

# PUBLIC TRANSPORT FOR HEALTHY LOW CARBON CITIES

NOVEMBER | 2022

## INTRODUCTION

*Well-designed public transport policies and investments will significantly reduce carbon emissions and health risks. This summary report outlines four priority actions that local, regional and national decision makers can take to bring about health, development and human benefits through public transport.*

## SCALE OF THE CHALLENGE

Air pollution is the greatest threat to health worldwide and is estimated to cause 6.7 million deaths each year. Urban transport is a significant source of urban air emissions, responsible for around a quarter of particulate matter globally and principally caused by private vehicle traffic. Almost the entire global population (99 per cent) live in places where air pollution levels exceed WHO guideline limits and not a single country managed to meet the latest air quality standard in 2021, so significantly more needs to be done at the international, national and local levels to meet this challenge.

The OECD has warned that due to predicted rapid rise in private motorization, urban air pollution will be the top cause of environmental mortality by 2050. More cars

in our cities will also mean more traffic fatalities, which already accounts for 1.3 million lives each year - half of which occur in urban areas. Carbon dioxide (CO<sub>2</sub>) emissions would also increase by 60%, which will result in catastrophic climate change which in turn will have significant negative impacts on human health leading to death and illness.

## PUBLIC TRANSPORT – BENEFITING PEOPLE, COMMUNITIES AND PLANET

Sustainable and safe urban mobility is built on public transport. It improves health, physical activity, air quality, social cohesion, employment, and much more and makes a major contribution to the Sustainable Development Goals (SDG) and related targets as well as the Paris Climate Agreement.



1 Global Mobility Report 2017 (World Bank, 2017)

### 3 GOOD HEALTH AND WELL-BEING



## SDG 3 – GOOD HEALTH & WELLBEING

Public transport encourages an active lifestyle and uses public space more efficiently.

Over 90% of public transport journeys in cities include at least two walking trips, and a standard bus takes more than 40 cars off the road. That would free up more green spaces in the city, make them safer and quieter places for people to meet and for children to play and increasing space for pedestrians and cyclists.

Every increase in share of public transport will also deliver big rewards for improved air quality, less noise and safer streets because when public transport ridership is high, traffic fatalities and injuries are lower. So more people using public transport would actually benefit everyone in the entire region, not just those who use it.



## COUNTING THE COSTS

The transport health costs associated with sprawling, car-dependent cities in developing countries is estimated to as high as 5% of GDP. Designing cities around public transport and active mobility will instead deliver significant health and social cost savings, with the net economic benefits outweighing the costs of the development. Johannesburg's Bus Rapid Transit (BRT) system yields up to \$900 million in savings, through improved access, road safety, increased physical activity and CO<sub>2</sub> emissions reductions<sup>4</sup>.

### 11 SUSTAINABLE CITIES AND COMMUNITIES



## SDG 11 – SUSTAINABLE CITIES AND COMMUNITIES

Good and affordable access to public transport

offers equal opportunities to all citizens, independent of their social standing. It provides access to the most essential functions of the city and ensures affordability for all groups of society as it costs 1/16 of what people pay for owning a personal car. If we were to double public transport journeys in cities by 2030, it will not only create millions of new sustainable jobs, emissions from transport in cities would be reduced by 50% in the next decade<sup>2</sup>, allowing us to take urgent action on climate change (SDG13).

## TRANSFORMATIVE ACTIONS FOR HEALTHIER CITIES WITH PUBLIC TRANSPORT

To improve the health of their citizens and help meet the latest [WHO air quality guidelines](#)<sup>5</sup>, cities need to focus on improving the alternatives to the car and giving more space to walking, cycling and public transport. By applying an integrated and balanced mix of Avoid-Shift-Improve transport policies, it will increase equitable access to resilient public transport systems needed to deliver on the SDGs and Paris Agreement.

Country and city leaders all around the world now have an unprecedented range of mobility policy options available to them. Here are four priority actions that decision makers can take.

