



Breathe London

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BREATHE
LONDON



BREATHE LONDON

A network of 100 state-of-the-art sensor pods located throughout the city, continuously transmitting air quality measurements.



Google Street View cars equipped with air quality sensors repeatedly measuring pollution over a thousand miles of London roadways.

A linked study deploying sensors worn by schoolchildren and teachers to monitor air quality during their journey to and from school.



BREATHE LONDON

GREATER
LONDON
AUTHORITY



UNIVERSITY OF
CAMBRIDGE

Google Earth Outreach



CHILDREN'S
INVESTMENT FUND
FOUNDATION



KING'S
College
LONDON

University of London



AirMonitors.co.uk
Quality - Service - Innovation



NPL 
National Physical Laboratory

Why London?

**Established
monitoring network**

**Congestion charging
and low emission
zones**

**New policy
interventions**

National action

Aims and objectives

**Testing low cost
network**

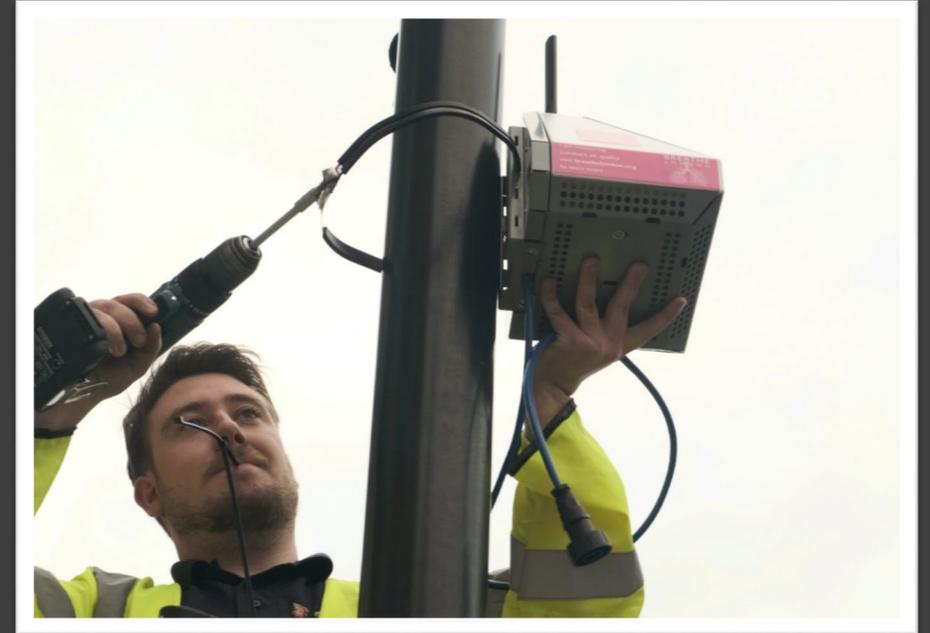
**Providing hyperlocal
data to public**

**Assess impact of
new policies**

Replicability

Measuring:

- NO_2
- NO
- PM in four sizes (PM_{10} , $\text{PM}_{2.5}$, PM_4 and PM_{10})
- CO_2 and
- in some locations, ozone (O_3)



