C40 CLEAN AIR ACCELERATOR

Cities are cleaning the air we breathe in an inclusive and equitable way

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Progress Report 2024

C40 CITIES

ACKNOWLEDGEMENTS

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INTRODUCTION

Clean air action is a transformative opportunity for cities. It delivers major public health benefits, increases residents' well-being, and spurs cities' economic growth while directly reducing the toxic pollutants that affect our air and climate. C40 cities are at the forefront of these efforts, with C40 mayors exemplifying the bold leadership needed to reduce air pollution – locking in the benefits for residents and building more resilient and equitable cities. In 2019, C40 launched the Clean Air Accelerator – a unifying framework for leading mayors to deliver ambitious action. Over the past five years, cities have been making meaningful changes where people live, work, and thrive, showing that cleaner air in cities is possible.

Air pollution is a global health and climate justice issue, with adverse health effects – even at relatively low concentrations – affecting people in cities across the world. According to the latest State of Global Air Report (2024), air pollution accounted for 8.1 million deaths globally in 2021, making it the second leading risk factor for death, including for children under five years.[1] Exposure to fine particulate matter (PM) and other pollutants can lead to significant health issues, including respiratory and cardiovascular diseases; exacerbate chronic conditions and accelerate neurodegenerative diseases; impact cognitive development and function, mental health, and reproductive health; and increase the risk of premature death, even when levels are below the current regulatory limits in many countries and cities.

The World Health Organization (WHO) updated its air quality guidelines in 2021 to reflect the latest scientific evidence on the health impacts of air pollution, which points to the need for more stringent air quality targets and standards.[2] This growing body of evidence also highlights the importance of ambitious policies to mitigate the risks associated with air pollution, with a particular emphasis on designing and implementing air quality and climate action with equity at its centre. The C40 Clean Air Accelerator was created to align with this same vision, bringing cities together and encouraging them to work towards achieving the WHO guidelines in an inclusive and equitable way.

Since the WHO updated its guidelines, many countries across the world have implemented stricter standards and regulations. In the USA, the Environmental Protection Agency lowered the annual $PM_{2.5}$ limit from 12 μg/m^3 to 9 μg/m^3, with effect from May 2024, to prevent thousands of premature deaths and reduce inequities and health costs. In October 2024, the European Union approved newer, more stringent air quality standards, with a target to reduce exposure to pollutants to 10 μg/m^3 for $PM_{2.5}$ and 20 μg/m^3 for NO_2 by 2030. These targets bring the EU's air quality standards closer to the new WHO guidelines, helping to protect more people and avoid hundreds of premature deaths.

By setting ambitious clean air targets, cities can create openings to deliver health improvements, economic opportunities, and equitable outcomes for all residents. Crucially, clean air action must

[1] State of Global Air Report 2024 | State of Global Air. (n.d.). https://www.stateofglobalair.org/resources/report/state-global-air-report-2024

[2] WHO global air quality guidelines. Particulate matter ($PM_{2.5}$ and PM_{10}), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. Geneva: World Health Organization; 2021. https://www.who.int/publications/i/item/9789240034228

put equity at the centre – from the initial design phase through to full implementation – in order to achieve these goals and successfully address the disproportionate burden of air pollution affecting frontline communities.

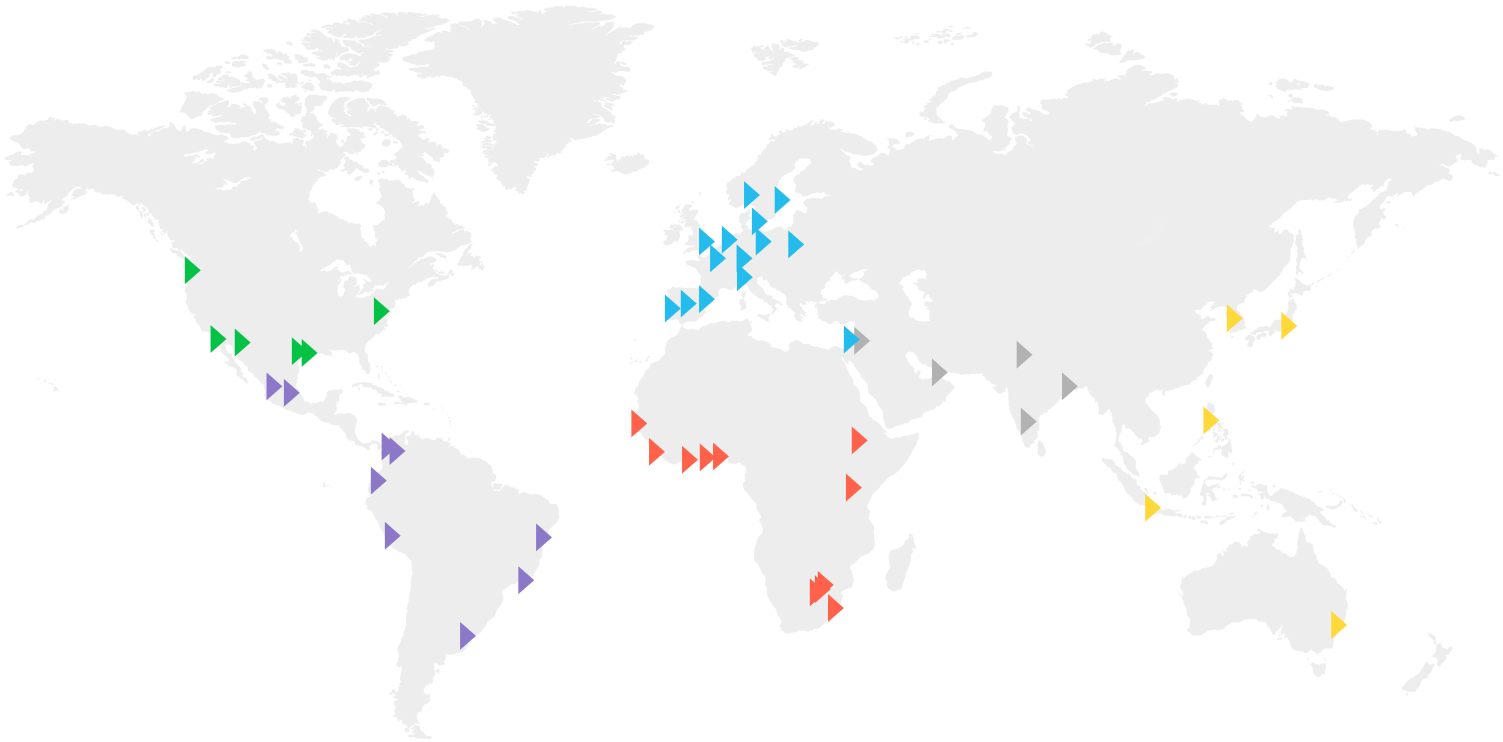
Cities have a unique opportunity to lead inclusive clean air initiatives – and paying special attention to addressing disparities, amplifying diverse voices, and centring underrepresented communities will bring about the greatest health and social benefits. Through tailored solutions and collaboration across sectors, cities can drive innovative and scalable projects; moreover, by engaging residents in inclusive urban governance, cities can design and implement co-created solutions that are truly effective in advancing public health, reducing inequity, and creating more resilient cities.

Mayors understand the urgency of this issue and are acting to reduce air pollution and inequities in their cities. By signing the C40 Clean Air Accelerator, mayors from 50 cities around the world have committed to:

- establish baseline levels and set ambitious reduction targets for air pollutants that meet or exceed national commitments. These targets will put cities on a path towards meeting WHO Air Quality Guidelines for particulate matter, nitrogen dioxide, ozone, and sulphur dioxide; and
- implement new substantive policies and programmes to address the top causes of air pollution emissions within cities and under their control.

This year's report highlights the approaches cities are taking to fulfil these commitments, deliver cleaner air to residents, and meet ambitious air quality and climate goals, all while placing equity at the heart of their strategies.

SIGNATORIES



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- Warsaw
- Washington, D.C.

HOW ARE CITIES CLEANING THE AIR WE BREATHE IN AN INCLUSIVE AND EQUITABLE WAY?

C40 cities play a key role in tackling the climate and air pollution crisis. With C40 cities accounting for more than 22% of global GDP, and representing 6% of total global emissions, local governments are in a unique position to tackle the climate crisis and air pollution for almost 600 million people living in them.

Local governments have both the power and responsibility to improve residents' quality of life. During the past five years, signatory mayors of the C40 Clean Air Accelerator have been working to fulfil this mandate by cleaning their air, tackling climate and health injustices, and delivering equity benefits. Through bold, inclusively designed and implemented policies and programmes, these leading mayors are reducing air pollution, improving public health, promoting fairness, boosting livelihoods, and creating better, greener jobs.

By focusing air quality action on frontline communities, mayors can ensure that the benefits of cleaner air reach those who need it the most. The intersection of social, economic, and environmental inequalities in cities leaves lower-income communities disproportionately exposed to the harmful impacts of air pollution. Many of these residents live near industrial facilities and transport routes or are exposed through their daily commutes. Some also live with inadequate access to services and clean energy options, leaving them cooking or heating with dirtier fuels. Other communities are exposed to pollution from solid-waste emissions and open-waste burning, or have reduced access to green, safe, and healthy public spaces. In addition, workers in low-paid jobs are more likely to be exposed to air pollution in their workplace, due to physical and/or outdoor-based work.

C40 cities have been working to tackle air pollution in an inclusive way, empowering communities to take part in policy decision-making and implementing ambitious actions and policies. These efforts are bringing improvements to people's working and living environments and delivering equitable health and well-being benefits by:

- **improving access to healthy, safe, and resilient public spaces;**
- **improving access to public transport and cleaner vehicles;**
- **promoting healthier and more sustainable homes;**
- **creating more good, green job opportunities; and**
- **empowering residents through data access and collaborative governance.**

This section will provide an overview of five different approaches signatory cities have taken during the past five years to clean the air in an inclusive and equitable way.

1. IMPROVING ACCESS TO HEALTHY, SAFE AND RESILIENT PUBLIC SPACES

Signatory cities of the C40 Clean Air Accelerator are building safer environments that are cleaner and healthier for people. By reallocating space from motorised vehicles to people, cities are creating safer, greener, and more accessible public areas, where residents can carry out their daily activities and enjoy outdoor spaces without worrying about how their health is being impacted by toxic air. Residents have access to urban environments where they can walk, roll, or cycle down the street; play or meet friends on city squares and parks; and get safely to the bus station to go to work. By promoting and democratising the use of these public spaces, cities are also increasing residents' sense of belonging and community, and looking after the needs of lower-income communities – who are often more dependent on public areas for socialising, recreation, or accessing essential services, and who rely on public transport to move across the city. The remainder of this section describes some of the ways in which cities are delivering on these commitments to create healthy, safe, and resilient public spaces.

Cities are creating **clean air zones** and **reallocating street space**, giving more space to people in a manner that better represents street use. The creation of clean air zones in urban areas is improving residents' lives – and is taking root across cities in many regions of the world. So far, 31 signatory cities have implemented regulations that tackle emissions from traffic by controlling the circulation of polluting vehicles, and more cities plan to implement these zones in the future. The use of private cars in cities is one of the top contributors to air pollution and greenhouse gases, making it a key area for targeted air-quality action. In **London**, for example, toxic nitrogen dioxide pollution has been reduced by almost 50% since Mayor Khan implemented the ultra-low emission zone (ULEZ) in 2019.

Streets that are designed for people, rather than vehicle usage, tend to be safer and less polluted. Cities like **Paris** have **reduced the speed limits** across most of their streets to 30 km/h, and given space back to people by **reducing the availability – and increasing the cost – of street parking** for the heaviest, most polluting vehicles. With cars in Paris taking up to 50% of street space while only accounting for 13% of journeys, reducing the space used for street parking has had a transformative impact on the urban environment, while prioritising disabled parking spaces to ensure that those who need them can move across the city.

Many cities are also **allocating the necessary space for people to move actively**, with better sidewalks and cycling infrastructure leading to an increase in the number of people cycling, walking, or rolling – to get to work, to visit friends and family, or to enjoy the city streets. In many African cities, such as **Addis Ababa, Dar es Salaam, Lagos**, and **Nairobi**, more than 40% of travellers go by foot or bike. This offers fertile ground for cities to promote active mobility solutions, emissions reduction, and safer transportation by building on these existing trends. **Addis Ababa**, for example, is expanding its infrastructure with 96 km of pedestrian walkways and 100 km of designated bike routes. Active travel policies and infrastructure can create a more equitable and inclusive urban environment, righting historical climate injustices by providing affordable and accessible transport options – especially for residents with diverse needs and those from lower-income and historically marginalised communities – while building people-centred streets and supporting a modal shift towards sustainable transport systems.

Lima has developed an inclusive cycle strategy to encourage the use of bicycles – especially among women and young people from low- and middle-income groups – and promote more equitable mobility. In **Berlin**, meanwhile, the Mobility Act paved the way for additional cycling and pedestrian infrastructure; between 2021 and 2023, 87.8 km of new cycle paths were built, bringing the total city network to over 2,000 km in length. This will help ensure that street space and usage prioritises people over cars, with the aim of reducing car traffic by almost 10 points to 18% by 2030.

Cities are also putting a special focus on improving the environment for their most vulnerable populations, including children. **Barcelona** is using urban planning tools, air quality audits, and educational and awareness programmes to improve air quality in school areas; more than 200 schools have been protected by actions such as the **school streets** initiative, the Escola Respira programme, and other street-calming projects that prioritise healthy and safer environments around schools. Some schools in the city have also been transformed into climate shelters that can be used by the community during climate emergencies.

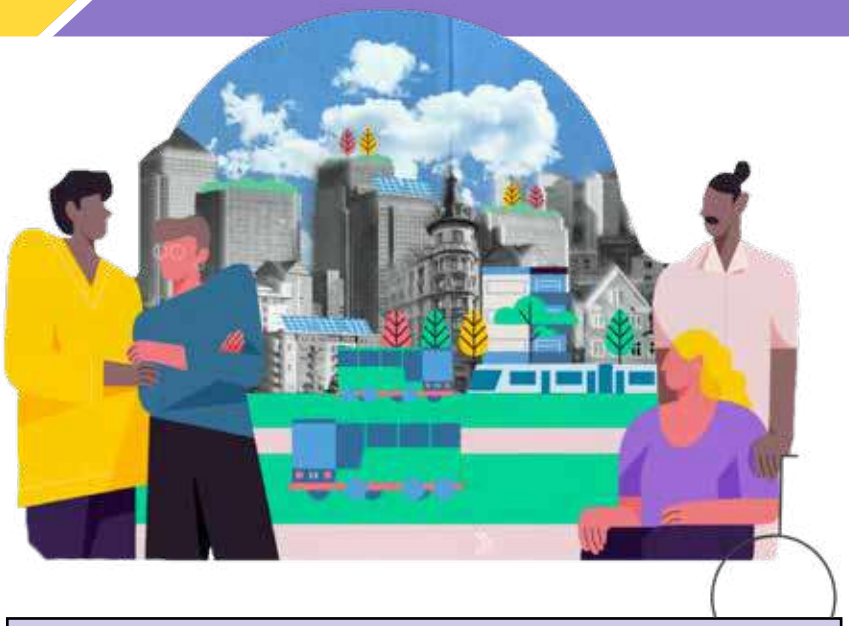
In **Bogotá**, the low-emission zone (ZUMA) and other initiatives such as Barrios Vitales are **improving access to healthy, safe, and good-quality public spaces** in neighbourhoods across the city, guaranteeing residents proximity to bike lanes and public transport networks; schools and universities; parks and gardens; health and other public services; and commercial areas. Inhabitants of these neighbourhoods also benefit from reduced air and noise pollution.

Increased urban greening and tree coverage is key to enabling a modal shift towards active and public transport, building resilience in cities, and adapting to the effects of the climate crisis. **Phoenix** is expanding its green coverage and increasing tree equity, planting trees in residential areas to ensure the greatest impact on human health and well-being, and focusing on reducing inequities by centring vulnerable populations.

2. IMPROVING ACCESS TO PUBLIC TRANSPORT AND CLEANER VEHICLES

Mayors are also creating more sustainable and fair cities by expanding, improving, and cleaning their public transport networks, delivering conditions that are better, safer, and more accessible, convenient, and reliable for people moving across cities. Public transport is often more affordable than owning a car, and many residents in lower-income neighbourhoods depend on public transport networks to access their places of work, schools, healthcare settings, or other essential services. These networks are also essential to people who can't drive and who may be vulnerable, including disabled people or the elderly. Public transport can also help improve safety in cities by reducing traffic-related incidents. Finally, access to public transport promotes active travel – which in turn helps to create healthier lifestyles and improve public health – and reduces the disproportionate impact that a lack of diverse and sustainable transport system has on marginalised communities.

Cities are **increasing their public transport coverage**; **Jakarta**, for example, has doubled the size of its public transit network in just five years, while **reducing the costs** of using it from around 30% of average income to around 10%. This ensure that the system is accessible to those who need it the most.



In addition, cities are focusing on targeted expansions that provide more public transport services for vulnerable and lower-income neighbourhoods – such as in **Ciudad de Mexico** and **Freetown**, where new cable bus lines are being provided to under-served communities.

Through its La Rolita initiative – the city's first public transportation operator with a 100% electric fleet – **Bogotá** is not only **electrifying its public transport** and creating green jobs but also driving gender inclusion and equality in the sector. The city's bus rapid transit (BRT) system has **improved and expanded access to public transport** and created over 2,000 new operations jobs, prioritising the employment of women and people from vulnerable social groups. As a result, nearly a quarter of Bogotá's TransMilenio employees are women, 62% of whom are single mothers.

Delhi is on track to **electrify its entire bus fleet** by 2025, giving special attention to **improving equitable access** and offering free bus rides for women to make public transport more accessible and reduce congestion. So far, over 1,900 compressed natural gas (CNG) buses have been replaced with electric buses, contributing to emissions reduction in the city.

Portland is implementing actions to **expand access to electric vehicles** – particularly for residents of colour and those from low-income communities – and to support a climate-friendly future through the Electric Vehicle (EV) Ready Code Project, aiming to minimise future retrofit costs. This type of action helps to reduce inequities in residents' access to clean transport alternatives when the use of active or public transport is not an option, and lowers the exposure of these communities to air pollution. This is particularly important as Black and minority groups in the USA are at greater risk of harm from air pollution compared to non-Hispanic white people – despite being less responsible for causing the pollution in the first place.

