



HOW & WHY C40 CITIES ARE IMPLEMENTING AIR QUALITY MONITORING INITIATIVES

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C40 Cities

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



700

Million people

97

Cities

25%

of Global GDP



C40 CHAIR, MAYOR OF LOS ANGELES, ERIC GARCETTI

“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



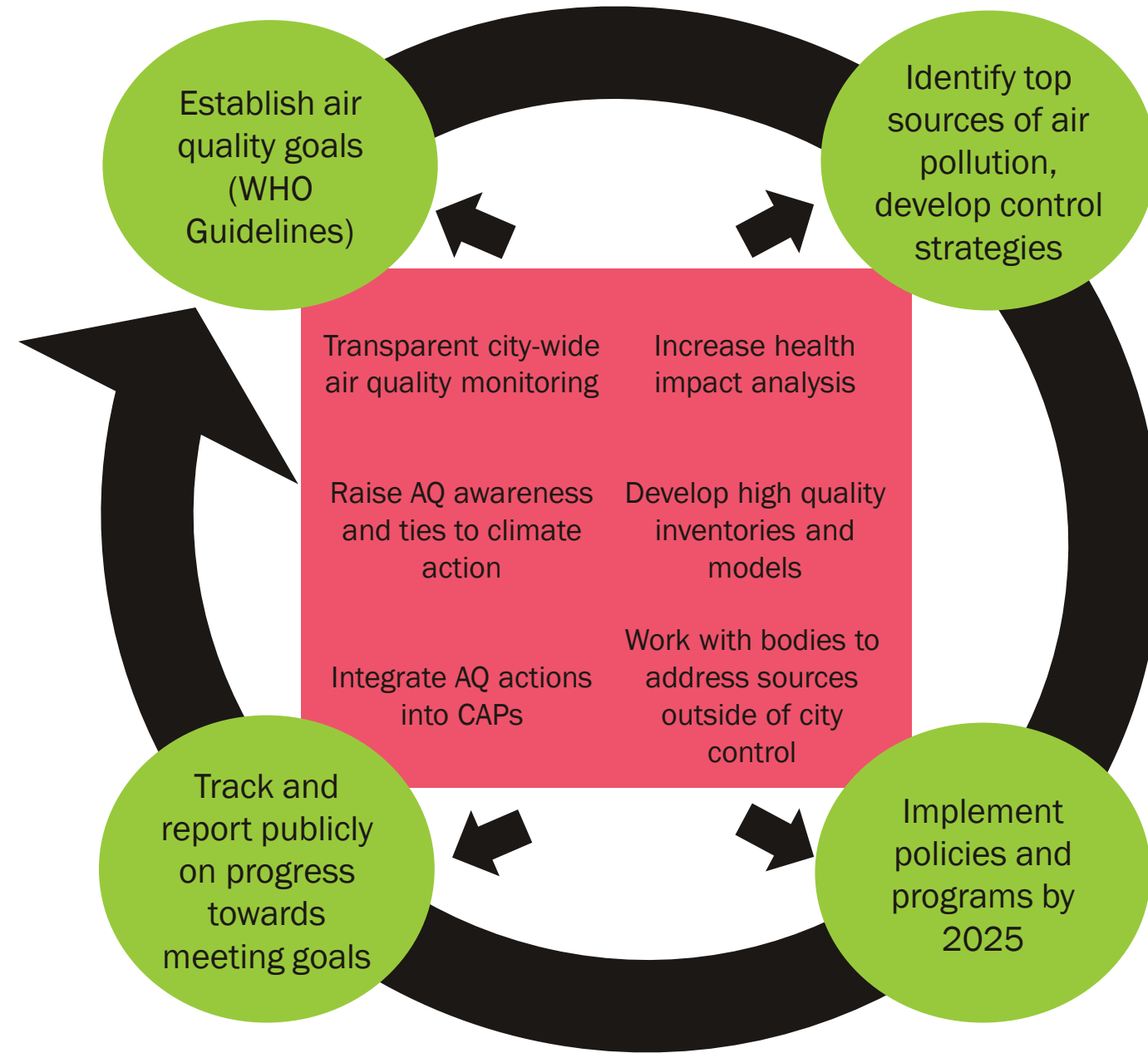
Supporting cities in planning and implementing solutions that align air quality and climate goals

