HOW & WHY C40 CITIES ARE IMPLEMENTING AIR QUALITY MONITORING INITIATIVES

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C40 Cities
C40 Cities

The world’s megacities working together to tackle climate change and create healthier cities

“Our residents deserve to know that future generations will inherit a livable planet — and that our air, water, and natural resources will be protected and preserved. C40 Cities are leading the global work to reduce emissions with bold, concrete actions to ensure our children and grandchildren can breathe clean, healthy air.”
C40 Air Quality Goals

Supporting cities in reducing the public health & climate impacts of pollution sources to meet World Health Organization guidelines & the commitments of the Paris Agreement.

- **Supporting mayoral leadership** in setting ambitious goals and advancing aggressive air quality and climate policies
- **Increasing pollution and health data** for more effective policymaking & to drive citizen engagement on air pollutants and GHGs
- **Supporting cities** in planning and implementing solutions that align air quality and climate goals
Clean Air Cities Declaration
Mayoral commitment to clean air action

- Establish air quality goals (WHO Guidelines)
- Identify top sources of air pollution, develop control strategies
- Transparent city-wide air quality monitoring
- Increase health impact analysis
- Raise AQ awareness and ties to climate action
- Develop high quality inventories and models
- Integrate AQ actions into CAPs
- Work with bodies to address sources outside of city control
- Track and report publicly on progress towards meeting goals
- Implement policies and programs by 2025

London
Amman
Austin
Barcelona
Bengaluru
Berlin
Bogotá
Buenos Aires
Copenhagen
Delhi
Dubai
Durban (eThekwini)
Guadalajara
Heidelberg
Houston
Jakarta
Lima
Lisbon
Los Angeles
Mexico City
Madrid
Medellin
Milan
Oslo
Paris
Portland
Quezon City
Quito
Rio de Janeiro
Rotterdam
Seoul
Stockholm
Sydney
Tel Aviv – Yafo
Tokyo
Warsaw
Washington DC

37 Signatories ➔

London
Amman
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Bogotá
Buenos Aires
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Delhi
Dubai
Durban (eThekwini)
Guadalajara
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Oslo
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Rotterdam
Seoul
Stockholm
Sydney
Tel Aviv – Yafo
Tokyo
Warsaw
Washington DC
C40 Air Quality Network
40+ cities working together to address air quality management challenges

- Improving air quality data and access in cities
- Establishing health impacts of air pollution
- Identifying and implementing local policies and programs
Urban Air Quality Monitoring
A foundation for making & meeting urban air quality goals and commitments

- **Regulatory**
  - Reference grade equipment to assess compliance, track trends, inform research

- **New technologies (low-cost sensors, mobile monitoring, data assimilation)**
  - Supplementing existing monitoring
  - Identifying hot-spots and sources
  - Assessing policy effectiveness
  - Raising public awareness
  - Engaging local communities
  - Supporting research

- **Cities often have more flexibility in applying new technologies**
AIR QUALITY MONITORING INITIATIVES:
EXAMPLES IN C40 AIR QUALITY NETWORK CITIES
Breathe London

Conduct high resolution air quality monitoring in Greater London suitable for policy development and evaluation

- **Mobile Monitoring**
  - 2 mobile units, reference grade equipment
  - BC, UFPs, PM$_{2.5}$, NO$_x$, CO$_2$, O$_3$

- **Fixed site monitors**
  - 100 continuous monitors
  - NO$_x$, CO$_2$, PM$_{10}$, PM$_{2.5}$, PM$_1$, O$_3$

- **Personal monitoring**
  - 250 school-children using backpack PM$_{2.5}$, NO$_2$, and BC

- **Implementing Mayoral commitments**
  - Expanding the ultra-low emissions zone (ULEZ)
  - Increasing local pollution monitoring
Watts Rising Air Quality Monitoring Network
Catalyzing pollution awareness in Los Angeles

- **Watts Rising Collaborative**
  - A $32 million dollar grant to create a healthier and more resilient Watts
  - Includes a range of efforts, from tree planting, bus electrification, and new solar installations
  - New community air quality monitoring

- **Community scale monitoring**
  - 13 low-cost sensors measuring NO$_2$, PM$_{2.5}$, and O$_3$
  - Strategically sited near parks and schools to raise awareness

- **Using data**
  - Expanding local awareness of air pollution, engaging local communities in data collection
  - Long term tracking of pollution levels in Watts

- **Implementing Mayoral commitments**
  - Expanding local air quality monitoring
  - Prioritizing disadvantaged communities
Quezon City
Baselining pollution levels through a city-led air quality monitoring strategy

• **Mayoral Commitments**
  • Establish baseline air pollution levels, by procuring and installing air quality monitoring systems within the City
  • Create a City Ordinance towards meeting National Ambient Air Quality Guideline Values and World Health Organization (WHO) Air Quality Guidelines by 2030

• **C40 – Clean Air Asia – EPWMD Partnership**
  • Assessment of the city’s institutional, financial, and human capacity for air quality management, identify where new investments are needed
  • Conducting modeling, using satellite data, and mapping sources and vulnerable receptors
  • Building the city’s air quality monitoring strategy, to include a mix of reference and low-cost sensors.
  • Deploying a low-cost sensor network to assess baseline levels and hotspots.

“The future we want for Quezon City is where people are well-informed and are actively participating in the campaign for clean air by shifting away from unsustainable practices.”

Josefina G. Belmonte
Honorable Mayor of Quezon City

Vulnerable sites (receptor areas) in need of AQ monitoring

• Monitoring is recommended in areas not covered by current AQMt sites, especially in areas which are prone to vulnerable populations being exposed to air pollutants (Districts 2, 3, 5, 6)
Copenhagen
Mapping pollution levels through the Google Air View project

• **Mayoral Commitments**
  • Electrification of buses, ferries, and trains
  • Introducing a zero emissions zone, expanding the low emissions zone
  • Expanding air quality monitoring

• **Google Air View project**
  • Mobile mapping of BC and UFPs to expand local knowledge of air pollution, better understand hot-spots and local sources

• **Using data**
  • Supporting broader awareness of air pollution
  • Evaluating exposures near schools, daycare facilities, and parks
  • Evaluating urban design measures that can reduce pollution exposures
Air quality monitoring is a foundational piece of city commitments to create clean air.

With new technologies, cities have many tools available to support local action and assess success.

New technologies are being applied across C40 cities to assess exposures and hotspots, identify sources, evaluate policy effectiveness, develop new policies, and engage local communities.

Important decisions in cities can be driven by data, multi-agency partnerships, engaged elected officials, and public support.

- New and emerging technologies and community engagement can help support these efforts.
Thank you

CONTACT

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Overarching concern: Staff time and capacity

Ask: easy to use sensors that can be co-located alongside other systems with relatively little maintenance. Minimize staff time needed.

Concern: Power/energy supply interruptions.

Ask: Battery operating period needs to be >2 weeks (ideally 4 weeks). Built in solar ideal.

Concern: high humidity degrades sensor performance.

Ask: Integrated physical dryer.

Concern: uncertainty re: sensor performance under certain conditions (high humidity, dust, PM2.5 levels)

Ask: Clear, transparent guidelines of utility and uncertainty under varied operating conditions (more detailed spec sheets).

Concern: data difficulties when using more than one sensor product

Ask: harmonize data protocols, so that data from multiple companies/products can be transmitted & visualized on a single data platform.