3. PROMOTING HEALTHIER AND MORE SUSTAINABLE HOMES

Air pollution in homes disproportionately affect lower-income, vulnerable, and marginalised populations.[3,4] Addressing the sources of emissions in households presents an opportunity not just to clean the air within these homes, but also to reduce health inequities, disproportionate healthcare costs, and energy poverty in cities. Signatory mayors are working to improve living conditions and indoor air quality in households, while promoting lower energy costs and a reduction in the use of dirty fuels. In some cases, households lack direct access to electricity, forcing them to rely on solid and fossil fuels for cooking and heating. The cost of transitioning to cleaner technologies can also be prohibitive for lower-income communities, further entrenching their reliance on these toxic fuels and hampering attempts to phase them out of use. Indeed, the high cost of energy can be unaffordable to many households, forcing people to choose between dirtier alternatives or disproportionate exposure to extreme weather conditions. All these issues in cities can drive disparities in health impacts and energy poverty, especially for frontline communities.

[3] World Health Organization (2024) Household Air Pollution and Health. www.who.int/news-room/fact-sheets/detail/household-air-pollution-and-health

[4] Figueroa, L., & Lienke, J. (2022) The Emissions in the Kitchen. https://policyintegrity.org/files/publications/Emissions_in_the_Kitchen_Report_v3_%281%29.pdf

Improving the energy efficiency of residential buildings, cleaning the fuels that residents use, or switching appliances to cleaner options can significantly reduce the pollutants people are exposed to at home.[6,7] These actions can lead to healthier home environments and promote household comfort and well-being, while reducing energy needs and bills. The greatest impacts of household air pollution are faced by frontline communities; improving indoor air quality for these groups lowers the associated health risks, reduces absences from school and work, and thereby protects incomes and helps foster economic stability and security.[8,9]

Warsaw has **passed legislation to phase out the use of polluting fuels for heating, while economically supporting residents.** The city passed a ban on "non-class" coal and wood boilers in the building sector and a subsidy programme providing residents with financial assistance for cleaner fuels, such as heat pumps and photovoltaics. Between 2017 and 2023, the number of non-class boilers fell by 80%, from 15,000 to 3,000, leading to the highest reduction in $PM_{2.5}$ among European cities. In addition, through its Carbon-neutral and Affordable Retrofits for Everyone in Need (CARE) project, Warsaw refurbished homes to increase their energy efficiency and improve residents' health and well-being. Many of the houses involved are now completely coal-free.

Addis Ababa is working to ensure that future buildings are cleaner, with a **new building energy efficiency directive** that will reduce emissions from biomass and diesel generators.

Other cities, including **Tshwane**, are working to **expand the provision of energy services to informal settlements**, thereby reducing the use of solid fuels and the burning of waste in informal households, and lowering the exposure of these communities to air pollution. This is especially important for women, who are disproportionally exposed to toxic fumes from cooking with dirty fuels.

[6] C40 Cities (2024) The Benefits of Healthy and Efficient Buildings Synthesis Report. www.c40knowledgehub.org/s/article/The-benefits-of-healthy-and-efficient-buildings?language=en_US#:~:text=City%20governments%20working%20directly%20with,more%20productive%2C%20or%20the%20increased

[7] C40 Cities (2023) Why cities need to move away from fossil gas. www.c40knowledgehub.org/s/article/Why-cities-need-to-move-away-from-fossil-gas

[8] C40 Cities (2021) Clean air, healthy planet: A framework for integrating air quality management and climate action planning. www.c40knowledgehub.org/s/article/Clean-air-healthy-planet-A-framework-for-integrating-air-quality-management-and-climate-action-planning?language=en_US

[9] Clean Air Fund (n,d,) Economy and Air Pollution. www.cleanairfund.org/theme/economics

4. CREATING GOOD, GREEN JOB OPPORTUNITIES

By implementing policies and actions that reduce air pollution and greenhouse gas (GHG) emissions, mayors are also contributing to the creation of good, green jobs that improve employment stability, working conditions, wages, and workers' well-being. With cities representing 80% of global GDP, supporting the creation of better employment opportunities is key to ensuring that these policies have the most beneficial impact on urban communities – and help foster more equitable and inclusive societies. There are over 7.7 million green jobs in cities signatories of the Clean Air Accelerator, generating equitable, sustainable, and secure employment opportunities for residents and driving progress towards a future where everyone can thrive.[10]

When done well, air quality action can help deliver a just transition away from fossil fuels in key sectors, leading to safer and healthier working environments, and training and capacity-building opportunities to reduce the skills gap for marginalised communities, young people, women, and the unemployed. The implementation of clean air policies and creation of good, green jobs in cities can also help protect incomes, reduce health costs and household bills, support more resilient economies, and benefit businesses. Street pedestrianisation is one example of an action that has been shown to increase local businesses' economic performance, which in turn can help create jobs.

Cities like **Amman** are reducing air pollution and creating green jobs by integrating informal waste pickers into recycling value chains. **Accra**, meanwhile, is **improving the well-being of waste workers** and tackling social stigma and marginalisation, using a billboard campaign to raise public awareness about the crucial role that these workers play in tackling key issues in the city, such as air pollution. The city is also supporting 200 informal waste workers with a first-of-its-kind social insurance registration initiative, providing them with protection from heat stress and loss of earnings.

[10] C40 cities (2024).Good, green jobs. www.c40.org/campaigns/good-green-jobs/

Appropriate and universal waste collection and management can help reduce the emissions caused by open burning and decomposition of organic matter close to urban settlements, which often impacts lower-income communities the most. Mayors are increasingly expanding waste-collection services across cities to achieve universal coverage for all residents. Cities like **Paris** are also **electrifying their refuse vehicles**, reducing emissions and ensuring that workers also benefit from positive impacts.

By creating safer and healthier working conditions, signatory cities are also reducing inequities. People who work outdoors, or in highly polluting industries like construction, are more exposed to air pollution and at higher risk of associated health problems. To help address this, **Delhi** is focusing on **tackling dust from the construction and demolition of buildings**, releasing a 14-point set of guidelines for construction sites of more than 5,000 square metres, in order to reduce dust pollution during the winter season. The city is also pushing for cleaner construction practices through compulsory registration and compliance, and a web-based dust control audit portal for mandatory self-reporting of dust-generating projects, including construction and demolition activities on plots of 500 square metres or more. Delhi's pollution control board has also published a toolkit, Advancing better air quality with clean construction, to guide cleaner construction and reduce workers' and residents' exposure to air pollution.

Meanwhile, cities like **Oslo** have **required fossil-fuel-free construction sites** in all new zoning plans since 2020, with all construction machines and equipment to be zero-emission by 2025 and construction vehicles to be zero or low emission (i.e. battery electric or hydrogen) or biogas, to further reduce direct exposure to air pollutants.

Other cities like **Los Angeles**, **Madrid**, and **Rotterdam** are improving working conditions through the reduction of emissions in the urban logistics sector. Actions such as the implementation of micro-logistics hubs or the deployment of zero-emissions delivery or freight zones are helping reduce the exposure of workers to pollution from vehicle exhaust.

5. EMPOWERING RESIDENTS THROUGH DATA ACCESS AND COLLABORATIVE GOVERNANCE

Mayors are also promoting collaborative air quality governance, **putting their residents at the centre and ensuring they can take an active part in climate-policy decision-making and implementation**. Alongside this, residents are being equipped with information on air pollution levels in their city and the health risks associated with exposure to toxic air.

Surveys conducted by C40 in cities worldwide have shown that many residents still don't have a good understanding of the main sources of air pollution and how it impacts their lives and health, despite city efforts to raise awareness. In Bogotá, for example, although 92% of residents say that they think about air quality daily, many are unaware of primary pollution sources. Strong and reliable data can help build people's knowledge of and support for the air quality policies that will bring cleaner air to their neighbourhoods. It will also help fight disinformation and build empowered communities that can actively participate in decision-making and drive action for cleaner air. Cities are using innovative visual tools in their **public communication campaigns** to expand public awareness on air pollution sources and impacts.

Cities are expanding their air quality monitoring networks, increasing coverage with a focus on improving the data around vulnerable populations and historically marginalised communities. To achieve this, cities are deploying a mix of reference-grade monitors alongside newer technologies that can measure air pollution levels with lower-cost monitors.

Stakeholder engagement is a powerful tool for building public and political support in cities. When engaging frontline communities, it is especially important to understand existing inequalities – and to work together with affected residents to identify the best strategies for tackling these injustices and preventing their perpetuation. Creating meaningful participation also means ensuring that **stakeholders are equipped with accessible, clear, transparent, and accountable information** about the air they breathe and the benefits of action. This is crucial to building public support, driving local action, and mobilising residents.

Quezon City set up the city's first air quality monitoring network – now the most extensive in the Philippines, with 40 sensors – **improving the availability of air quality data** with a special focus on vulnerable communities in the selection of sites for the monitors. With C40's support, **Quezon City** has engaged public schools and disability centres, strengthening the support given to teachers and parents to deliver city-wide climate and air quality awareness, education, and empowerment – with a specific focus on young people, including those with disabilities.

In another example of community engagement and empowerment, the Department of Energy and Environment (DOEE) in **Washington, D.C.** worked with local residents and community groups to determine the placement of a new air quality monitor in Ward 8.

Meanwhile, in **Bogotá**, city officials sought to improve air quality management with a more community-centred focus, through the launch of their Collaborative Microsensor Network. Joint data collection efforts have given both the city and its residents a better picture of local air pollution and its impacts on communities, while promoting citizen participation and learning about environmental science. Bogotá has also worked to enhance inter-sectoral collaboration, launching its public declaration "United for a New Air Pact" in 2021 as part of the city's Strategic Plan for the Comprehensive Management of Air Quality in Bogotá 2030. The pact combines multi-sectoral commitments from residents, the private sector, and academia on habits and actions that will contribute to improving air quality in the city.

Cities like **Delhi** and **Quezon City** are also empowering residents by promoting their shared responsibility to report activities that contribute to local pollution. Tools such as the "Green Delhi App" provide access to real-time air quality data and allow users to report grievances – such as the illegal burning of trash, dust pollution from building sites, smoke emissions from vehicles, and noise pollution, among others.

Implementing equitable and data-driven air quality policies and programmes is key to advancing towards healthier, happier, and more sustainable cities. The ways in which cities are tackling air pollution vary, with approaches depending on legal mandates and levels of power to reduce emissions, as well as different social and economic factors. Signatory cities of C40's Clean Air Accelerator have the opportunity to improve the lives of their more than 252 million residents, creating healthier and more resilient environments and economies. Cities are showcasing a range of innovative and impactful approaches – to improving public spaces, enhancing public transport, ensuring healthier homes, creating green jobs, and empowering communities with data access and participatory governance – to effectively combat air pollution and foster sustainable urban development, and ultimately to promote public health and social equity.

Raphael Pouget / Climate Visuals Countdown

CITY PROGRESS SUMMARIES

The following section of this report contains progress and action summaries that were self-reported by each of the C40 Clean Air Accelerator signatory cities. The city summaries showcase the advances made since joining the accelerator, with details on actions the city is undertaking to achieve the implementation milestones of the accelerator.

SIGNATORY CITIES IN

AFRICA

ACCRA

GHANA

Since joining the C40 Clean Air Accelerator in May 2022, Accra has developed a number of initiatives to improve air quality, including the city's contribution to Ghana's National Electric Vehicle Policy towards a national transition from fossil-fuel-powered to electric vehicles. Around 50 air quality monitors have been mounted in the Greater Accra Metropolitan Area, in collaboration with the Ghana Environmental Protection Agency and with support from the Clean Air Fund.

The C40-supported Accra Inclusive Climate Action Programme emphasises stakeholder involvement and sustainability in actions across the waste management, transport, and energy sectors. A new waste separation project was rolled out in 2024, as part of a sustainable, circular-waste approach to curb the open burning of waste and improve air quality in the city. This will be accompanied by a planned electrification scheme for the city's mass transit system, with fossil-fuel-powered vehicles being retired from the fleet.

Also in 2024, Accra joined the Breathe Cities programme – part of the initial cohort of 10 cities that will receive support to scale local impact and exchange knowledge. Spearheaded by the Breathe Accra Project Coordinating Unit at the University of Cape Coast, in collaboration with 13 municipal assemblies in the Greater Accra Metropolitan Area, the Breathe Accra project seeks to strengthen Accra's capacity for monitoring and managing air quality, accelerate local air quality improvements, and help inspire greater action on air pollution in other African cities. Recognising that poor air quality causes significant health risks and economic costs, the initiative seeks to create a cleaner, healthier urban environment while fostering sustainable development.

Clean air is essential for human health, environmental sustainability, economic prosperity, and social equity. Accra, like many rapidly urbanising cities, faces rising air pollution levels due to emissions from transportation, industries, open burning, and improper waste

Educating plastic recyclers on air quality © GAMA

management. The resulting poor air quality threatens vital aspects of life and brings significant public health impacts, including respiratory and cardiovascular diseases, premature deaths, and increased burdens on healthcare systems. Without intervention, the health and environmental costs of air pollution in the metro area will increase, undermining the city's growth and damaging residents' quality of life. Breathe Accra aims to mitigate these issues through a combination of policy measures, technological advancements, and active community engagement, to reverse current harmful trends and foster a sustainable, healthier future for the metropolis. Its defined objectives are: to improve air quality; promote public awareness; foster sustainable practices; strengthen partnerships; and monitor and evaluate progress.

The AMA has benefited from 13 lower-cost air node sensors and four higher-cost sensors provided by the Breathe Cities project. Real-time air quality information from these monitors will be shared with residents through a user-friendly map interface, to raise awareness about the air pollution problem and encourage behavioural change for improved air quality. The information collected will also help in the design and implementation of future data-driven action.

Other awareness-raising initiatives promoted by the AMA include workshops, public forums, media campaigns, and school programmes to improve residents' understanding of the causes and impacts of air pollution.

Carrying out group engagement © GAMA

© Emad Aljumah / Getty Images

ADDIS ABABA

ETHIOPIA

Addis Ababa is making significant progress in improving air quality through a variety of initiatives and projects. The city is collaborating with organisations such as Geohealth, C40, the MAIA project, SEI, and local academic institutions, including Addis Ababa University, to collect crucial data that will support its efforts to enhance air quality.

Notable achievements in 2024 included the successful launch, in May, of a pollution-awareness campaign that engaged the media and thousands of residents across various sub-cities to raise awareness and encourage community involvement. Based on the vehicle emission standard set at federal level, the directive drafted in 2023 will be implemented to regulate pollution from tailpipes during annual inspections. The city is also working actively, in partnership with the national government, to transition from fuel-powered to electric vehicles (EVs). Meanwhile, plans are underway to expand the city's cycling and walking infrastructure, with 96 km of pedestrian walkways and 100 km of designated bike routes designed to promote active travel for short-distance travel and reduce emissions.

Expansion of cycling and walking infrastructure © Tibebu Assefa

Looking ahead to 2025, the city is planning several major initiatives to further advance air quality management. This includes investments in air quality monitoring instruments, particularly to increase the number of lower-cost sensors across Addis Ababa. These sensors will facilitate effective communication about air quality issues via mainstream and social media, keeping residents and stakeholders informed and enabling prompt action where necessary. The city is also currently drafting directives focused on building energy efficiency and the management of emissions from construction activities, aiming to address pollution and dust generated by these sites.


© Karen Nash / Unsplash

DAKAR

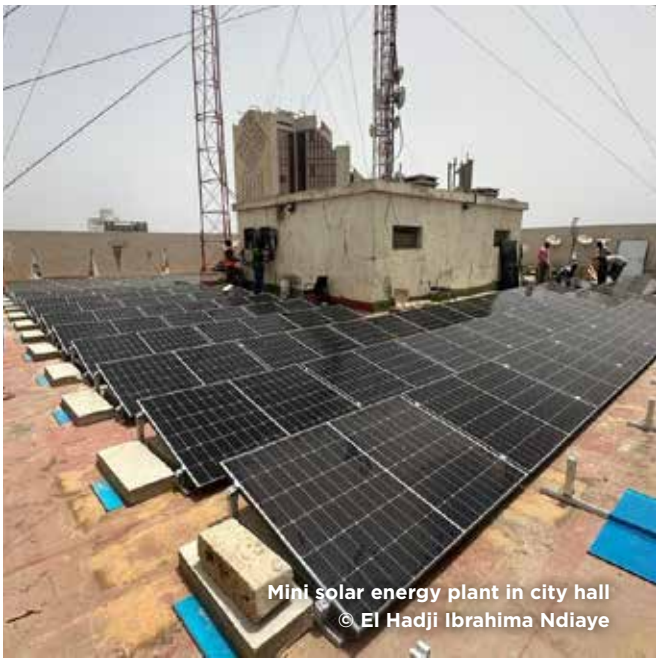
SENEGAL

Since signing the C40 Clean Air Accelerator in 2022, the city of Dakar has made significant progress in improving air quality in line with the commitments made under the C40 Clean Air Accelerator. Dakar has developed an Air Quality Management Plan, which first required the establishment of reference levels of pollutant emissions. The health and economic impacts of pollution were also assessed, to support decision-making with the aim of reducing exposure of residents and vulnerability of communities.

Among the main sources of pollutant emissions, the road transport, energy, and waste sectors have all seen significant progress in 2024. Having launched the hybrid express train in 2023, Dakar started the pilot phase of its bus rapid transport (BRT) system in May 2024. The fleet of 121 electric buses, which use photovoltaic panels for recharging, serve routes from the city centre to the Dakar suburbs. The system offers an efficient transportation alternative that combines a fast and comfortable passenger service with the benefits of reduced congestion and urban pollution.

As part of its energy transition, Dakar has now inaugurated its first mini solar energy plant located in the city hall. With the technical assistance of the C40 Cities Finance Facility (CFF), the city has successfully carried out all the technical and financial feasibility studies to increase the share of renewable energy installations in municipal buildings. These projects are all aligned with national policy, as well as the city's local energy transition objectives.

By the end of 2025, Dakar plans to contribute to the restructuring of urban mobility, by proposing innovative axes of emission reduction inspired by the Air Quality Management Plan.


Mini solar energy plant in city hall
© El Hadji Ibrahima Ndiaye

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EKURHULENI

SOUTH AFRICA

Since signing the C40 Clean Air Accelerator in 2022, the city of Ekurhuleni has made great strides in air quality management and emissions reduction. As a critical government stakeholder, Ekurhuleni has actively participated in the development of the Highveld Priority Area AQMP, and the HPA Regulations.

As a member of the project steering committee for the development of the Highveld Priority Area AQMP and regulations, the city ensured that effective policies and legislation are in place to manage and regulate the various air pollution sources – both within its jurisdiction and from the neighbouring Priority Area municipalities.

The city of Ekurhuleni has ten ambient air quality monitoring stations, five of which are maintained by the South African Weather Service as they form part of the National Air Quality Index Project. The stations measure PM_{10}, $PM_{2.5}$, SO_2, NO, NO_2, NO_X, O_3, CO, and meteorological parameters. The city is working to put out a tender for the management of five reference stations going forward.

