Breathe London - The first year

Stephen Hoskin
ACOEM Air Monitors

acoem

Air Monitors

BREATHE LONDON

Breathe London combines state-of-the-art technology with new data analytics to better understand Londoners' exposure to air pollution. Measuring harmful pollution at thousands of locations informs data-driven solutions to clean up our dirty air and foster healthier, stronger communities.

C40 CITIES CLIFF CHILDREN'S INVESTMENT FUND FOUNDATION CERC EDF ENVIRONMENTAL DEFENSE FUND GREATER LONDON AUTHORITY KING'S College LONDON NPL National Physical Laboratory UNIVERSITY OF CAMBRIDGE

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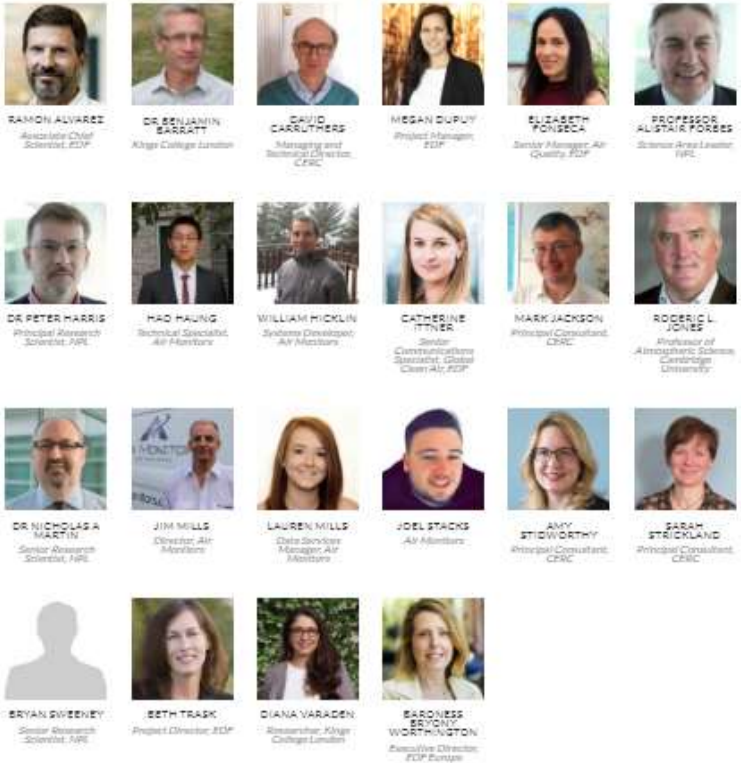
People



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Hyperlocal Monitoring Network

Nitrogen Dioxide
Nitric Oxide
Carbon Dioxide
Ozone
PM10
PM2.5

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Nitrogen Dioxide
Nitric Oxide
Carbon Dioxide
Ozone
PM10
PM2.5
Black Carbon
Ultrafines