2 <https://www.c40.org/campaigns/the-future-of-public-transportation/>

3 OECD, 2014. The Cost of Air Pollution: Health Impacts of Road Transport.

4 New Climate Economy Report 2015, Accelerating Low-Carbon Development in the World's Cities.

5 <https://www.who.int/publications/i/item/9789240034228>

## 1) DESIGN CITIES AROUND PUBLIC TRANSPORT AND ACTIVE MOBILITY

Cities need to have an integrated approach to land-use and transport planning. To do so, cities must build strong institutions that will work together. Creating frameworks such as an **integrated public transport authority (PTA)** is one efficient solution.

The development of **Sustainable Urban Mobility Plans (SUMP)**s can assist planning authorities in the development of an integrated vision and approaches. Focusing these on health and people-friendly urban planning policies can support the development of compact, coordinated and connected cities by reforming land-use strategies that fuel urban sprawl. This means influencing the territorial plans, **promote transit-oriented developments (TODs)** and new buildings where there are or could be good connections by public transport.

They can also apply **land-value capture** around transport facilities and promote mixed-used developments to reduce distances people need to travel. Greater use of land value capture can also help finance large-scale public transport infrastructure, while also driving more compact urban forms.

### CURITIBA, BRAZIL, IMPROVING PUBLIC TRANSPORT ACCESSIBILITY

The city has combined its zoning regulations with transport planning to encourage high-density development close to the BRT system. Since there is now more people with convenient access to public transport, as they can now reach the nearest stop on foot or by bike, there are now fewer than 27 million private vehicle journeys made each year, which means the city uses around 30% less fuel per person than other comparable cities and has one of the lowest levels of air pollution in the country.



### IMPROVING EUROPEAN CITY'S AIR QUALITY WITH LOW EMISSIONS ZONES (LEZ)

In Berlin, Germany, diesel particles emissions were reduced by 58%, while nitrogen oxides emissions decreased by 20%. In Brussels, Belgium, nitrogen oxides emissions have been reduced by 9% and black carbon emissions by 38%.

LEZ can also be coupled with urban tolls, such as the Area C in Milan's city centre in Italy, which has reduced incoming traffic by 30%, reduced particulates by around 20% and helped increasing the efficiency of public transport in the area.

## 2. IMPROVING AIR QUALITY IN CITIES WITH LEZ

Several dozen cities globally, most of them in Europe, have implemented or announced plans to implement LEZs. The aim is to reduce emissions of air pollutants, by either **forbidding the access or charging high fees to polluting vehicles**. Often, electric or vehicles meeting certain fuel standards are permitted to enter or are exempt from the charge, depending on the scheme's design.

The socio-economic benefits associated with the zones - through improved health, reduced noise and by creating a more attractive environment for companies and people - offset the costs of introducing and operating the scheme.

The effectiveness of LEZs has depended on the enforcement and level of stringency in the types of vehicles re-



stricted from the zone. Politically LEZ's have been difficult to gain public support and to pass at first but **national governments can support the uptake**, for example Spain has made LEZ mandatory in all cities and towns with more than 50,000 people by the end of 2023.

### 3. APPLY URBAN VEHICLE ACCESS RESTRICTION (UVAR)

The most well-known solution to UVARs is **congestion charging**, which imposes a fee on all vehicles entering a specific zone, typically during peak hours. This differs from LEZ in that all vehicles are subject to a fixed levy rather than just those with the highest emission rates. Implementing a congestion charge is a policy aimed at reducing traffic congestion but can also be used to **fund public transport and promote a modal shift**.

The monitoring of performance is viewed as essential to inform the public of ongoing changes and show the benefits and improvements that these schemes bring given the sensitivity of congestion charge. Cities should also listen to citizens' concerns and needs, so they can improve the effectiveness of the measures implemented and raise awareness of air pollution more generally.

#### IMPROVING THE UK CAPITAL'S AIR QUALITY AND PUBLIC TRANSPORT

London's congestion charge was introduced in 2003, and the revenues raised have been ring-fenced for invest in more public transport. Since the schemes introduction, London's road safety and air quality improved significantly, with a 12% reduction of particulate matter and nitrous oxide emissions.