Ekurhuleni is one of five municipalities located within the Gauteng province, part of the Highveld Priority Area, and in proximity to the Vaal Triangle Airshed Priority Area. The city faces complex air quality management challenges, and is working to ensure that the constitutional right to an environment that is not harmful to health or wellbeing is upheld for all residents.

Ekurhuleni is host to a mixture of industrial, mining, commercial, agricultural, and residential land use activities in close proximity to one another, together with vehicle-, waste-, and biomass-burning emissions, and dust from human activities.

Vehicle Emission testing © City of Ekurhuleni

The city has implemented a number of impactful policies and actions to tackle these emissions, including licenses for listed industrial activities, with strict emissions reduction requirements; registration of controlled emitters, requiring compulsory stack emission testing and reporting; and the requirement for dust monitoring programmes and plans. The city is currently regulating and monitoring more than 200 licensed industries for compliance with atmospheric emission requirements. Meanwhile, the implementation of new plant minimum emissions standards has seen a significant reduction in stack emissions from various industrial facilities. This is attributed to the commissioning and installation of "best available technologies" to abate chimney stack emissions.

In the road transport sector, the city has conducted vehicle-emission-testing campaigns in conjunction with Gauteng provincial government air quality officials and the provincial traffic authority. The most recent campaigns ran on 2 and 3 October 2024, with information shared with vehicle drivers/owners to raise awareness of the effects of vehicular traffic emissions.

Other actions include the personal-solar-study-lamp initiative at Buthle Park Secondary School. Through a public–private partnership, 162 personal solar study lamps were distributed to Grade 12 students to encourage a shift from fossil fuels to renewable sources. The initiative aims to reduce the exposure of students to air pollution, while also creating awareness of air quality and renewable energy.

Tree planting initiative at school © City of Ekurhuleni

Other awareness-raising actions delivered by the city include the planting of indigenous trees on the grounds of Encochoyini Primary School, to commemorate the fourth International Day of Clean Air for blue skies, with the community.

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ETHEKWINI

SOUTH AFRICA

The city is working to tackle emissions from air pollution sources such as industrial activity, small boilers, waste burning, illegal landfill, biomass burning, and vehicle emissions. Overlapping mandates mean that strong inter-departmental collaborations are essential to overcoming the city's challenges, such as those of waste dumping and burning, which have significant impacts on air quality, especially around low-income communities.

Since joining the accelerator, eThekwini has done significant work to improve its air quality management. In 2021, the city's air pollution monitoring capacity increased through the procurement of new reference monitors for SO_2, PM_{10}, $PM_{2.5}$, and volatile organic compounds (VOCs). The collected data shows that PM_{10} levels met the annual standards but failed on daily exceedances, while $PM_{2.5}$ levels were non-compliant with both annual and daily National Ambient Air Quality Standards. Meanwhile, the data acquisition system was updated; historical air quality data was validated; and dispersion modelling using NAEIS emission inventories was completed for all listed activities. Moreover, the city's equity assessments highlighted the need for low-emission zones (LEZs) to reduce exposure for vulnerable groups, particularly street vendors from lower socioeconomic communities. EThekwini's air quality bylaws have all been approved by the council.

In 2022, the city worked to improve the spatial distribution of its air quality monitoring stations, with several units being relocated to achieve better coverage. To tackle emissions, a vehicle emission inventory was delivered to inform the development of LEZs, with a participatory public consultation on their location taking place in 2023. The city has also established the eThekwini Air Quality Forum to foster collaboration on wider air quality issues.

In 2023, city air quality officials received training on health-benefit analysis and impact assessment, and used the BenMAP tool to quantify the benefits of meeting revised $PM_{2.5}$ standards. Meanwhile, a draft odour-management strategy was developed to address odours from industries, wastewater treatment, and solid waste management.

In 2024, a controlled fuels policy for small fuel-burning appliances was drafted, with support from C40 and the Clean Air Fund. After extensive stakeholder engagement, the policy is now awaiting council approval. An emissions inventory for small energy-generation appliances has also been developed, addressing a gap in the city's second-generation Air Quality Management Plan. Monitoring data is showing that more action is needed to tackle increasing levels of $PM_{2.5}$ from still industry or commercial facilities with uncontrolled emissions. Compliance and enforcement capacity within the city air quality section has been strengthened, with its function transferred to the planning and environmental management cluster. The air pollution team has also intensified efforts to address illegal landfills and waste burning through compliance measures and environmental education.

Controlled Fuels Multistakeholder Workshop © eThekwini Municipality

© viti / Getty Images

FREETOWN

SIERRA LEONE

Freetown City Council has continued to make progress in implementing some of the policy interventions it committed to under the C40 Clean Air Accelerator. The city's first Climate Action Plan, launched in early 2023, outlined the scope of planned interventions to tackle air quality in the city.

Freetown is advancing in the implementation of measures to tackle emissions from the transport sector. It has established a bus improvement corridor that came into operation in February 2024. With support from C40's City Finance Facility, the city has completed a feasibility study to develop the eastern route of the Freetown Cable Car mass transit network, which is forecast to reduce traffic congestion and contribute to overall improvements in air quality along the corridor and in the Central Business District (CBD). Financing arrangements for the cable car project are currently underway, and implementation is forecast to start by the end of 2026.

Meanwhile, a project to reduce traffic congestion in the CBD is being progressed through traffic capacity restraint measures, namely the implementation of controlled parking zones with the district. The project is being carried out in partnership with the city of Zurich and UN Habitat.

Working closely with C40's African Cities for Clean Air programme, Freetown received training in the use of air quality benefits tools such as BenMAP and C40's Air Quality through Urban Action (AQUA), and city staff also attended a three-day workshop in Addis Ababa on air quality communications. The city also worked with the C40 African Cities for Clean Air team on a project proposal to reduce emissions from the open burning of waste in marginalised communities; over the course of 2024, Freetown has prepared further requests for technical assistance to continue its emissions reduction work. Meanwhile, city officials have attended international workshops on air quality at the University of Ghana and the Climate and Clean Air Coalition (CCAC) in Bangkok. The city has now applied to join the CCAC – in partnership with the Ministry of Environment and Climate Change – in order to access additional technical assistance to deliver on its commitments. Finally, Freetown City Council took part in peer-to-peer exchanges with the eThekwini Metropolitan Municipality on the application of the BenMAP tool for assessing the health impacts of urban air quality, while city officials also benefited from online and in-person training workshops on the C40 African Cities for Clean Air communications training tool.

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JOHANNESBURG

SOUTH AFRICA

In 2022, Johannesburg signed the C40 Clean Air Accelerator, reaffirming its commitment to securing clean air for all residents – in line with the WHO Air Quality Guidelines and the goals of the Paris Agreement – by 2030. A properly structured air quality monitoring system has been realised in the city, with the re-commissioning of a station in Davidsonville and the deployment of six lower-cost monitors that provide data on PM_{10}, $PM_{2.5}$, PM_{1}, and NO_2 levels.

Monitoring station © Gulshan Khan / Climate Visuals

In 2021, the city completed and published air pollution control bylaws focussed on dust control and emissions from small industrial facilities, open burning, and diesel vehicles. It is working to develop a new permitting system that will create a database of all small industrial activities, helping the city to track emissions from the sector.

Johannesburg's 2019 Air Quality Management Plan identified vehicle emissions as one of the major contributors to poor air quality, with 46% of NO_x emissions attributable to vehicles. In turn, the city's Vehicle Emissions Control Strategy, developed in response, identified the implementation of a low-emission zone (LEZ) as a solution that could reduce emissions from the transport sector by up to 30% annually. After joining the accelerator, and through the African Cities for Clean Air programme, the city of Johannesburg conducted a feasibility study to assess the potential implementation of LEZs in the Johannesburg and Sandton central business districts. The stated aim of the proposed LEZs

was to create a mode shift away from private vehicles towards public and active transport, and to provide strategies for scalability within the city. The feasibility study analysed the air quality, socioeconomic, and environmental impacts of various transport measures, with the ultimate goal of determining the most impactful and making the case for their implementation within the LEZs. Key findings indicated that due to the impact of the city's diesel bus fleets, the implementation of LEZs, focusing only on transport in the proposed sites, would not significantly impact pollution levels, even in the most ambitious scenario, and therefore were not currently feasible. A number of recommendations generated from the study will help the city work towards the future feasibility of LEZ implementation.

The findings of the LEZ feasibility study will also inform a survey or polling exercise designed to provide city officials with data and evidence on residents' thoughts and perceptions of air quality, transport interventions, and other emissions reduction measures. The polling results will then feed into the design and development of the Clean Air Zone policy, ensuring that the implementation measures reflect the interests and needs of residents and businesses, while also maximising the impacts of emissions reduction.

Johannesburg joined the Breathe Cities initiative in December 2023, and the Breathe Cities Johannesburg Strategy was approved in March 2024. The strategy outlines Johannesburg's ambitious and inclusive interventions, with the objectives of 1) moving the city closer to achieving National Ambient Air Quality Standards and WHO Air Quality Guidelines or interim targets (IT), and 2) improving the health and quality of life of the residents living and working in the city and protecting those most at risk from the impacts of air pollution.

As part of the Breathe Cities project, the city is planning to complete a source apportionment study by 2026, the findings of which will be a key policy informant in the revision of the city's AQMP in the same year. This will ensure that the outputs generated by the source apportionment study are integrated into the city's legislated planning documents.

The week leading up to the International Day for Clean Air for blue skies on 7 September is considered an Air Quality Week in the city of Johannesburg, with several public campaigns targeting community engagement and awareness. In 2024, the Clean Air Week campaign included school competitions, tree-planting at the Ivory Park Secondary School, and a community-based organisation workshop in Alexandra, culminating in the launch of the Johannesburg Breathe Cities initiative on 6 September. This was coupled with an impactful social media campaign using the slogan #Clean Air Jozi, calling for a collaborative effort towards the improvement of the air quality in Johannesburg.

Tree planting © C40

© Jaxons / iStock

LAGOS

NIGERIA

Since joining the C40 Clean Air Accelerator in 2022, Lagos has worked to significantly increase the consistent collection of air quality data, using 51 lower-cost monitoring sensors deployed between 2023 and 2024. Real-time, 24-hour air quality measurements have allowed Lagos to identify and address pollution hotspots effectively, leading to heightened public awareness of the impacts of air pollution and targeted intervention strategies.

Several impactful initiatives have been undertaken in line with the city's Clean Air Accelerator commitments. In partnership with C40 Cities, the Ministry of the Environment and Water Resources, and the Lagos State Environmental Protection Agency, Lagos has deployed a network of air quality sensors to enhance its monitoring of and responses to the city's pollution hotspots. The city has also enforced emissions control policies across industrial, residential, and commercial activities, significantly curbing emissions from key pollution sources; and a further reduction in urban air pollutants has been achieved through the promotion of cleaner public transport, with the city incentivising the adoption of electric and compressed natural gas vehicles. Finally, the launch of the Lagos Carbon Registry, incorporating a greenhouse gas registry and industrial-sector emissions inventory, is proving instrumental in monitoring greenhouse gas emissions while attracting green investments.

In 2025, Lagos aims to expand its air quality monitoring network, deploying additional lower-cost and reference-grade monitors across 20 local government areas. This will support the collection of more granular data for effective policy-making. The city also plans to develop a comprehensive clean air policy, which will include strict vehicle emissions standards, a transition to cleaner fuels, and the promotion of green infrastructure to improve urban ventilation. Additionally, community engagement and education programmes will be scaled up to ensure the active involvement of Lagos residents in air quality improvement efforts. These initiatives reflect Lagos's commitment to providing cleaner air and healthier living conditions for all residents.

LASEPA Air Quality Monitoring Station © Lagos State

The Eco Explorer - Children advocacy on greening to promote clean air © Lagos State

© Derejeb / Getty Images

NAIROBI

KENYA

Since 2022, and after joining the C40 Clean Air Accelerator, Nairobi has been working on the implementation of its city action plan to improve air quality monitoring, and forming strategic partnerships to create a foundation upon which air quality data can be monitored and managed. Since joining the accelerator, Nairobi has almost doubled the number of $PM_{2.5}$ monitors – from 17 to 33 – collecting data continuously and in real-time, and making it available to the general public to improve awareness and perception of air quality among its residents.

Other efforts undertaken by Nairobi include new policies and regulations, as reflected in its new air quality regulations, and the creation of the Nairobi Air Quality Working Group. Co-chaired by the city, this working group brings together stakeholders from academia and the scientific community to collaborate on air quality issues. The city has also carried out surveys to determine the public's general perception of and knowledge about air pollution, the results of which will enable future baseline comparisons and inform advocacy.

Nairobi's commitment is further supported by its creation of a climate and air quality unit, comprising a total of 12 technical staff focused on air quality and global heating issues. The city has also conducted a survey to establish residents' knowledge of current air pollution sources, and their perception of and attitudes towards air pollution in Nairobi.

The city continues to advocate for electric mobility, increased green spaces, and the construction of active travel infrastructure, and is working on the implementation of its BRT system, with five corridors planned. Future plans also include finalising the Nairobi Air Quality Management Plan, refreshing the city action plan for 2024, improving air quality regulations, and monitoring emissions while engaging with partners to generate and obtain pollutant data.

In September 2024, Nairobi officially joined the Breathe Cities initiative and developed the Breathe Nairobi Strategy. The strategy was put forward for validation through a workshop where it received the endorsement of 64 stakeholders. The programme will establish air quality standards, a cabinet-approved action plan, and a city-operated data management system, with targets to cut emissions by 51% by 2035 and ensure long-term funding for clean air actions. This also complements the county's 2023–2027 plan to map areas of high-risk pollution and extend air quality monitoring.

Nairobi's plans for 2025 include: formulating the Nairobi City County Air Quality Regulations to support the implementation of the Nairobi City County Act 2022; developing the Nairobi Air Quality Action Plan 2024–2027; developing a city-led data management system that can display air quality data, with a plug-in feature for partners installing monitors in the city, and the facility to incorporate air quality predictions; increasing the number of $PM_{2.5}$ monitors from 37 to at least 85, to reach every ward in the city, and collocating all lower-cost sensors with the two recently installed reference monitors; developing a community-focused and data-led air quality communication strategy; developing of an inventory for transport-related emissions and waste burning to inform future policy-making; carrying out studies on the implementation of clean air zones; and developing a policy brief on transport-related emissions.


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TSHWANE

SOUTH AFRICA

Tshwane has been working to put programmes in place for effective air quality management.

The city has conducted winter awareness campaigns to ensure that residents understand the air pollution problem and how this affects their quality of life – as public awareness is key to improving air quality. Clean-fire campaigns are being held every year, targeting communities that are still dependent on fire for space heating and cooking, across various regions within the city. For example, since 2022, the city's health and the social services departments have been working together with the air quality management section to provide alternative sources of heating to homeless people, with the aim of reducing air pollution in Marabastad and reducing their exposure to toxic air. As part of these efforts, the city is also working to provide shelter to this vulnerable population.

Meanwhile, the city has been working on media campaigns and has distributed information and articles to resource centres, emphasising the impacts of poor air quality on human health and recommending measures to prevent air pollution.

Another campaign, carried out in collaboration with the Gauteng Department of Environment, the Provincial Traffic Department, and the

Vehicle Emissions Testing © Environment & Agriculture Management Department, City of Tshwane

Tshwane Metro Police, has aimed to increase awareness of traffic pollution, targeting people that use private vehicles and residents at large with information about the impacts of emissions from vehicle tail pipes. As well as raising awareness, the initiative focuses on encouraging vehicle owners to stop driving vehicles that are not road worthy and that emit dark smoke. Diesel-emitting vehicles were particularly targeted for this campaign, with trucks being stopped and tested for compliance with emissions standards.

Sources of pollution from informal settlements – including dusty roads, the burning of waste, and the use of fossil fuels for cooking and space heating – are among the most problematic air pollution sources in the city. Tshwane's informal settlement management policy has been developed with the aim of formalising these existing informal settlements and preventing further unplanned growth. The policy is still at a draft stage, while the city continues to work year after year to formalise some of the settlements and bring improved quality of life to their residents. Actions include reducing residents' exposure to indoor and outdoor air pollution by rehoming them in neighbourhoods with electricity and tarred roads. In addition, a sustainable waste management strategy for informal settlements has been developed, to address illegal dumping and improve waste management within these communities. Tackling the burning of waste – which currently take place on a regular basis – will improve air quality drastically, while addressing the problem of illegal dumping, which is a threat to human health, will result in a better quality of life for residents of informal settlements.

Since 2022, Tshwane's environment and agriculture management department has committed to planting 10,000 trees per annum, to contribute towards clean air in the city. To date, the city has exceeded this target every year. In order to make sure that both existing and newly planted trees are preserved and protected, the city has drafted an urban forestry tree protection bylaw.

Tree planting © Environment & Agriculture Management Department, City of Tshwane

SIGNATORY CITIES IN

EAST, SOUTHEAST ASIA AND OCEANIA

JAKARTA

INDONESIA

Since signing the C40 Clean Air Accelerator in 2019, Jakarta has been taking concrete steps towards improved air quality. The city developed a roadmap for air quality improvement ("Grand Design for Air Pollution Control") involving active participation from the main stakeholders: the central government, NGOs, and universities. Among the city's major efforts has been the expansion of its reference-grade air quality monitoring network. This now includes the measurement of $PM_{2.5}$ and hydrocarbon, as mandated in the latest Indonesia air quality index, and provides data to inform the setting of pollutant baselines and reduction targets.

In 2021, Jakarta created a low-emission zone within the Kota Tua area, supported by a comprehensive package of measures including vehicle emission tests, parking regulations, and improvements in public transportation. The Governor's Regulation 66/2020 mandated exhaust emission tests for private cars and two-wheelers, integrating these vehicles into the city's parking system and its non-compliant disincentive.

In 2022, Jakarta began setting its air pollution baseline level and reduction targets in line with the WHO Air Quality Guidelines. The 2018 $PM_{2.5}$ level was established as the benchmark, aligning with new national Ambient AQ Standard being introduced through Government Regulation No. 21/2022. The city has also started cooperating with surrounding areas, such as Bekasi and South Tangerang, in joint efforts to control pollution. Meanwhile, Jakarta is working on the city's Air Pollution Control Strategy (SPPU), which outlines 16 programmes and 68 action plans aimed at enhancing governance and reducing emissions from mobile and stationary sources.

The SPPU was introduced and formalised through Governor's Decree 576/2023 in 2023, while Governor's Decree 593/2023 established the Air Pollution Control Task Force as a structured framework for managing these efforts. Other major accomplishments in 2023 included the introduction of on-road emission tests for private cars and two-wheelers, implementation of the Transit Oriented Development mode to increase public transport use, and expansion of

the city's pedestrian infrastructure. Improved traffic management and infrastructure were also prioritised. Jakarta aims to introduce over 10,000 battery-powered electric vehicles by 2030, of which 100 electric buses were already operating in September 2024 and another 200 were added by the end of 2024. Finally, in 2023, Jakarta procured 14 additional lower-cost sensors, and completed the city's air quality monitoring sensor unit-need assessment study.