Pod placement

Filling gaps

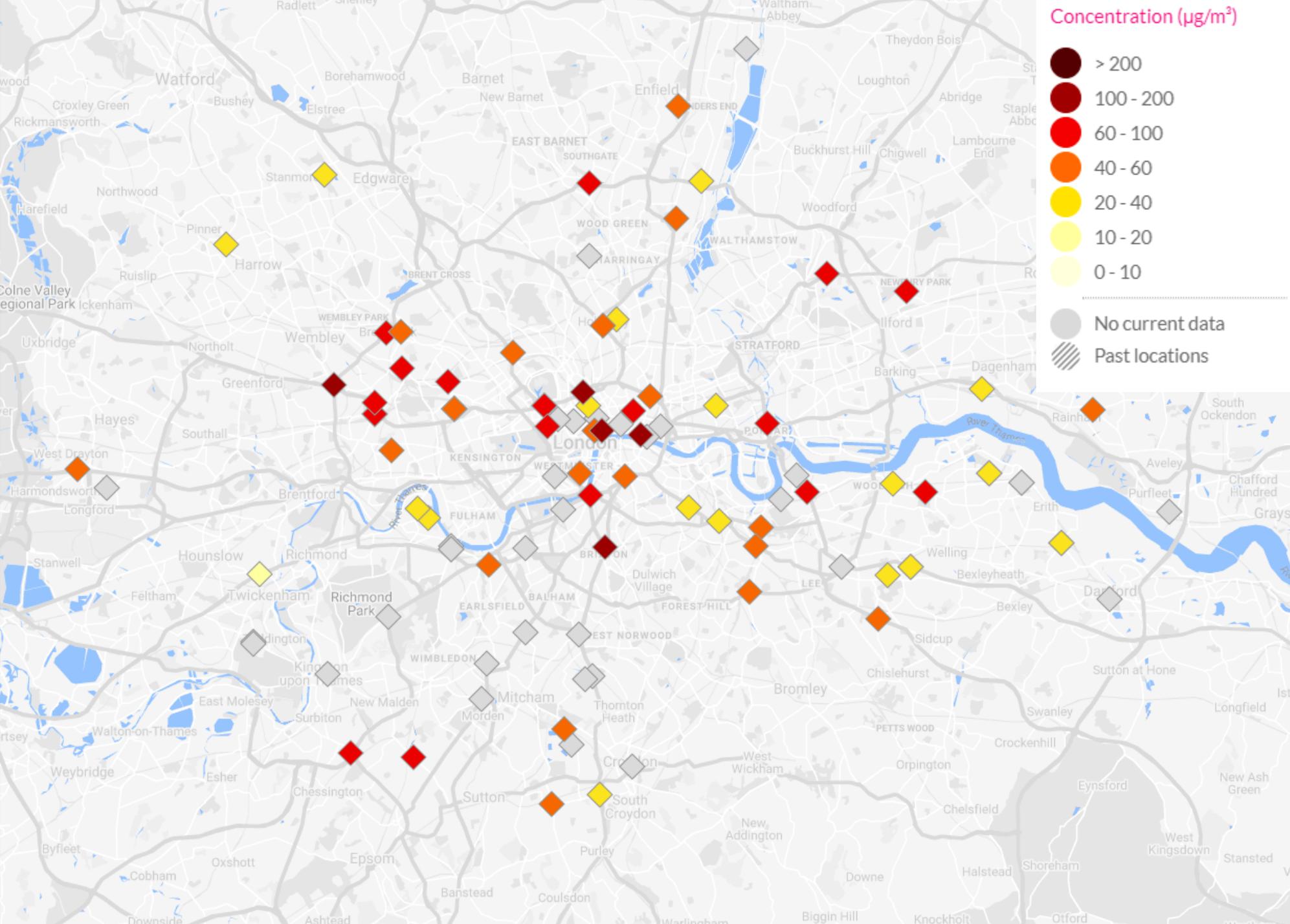
Mix of traffic

**Schools and sensitive
areas**

**Assess impact of
new policies**

1 pod per borough

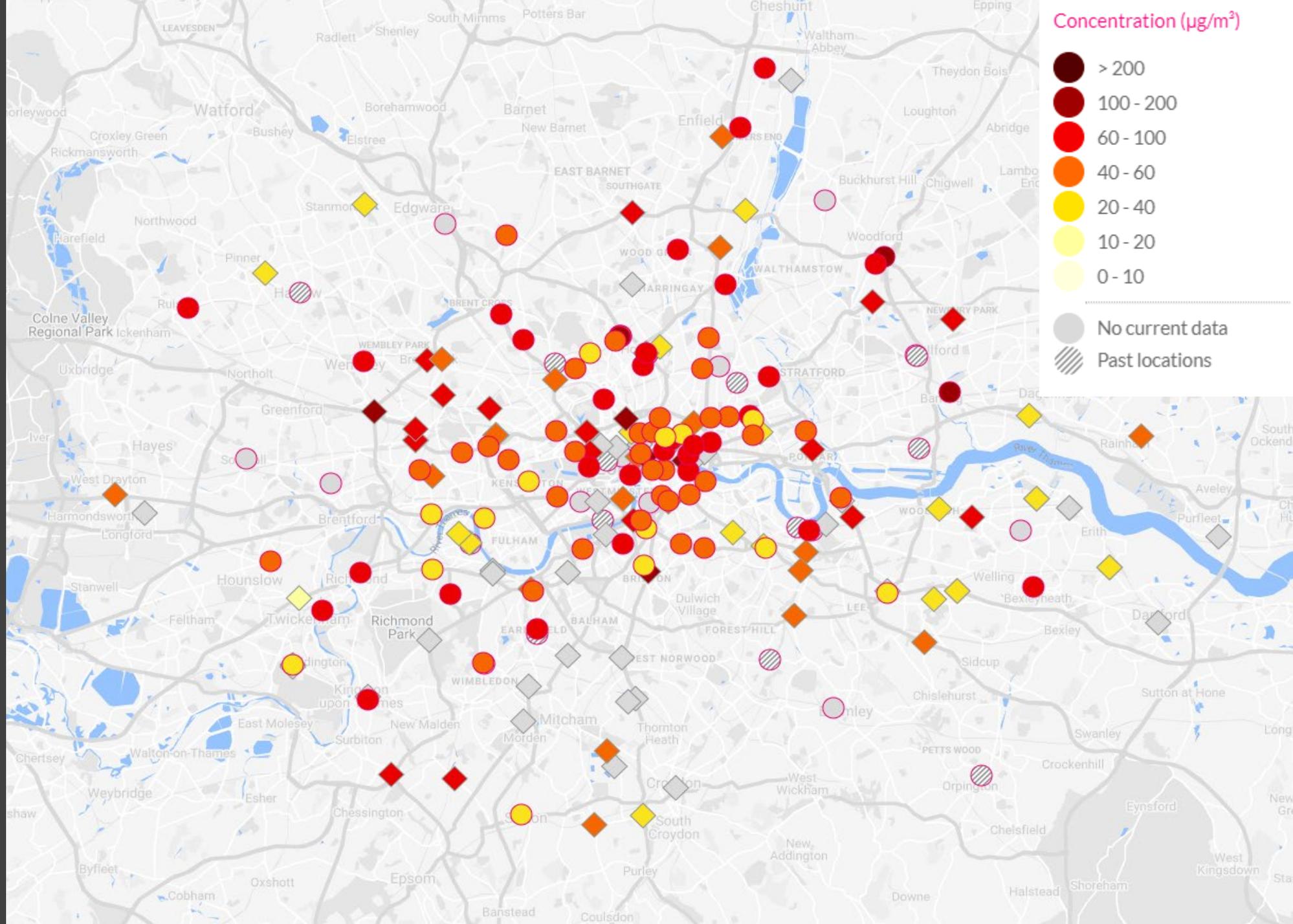
Existing air monitoring network



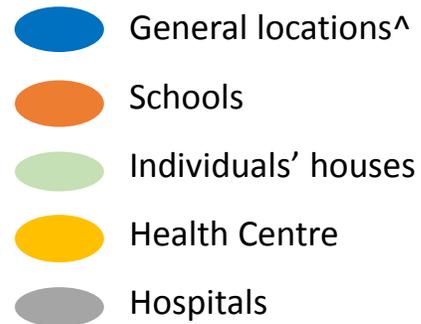