### 4. EMBRACE THE TRANSITION TO LOW EMISSIONS PUBLIC TRANSPORT

While the rail sector is already highly electrified and considered zero emissions at point of use, renewing and modernising bus fleets to cleaner technology is always an opportunity for cities to improve the quality of transport and reduce polluting emissions as they are the most used mode of public transport around the world. At the same time, buses are often stigmatised as being the reason for poor urban quality and health in cities but this could not be further from the truth. Regardless of the type of fuel that a public transport vehicle uses, riding the bus or taking a train helps to reduce air pollution. Studies have shown that a diesel bus with the most stringent emissions standard emit four times less NOx per passenger/km than an equivalent diesel car .

Bus fleet renewal and/or extension represent an important opportunity to improve the quality, efficiency and image of public transport as a whole, which can encourage more people to use it. There is a wide choice of cleaner fuel and engine technology for urban bus operations as well as non technical measures such eco-driving and public transport prioritisation lanes, which can also improve tailpipe emissions by as much as a quarter.

Electric buses are becoming an increasing part of the bus fleet renewing process and by replacing their conventional buses with fully electric buses alongside clean energy, they can make significant cuts in emissions. This is because they have zero tailpipe emissions and are quiet, which can play a significant role in enhancing health and quality of life in urban centers, by helping to reduce fatigue, improve sleep and enhance people's mood <sup>6</sup>. This provides new opportunities for better urban planning and increased flexibility for public transport in cities.

Clean and low emissions public transport can be especially helpful in implementing LEZ or UVARs in areas that suffer from high levels of air pollution through modal shift. When it comes to zero-emission technologies like battery-electric or fuel cell hydrogen, fleet renewal includes a fundamental paradigm shift from purely vehicle, to complete system procurement.

#### THE LARGEST FULLY ELECTRIC BUS FLEET IN SHENZHEN, CHINA

Shenzhen is currently the only city in the world to have converted its entire bus fleet of 16,700 buses to electric. UITP Training Centre in Shenzhen shows how to evolve from an experimental stage to a viable product. The maintenance regime is digitalised and data-driven allowing the company to set a global benchmark for other bus companies to follow. The benefits are significant, saving around 194,000 tons of CO<sub>2</sub> per year, with no tailpipe pollutant emissions.



<sup>6</sup> University of Gothenburg, 2022. Better residents' health after switch to electric buses: <https://www.gu.se/en/news/better-residents-health-after-switch-to-electric-buses>

## CONCLUSION

*To create healthy, inclusive, economically competitive, zero-carbon urban areas, cities need to have an integrated approach to land-use and transport planning. This means establishing cross-party political support and commitment, strengthening visions and policies. To do so, cities must build strong institutions that will work together to deliver the vision, make sure urban and mobility planning work hand in hand to control urban sprawl, regulate the mobility market and stabilise long-term funding to enhance infrastructure and service provision to scale up the modal split of public transport and active mobility.*



## RECOMMENDATIONS

- A significant part of the health solution should involve equipping cities with integrated public transport, reducing risks from traffic injuries, sedentarism, air pollution and noise. It will deliver significant health and social costs savings, with the net economic benefits significantly outweighing the costs of development.
- Prioritise public health and reducing emissions through integrated long-term planning. Develop a long-term strategic plan that considers land-use, housing and transport all together: acknowledging the relationships between health outcomes and the way we travel, and adopting a people-centred perspective that individual health does depend on a multiplicity of environmental factors.
- The denser and more compact a city is, the more sustainable it becomes. Avoid urban sprawl, densify, influence the type and location of new developments and concentrate them around public transport infrastructures.
- Diverse mechanisms are available to support investment in the sector, which is then reinvested back into the economy. Cities should consider implementing charging schemes as they have proven to be an efficient tool to fund the public transport sector and/or improve public realm and limit through traffic in cities, thus reducing air pollution.
- Support a modal shift to public transport as it is the easiest and quickest way to decarbonise the transport sector, improve health and fight climate change.
- Incentivise investment in decarbonisation as clean and zero-emission solutions are available now for all types of public transport vehicles and services.

This is a Summary Report of UITP, the International Association of Public Transport. UITP represents the interests of key players in the public transport sector. Its membership includes transport authorities, operators, both private and public, in all modes of collective passenger transport, and the industry. UITP addresses the economic, technical, organisation and management aspects of passenger transport, as well as the development of policy for mobility and public transport worldwide.

DIGITAL VERSION AVAILABLE ON  
 MYLIBRARY

NOVEMBER | 2022