Since December 2023, Jakarta has been collaborating with C40 Cities, along with Vital Strategies, the Clean Air Fund, and Bloomberg Philanthropies, on the Breathe Cities Jakarta programme, as announced at the Local Climate Action Summit at COP28. The project aims to reduce emissions from transportation and industry, and to implement integrated low-emission areas known as "Kawasan Nol Emisi". Significant milestones so far include the establishment of a single platform "Kualitas Udara Jakarta" integrating data from 17 current reference-grade air quality monitors, an additional 14 lower-cost sensors procured in 2023, and a number of non-government monitoring stations. Other efforts include the expansion of tree planting and green open space within the city; the introduction of sanctions for non-compliant industries; and the electrification of the city's official operational vehicles.

With the changes to Jakarta's status reflected in Law 2/2024, concerning the Special Region of Jakarta, the city is able to leverage its leadership mandate to establish cooperation and tackle transboundary air pollution in agglomeration areas. Moreover, by the end of 2025, Jakarta will have formulated regional regulations for the city's transport masterplan and transport demand management plan. This consists of four action plans, namely: (1) parking management; (2) congestion pricing; (3) low-emission zone(s); and (4) vehicle scrapping.

Transjakarta buses © C40

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QUEZON CITY

PHILIPPINES

The Climate Change and Environmental Sustainability Department of the Quezon City government currently operates an air quality monitoring network of 40 non-reference sensors and one reference-grade monitor.

Annual data shows that the city's air quality index (AQI) from 2021 to 2023 is classified as "Good" (without cautionary statements), following the national ambient air quality standards promulgated by the Department of Environment and Natural Resources. This data is vital in (1) developing policies and measures to further improve air quality, (2) providing air quality information to the general public, and (3) monitoring and evaluating the impacts of implemented interventions.

The air quality monitoring network provides real-time data through a dashboard that is regularly monitored, and the city's AQI is published every Monday, Wednesday, and Friday on the Quezon City government's official website, Facebook, and Twitter accounts, as well as on the Facebook page of the Climate Change and Environmental Sustainability Department. The AQI provides information on the city's air quality status, along with cautionary statements about the health effects of exposure to pollution. The knowledge and guidance provided to residents positively contributes to improving their well-being and quality of life.

As part of its efforts to achieve the WHO's air quality guideline values, the city also developed and completed in 2023 an Air Quality Management Plan (AQMP). This serves as a core and dynamic component of the city's air quality management, integrating various approaches to create a long-term programme. Part of the AQMP formulation is to trace the sources of air pollution through an emissions inventory (EI)

Air quality monitor © Quezon City Local Government

and assess the air quality and health benefits of emissions reduction measures using the Low Emission Analysis Platform-Integrated Benefits Calculator. The results of the EI, along with consultations and planning activities conducted with various stakeholders, facilitated the identification of priority projects within the transport, land-use, energy, waste, industrial, and construction sectors, which will be implemented by the city.

In January 2023, Quezon City created an air quality technical working group to oversee the development and implementation of the AQMP, ensure compliance with national and international standards, and uphold international commitments on air quality.

As part of the AQMP, the city also developed a strategic communication plan, using a stakeholder analysis tool and carrying out a perception survey to help in the formulation of appropriate communication materials.

The launch of the Quezon City Advocates for Cleaner Air saw residents being encouraged to report any form of activity that may contribute to pollution within the city, and the establishment of a reporting system involving city traffic enforcers and personnel from communities hosting the air quality sensors to ensure timely monitoring and immediate checking of prevailing conditions.

The city continues in its efforts to tackle air pollution. The second phase of the AQMP has been initiated to pilot two strategic projects: (a) an electric/hybrid vehicle transition and fleet management system for city-government-owned vehicles, and (b) a bike-to-school project to promote active transport in the youth sector.

Other areas covered by the project include the development of guidelines for school response and suspensions during episodes of high air pollution; the conduct of air quality modelling and health impact assessment; and integration of the city's air quality knowledge base through updates to key development plans.

The city government is strengthening its air quality monitoring capabilities through the integration of an air quality risk analysis system, which will provide efficient automated report generation, real-time alert notifications, and reliable data for evaluating policies and formulating effective air-quality-related strategies. The knowledge and capacities of the Air Quality Technical Working Group will also be enhanced through continuous training and knowledge-sharing activities with various stakeholders. Engagement will be conducted with local communities, the private sector, academe, non-governmental organisations, and other stakeholders, to align goals and resources for clean air initiatives, with a goal of having 500 clean air advocates in the city by the end of 2025.

An air quality monitoring control centre will also be established, bringing together air quality and weather station dashboards, other media and information sources, and video feeds from selected cameras under the city government's Unified CCTV Command Center. The integrated system will have the capacity to monitor real-time situations within the vicinity of the air quality stations, to determine the factors that affect air pollution levels and support the development of effective interventions. Two additional reference-level monitors will also be procured to complement the existing non-reference air quality sensors.

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SEOUL

SOUTH KOREA

In 2020, the Seoul Metropolitan Government established the "Seoul Air Quality Management Implementation Plan (2020–2024)" to reduce emissions and protect residents' health. This plan includes 67 initiatives across seven key areas, aiming to lower the average annual concentration of $PM_{2.5}$ to 17 μg/m³ by 2024, representing a 35% reduction from the 2016 level of 26 μg/m³. As at 2023, Seoul's $PM_{2.5}$ concentration had dropped to 20 μg/m³, achieving a 23% reduction (6 μg/m³) from the 2016 level.

The improvement in air quality has led to greater levels of outdoor activity among residents. This can be seen in the rise in visits to the city's Hangang Park, which increased from 56.3 million in 2020 to 60.5 million in 2023, and the increased use of public bicycles (Ddareungi), from 23.7 million uses in 2020 to 44.9 million uses in 2023.

Seoul has implemented a number of impactful policies for air quality improvement. Initiatives included the retrofitting of 65,811 old, polluting vehicles, and an early scrappage scheme for older diesel vehicles, which was expanded in 2023 to include Grade 4 diesel vehicles. Additionally, a ban on Grade 5 vehicles was implemented during the seasonal management period (December to March), with enforcement leading to a 97% reduction in vehicles monitored daily, from 1,424 per day in Phase 2 to 46 per day in Phase 5. Further emissions reduction was achieved through the deployment of 70,262 electric vehicles and the installation of 921,496 cleaner residential boilers across the city.

Seoul Tower is lit in four colours of blue, green, yellow and red depending on the day's air pollution levels © Seoul Metropolitan Government

Seoul is also working to further understand the health impacts of air pollution, through the study "Health Effects of $PM_{2.5}$ Components and Identification of Priority Emission Sources". By the end of 2025, Seoul will be developing the city's third Air Quality Management Implementation Plan (2025–2029). The city will also expand the internal-combustion-engine-vehicle operation restrictions across Seoul, going from the current restriction on Grade 5 vehicles during December to March, to the implementation of year-round restrictions.

SYDNEY

AUSTRALIA

In 2019, there was no reliable air quality monitoring taking place within the City of Sydney. Since joining the C40 Clean Air Accelerator, Sydney has conducted a trial of low-cost sensors, and successfully advocated to the New South Wales State Government for the installation of regulatory-grade air quality monitoring systems across the city.

The data collected by both the regulatory stations and the local sensors confirmed that the City of Sydney is fortunate to have very good air quality compared to many other cities around the world.

For example, particulate matter mostly only exceeds guideline levels when there are bushfires, and particulates and other air quality parameters are not a significant problem in the city under normal conditions.

Sydney continues to encourage active transport as the first mobility option, via the provision of physical infrastructure such as cycle ways, footpath widening, pedestrianisation of roadways, and the delivery of behaviour-change programmes.

The Greening Strategy and programmes to expand canopy and greening across the city help to improve air quality, provide myriad benefits to health and wellbeing, and contribute to the reduction of urban heat.

Sydney's electrification of transport strategy is about creating a city for walking, cycling, and public transport; advocating for state and federal government pricing and policy to prioritise electric vehicles over internal-combustion-engine vehicles; electrifying high-impact transport fleets; and supporting electric vehicle charging options.

The City of Sydney will continue its greening and low-emissions-transport programmes and advocacy in 2025, while using the data from New South Wales Government air quality monitoring stations in the city to report any exceedances of air quality standards.


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TOKYO

JAPAN

Since signing the C40 Clean Air Accelerator in 2019, Tokyo has been working ambitiously to achieve its air quality commitments.

The Tokyo Metropolitan Government achieved the national environmental standards for $PM_{2.5}$ in 2019, and, in an effort to make further improvements, has set a goal of reducing the average value at all measurement stations to 10 µg/m³ or less by 2030. Tokyo achieved this goal for the first time in 2021, setting a new target of an annual average value of 10 µg/m³ or less at each measurement station. In 2023, the target year was brought forward from FY2030 to FY2026. To achieve this new goal, Tokyo will continue to expand and implement the measures it has been taking so far.

The Tokyo Metropolitan Government is working to reduce $PM_{2.5}$ – for which a new target has been set – and ozone, for which the national environmental standard has not yet been achieved. In the case of the latter, efforts are being focused on reducing VOCs and NO_X, which are common causative agents of ozone production. Work is also being delivered to further understand the sources of these VOCs. In the transport sector, Tokyo is implementing measures to improve the atmospheric environment by expanding and encouraging the use of non-gasoline vehicles. Voluntary efforts by businesses and individuals are being promoted through the city's "Atmospheric Environment Improvement Promotion Project for the Realisation of Clear Skies", alongside public-awareness-raising campaigns.

To ensure that everyone can access air quality data, the metropolitan government is converting its atmospheric environmental data into open data, linking to air pollution countermeasures using the latest technologies such as 5G.
In addition, cooperation is in place with neighbouring prefectures and cities to promote air pollution countermeasures over the wider area.

The Guidebook on Clean Air © Bureau of Environment - Tokyo Metropolitan Government

SIGNATORY CITIES IN

EUROPE

© Allan Baxter / Getty Images

BARCELONA

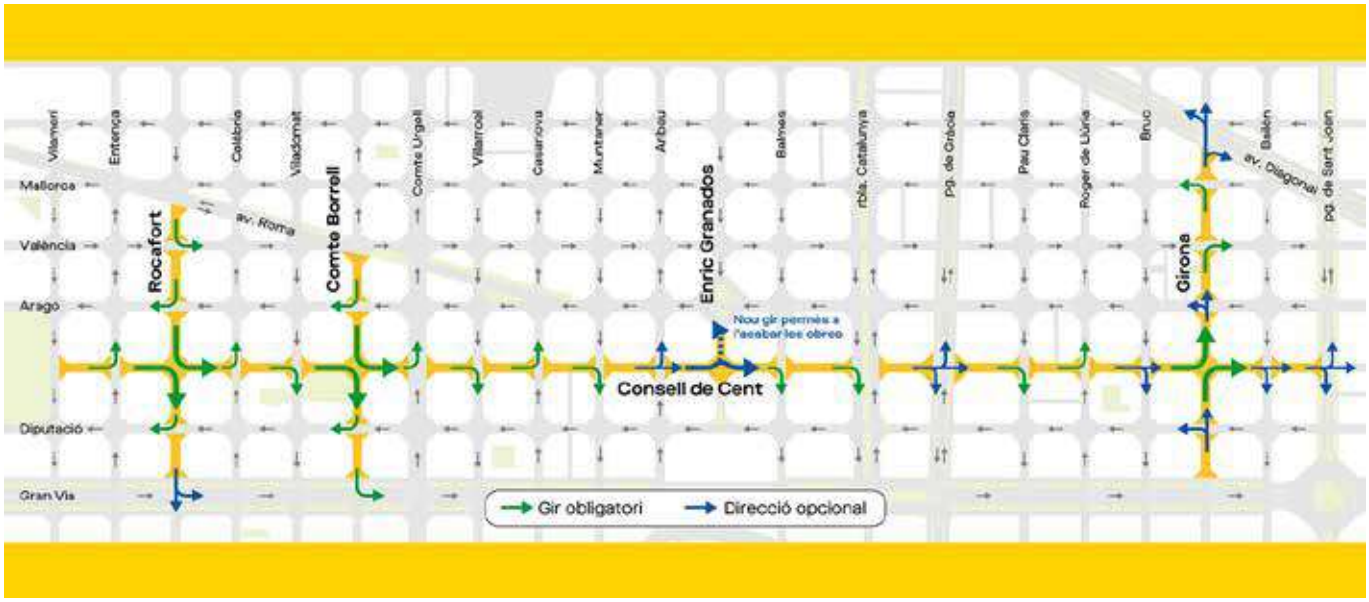
SPAIN

Since 2005, air quality levels for NO_2 in Barcelona have consistently exceeded both the limit established by the regulatory standards and the WHO Air Quality Guidelines.

In recent years, especially since the city joined the C40 Clean Air Accelerator in 2019, Barcelona has been improving its air quality levels, especially for NO_2. In 2022, the average NO_2 levels across the city's monitoring stations showed an increase from the years 2020 and 2021. However, the levels decreased again in the 2023 measurements, with all monitoring stations in compliance with regulatory standards. This trend is expected to become definitive in the following years.

With regard to particles, over the last decade, PM_{10} and $PM_{2.5}$ levels have remained stable in the city, both at traffic stations and urban background stations, staying within legal compliance limits but consistently exceeding the WHO Air Quality Guidelines values.

Long-term exposure to pollution levels in 2023 is estimated to be responsible for 1,300 deaths each year in the city. The social cost of this annual mortality is estimated at €891 million (US$ 943 million) (95%CI=617-1.233), which represents 0.9% of the city's GDP and around €537 (US$ 568) per capita. The mortality attributable to pollution levels in 2023 is 32% lower than that estimated for the years 2018–2019 (which was 1,900 attributable deaths annually).



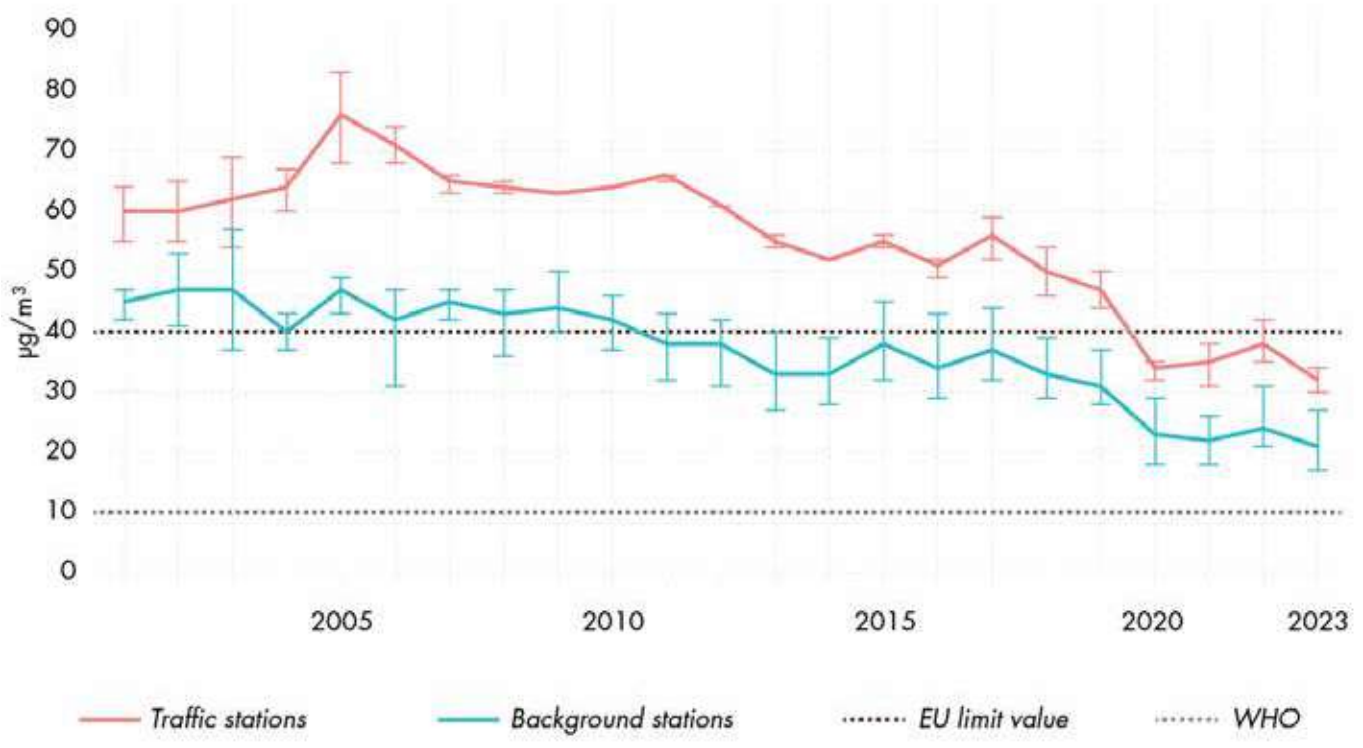
Transformed streets into green axes © Ajuntament de Barcelona

One of the most impactful policies that Barcelona has carried out in line with its commitments under the Clean Air Accelerator is the implementation of the Barcelona Low Emission Zone in 2020. This measure has achieved a significant acceleration in the renewal of the vehicle fleet, which in turn has resulted in a substantial reduction in emissions, especially NO_2.[11]

Another key policy has been the Superilles project, focusing on the transformation of Barcelona's streets with the aim of recovering – for residents – part of the space currently occupied by private vehicles. The objective is to achieve a healthy public space that is fairer and safer, has more greenery, and favours social relations and the economy of proximity.

Between 2022 and 2023, parts of four important streets were transformed into green axes. In addition, four large squares of about 2,000 square metres each have been created at the junctions between these green axes.

In the near future, Barcelona City Council intends to continue implementing efficient measures to improve air quality, in parallel with the implementation of a new urban mobility plan. The city aims to establish cross-cutting strategic guidelines for the various areas that affect air quality, in order to direct efforts to improve it in the most effective way – with the ultimate goal of meeting the new requirements established by the European Union Directive, and tending towards the WHO Air Quality Guidelines, by 2030.



Average NO_2 levels at the city's monitoring stations © Ajuntament de Barcelona

[11] https://ajuntament.barcelona.cat/qualitataire/sites/default/files/ZBE_informe_AjBCN_v2023_v2_EN.PDF

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BERLIN

GERMANY

Since signing the C40 Clean Air Accelerator, Berlin has been able to achieve significant improvements in air quality. Over the past five years, emissions at street monitoring stations have fallen by more than 25% for NO_2 and by around 17% for $PM_{2.5}$. As a result of this significant progress in air quality, outdoor activities such as cycling to work or spending time in the park have become much healthier, helping to considerably improve overall health and quality of life for the city's population.