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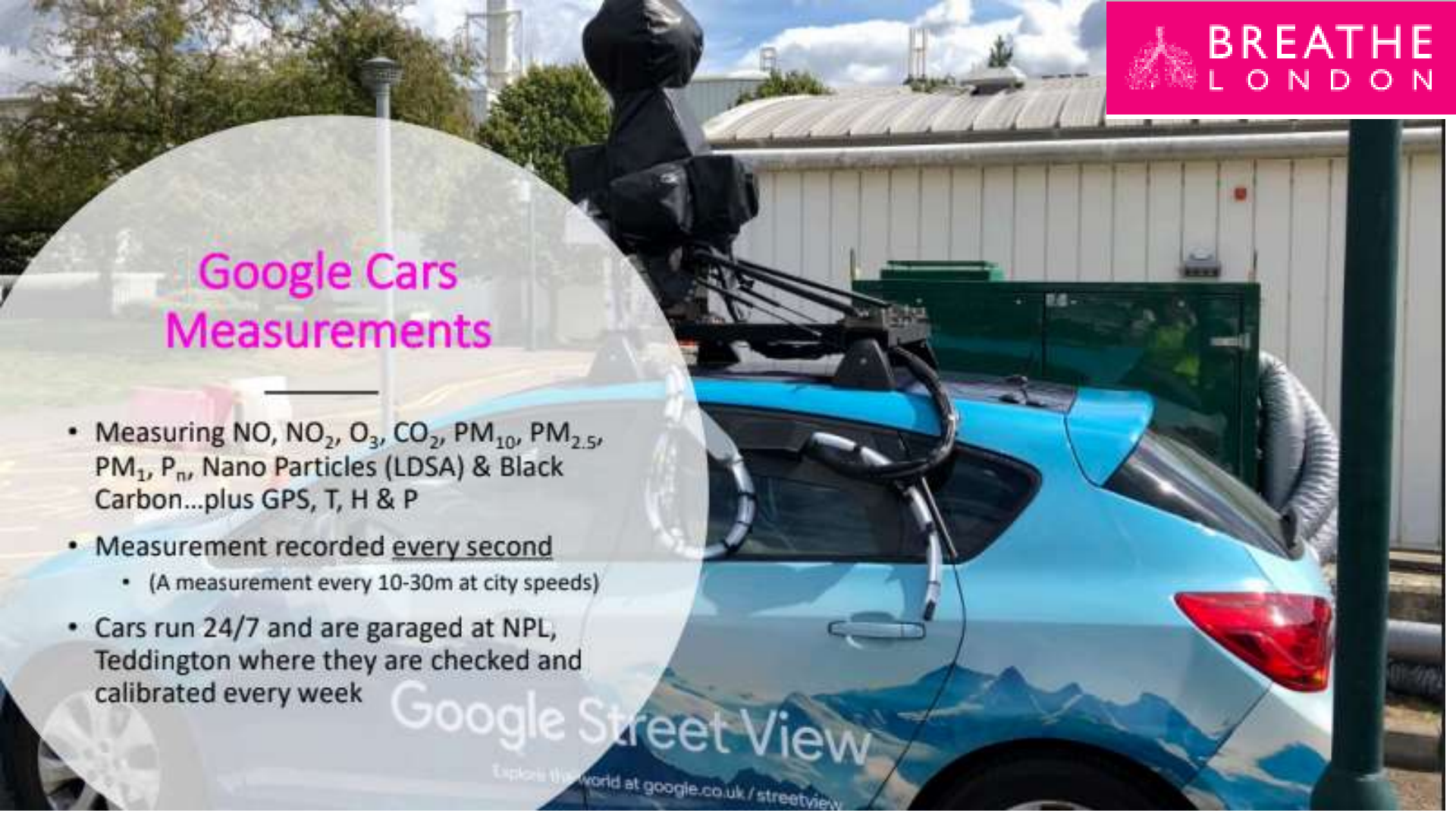
BREATHE LONDON

MOBILE
AREA
COVERAGE

STATIC
TEMPORAL
RESOLUTION

WEARABLES
REAL LIFE
EXPOSURE

Courtesy - Dr Ben Barratt (Kings College London)



BREATHE LONDON

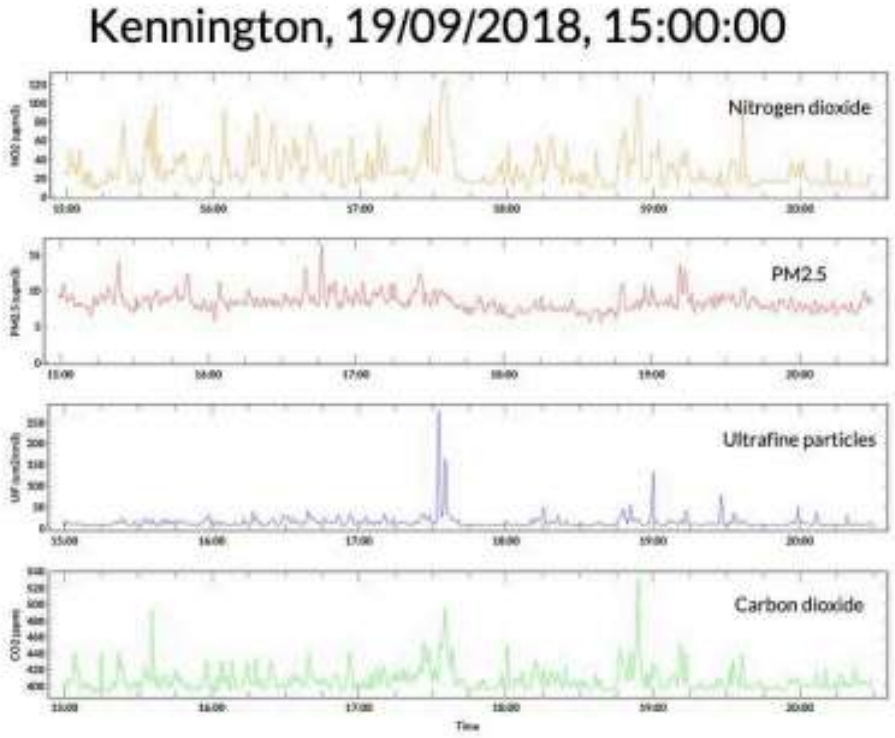
Google Cars Measurements

- Measuring NO, NO_2, O_3, CO_2, PM_{10}, $PM_{2.5}$, PM_1, P_n, Nano Particles (LDSA) & Black Carbon…plus GPS, T, H & P
- Measurement recorded <u>every second</u>
  - (A measurement every 10-30m at city speeds)
- Cars run 24/7 and are garaged at NPL, Teddington where they are checked and calibrated every week