Clean Air Cities Declaration

Mayoral commitment to clean air action

37 Signatories →

London
Amman
Austin
Barcelona
Bengaluru
Berlin
Bogotá
Buenos Aires
Copenhagen
Delhi
Dubai
Durban (eThekweni)
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



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:**

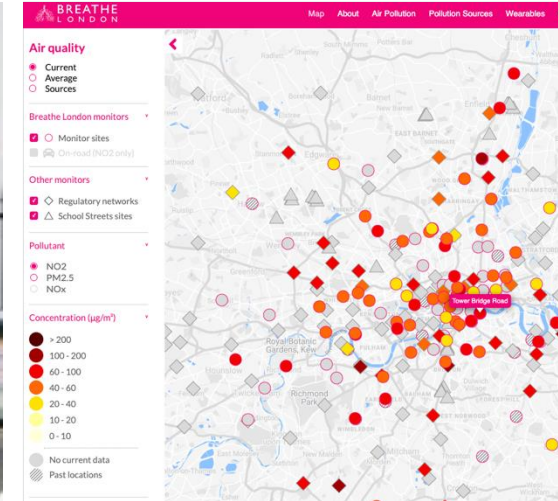
**EXAMPLES IN C40
AIR QUALITY
NETWORK CITIES**



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, CO₂, O₃
- **Fixed site monitors**
 - 100 continuous monitors
 - NO_x, CO₂, PM₁₀, PM_{2.5}, PM₁, O₃
- **Personal monitoring**
 - 250 school-children using backpack PM_{2.5}, NO₂, 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 NO₂, PM_{2.5}, and O₃
- 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

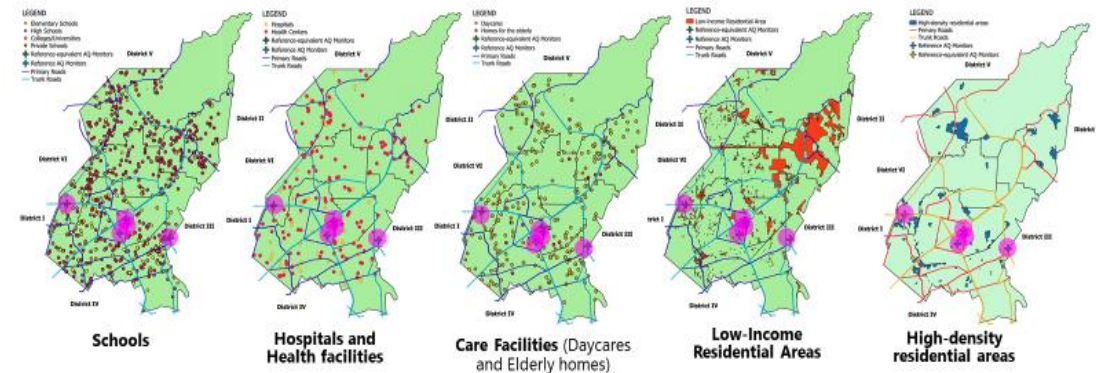
“The future we want for Quezon City is where people are well-informed and are actively participating in the campaign for clean air by shifting away from unsustainable practices.”

Josefina G. Belmonte
Honorable Mayor of Quezon City

- **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.