Thanks to the support of C40 and Berlin's commitments under the Clean Air Accelerator, far-reaching measures have been implemented that improve quality of life and reduce air pollutants. A key foundation for this was the Berlin Mobility Act, which paved the way for additional cycling and pedestrian infrastructure. Between 2021 and 2023, 87.8 km of new cycle paths were built with the help of this law. In addition, in 2024, the city introduced a monthly public transport ticket, allowing unlimited use of all public transport across Berlin for €29 (US$ 30) per month.

The additional measures introduced through the city's clean air plan since 2019 have made particularly significant contributions to the improvement in Berlin's air quality. These include the introduction of speed limits on around 20 km of roads, as well as the expansion of parking management in the city centre and the increase in parking charges. The C40 Clean Air Workshop, which took place in Berlin in 2023, gave these measures additional impetus.

The city has reaffirmed its goal of achieving the WHO Air Quality Guidelines in the long term, with plans for the dynamic expansion of infrastructure for cycling and pedestrian use, and the addition of 100 more electric buses to the city fleet by the end of 2025. With the help of the C40 city network, improving air quality has become one of the city's key concerns.

Cycling infrastructure © Ralf Rühmeier

Sustainable transport © Ralf Rühmeier


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COPENHAGEN

DENMARK

Copenhagen's air quality has been improving since the city joined the C40 Clean Air Accelerator. Five municipal measuring stations were in place between 2020 and 2023 (three of which remain currently), and significant reductions were observed in the annual averages of NO_2 and $PM_{2.5}$, and in the number of days with elevated levels of NO_2.

In an inventory of the health effects of air pollution in Copenhagen, scientists from Aarhus University estimated that 415 premature deaths and 278,000 days of restricted activity were caused by air pollution in 2022. This compares with an estimated 460 premature deaths and 440,000 sick days resulting from air pollution in 2017.

In 2019, compliance with the WHO Air Quality Guidelines for good air quality was adopted as an official objective. Copenhagen continuously works to reduce air pollution from private car traffic; among other things, the city council has recently agreed to further increase the cost of parking and to significantly reduce the number of on-street parking spots. The released areas are transformed into greener spaces that can be used by residents, with more bike parking and charging stations being made available. In addition, the city continues to work on options to cover the two urban highways that go through the city.

Copenhagen's LEZ requirements have been tightened several times since 2019, most recently to include passenger cars. The latest revision resulted in a 36% reduction in $PM_{2.5}$ emissions from vehicle exhausts.

Further, to eliminate CO_2 emissions and other pollutants, the city council has mandated the use of zero-emission buses on all city bus lines by 2026. In collaboration with Movia, Denmark's largest public transit agency, the city has created new transport-sector solutions that are efficient, green, and zero-emission based.

The city council plans to continue this very important work to clean the air for all Copenhageners. With a ban on older wood stoves (from before 2008) in all areas with access to district heating adopted in October 2024. After a required 12 months' notice period, the ban will be enforced from the end of 2025. It is estimated that of approximately 13,000 wood stoves in use in the city, around 3,200 will fall within the scope of the ban, having been installed before 2008.

Meanwhile, national legislation on zero-emission zones is expected to come into force at the beginning of 2025. The city council is expected to implement a local zero-emission zone in 2026 or 2027.

At the beginning of 2025, the municipality will launch a tool to forecast air quality in the city for the coming four days. This project is being prepared in cooperation with the municipal health administration, which will develop a warning system for particularly vulnerable groups to take relevant precautions in case of particularly high levels of pollution.


Modern electric buses © Public Transport Authority, Movia

© Westend61 / Getty Images

HEIDELBERG

GERMANY

The air quality in Heidelberg has improved significantly since the city introduced its low-emission Environmental Zone in 2013, showcasing that these types of actions work to reduce emissions and air pollution and improve residents' health and quality of life.

The city has been in compliance with the national NO_2 limit since 2017, and the yearly mean value of this pollutant at the Berliner Straße measuring station has decreased from 16 µg/m³ (2021) to 14 µg/m³ (2022) to 12 µg/m³ (2023). Values for particulate matter $PM_{2.5}$ and PM_{10} remain constant below reporting levels.

The Heidelberg Environmental Zone was rolled back by the Karlsruhe regional council on 1 March 2023, in accordance with an update to the air pollution control plan for the Karlsruhe administrative district following this improvement in the city's air quality. Data analysis shows that pollutant limits have not been exceeded since the Environmental Zone roll-back.

The city maintains further measures to reduce emissions through its sustainable mobility funding programme, including the expansion of active travel and enlargement of the private electric vehicle fleet. The climate neutrality targets agreed in July 2020 are still valid in 2024, aiming for climate neutrality by 2040 at the latest.

A new data platform, known as Climate Compass 2.0, is currently being developed, which will present real-time air quality and meteorological data, as well as urban climate maps, at unprecedented high resolution. A citywide heat action plan has also been rolled out, additionally taking into account measures to tackle high ozone levels in summertime.

Various actions are still to be finished before the end of 2025, such as implementation of the city's noise action plan; the introduction of a heat protection routing service; initiation of the "urban green" funding programme; legal determination of facade-greening; and other planned climate adaption measures, including the further expansion of district heating and increased wind-energy-production sites.


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LISBON

PORTUGAL

Lisbon is among the European cities distinguished with the European Union (EU) Smart and Climate-Neutral Cities Mission. The EU Mission Seal is an important milestone recognising cities' plans to achieve climate neutrality by 2030.

Lisbon is committed to aligning its climate neutrality strategic document, the Climate City Contract, with its air quality improvement strategies.

In 2023, the concentrations of most pollutants in Lisbon were under the maximum limits by a large margin. PM_{10}, $PM_{2.5}$, O_3, and SO_2 are not currently a problem in the city; however, NO_2 concentration remains a challenge. While concentrations of this pollutant have reduced significantly from the levels observed before the COVID-19 pandemic (16% reduction since 2019), a slight increase was recorded in some locations in 2023.

Lisbon is preparing for the implementation of a pilot near-zero-emissions zone in the downtown area of the city, which will be automatically controlled by a camera system. This will be supported by information and data from the lower-cost sensor network, which has been in place in Lisbon since July 2021, to provide a more detailed picture of air quality in the city alongside data from the air quality reference network.


Sensores Parque Ecológico © Lisbon Municipality


Parque Eduardo VII © Lisbon Municipality

Over the next few years, Lisbon's focus will be on lowering the city's NO_2 levels and reducing traffic circulation, thereby improving residents' health and quality of life. Lisbon's "There is Life in My Neighbourhood" (Há Vida no meu Bairro) programme seeks to develop a set of interventions in public spaces to encourage journeys on foot and prioritise pedestrians. Additionally, Lisbon will introduce 15-minute-city measures to ensure that essential services such as shops, pharmacies, schools, and parks are all within easy walking or cycling distance for residents. All actions will be constantly evaluated, either by the reference network or the lower-cost sensor network, along with other monitoring instruments that allow for greater granularity in the collected information. This will help Lisbon achieve its goal to become a more people-centred city that is sustainable, equitable, and liveable.


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LONDON

UNITED KINGDOM

Since 2019, London has implemented a series of impactful initiatives across various sectors, ambitiously led by C40's co-chair and Mayor of London's Sadiq Khan. The expansion of the Ultra-Low Emission Zone (ULEZ) in August 2023, which now covers all of Greater London, made it the world's largest clean air zone of its kind, improving air quality for more than 9 million Londoners. Now 95% of vehicles seen driving in London on an average day meet the ULEZ emission standards, up from just 39% in 2017. Since the launch of the original ULEZ in 2019, the city has seen measurable improvements in air quality, with levels of toxic NO_2 measuring 53% lower in central London, and over 20% lower in inner and outer London, than they would have been without the scheme. The mayor also provided financial assistance to London residents, businesses, and charities, through a £200 million (US$ 253 million) scheme to scrap, donate, or retrofit vehicles that do not meet the ULEZ emissions standards. To date, over £188 million (US$ 238 million) has been allocated to 54,716 successful applicants. A full evaluation report will be published in 2025.

The city has also focused on improving equitable access to sustainable transport options. A record number of zero-emission buses are now on the roads, and over 21,000 electric vehicle (EV) charging points have been installed in the capital, accounting for nearly one-third of the UK's total. Additionally, the Breathe London air quality monitoring network has been expanded from 300 to almost 450 monitors citywide, including 136 strategically placed near schools and hospitals. This data, which is made publicly accessible, supports community-led efforts to improve local air quality. London has committed to maintaining the 136 strategically placed sensors and to significantly expanding stakeholder engagement activities in the next phase of Breathe London. At COP26 in 2021, building on the success of the Breathe London initiative, Mayor Khan called for the creation of Breathe Cities to help more cities address the global air pollution crisis. Breathe Cities has now launched and is supporting the implementation of impactful action in more than 12 cities across the globe. London remains committed to the Breathe Cities programme and will be presenting on the success of Breathe London in the first Breathe Cities workshop hosted by the city of Paris in December 2024.

To reduce emissions, London has also worked to clean the city's fleets, putting a record number of over 1,600 zero-emission buses on the capital's roads and committing to a fully zero-emission bus fleet by 2030. Additionally, over half of London's taxi fleet and 25% of its private hire vehicles are now zero-emission capable. The mayor has committed to doubling the amount of EV charging points installed in London since 2016 to more than 40,000 by 2030 Meanwhile, London's cycle network has more than quadrupled in size, from 90 km in 2016 to 390 km in June 2024, and around 600 School Streets are in place across London. These measures are improving residents' access to safe and healthy public spaces and ensuring they can choose sustainable mobility options.

London's commitment to building an equitable and green city is being materialised through actions to mitigate and adapt to the impacts of climate change. For example, the £20 million (US$ 25.3 million) investment in creating and improving 400 hectares of green space and planting 340,000 trees is supporting London's status as the world's first National Park City. The city's Green New Deal, aimed at doubling the size of London's green economy by 2030, has further accelerated initiatives in renewable energy and sustainable urban development. London's Future Neighbourhood 2030 programme has provided funding for inclusive, community-led climate initiatives that have accelerated local action in neighbourhoods across London. Overall, these comprehensive efforts across sectors highlight London's determination to meet its 2030 net-zero target and significantly improve air quality for its residents.

London's mayor has been clear that he is committed to meeting the new WHO Air Quality Guidelines (updated in 2021) as soon as possible – and that this will require coordinated action from all levels of government. The Greater London Authority (GLA) has commissioned a scientific and technical evaluation of what action could enable London to achieve its existing target of 10 µg/m^3 annual average $PM_{2.5}$ by 2030. This research will also provide a credible roadmap to attainment the new WHO Air Quality Guidelines for each individual pollutant – averaging time combinations, including for 5 µg/m^3 annual average $PM_{2.5}$. The city will be engaging with key stakeholder groups in the coming months to ensure Londoners' diverse voices are heard and considered in these efforts. London's official pathway to achieving the WHO Air Quality Guidelines will be published by the end of 2025.

The mayor has also committed to delivering the School Filters Programme, which will provide indoor air quality filters to 200 London schools. The programme will launch this winter and will fund the provision and maintenance of the filters, engagement with participating schools, and monitoring and evaluation to inform a decision on rolling out filters to further schools across the city.

The London-wide ULEZ One Year Report will be published in early 2025. It will look at the impact of the scheme after one year of operation, building upon the previously published London-wide ULEZ Six Month Report. The One Year Report will provide a fuller analysis of the impact of the scheme on both air pollutant emissions and concentrations, and will be supported by an advisory group of external experts. Also in early 2025, Transport for London will publish a report evaluating the impact of the GLA-funded vehicle scrappage scheme that supported the London-wide ULEZ.

The mayor has provided over £5 million (US$ 6.3 million) in funding to 17 projects under Round 4 of the Mayor's Air Quality Fund (MAQF). These will be delivered across London between 2024 and 2027, and include projects to raise awareness about air pollution, reduce the impact on those who are most vulnerable, decrease dependence on private vehicles, and increase access to green spaces. A full list of current MAQF projects can be found on the website: Mayor's Air Quality Fund | London City Hall.

As first communicated in September 2015, the emissions standards for non-road mobile machinery (NRMM) are due to change in 2025. Currently, different NRMM Standards apply based on the location of the construction site, but from 1 January 2025, the standards will become uniform and NRMM across the whole of Greater London will be required to meet EU Stage IV, as a minimum. The standards are set to become progressively tighter and, by 2040, all NRMM will be required to be zero emission.

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MADRID

SPAIN

Levels of the main air pollutants have continued to decrease in Madrid since 2019, except for that of tropospheric ozone. Actions arising from the development of the city's Air Quality Plan and the Madrid 360 Sustainability Strategy have led to the decrease in NO_2 levels, which are now in compliance with the annual limit value (2022–2023) and hourly limit value (2020–2023) for this pollutant.

The main actions that contributed to these improvements were; the establishment of Madrid's low-emission zone, covering the municipality, as well as two low-emission zones of special protection in the Central District and Plaza Elíptica; the elimination of diesel vehicles from the Municipal Transport Company's bus fleet, of which 12.9% is now electric; expansion of the public bicycle rental service (BICIMAD) to the entire city, now providing 611 stations and 7,866 bicycles; and increasing the electric charging infrastructure for private vehicles.

Madrid Central Low Emission Zone © Eduardo Peralta

Also noteworthy is the city's subsidy programme (Plan Cambia 360), which provided investment of €103 million (US$ 108 million) between 2020 and 2024 to support the reduction of polluting sources in the city. The subsidy was distributed as follows; €35.1 million (US$ 37.1 million) for the renovation of thermal and air conditioning installations; €43.8 million (US$ 46.3 million) for the renovation of the private vehicle fleet; €12 million (US$ 12.6 million) for the renovation of the city's taxi fleet; €5.7 million (US$ 6 million) for the renovation of fleets dedicated to the urban distribution of goods; €5 million (US$ 5.2 million) for the promotion of electric charging infrastructure; and €1.45 million (US$ 1.5 million) to promote personal mobility, including bicycles, scooters, and motorcycles.

By the end of 2025, the city is planning to implement further actions that will continue to clean Madrid's air. These include, among others, the Madrid LEZ; increasing the number of electric buses to 25% of the total fleet; and increasing the number of rapid EV charging points in public spaces to 283. An additional 718 charging points will be managed by the Municipal Transport Company (EMT).


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MILAN

ITALY

Milan keeps working to improve air quality through a comprehensive Air Quality and Climate Action Plan, which was approved by the city council in February 2022. The plan focuses on three main objectives: complying with EU atmospheric pollutant limits; reducing CO_2 emissions by 45% by 2030; and reaching carbon neutrality by 2050. To monitor the impact of implemented actions, five near-reference-grade air quality monitors have been deployed across the city, in addition to the five part of the city's institutional network. These stations measure pollutants such as PM_{10}, $PM_{2.5}$, NO_2, black carbon, and CO_2, with a focus on areas close to schools, hospitals, and vulnerable communities. The city is also advancing citizen science initiatives to enhance hyperlocal air quality monitoring and raise public awareness.

Milan has implemented significant actions to reduce air pollution in the transport sector. The city's public transport company stopped purchasing internal combustion engine buses in 2021, aiming to build a fully carbon-free fleet by 2030. In October 2024, it also opened the final section of the new metro line M4, connecting Linate airport with western neighbourhoods via the city centre, over a total of 15 km and 21 stops. On 1 October 2024, Milan further tightened regulations on polluting vehicles in its low-emission zones (Area B and Area C). These measures are supported by the development of an urban electric charging network, which currently counts more than 1,100 charging points across the city, to encourage the switch to electric vehicles.

To reduce air pollutant exposure for Milan's most vulnerable residents, including children and elderly people, the city is prioritising its "Open Squares for Every School" interventions, focused on expanding public spaces without cars. The increase of pedestrian zones is also part of a set of actions to promote active mobility, which additionally include the extension of the bike lane network to around 330 km across the city. In October 2024, Milan launched the communication campaign "Milano Futura Ora", aiming to raise awareness about municipal policies on transport, urban regeneration, and green areas. The campaign highlights the positive impacts on health and quality of life from measures that enhance shared public space and sustainable mobility, with a view to encouraging behavioural change.

In addition to these transportation initiatives, Milan continues to address emissions from the building sector. Actions include the provision of €600,000 (US$ 633,400) in grants for maintaining private heating systems in 2022, and the replacement of municipal diesel boilers with cleaner alternatives.

In December 2023, Milan joined the Breathe Cities programme, as part of the initial cohort of 10 cities that will receive support to scale local impact and exchange knowledge with other leading cities.

By 2025, Milan aims to be in compliance with EU air quality standards, through the implementation of impactful actions such as the updated Air Quality Regulation, issued in 2020, and measures to tackle various emissions sources, including construction sites, non-road mobile machinery, building heating systems, and wood combustion. In January 2025, the regulation will also introduce a smoking ban in all public spaces.

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OSLO

NORWAY

Air quality in Oslo has continued to improve – particularly NO_2 levels, thanks to abatement measures for reducing exhaust emissions from road transport and the significantly increased proportion of electric vehicles. This has led to compliance with the current EU limit values for NO_2, although annual mean concentrations are still above the 2021 WHO Air Quality Guidelines.

Concentrations of PM_{10} have stayed stable during recent years, remaining above the national limit values at sites in heavy-traffic areas. Annual mean levels of PM are generally not in compliance with the 2021 WHO Air Quality Guidelines.

Since 2019, some changes have been made to the city's air quality monitoring network, with the establishment of new monitoring stations and relocation of some existing installations.

Recent and ongoing efforts to improve air quality in Oslo include increased traffic tolls from 2022; the removal of on-street parking areas to make more space for residents; new and upgraded cycling infrastructure; and the deployment of zero-emission buses.

Oslo's existing air quality action plan expires in 2025 and work on a revised and updated plan is in progress, focusing on measures to reduce particulate matter to below the limit values. To achieve this and also meet WHO Air Quality Guidelines, additional PM-reduction actions – such as road cleaning and dust binding – will be needed alongside the city's range of existing measures.

Electric Bus © Oslo Kommune


© Alexander Kagan / Unsplash

PARIS

FRANCE

Paris has made significant progress in improving air quality through a series of impactful actions across multiple sectors. The most notable achievements in recent years include the continued tightening of bans in the low-emission zone (LEZ), which began in 2015 with a ban on highly polluting vehicles. The Greater Paris Metropolis joined the LEZ initiative in 2019, and restrictions have continued to be tightened. The city of Paris aims to have 100% clean vehicles by 2030. This is part of a major effort to reduce the number of residents exposed to excessive levels of nitrogen dioxide from 250,000 in 2019 to just 2,500 in 2023.