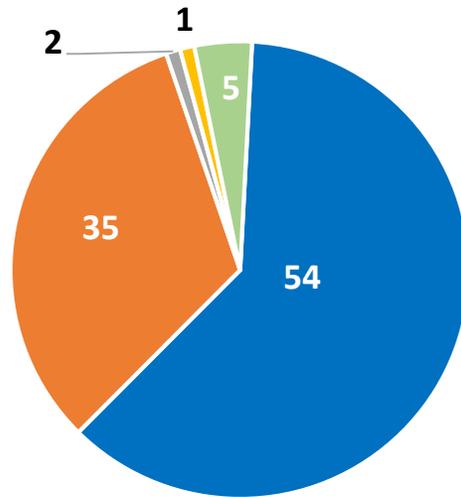
Existing air monitoring network

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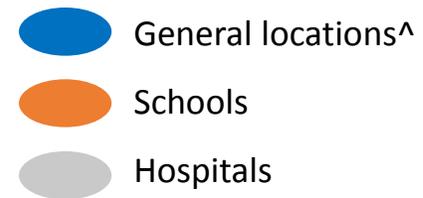
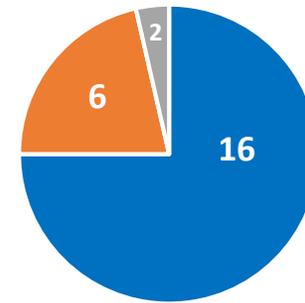
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**Distribution of 97*
Breathe London pods**