Google Cars Instrumentation

- Data is collected from each instrument **every second** and sent via cellular networks to the cloud. It is then available to the project partners in near real time for processing, analysis and visualisation.

Google Street View Car – 1 second data output



Courtesy – Prof R L Jones (University of Cambridge)

Typical AQMesh Pod Installation

Methodology

Over 100 AQMesh pods
Taking a reading every 10 seconds
Creating 1 - 15 minute averages

Methodology

- Coverage in all 32 London boroughs plus the City of London.
- Filling gaps in the existing network of government air quality monitors.
- Placing priorities on “sensitive” locations, such as primary schools and medical facilities.
- Supporting assessments of the impact of new policies designed to reduce air pollution, such as the Ultra-Low Emission Zone (ULEZ), the Expanded ULEZ and the Low-Emission Bus Zones (LEBZ).

Methodology

- Distribution across a mix of traffic levels and varying distances from major roads and intersections, parks, residential areas, high-traffic streets and other commercial areas.
- Reserving 3 of the pods (termed “gold pods”) for performance evaluation over the long-term using periodic co-location studies alongside reference instruments.

Methodology

- AQ/QC

Local Scaling

Gold Pods

Automatic

Methodology

- AQ/QC

Local Scaling

Gold Pods

Automatic

Methodology

- AQ/QC

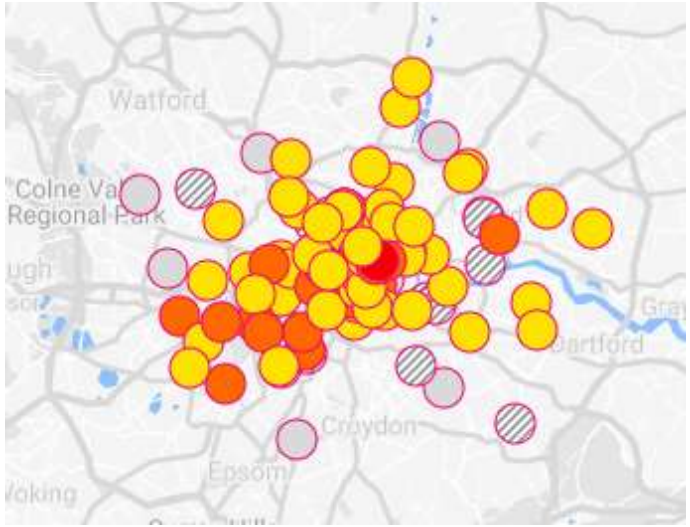
Local Scaling

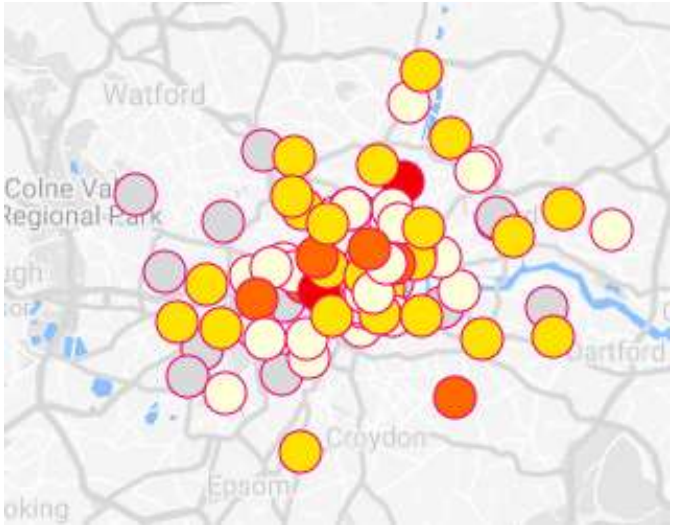
Gold Pods

Automatic

Methodology

Data





NO2

PM2.5

Environmental
Research Group

KING'S College LONDON

The Breathe London Wearables Study
Engaging primary school children to monitor air pollution in London

King's College London Environmental Research Group

Prepared for the Greater London Authority

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