In the transport sector, the city has encouraged the adoption of cleaner vehicles, with more than 2,300 charging points for electric vehicles now available in Paris. Public transport operator RATP has committed to introducing a fleet of fully electric or biogas buses by 2025, with 1,000 electric buses planned by the end of 2024. Cycling infrastructure has also been significantly improved, with over 1,500 km of cycle lanes in place and 19,000 public bicycles in circulation (35% of which are electric), resulting in a 34.1% increase in the number of cyclists between 2021 and 2023.

Paris has also focused on improving air quality in the vicinity of schools through its “Rues aux enfants” programme, which has involved the pedestrianisation of streets near a number of schools to reduce traffic and pollution. By the end of 2024, 218 streets were made quieter, covering half of all nursery and primary schools. Of these, 70 streets had been completely closed to traffic, renovated and planted with vegetation. The objective for the current term of office, by 2026, is to have 300 calmed streets, 100 of which will be closed to traffic. A series of before-and-after photos can be viewed at this link.

From October 2022 to June 2024, Paris deployed a vast programme to raise awareness of air quality in Parisian schools and colleges through educational workshops and street stands for the general public. The operation, called “Paris prend l'air” (‘Paris takes the air’), was run in partnership with Airparif and the scientific mediation association Les Petits Débrouillards, and supported by Bloomberg Philanthropies.

In December 2023, Paris joined the Breathe Cities initiative and committed to introducing a limited traffic zone in the city centre.

Sustainable transport © Sarah Bastin

This was implemented in November 2024, following extensive consultation with residents and stakeholders. A majority of Parisian voters (54.55%) expressed their support for the increase in the price of parking for SUVs. Furthermore, the city is continuing the electrification of its municipal street cleaning and waste collection fleet, with 18 electric vehicles introduced in 2023. With the order placed in 2024, for 42 electric machines to be delivered in the first half of 2025, the city will have 126 electric sidewalk vehicles out of a total 244-vehicle fleet (44 vacuum trucks out of 101 and 82 washing machines out of 143). This represents a 50% electric fleet, furthering the city's efforts to reduce air pollutant and greenhouse gas emissions from vehicles operating on the streets of Paris.

Paris is continuing its efforts under the Breathe Paris data pillar with two key projects:

1. The continuing assessment of ultrafine particles. This study, initiated in 2019 and originally funded by Bloomberg Philanthropies as part of the Air Quality Partnership with Airparif, will be completed by April 2025. It aims to deepen the understanding of ultrafine particles, including their characteristics, sources and impacts, providing valuable data for researchers and public health experts.
2. An assessment of the impact on air quality of urban development and traffic management plans in Paris. In particular, this will involve a double ex-post evaluation of the impact on emission levels and air quality of two major initiatives: a) the transformation of the Trocadéro-Iéna sector, following the example already underway on the Place de la Concorde, through improvements to public space with an impact on the road network; and b) the implementation of the limited traffic zone in the city centre. Planned for 2025, the assessments will use modelling tools to evaluate the effects of traffic reduction on air quality when other factors are held constant.

Paris has begun restructuring the ring road, by lowering the speed limit from 70 km/h to 50 km/h in October 2024, and plans to ban motorists from one of the lanes with effect from spring 2025. Long-term monitoring is planned over four years via the creation of a joint observatory for air quality, the noise environment, and traffic, run by Airparif, Bruitparif, and Cerema respectively.

In addition, between now and 2026, Paris plans to continue its policy of reducing the use of cars in public spaces in favour of pedestrians and soft mobility.

The city's efforts are supported by ongoing studies, such as those carried out by Airparif, which highlight the need to reduce road traffic emissions by 60% and residential sector emissions by 40% in order to comply with future European air quality thresholds for NO_2 in 2030. Paris continues to update its strategies, ensuring that it remains on track to meet these ambitious targets.

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STOCKHOLM

SWEDEN

Concentrations of air pollution have steadily decreased in Stockholm. The already low annual concentrations of $PM_{2.5}$ continue to decrease every year, and the city's aim to meet the newer and stricter WHO Air Quality Guidelines for $PM_{2.5}$ is now considered to be achievable within the next few years.

Further work in needed to meet the WHO Air Quality Guidelines for yearly average NO_2 concentrations in Stockholm. Nonetheless, concentrations of NO_2 have almost halved at all city measurement stations over the last five years, going from yearly averages of around 30 µg/m^3 to about 15 µg/m^3 in that period. This is partly attributable to the rapid increase in electric vehicles and the phase-out of "dirtier" diesel cars.

Stockholm's inner city area has become a more welcoming public space for visitors and residents, thanks to efforts to prioritise people over cars by turning busy roads into streets for walking, shopping, restaurants, and nightlife instead of traffic during the summer months. From 31 December 2024, Stockholm will be implementing one of the strictest low-emission zones in the world, and efforts are already in place to identify areas for expanding the zone further during 2025. Other ambitious goals for Stockholm in the near future include cutting city traffic by 30% by 2030, and becoming climate positive within the same year.

Air Quality Meaurements Stations
© Johan Pontén - City of Stockholm

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TEL AVIV - YAFO

ISRAEL

In the city of Tel Aviv-Yafo, 14 permanent monitoring stations are continuously tracking air pollutants, including NO_X, NO, NO_2, $PM_{2.5}$, PM_{10}, benzene, and CO. Data analysis shows a trend of improving air quality in the city over the past decade. This improvement is reflected in a significant decrease in pollutant concentrations, which now comply with the environmental standards set by the national Clean Air Law.

2023 annual averages:
- $PM_{2.5}$ = 18.12 µg/m^3
- NO_2 = 26.46 µg/m^3

Real-time air quality data is available to the public through a monitoring system available at https://air.sviva.gov.il.

In 2020, Tel Aviv-Yafo approved its strategic transportation plan, prioritising pedestrians and placing private vehicles at the bottom of the hierarchy. The plan is based on expanding the network of green routes, connecting key areas throughout the city and improving both quality of life and air quality, with a focus on enhancing conditions for walking and cycling. Features will include wide sidewalks, separate bike lanes, improved shading and urban street trees, pedestrian-friendly crossings, and seating areas. Recent developments include green routes starting in the Bitzaron neighbourhood and ending at the seafront, and the Park HaMesila route, which spans 1.3 km and covers an area of approximately 26 dunams (26.000m^2), with access to the light rail station.

Tel Aviv-Yafo is home to approximately 260,000 trees (150,000 of which are in public spaces), forming an urban forest covering about 18% of the city's area. In 2020, the city adopted a target to plant 100,000 trees as part of its climate adaptation plan. Additionally, over 25 streets have been designated for exclusive pedestrian use, allowing only walking, cycling, and e-scooter use. The city has also expanded its bike lane network, with approximately 330 bike paths covering 180 km, and plans to expand to 250 km by 2030.


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The city is also expanding its public transport lanes, with about 73 km of lanes so far and a plan to extend to 123 km by 2030. Naim B'sofash, a collaborative initiative led by the Tel Aviv-Yafo municipality and involving 14 local authorities in the metropolitan area, provides a weekend shuttle service when the national public transportation system is inactive. The system has 16 routes spanning 350 km. On an average weekend, more than 30,000 passengers use the services, totalling over 120,000 monthly trips. In August 2023, Tel Aviv-Yafo launched its first light rail line, the Red Line. The line connects five cities, spans approximately 24 km – 12 km of which are underground – and features 34 stations, of which 10 are within Tel Aviv-Yafo. According to official reports, 100,000 passengers used the line daily in its first year.

Tel Aviv-Yafo is also expanding its network of electric vehicle charging stations to promote the electrification of vehicle fleets – with more than 12,000 electric vehicles currently in use. The city has installed 128 AC and 10 DC charging points in parking lots, and 11 more charging stations will be installed by the end of 2024.

To support the reduction of reliance on private vehicles, the municipal parking standards were revised in June 2024. Starting from January 2025, each household will be limited to two parking permits, with an annual fee for the second permit. Additionally, residents must pay for street parking outside their residential area.

Reducing construction-related pollution is also a focus for Tel Aviv-Yafo, with new guidelines published that outline conditions for demolition and construction activities to reduce air pollution from the city's numerous construction sites. Requirements include the establishment of temporary electrical connections; a prohibition on using generators; and the requirement to minimise dust generated by construction activities. In addition, all on-site construction machinery need to be authorised by the Ministry of Environmental Protection.

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WARSAW

POLAND

Warsaw has put in place effective measures to improve air quality across different sectors. Since becoming a signatory of the Clean Air Accelerator, the city has significantly expanded its air quality monitoring system, with the installation of two monitoring stations and more than 100 sensors across Warsaw and neighbouring municipalities. Warsaw has seen an improvement in air quality, with a **33%** reduction in annual $PM_{2.5}$ levels from 23.3 µg/m³ to 15.6 µg/m³; PM_{10} from 34.8 µg/m³ to 22.6 µg/m³ (**35%**); and benzo[a]pyrene from 1.5 µg/m³ to 0.5 µg/m³ (**66%**) between 2017 and 2023. This is the result of impactful policy development across sectors, and has brought about associated improvements in residents' health and quality of life.

The city now complies with the EU's Ambient Air Quality Directive standards for $PM_{2.5}$ and benzo[a]pyrene (2008 standards). This success stems from the ban on "non-class" coal and wood boilers in the building sector and a subsidy programme providing residents with nearly 100% financial assistance for cleaner fuels, such as heat pumps and photovoltaics. Between 2017 and 2023, the number of non-class boilers fell by 80%, from 15,000 to 2,650, leading to the highest reduction in $PM_{2.5}$ among European cities. This achievement highlights the effectiveness of both legal measures and generous subsidy programmes, with investments exceeding PLN 80.7 million (US$ 20.2 million), and almost 5,000 grants totalling over

PLN 55.5 million (US$ 13.9 million), further advancing the city's ambition to reduce CO_2 emissions and improve air quality.

Warsaw's air quality strategy prioritises reducing emissions from the transport sector. The city expanded its metro and tram networks to a total of 45.4 km by the end of 2024 and is upgrading its public transport fleets to cleaner alternatives. On 1 July 2024, the city introduced Eastern Europe's first all-year-round low-emission zone (LEZ), known locally as the "Clean Transport Zone". Spanning 37 square kilometres and covering 7% of the city, this initiative marks a significant milestone in Warsaw's commitment to cleaner air through its partnership with Breathe Cities, beginning in 2024. The implementation has been bolstered by extensive public awareness campaigns. A national survey in early 2024 indicated that approximately 75% of Poles were familiar with LEZs, up 5% from mid-2022. In Warsaw alone, awareness increased from 72% to 84% during the election period.


Sustainable transport © Tim E White / Getty Images

Warsaw has actively engaged with the community through initiatives such as the "Streets for Kids" event, which allowed 60 children to reclaim the streets. The city facilitated interactions among 30 parents, NGOs, residents, and representatives from the offices of air protection, architecture, education, and traffic management, and the Warsaw Roads Authority. The city also launched the "Transport Zone Billboard Campaign", which displayed animations about air pollution on six digital billboards along major streets. This campaign, complemented by a social media effort, reached over 26,000 people in its first week.

The city's plans for 2025 include: 1) continuing to replace solid fuel boilers, with an increased emphasis on combining boiler replacement with thermal upgrading (encouraging the use of government subsidies under the "Czyste Powietrze" [Clean Air] programme); 2) fighting energy poverty, with programmes for boiler replacement and thermal upgrading dedicated to the poorest households; and, 3) a new granting scheme to subsidise the replacement of old, inefficient gas boilers with heat pumps and photovoltaics.

SIGNATORY CITIES IN

LATIN AMERICA


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BOGOTÁ

COLOMBIA

Since Bogotá joined the Clean Air Accelerator, the city has advanced in its efforts to reduce emissions from traffic. One of the most important measures taken was the implementation of Urban Zones for Better Air (ZUMA), announced in September 2023, with the purpose of reducing air pollution in certain specific areas. The first ZUMA, set up in the zone of Bosa-Apogeo, will improve air quality for over 35,000 inhabitants, especially for vulnerable groups including children under 10-years old and adults over 60.

Bogotá has also worked with C40's Air Quality Technical Assistance programme, to develop a plan for the installation of approximately 70 air quality sensors across the city over the next few years; support decision making on ZUMA-related interventions, through a feasibility study and air quality and public health modelling; and carry out polling and design a communications strategy and messaging framework for engaging with residents on and building support for the ZUMA.

In 2021, Bogotá adopted Decree 332 of 2021, establishing the Strategic Plan for the Integral Management of Air Quality (Plan Aire 2030), which aims to reduce air pollutants within the city and to reach the WHO's interim target (IT) 3. The city has been advancing on the implementation of this plan, with actions including environmental vehicle labelling, which labels vehicles according to their air quality and greenhouse gas emissions. In addition, the city has developed a new regulation for its vehicle fleet and worked on the production of sustainable driving and good practice guides. As part of the Intervention Plan for the South Western Zone (PIZSO) initiative, the District Environment Secretariat, in collaboration with the local mayors, has carried out the paving of 15 roads, with a decrease in $PM_{2.5}$ levels evidenced in the surroundings.

Bogotá also continues to promote and improve active mobility, through new policies and strategies such as the public bicycle policy, public pedestrian policy, and vital neighbourhood strategy. The city has also made great strides in improving and cleaning its public transport service, with La Rolita becoming the first district-led public transport operator with a 100% electric bus fleet. This initiative also created 2,000 new green jobs in bus operations, prioritising the recruitment of women and people from frontline communities.


Bogota_Tembici © Secretaría Distrital de Movilidad de Bogotá

Microsensors © Alcaldía de Bogotá

In 2023, Bogotá's air quality monitoring network received accreditation to monitor PM_{10}, $PM_{2.5}$, and black carbon. It has been operating a total of 19 continuous monitoring stations since September 2023, helping to measure the air quality improvements in the city and raise awareness about toxic air pollution, and enabling the city to also warn residents during episodes of bad air pollution, such as those linked to forest fires.

Regarding the periodic update of the air pollutants emissions inventory, the "Bogotá Emissions Inventory, Criteria Pollutants and Black Carbon 2022" has been officially approved and published. This report consolidates the estimated emissions from the primary sources identified in Bogotá, including on-road mobile sources (vehicles), industrial fixed sources, resuspended particulate matter generators, and other emission sources.

During 2024, as part of the microsensor collaborative network, 25 PM microsensors were installed as part of the government's first 100-day milestone. An additional nine devices were later installed, five of which are currently providing indicative air quality measurements near the construction sites for the Bogotá Metro Line 1, specifically at the Marly and Calle 26 stations.

In 2024, Bogotá joined the Breathe Cities initiative, which will support the city to enhance its air quality data, community engagement, and capacity building. During the second half of 2024, city officials, together with C40, the Clean Air Fund, and Bloomberg, will design the city's strategy document setting out the activities that will be supported by the programme. This will be aligned with the current administration development plan 2024–2027, which includes significant goals such as the implementation of a financial mechanism to renew freight vehicle fleets (FonCarga), and two urban zones for better air (ZUMAs).

By the end of 2025, the city plans to implement several key policies and actions. These include executing the Bosa-Apogeo ZUMA action plan and initiating preliminary studies for a new ZUMA to be declared within the city. Additionally, following the establishment of the FonCarga financial instrument by the end of 2024, the technological upgrade of cargo vehicles with a gross vehicle weight of 10.5 tonnes or less, as well as dump trucks operating within the city, is expected to begin in 2025. The environmental self-regulation plan will also be restructured to include public motorised passenger transport services, such as the Integrated Public Transportation System (SITP) and intermunicipal transport, along with public and private freight transport, mixed transport, and special services like school, tourism, and corporate transport. Furthermore, the city aims to expand its air quality microsensor network to enhance the monitoring of pollution levels across various zones. Lastly, the "Bogotá Emissions Inventory, Criteria Pollutants and Black Carbon 2023", will be published in 2025.

ZUMA Launch © Alcaldía de Bogotá

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BUENOS AIRES

ARGENTINA

Since signing the C40 Clean Air Accelerator in 2019, the city of Buenos Aires has been on a pathway to improving its diagnostic capacity by readjusting its atmospheric monitoring network. In 2021, work was undertaken to update the city's air quality regulations, with the signing of Resolution 68-APRA-21 establishing the progressive adoption of admissible air quality limits in line with WHO Air Quality Guidelines.

In terms of public transportation, Buenos Aires is promoting a modal change from private uses to mass transport modes, while simultaneously encouraging the use of alternative energy sources and carrying out pilot tests on electric and low emission buses. (Image N°2).

The implementation of the Ecobici system in 2019 saw increased numbers of stations and bicycles available to residents, and greater options for using the existing network of cycle lanes. Meanwhile, an exemption from paying for license plates was established for all vehicles powered by hybrid or 100% electric motors in the city of Buenos Aires.

Pilot tests have been carried out with low-emission vehicles to evaluate the viability of their use within the urban logistics network, particularly for last mile transport. In addition, delimited spaces for urban logistics loading and unloading were created.

Actions planned for implementation by the end of 2025 are grouped into five axes: public transportation; private motorised mobility; urban logistics; active mobility; and transversal measures that can be applied across the aforementioned axes holistically.

Among the main actions being planned within these axes are: implementing at least one electromobility project in public passenger transport (Image N°1); promoting the transition of buses to alternative sources; and developing charging infrastructure for electric/hybrid vehicles.

MiniMUBE © Gobierno de la Ciudad de Buenos Aires

Pilot test with electric buses (2019)
© Gobierno de la Ciudad de Buenos Aires

© Lukas Pariza / Getty Images

GUADALAJARA

MÉXICO

Since Guadalajara joined the Clean Air Accelerator in 2019, the city has implemented various actions to improve air quality and quality of life for its residents. In the last five years, work has been undertaken to construct a new light rail line, expand the public bicycle network, and develop infrastructure for the first low-emission zone (LEZ) in the city's historic centre. An important milestone was the semi-pedestrianisation of Paseo Alcalde, one of the most polluted avenues in the city, which has significantly transformed urban mobility. The implementation of the LEZ – one of the High Impact Actions of the UCAP CAI Climate Action Implementation Programme, funded by the British Embassy and executed in collaboration with C40 Cities – has resulted in $PM_{2.5}$ and NO_X emissions being reduced by 94% within the Paseo Alcalde area of intervention, based on a comparative analysis between 2012 and 2022 carried out by C40.

By 2025, the city plans to expand the LEZ, increase the use of electric public transport, and improve urban tree planting, thereby consolidating its commitment to climate action and the creation of a healthy and resilient urban environment. The studies and results of the LEZ project will be published for public consultation once completed, strengthening transparency in the environmental management of Guadalajara.