**Distribution of 24 Breathe
London pods within the
ULEZ**



** 3 Breathe London pods are normally stationed at reference sites and used in data validation process
^ Street furniture*

Air quality

Current Average

Breathe London monitors

- Monitor sites
- On-road data

Other monitors

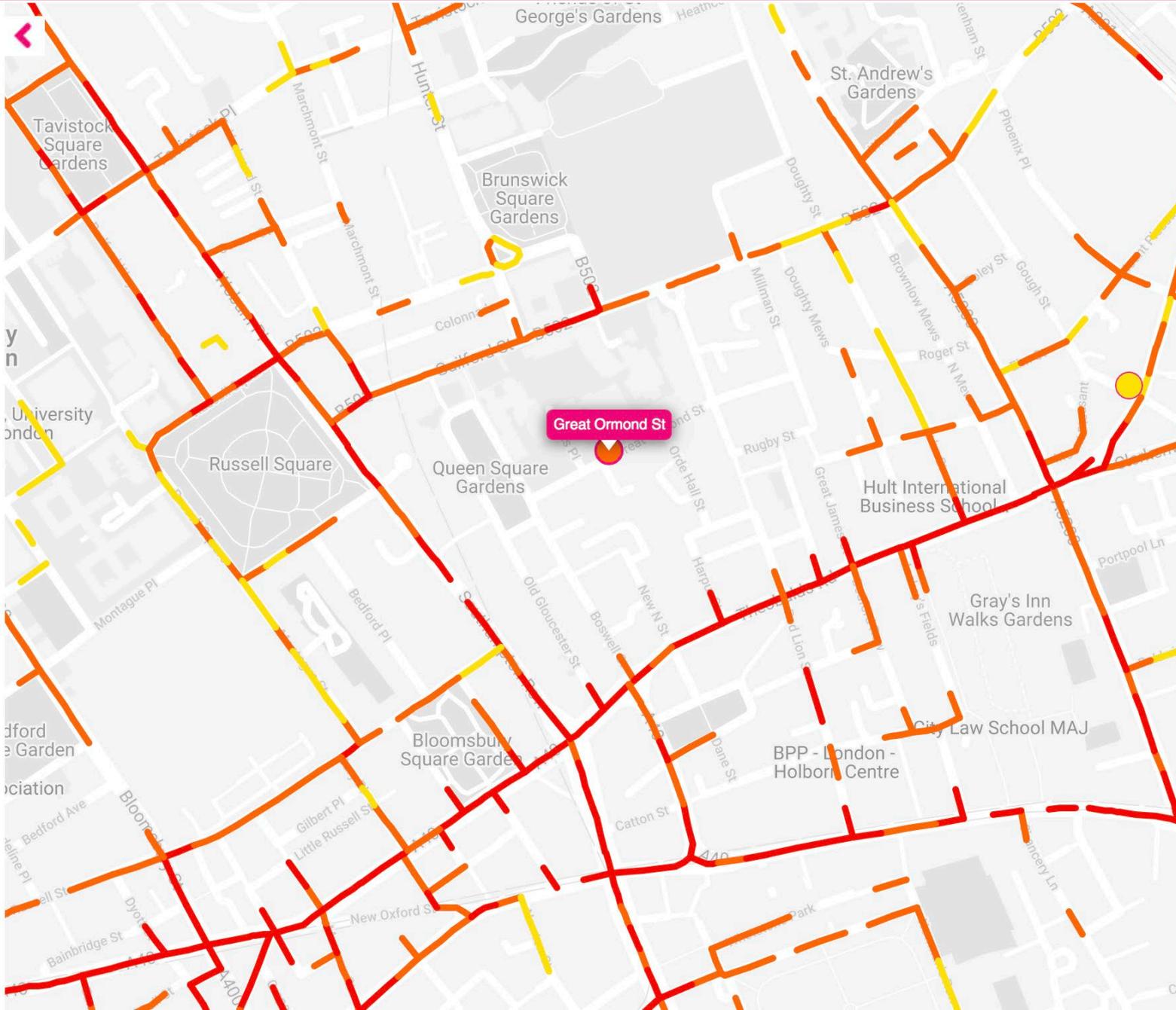
- Regulatory networks

Pollutant

- NO2
- Coming soon
- PM2.5
- PM10
- O3

Concentration ($\mu\text{g}/\text{m}^3$)

