network Nepal, 8 October, https://cyclecity.org.np/world-bicycle-forum-2020-tobe-held-in-nepal.
- 95 World Cycling Alliance, "About", https://www.worldcyclingalliance.org/who-weare/about (accessed 27 May 2021).
- 96 M. Meireles and P. J. G. Ribeiro (2020), "Digital platform / mobile app to boost cycling for the promotion of sustainable mobility in mid-sized starter cycling cities", Sustainability, Vol. 12/5, p. 2064, https://www.researchgate.net/publica-tion/339791706_Digital_PlatformMobile_App_to_Boost_Cycling_for_the_Promotion_of_Sustainable_Mobility_in_Mid-Sized_Starter_Cycling_Cities/ fulltext/5e663578299bf1744f6badb7/Digital-Platform-Mobile-App-to-Boost-Cycling-for-the-Promotion-of-Sustainable-Mobility-in-Mid-Sized-Starter-Cycling_Cities, pdf; TDDP, Pedestrians First: Tools for a Walkable City, New York, https://www.itdp.org/publication/walkability-tool.
- 97 Walk21, personal communication, with SLOCAT, 14 May 2021.
- 98 F. O'Sullivan (2020), "Paris mayor: It's time for a '15-minute city", Bloomberg CityLab, 18 February, https://www.bloomberg.com/news/articles/2020-02-18/ paris-mayor-pledges-a-greener-15-minute-city.
- 99 J. McMahon (2019), "How bike lanes are transforming Paris", Forbes, 28 December, https://www.forbes.com/sites/jeffmcmahon/2019/12/28/how-bike-lanes-aretransforming-paris/#700ceb0af620.
- 100 Секретаријат за саобраћај (2020), "Контролисан улазак возила у пешачку зону", http://www.bgsaobracaj.rs/kampanja-manifestacija/43/kontrolisan-ulazak-vozila-upeshacku-zonu; D. Bol (2019), "Council reveals £314m overhaul of Edinburgh centre", BBC News, 6 September, https://www.bbc.com/news/uk-scotland-edinburgheast-fife-49613258; C. Wahlquist (2019), "Walking into the future: Melbourne backs plan to curb cars in the CBD", The Guardian (UK), 21 May, https://www. theguardian.com/australia-news/2019/may/22/walking-into-the-future-melbournebacks-plan-to-curb-cars-in-the-cbd.
- 101 A. Buczynski (2019), "32% more cycling in one year after eliminating through car traffic from the centre of Leuven", ECF, 24 July, https://ecf.com/news-and-events/ news/32-more-cycling-one-year-after-eliminating-through-car-traffic-centre-leuven; UK Aid et al., op. cit. note 16.
- 102 Gemeente Utrecht, "Bicycle parking Stationsplein", https://www.utrecht.nl/city-ofutrecht/mobility/cycling/bicycle-parking/bicycle-parking-stationsplein (accessed 27 May 2021).
- 103 Bicycle Dutch (2020), "A huge new bicycle parking garage in The Hague", 1 July, https://bicycledutch.wordpress.com/2020/07/01/a-huge-new-bicycle-parking-garage-in-the-hague.
- 104 Sheffield City Region (2020), "Sheffield City Region announces plans for 1000km of walking and cycling routes", 4 June, https://sheffieldcityregion.org.uk/sheffield city-region-announces-plans-for-1000km-of-walking-and-cycling-routes.
- 105 Houston Bikeways (2017), "Chapter 2: Existing conditions and opportunities", in Houston Bike Plan, Houston, https://houstonbikeplan.org/wp-content/uploads/2017/07/HBP-Chapter-2-Opportunites_Feb17.pdf.

Annex: Methodological Note

- M. Crippa et al. (2020), Fossil CO2 Emissions of All World Countries, JRC Science for Policy Report, Publications Office of the European Union, Luxembourg, https:// ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/fossil-co2-emissions-all-world-countries-2020-report.
- 2 US Energy Information Administration (2020), "Energy and the environment explained: Greenhouse gases," https://www.eia.gov/energyexplained/energy-and-the-environment/greenhouse-gases.php (accessed 14 April 2021).
- 3 International Organization of Motor Vehicle Manufacturers (OICA), "Definitions", https://www.oica.net/wp-content/uploads/DEFINITIONS-VEHICLE-IN-USE1.pdf (accessed 20 May 2021).
- 4 United Nations Statistics Division, "Standard country or area codes for statistical use (M49)", https://unstats.un.org/unsd/methodology/m49 (accessed 20 May 2021).
- 5 World Bank (2021), "World Bank Country and Lending Groups", https://datahelp desk.worldbank.org/knowledgebase/articles/906519 (accessed 20 May 2021).
- 6 United Nations (2019), "World Population Prospects 2019", https://population. un.org/wpp (accessed 20 May 2021); World Bank, "GDP (constant 2010 US\$)", http://data.worldbank.org/indicator/NY.GDP.MKTP.KD (accessed 20 May 2021).
- 7 SLOCAT (2021), "Transport Knowledge Base", https://slocat.net/our-work/knowledge-and-research/trakb (accessed 20 May 2021).



Tracking Trends in a Time of Change: The Need for Radical Action Towards Sustainable Transport Decarbonisation

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:

Attribution 4.0 International (CC BY 4.0) Share — copy and redistribute the material in any medium or format. Adapt — remix, transform and build upon the material for any purpose. Attribution — you must give appropriate credit, provide a link to the licence and indicate if changes were made.



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.

For a full list of acknowledgements, please visit the the online page here.

Explore more online
Download the full report
Download the full endnotes
Contact us



#TransportClimateStatus