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LIMA

PERU

Since the city of Lima joined the Clean Air Accelerator, it has made significant progress against air pollution, on various fronts. The city has significantly expanded its air quality monitoring network through low-cost monitors, increasing from 10 monitors in 2019 to more than 70 in 2024, supported by regulatory instruments such as the Local Climate Change Plan 2021–2030 and the annual Institutional Operational Plan. Within this initiative, the "New Air for Children in the Province of Lima" project was developed, focused on promoting and improving air quality for residents in early childhood. This project was highlighted for recognition by the "Bloomberg Philanthropies" awards.

Other initiatives carried out by Lima include: monthly "Breathe Clean" campaigns to diagnose, control, and raise awareness about vehicle emissions; fuel catalytic converters installed in the municipal vehicle fleet to reduce polluting emissions and improve engine performance; development of a more sustainable transportation system; a cycle-inclusive strategy to encourage the use of bicycles, especially among women and young people from low- and middle-income groups, promoting more equitable mobility; and establishment of a clean air zone to improve air quality in the historic centre.

The city is also amplifying its goals in the collection and recovery of organic, inorganic, and electronic waste, with the aim of reducing GHG emissions and improving air quality. These efforts are projected to continue in 2025, with the progression and expansion of the aforementioned programmes.


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MEDELLÍN

COLOMBIA

Metropolitan Agreement 16 of 2017, which adopts the Aburrá Valley Comprehensive Air Quality Management Plan, sets out intermediate goals for reducing annual concentrations of target atmospheric pollutants in the Aburrá Valley, such as $PM_{2.5}$, PM_{10}, and O_3. Following the implementation of the plan's 10 thematic axes between 2019 and 2023, the city has been able to reach compliance with these goals, particularly for $PM_{2.5}$ and PM_{10}.

Medellín has made significant progress in improving air quality, with the adoption of comprehensive actions including the renewal of the public transport fleet with electric buses and/or the use of cleaner fuels; the creation of low-emission zones in critical areas of the city; and the strict regulation of mobile and industrial sources of emissions. In addition, the SIATA early warning monitoring system, which monitors air quality continuously and in real-time, has allowed for the better management of critical episodes of pollution, helping policies to be more reactive and precise. This has improved rapid decision-making in terms of both public policy and citizen management.

By 2025, Medellín seeks to improve its public transport network, including renewing its fleets with low- or zero-emissions vehicles, and training drivers on efficient driving practices. Actions to reduce emissions and the use of clean technologies in the public and private sectors will be encouraged through the city's "Great Alliance for the Circular Economy" strategy. Additionally, green corridors will be created to help with mitigation of and adaptation to the climate crisis and air pollution; and the implementation of the Laneshift programme, funded by Global Optimism and Amazon's Climate Pledge, with support from C40, will accelerate the transition to zero-emission freight vehicles in Medellín and other cities across Latin America and India. These actions reinforce Medellín's commitment to the continuous improvement of air quality and the well-being of its inhabitants.


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MEXICO CITY

MÉXICO

Since joining the C40 Clean Air Accelerator, Mexico City has been actively working to tackle emissions across sectors and improve air quality for its residents. In 2021, the city launched the Air Quality Management Plan for the Metropolitan Area of the Valley of Mexico (ProAire ZMVM) 2021–2030, focusing on the twin goals of reduced pollutants and improved public health. The plan includes targets to reduce atmospheric pollution by 20% for PM_{10}; 35% for $PM_{2.5}$; 35% for NO_X; and 20% for VOCs by 2030. This is aligned with Mexico's national standards, and advances progress towards compliance with WHO Air Quality Guidelines. Additionally in 2021, the city participated in the revision and updating of four environmental air quality standards for O_3, CO, NO_2, and PM_{10} and $PM_{2.5}$ respectively.

Since then, the city has implemented a range of impactful actions, including the modernisation of its public transport network. Between 2019 and 2023, Mexico City acquired 425 new electric trolleybus units, (electric buses) the whole fleet and extending its trolleybus system. These public-transport investments were complemented by the modernisation of Line 1 of the Metro system, covering 22 km of renovated tracks. In addition, a cable car system (Cablebus) was introduced in 2021 and now runs three lines. The BRT and the public bus network were also extended and renovated with electric units and low-emissions buses, resulting in the full electrification of the BRT corridor (Line 3 of the Metrobus). Meanwhile, the city has taken steps to promote electric mobility in cargo transport, with a self-regulating programme showing a shift towards cleaner options; expanded the public bicycle sharing system; and increased the cycle lane network to over 242 km, leading to daily cycle-trip records being broken twice in 2024. Additionally, the first interstate metropolitan bike lane was inaugurated, covering 11.9 km and connecting the city with the State of Mexico.

Other actions delivered by the city include the installation of solar heaters in city-built homes; the reforestation of 12,000 hectares of conservation land and 1,700 hectares of urban forest; and the provision of training on forest fires for fire brigades.

During 2024, the city worked with the federal government to establish standards to regulate emissions from new motorbikes and off-road machines; plans for 2025 include updating the city's local air quality alerts app. Mexico City continues to work to improve air quality, with a focus on VOCs and ozone, through the development of policies and legislation for domestic products in the residential sector, as well as electric mobility in public transportation.

Mexico City has a comprehensive air quality monitoring network, allowing it to track air pollution improvements through data from 44 monitoring stations across the Metropolitan Area of the Valley of Mexico. Stations measure CO, SO_2, NO_2, NO_X, O_3, and PM. The city also has a laboratory for environmental analysis, a mobile monitoring station, and a forecasting system for local air quality.


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QUITO

ECUADOR

Since Quito joined the Clean Air Accelerator in 2019, the city has made significant progress in improving air quality. The Metropolitan Atmospheric Monitoring Network, with its nine stations, has shown a sustained decrease in several pollutants, as reflected in the 2023 Annual Air Quality Report. This reduction has contributed to an improvement in public health and better quality of life for city residents.

The operation of the Quito Metro has been key in reducing emissions, with 20% of users adopting new forms of sustainable transport. The low-emission zone within the city's historic centre has also been strengthened, and a proposal has been submitted to reform the municipal organic code, incorporating the WHO Air Quality Guidelines into local regulations. This is essential for the future of environmental management in the city.


"It's in the air" campaign © C40

Scientific studies have played a crucial role in decision-making; the Quito Environment Secretariat has co-authored two articles – "Respiratory Health Impacts of Outdoor Air Pollution and the Efficacy of Local Risk Communication in Quito" (2023) and "Carbonaceous fraction in $PM_{2.5}$ of six Latin American cities" (2024) – which provide valuable information on the distribution and sources of pollutants, especially $PM_{2.5}$. These studies have made it possible to improve public policies and strengthen local actions to control pollution. Additionally, new automatic PM_{10} sensors have been installed in some identified sectors, while low-cost equipment is maintained in other locations, or at specific times, in order to evaluate specific actions.

Looking ahead to 2025, Quito will continue to move forward with the expansion of electric transport and the use of low-cost sensors in strategic areas to better monitor air quality, consolidating its commitment to cleaner air for all.

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RIO DE JANEIRO

BRAZIL

Rio de Janeiro has adopted strategies to improve air quality in the city by reducing levels of PM_{10} and $PM_{2.5}$. The city's Sustainable Development and Climate Action Plan (PDS), launched in June 2021, proposes new air quality targets and commits the city to reducing PM_{10} concentrations to 30 µg/m³ by 2030. Impactful actions implemented by the city in its work towards this target include the establishment of a low-emission district.

In 2022, the city introduced a decree to regulate the low-emission district, which is planned for the central region. The pilot implementation will cover 35,000 square metres of public space in the district area, and aims to promote transport options with clean technologies; urban requalification, with sustainable solutions to foster the increase of green infrastructure; and active mobility. Other pilot actions that have already been carried out include the Safe Cycling Advocacy Programme cargo bike project, supported by Transporte Ativo and the European Cyclist's Federation.

In the same year, the air quality monitoring network managed by the City of Rio de Janeiro joined the Ministry of the Environment's "Monitorar" platform, thereby expanding the city's access to and use of real-time information on local air quality, as well as increasing transparency and public awareness on the topic.

The C40 Technical Assistance Programme also supported the city's efforts to acquire two compact air monitoring stations in the low-emission district. These are crucial for monitoring PM_{10} and $PM_{2.5}$ levels, which in turn are essential for assessing the district's air quality.

In 2023, the city consolidated its efforts to deliver impactful actions by incorporating air quality management across the city, creating a permanent technical committee composed of experts from different areas of the city government. Representatives from city departments such as environment, health, and transportation collaborated to consolidate the relationship between causes and effects related to air pollution. The city additionally created an air quality monitoring plan and a communication plan for the low-emission district, where it also carried out a simulation using C40's AQUA tool. In late 2023, Rio de Janeiro officially joined the Breathe Cities initiative, which is supporting the city to pursue a bolder approach to reducing air pollution and improving its air quality monitoring system.

In the first half of 2024, the Breathe Cities project focused on delivering City of Rio de Janeiro's strategy, engaging with city officials and civil society/academia representatives from different sectors over several months of meetings and workshops. The outcome of this work has defined the city's priorities for improving its air quality monitoring system, particularly in strategic urban and economic centres where sustainable interventions and inclusive zero-emissions transport are planned.

Breathe Cities Rio will initially support the municipality in expanding its air quality monitoring network, using lower-cost, compact sensors to strengthen City of Rio de Janeiro's air quality management system and enable robust and inclusive coverage across different areas of the city. The programme will also work to achieve greater availability of air pollution data to Rio's residents, aiming to raise awareness of the effects of poor air quality. The technical assistance also aims to support the development of sustainable urban intervention projects

Air quality monitor installation
© Prefeitura da Cidade do Rio de Janeiro

focused on promoting active mobility; increasing green infrastructure; implementing necessary charging infrastructure; expanding bike lanes and pedestrian-only streets to encourage modal shift; and inclusive zero-emission transportation studies that will pave the way for reduced transport-sector air pollutants and the replacement of old diesel buses with zero-emission technologies.

By 2025, the Breathe Cities programme, with the assistance of the city, aims to deliver projects that will support sustainable urban requalification interventions in Rio de Janeiro's city-centre low-emission district. Additionally, it aims to prioritise active mobility; provide guidelines for public interventions in important central areas in the north of the city; and evaluate better ways to integrate intermodal transportation, to improve user accessibility of the current transportation system. An electric fleet renewal plan – involving the conversion of the public bus fleet to electric vehicles – is also supporting the city's target to electrify 20% of all vehicles by 2030.

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SALVADOR

BRAZIL

Since September 2023, the city of Salvador has been in the early stages of developing a roadmap to establish air quality baseline levels and set ambitious reduction targets aligned with the WHO Air Quality Guidelines.

The city has begun implementing air quality monitoring projects in strategically selected locations, deploying lower-cost sensors to monitor air pollution emissions putting special attention to vulnerable communities. The sensor network will consist of 20 stations throughout Salvador, with a particular focus on vulnerable areas, including Subúrbio Ferroviário, Ilha de Maré, and Ilha dos Frades.

Meanwhile, the publication of municipal decree No. 38,598 of May 22, 2024, establishes sustainable administrative measures, within the scope of the Municipal Public Administration, for the gradual replacement of fossil fuels used in Salvador's city vehicle fleet. With the transportation sector being responsible for 75% of the city's $PM_{2.5}$, O_3, NO_2, and/or SO_2 emissions, these efforts to reduce vehicle emissions will contribute significantly to improving air quality.

Salvador is a city where 38% of the population travels on foot, and the city is investing in expanding cycle path coverage, to allow and encourage more people to travel by bicycle. The Department of Urban Mobility's active mobility plan[4], developed with the support of the World Bank and fully financed through a donation from the UK government's PACT programme, aims to reach 25 km of cycle paths per 100,000 inhabitants within ten years.

[4] The Department of Urban Mobility's active mobility plan.

SIGNATORY CITIES IN

NORTH AMERICA

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AUSTIN

UNITED STATES

Austin has been working to reduce air pollution in the city to comply with the WHO air quality guidelines and the US Environmental Protection Agency's National Ambient Air Quality Standards.

Since joining the Clean Air Accelerator, the city has maintained its focus on reducing fossil-fuel dependency in the transportation and energy sectors. With the implementation of its Regional Air Quality Plan and Climate Equity Plan, which was approved in 2021 and includes measures targeting energy, transportation, and natural systems, the city is tackling transport emissions through improved public transport, active travel promotion, and the transition to electric vehicles. Other key initiatives include “Project Connect”, aimed at building a comprehensive public transportation system, and the Austin Energy EV Buyers Guide, which has been instrumental in increasing electric vehicle adoption among residents. Meanwhile, the city has set ambitious goals for its electricity generation to be fully carbon-free by 2035, and is also championing cross-departmental climate resilience activities, including a collaboration with the Austin Fire Department on wildfire mitigation policies.

Austin has expanded its air quality monitoring efforts, deploying real-time small-scale sensors and collaborating with the University of Texas on a research project to gain more localised data. This builds on previous actions, such as the deployment of additional $PM_{2.5}$ sensors by the Capital Area Council of Governments in low-income and historically industrialised areas. The city’s commitment to data-driven strategies ensures a focused approach to tackling pollution hotspots.

The voters of Austin approved a historic investment for the city’s public transit system, which will bring comprehensive bus and light rail options to the city to get more Austinites out of their cars, while also fostering greater urban density. The city is also leading regional efforts to coordinate climate planning and reduce emissions, thanks to two important grants from the Environmental Protection Agency (EPA). These efforts will be key to developing and implementing strategies to improve air quality in Central Texas. In particular, the funding awarded through the EPA will be used to promote the adoption of transit, carpooling, and active transportation – leading to long-lasting impacts on congestion and achieving the city’s goals around mobility and reducing air pollution.


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PHOENIX

UNITED STATES

Working alongside regional partners, residents, and businesses, the city of Phoenix continues to work towards its goal of improving air quality to meet the Environmental Protection Agency's National Ambient Air Quality Standards. The region is in compliance with the standards for NO_2, CO, SO_2, and lead; but is not compliant with those for $PM_{2.5}$, PM_{10}, and ozone. The city does not have regulatory authority to set reduction targets beyond the current regulatory commitments and depends on the monitoring capabilities of the Maricopa County Air Quality Department, the region's regulatory authority. Phoenix has undertaken many impactful policies and programmes to improve residents' quality of life. Through implementation of these actions, the city is seeing progress on its climate goals and making strides towards better air quality. A particular focus for the latter is the transportation sector, which is a large source of these pollutants. Relevant and complementary policies include: Transportation 2050, investing in public transit, including light rail and bus rapid transit; the Zero Emission Bus Plan, transitioning the city's 500 buses to zero-emission vehicles by 2040 – with expected deployment of the first buses in 2024; the Bipartisan Infrastructure Law, providing funding for 47 new electric school buses to reduce emissions near the city's schools; the Active Transportation Plan and the Phoenix Vision Zero Road Safety Action Plan, improving accessibility for pedestrian travel; and the Transportation Electrification Action Plan, providing a roadmap for the electrification of over 280,000 vehicles by 2030.

So far, there are almost 20,000 electric vehicles in Phoenix – of which more than 70 are city-owned – and 300 charging stations on city-owned properties. The city has received the Top Green Fleet Award from the National Association of Fleet Administrators and the EV City Award from Plug In America for its electrification efforts.


Publicly available electric vehicle charging station at Burton Barr Central Library
© Karen Apple, Electric Vehicle Program Manager

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PORTLAND

UNITED STATES

The City of Portland has taken several impactful actions to improve air quality, with a focus on climate justice and equity. Since adopting the Climate Emergency Declaration in 2020, Portland has prioritized addressing air pollution and climate change, particularly for marginalized communities.

The Climate Emergency Workplan, released in late 2022, outlines 47 actions across transportation, land use, industrial, and utility sectors to reduce emissions and build community resilience. One major achievement in 2023 was the adoption of the EV Ready Code Project, which mandates EV-ready infrastructure in new developments with five or more units, particularly benefiting low-income and communities of colour. This project aligns with Portland's broader goal of expanding electric vehicle access and reducing fossil fuel reliance. In 2022, Portland also adopted an overhaul to the Renewable Fuel Standard, phasing out the sale of diesel fuel by 2030. An impact study conducted by Eastern Research Group found that switching to renewable products could reduce diesel particulate pollution up to 39% and reduce VOCs by about 20%.

In July 2023, the 2040 Freight Plan was adopted, focusing on reducing environmental impacts from freight transportation. The plan includes 52 actions, with seven prioritized for immediate implementation, emphasizing community collaboration and regulatory support. Additionally, the Portland Clean Energy Community Benefits Fund's Climate Investment Plan (PCEF), established in 2018, continues to provide long-term funding for climate action, particularly benefiting marginalized communities. In September 2024, US$92 million were approved for community grants through PCEF, funding a wide variety of climate and climate justice related projects. In addition, the city has been implementing the clean air construction standard and contracting programme, coordinating with public agencies in the Portland Metro Area to provide assistance to diesel equipment owners to replace or retrofit engines, and investing in the decarbonisation of the city's fleet. Portland also voted for the phase-out the use of gas-powered leaf blowers, starting in 2026, with a full ban effective in 2028.

Portland relies on the Oregon Department of Environmental Quality (DEQ) for air quality monitoring. The latest data shows that annual mean levels of particulate matter ($PM_{2.5}$ and PM_{10}) and nitrogen dioxide (NO_2) remain below national standards. However, the city continues to explore further initiatives to enhance air quality, despite lacking regulatory authority to set new reduction targets. These efforts reflect Portland's ongoing commitment to cleaner air and environmental justice.