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**

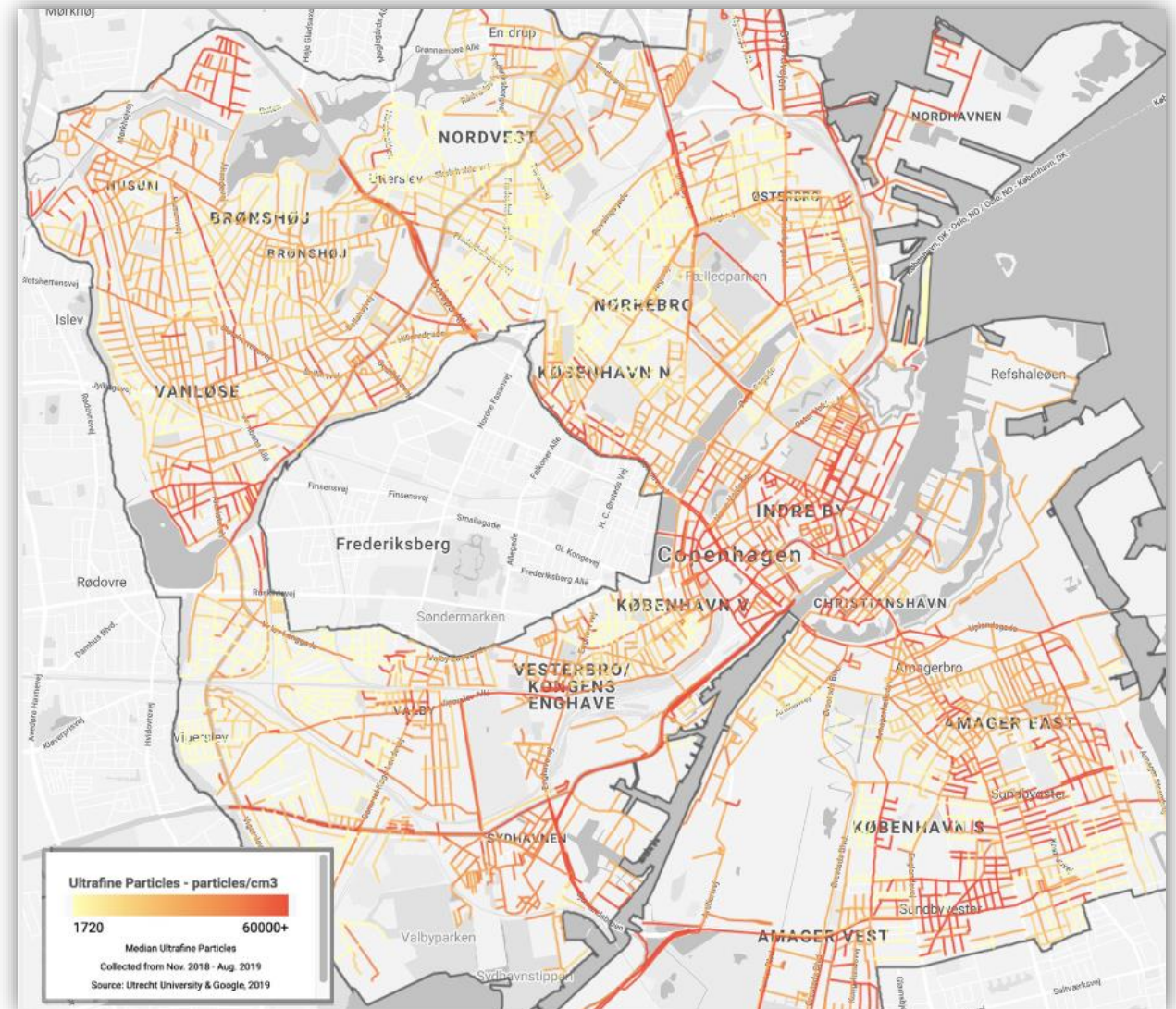
- Electrification of buses, ferries, and trains
- Introducing a zero emissions zone, expanding the low emissions zone
- Expanding air quality monitoring

- **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



Summary

- 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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C40
CITIES

City needs re: sensor design

- 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.