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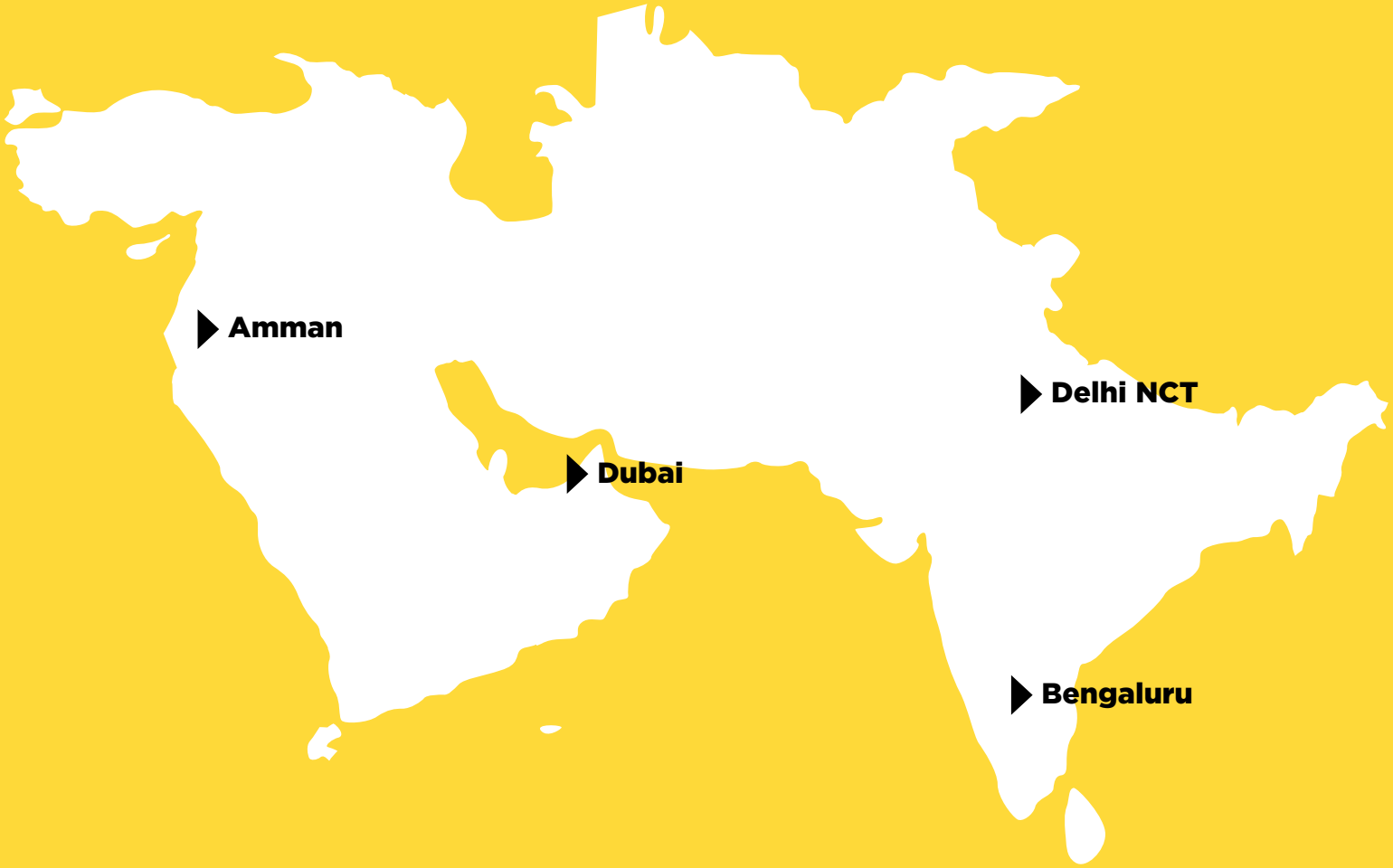
WASHINGTON, D.C.

UNITED STATES

The District of Columbia has expanded its ambient air monitoring network, deploying a new monitoring station within an overburdened community in Ward 8, with federal funding through the American Rescue Plan Act. As part of its commitment to community engagement and empowerment in the District, the Department of Energy and Environment (DOEE) worked with local residents and community groups in Ward 8 to determine the placement of the new monitor. The new monitoring station began operating in April 2024.

The District also adopted stricter emissions standards for new cars, beginning with model year 2027, that are bought, sold, and registered in the city. The standards will become tighter over time and, starting with model year 2035, residents will no longer be able to register or purchase a brand-new gasoline-powered car in the District. These new regulations, modelled on California's Advanced Clean Cars II emissions standards, establish requirements that will reduce harmful vehicle emissions, including those posing an increased risk of asthma, lung disease, and cancer, as well as greenhouse gases. The standards will also bring the District closer to meeting its wider climate, environmental justice, and greenhouse gas emissions reduction goals.

In addition, the DOEE expanded its air quality mobile monitoring programme – focussing primarily on environmental justice for communities – to cover over 30 square miles of the District for six weeks in the summer of 2024. The effort to map hyperlocal air pollution and greenhouse gases at the community-block level will provide valuable insights into the differences in air quality and emissions in these communities, as well as highlighting local pollution sources.



SIGNATORY CITIES IN

SOUTH AND WEST ASIA

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AMMAN

JORDAN

Since joining the Clean Air Accelerator in 2019, the Greater Amman Municipality (GAM) has realised some significant improvements in both air quality and quality of life for its residents.

The city's transport sector saw a significant transformation with the establishment of the GAM vision for transportation, bringing actions such as the introduction of new, cleaner buses that operate on Euro 5 fuel, and improvements to the service through the use of intelligent-transportation-system and automatic-fare-collection technologies. There are currently 321 buses in operation in Amman on more than 40 regular routes, with three BRT phase-one routes and two BRT routes between Amman and Zarqa in soft operation. This system serves around 150,000 passengers daily, reducing the usage of private cars. The GAM is also set to launch a pilot project involving 15 electric buses, seeking to gain knowledge to inform plans for future electrification of the fleet. This initiative may be integrated into the already-studied phase two of the BRT project.

In line with the city's commitment to sustainable waste management, 4,000 tonnes of waste per day are treated at the Ghabawi landfill site, using industry best practices to minimise exposure and emissions. Other waste-sector actions implemented by the GAM include: the expansion of a mechanical-biological treatment facility to process 239 tonnes of waste daily, producing compost and recyclables; waste-sorting and recycling initiatives targeting residential and commercial sectors to reduce waste-sector emissions; and development of a sixth cell at the Ghabawi sanitary landfill site, driving further emissions reduction and aiming to cover approximately 40–45% of the GAM electricity bill through bio-gas collection and electrical generation.

The GAM is also improving access to healthy and safe environments for residents by expanding the coverage of green urban spaces. Between 2019 and 2021, Amman increased its area of green open public spaces by 1.5 km^2 and the per capita share reached 3.22 m^2. In the current

period of 2022–2026, strategic policies are being implemented to increase coverage even further, from 1.6% to 2.5% of the city area. Efforts so far have included the rehabilitation and development of 70 gardens, three parks, 25 intersections, and 99 streets, along with planting campaigns such as "Green Amman Slopes". The policy goal can be achieved by planting around 7,000 donums of new green land to increase the per capita share from 3.22 m^2 in 2022 to 5 m^2 by the end of 2026.

The GAM has implemented a number of impactful policies and initiatives in alignment with its Clean Air Accelerator commitments, including: the development of the Amman Green City Action Plan 2021, including a detailed assessment of social, economic, and institutional co-benefits from actions across various sectors, such as integrated water resources management, comprehensive and reflective land-use planning, and responsive and forward-looking climate adaptation practices. Specific plans include increasing blue and green infrastructure in the city by 2030, to reduce the urban heat island effect, lower emissions, and improve air quality; awareness raising and community engagement efforts with schools, businesses, and local associations, focused on waste reduction, recycling, and environmental protection; and publication of the Climate Action Plan 2024, updated to reflect the GAM's commitment to integrating climate change adaptation and mitigation across all its operations to enhance residents' quality of life. The update also reflects the evolving context of increasing human and institutional capacities for mainstreaming climate change.


BRT System © Greater Amman Municipality

These actions and strategies have provided tangible results in reducing pollution levels and fostering sustainable living within urban environments.

Looking ahead, the GAM intends to implement the following transformative projects to drive further improvements in air quality and environmental sustainability by the end of 2025: expansion of the city's public transportation network, with the integration of electric buses and completion of phase two of the BRT project; enhanced waste management systems, including finalisation of the mechanical biological treatment facility operations, extended capacity, integration of the improved waste collection system with municipal solid waste management regulations, and expanded recycling banks; additional greening projects, including completion of the Telal Alphosphat rehabilitation area, with 600 dunums planted in two phases with native, drought-tolerant plants; expansion of the King Abdullah II Gardens to include the fourth and fifth phases; and the greening of major traffic corridors and BRT routes with thousands of trees and shrubs; urban agriculture projects, including the Miyawaki urban park forest and the establishment of an urban agriculture training centre; and Amman's first climate academy for children, with cooperation with the Mayors Migration Council, aimed at raising environmental awareness and equipping children with skills to address the climate challenge.

The GAM reaffirms its commitment to the Clean Air Accelerator and remains steadfast, pulling out all stops through innovative policy-making, sustainable infrastructure, and active community participation to build a green, healthy city for all.

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BENGALURU

INDIA

Bengaluru's PM_{10} levels have improved between 2017 and 2024 – owing largely to city efforts funded through the National Clean Air Programme (NCAP) – and continue to maintain lower-than-pre-pandemic concentrations. In addition, average $PM_{2.5}$ levels decreased from 31.5 µg/m³ in 2022 to 28.6 µg/m³ in 2023, recording the best air quality in the city since 2018. The city has received INR511 crores (US$ 60 million) through the NCAP and an additional 30 crores due to improvements in air quality, bringing positive impacts to the lives of residents and workers such as traffic police, bus drivers, autorickshaw drivers, cab drivers, construction workers, and so on.

Through the NCAP, the Indian national government has set up a Portal for Regulation of Air Pollution in Non-Attainment Cities to provide residents with information about air quality in their city.

The Karnataka State Pollution Control Board has established the Integrated Command Control Center (ICCC) at its head. The ICCC is tasked with addressing complaints pertaining to pollution in the state, with the aim of improving the urban environment. The environmental monitors installed across the city by the state pollution board will be integrated with the ICCC's platforms and related applications, to continuously track environmental variables such as temperature, humidity, rainfall, and pollutants within the city of Bengaluru.

An environmental sensor dashboard has been deployed to display an overview of city air quality, with visual representation of air quality index (AQI) levels and pollutant concentration in a single interface. Real-time alerts and notifications are sent to relevant departments, which can then take the necessary actions to prevent or reduce the environmental pollution. Precautionary measures and health advice are also provided via the portal, and through a mobile app for city residents. In the event of any environmental emergency – such as biodiversity loss, climate disruption, or escalating pollution – mass notifications can be triggered by the ICCC to alert residents and city departments.

Using funding through the NCAP, Bruhat Bengaluru Mahanagara Palike (BBMP) and the Karnataka State Pollution Control Board have set up four new continuous ambient air quality monitoring stations, bringing the total across the city to 11 such monitoring stations.

As per the air quality action plan prepared under the NCAP, BBMP, along with other city agencies, is implementing a number of high-impact actions towards air quality improvements, including mobility and waste management measures, and green space creation.

Using funding from the state government, BBMP has improved pedestrian infrastructure on nine high-density corridors. Meanwhile, the Bengaluru Metropolitan Transport Corporation (BMTC) has

deployed 100 non-AC electric buses across 19 routes, with plans for an eventual total of 921 such buses to promote public transport and curb air pollution.

Other actions already taken by BBMP include the building of 50 new transfer stations for management of Construction and demolition waste that was previously taken to landfill sites; and the planting of close to 91,400 trees, with residents' support, during World Environment Day in 2023.

Green infrastructure © Raghavendra Prasad

Plans currently in place include: improving 31 junctions across four city zones focusing on footpaths, kerbs, multi-utility zones, drainage, street lighting, signage, and greening. This will improve safety and streamline traffic movement; improving pedestrian/cyclist infrastructure on 197 roads, including white topping, to create infrastructure for active travel; introducing 900 new electric buses over the next two years, in parallel with BMTC's starting to phase out its diesel buses and transition to EV, to bring considerable air quality improvements and carbon emissions reduction; undertaking road sweeping using electric sweeping machines, bringing a considerable reduction in fine dust particles, which are a major cause of deteriorating air quality levels; creating 12 new parks, primarily in north Bengaluru, which has a lack of open spaces and experiences increased air pollution during winter months. These open spaces will act as sinks for air pollution and improve air quality.

C40 is supporting Bengaluru to transition strategic areas towards clean air zones. This will be a game changer in drastically improving air quality in the city. Currently, a study is underway to identify potential areas to make this transition, based on parameters such as current air pollution levels, the presence of vulnerable populations, and levels of traffic congestion. As local communities start deploying their own hyperlocal air quality monitoring devices, this will be a critical step towards addressing air quality at the local level.

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DELHI NCT

INDIA

Since joining the C40 Clean Air Accelerator in 2019, Delhi has made significant strides in improving air quality and enhancing the wellbeing of its residents. In the first half of 2024 alone, the city experienced 128 days of "good to moderately clean air", with an equal number expected for the latter half of the year. According to these projections, 70% of the days in 2024 would have experienced clean air, marking a notable improvement from 57% in 2023. Importantly, these efforts have translated into better health outcomes for Delhi's residents, contributing to a healthier and more liveable urban environment.

In 2024, the city has introduced targeted action plans on a seasonal basis, including summer and winter action plans. These focus on enforcing pollution control measures during specific periods. For example, the 21 actions in the 2024 Winter Action Plan include a complete ban on firecrackers; construction restrictions; and limitations on diesel vehicle movement. The plan also emphasises improved coordination among over 30 stakeholder departments/agencies to ensure better enforcement. Additionally, drone-based technology is being used to monitor pollution hotspots closely, and the "Harit Ratna Puraskar" incentive/award scheme has been introduced to recognise agencies that make extra efforts to reduce emissions.

Delhi also has provided financial incentives to promote cleaner energy adoption. Restaurants, hotels, and banquet halls receive a 50% subsidy, or INR 5,000 (US$ 59), for switching from traditional tandoors to gas or electricity-based alternatives. Small industries are also granted INR 50,000 (US$ 590) and larger industries INR 100,000 (US$ 1180) for transitioning cleaner fuels.

Delhi is on track to electrify its entire bus fleet by 2025. Currently, over 1,900 compressed natural gas (CNG) buses have been replaced with electric buses, contributing to reduced emissions. To further encourage public transport usage, the city has launched a premium bus service with an app-based pre-booking system that includes dynamic pricing and demand-based routes. This will optimise bus operations, reducing idling times and traffic congestion.

Delhi has developed a web-based dust control audit portal, mandating self-declaration for dust-generating projects, including construction and demolition activities on plots of 500 square metres or more. This system promotes self-monitoring and ensures timely actions to mitigate dust pollution by project developers.

Looking ahead, Delhi has set ambitious goals to be achieved by the end of 2025: **increasing green cover:** The city aims to expand its green cover to 25% by 2025. To achieve this, a massive afforestation initiative is underway, with 6.4 million saplings already planted by March 2024; **promoting circular economy:** Delhi is pushing forward with its circular economy initiatives, particularly in construction and demolition (C&D) waste management. The city has established 158 new scientifically operated collection sites to pre-process dumped C&D waste, which will be directed to five processing plants with a combined daily capacity of 5,500 tonnes. This initiative promotes waste recycling and raw material optimisation, aligning with the broader goal of resource recovery and minimising environmental impact; and **electrification of bus fleet:** The city's target to fully electrify its bus fleet of over 7,500 CNG buses by 2025 remains on track, with of 1,900+ electric buses already operational. This effort is expected to significantly reduce vehicular emissions.

Through these key initiatives, Delhi is committed to further improving air quality, reducing pollution, and enhancing quality of life for its residents, while also meeting its Clean Air Accelerator commitments by 2025.

Dhl1 electric busses flagg-off © Switch Delhi / Transport Department, Government of NCT of Delhi

DUBAI

UNITED ARAB EMIRATES

Since January 2023, Dubai has furthered the development of its Air Quality Strategy 2030, by refining existing pollutant baseline levels and setting ambitious reduction targets that align with both national and WHO Air Quality Guidelines. The city is committed to achieving the following key targets:

- 90% clean air days by 2030, in accordance with the WHO Air Quality Guidelines;
- 100% clean air days by 2040, in accordance with the national standard; and
- Annual average $PM_{2.5}$ concentration in residential areas below WHO's interim target (IT) 1 (35 µg/m^3) by 2030.

The Dubai Air Quality Strategy 2017–2021 overachieved on its emissions reduction targets. The overall United Arab Emirates (UAE) target of 90% clean air days was met, with 99.1% clean air days recorded in the city in 2021.

Meanwhile, the UAE National Air Quality Agenda 2021–2031 was launched in September 2022. This aligns with the UAE Environmental Policy, which includes targets to increase national clean air days to 100% by 2040 and to reach 35 µg/m^3 annual average $PM_{2.5}$ concentrations by 2030. Other relevant policies include the Dubai Plan 2030, the Dubai 2040 Urban Master Plan, and the Dubai Municipality Strategic Plan 2022–2026.

Dubai is currently developing its Air Quality Strategy 2030, which will set new emissions reduction targets aimed at achieving the WHO Air Quality Guidelines. These will also align with the UAE National Air Quality Agenda 2021–2031, the Dubai Plan 2030, and Dubai's C40 commitments.

Dubai has implemented new policies and programmes to address the top causes of air pollution in the city. A key milestone in these efforts was the completion of a comprehensive particulate matter characterisation and source apportionment study in November 2022. This study has provided valuable insights into the sources of air pollution, enabling Dubai to refine its approach and set more targeted strategies for air quality management in 2023 and beyond.

CONCLUSION

C40 cities continue to demonstrate their leadership through the implementation of evidence-based clean air and climate action, showing that change is possible. This report showcased how signatory cities are implementing best practices across sectors, to clean the air for their residents and create more equitable and inclusive societies. On average, air quality in C40 member cities has improved between 2002 and 2022, leading to better health for millions of residents. In this same period, there has been a 27% increase in the number of C40 cities achieving $PM_{2.5}$ levels lower than the WHO's interim target 4.

But with over 8 million deaths globally attributed to air pollution in 2021, there is still a lot that needs to be done to achieve healthy and safe air in cities across the globe – particularly in the rapidly urbanising Global South. Coordinated and long-term implementation of actions across all levels of government is essential to deliver the needed improvements. Mayors play a leading role in protecting their city's air quality – and their residents' well-being – but they cannot do it alone. Clean air action needs to be coordinated with metropolitan, regional, state, and national governments to enact the necessary changes across the industries and economic systems that are responsible for the main sources of pollution.

Furthermore, by mainstreaming equity and inclusion into clean air projects and policies, leading mayors and city teams are cleaning the air and delivering on their broader climate and sustainable development goals, while simultaneously helping to address deep-rooted systemic inequalities. By tackling injustices that have historically excluded marginalised communities from the environmental and social benefits of living in thriving cities, mayors are successfully preventing the impacts of air pollution on these clinically vulnerable populations.

Signatory cities are collecting the necessary data not just to deliver impactful, evidence-based, and equitable action, but also to keep residents informed of the benefits, build awareness and support for air quality and climate action, and inspire others to follow their lead. Empowered residents can use the information and tools available to them to advocate for actions and to participate actively in their city's clean air initiatives. By demanding accountability and raising awareness, communities can also help maintain the momentum of clean air and climate action.

Thanks to these efforts, mayors across the globe are building more inclusive societies, with healthier and happier communities and more resilient and sustainable cities. Together we can clean our skies and the air in our lungs, creating cities where we can all live and thrive. Will your city be next?





C40
CITIES