- > 200
- 100 - 200
- 60 - 100
- 40 - 60
- 20 - 40
- 10 - 20
- 0 - 10
- No current data
- Past locations



Breathe London

Great Ormond St
Camden
ROADSIDE

From: 5th May 2019 01:00
To: 10th October 2019 13:00

Average (mean) air quality

NO2 **42.0** $\mu\text{g}/\text{m}^3$

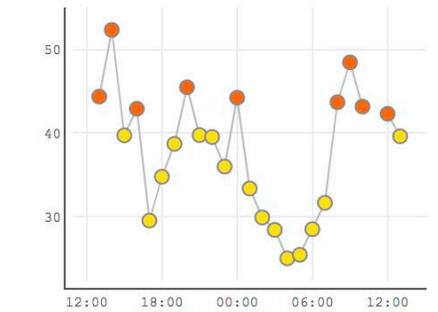
Exceedences **5** hours (0.1%)

Average air quality since start

Past 24 hours

[More data](#)

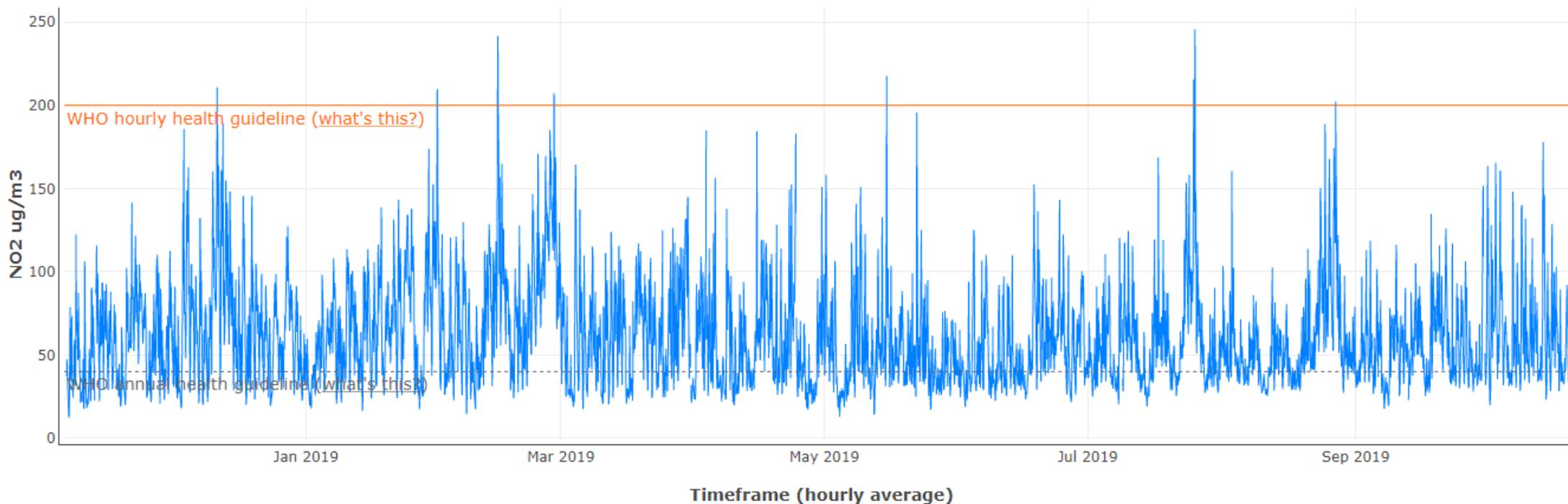
NO2 ($\mu\text{g}/\text{m}^3$)



[Frequently Asked Questions](#)

Nitrogen Dioxide (NO2)

London Wall



The graph shows hourly average concentrations of NO2 at London Wall, City of London. Also displayed are the World Health Organization's [Air Quality Guidelines](#) for NO2; evidence-based targets for air quality management to protect populations from the adverse health effects of air pollution.

Select Data

Date From:

6-Nov-2018

Date To:

22-Oct-2019

Pollutant: [i](#)

NO2

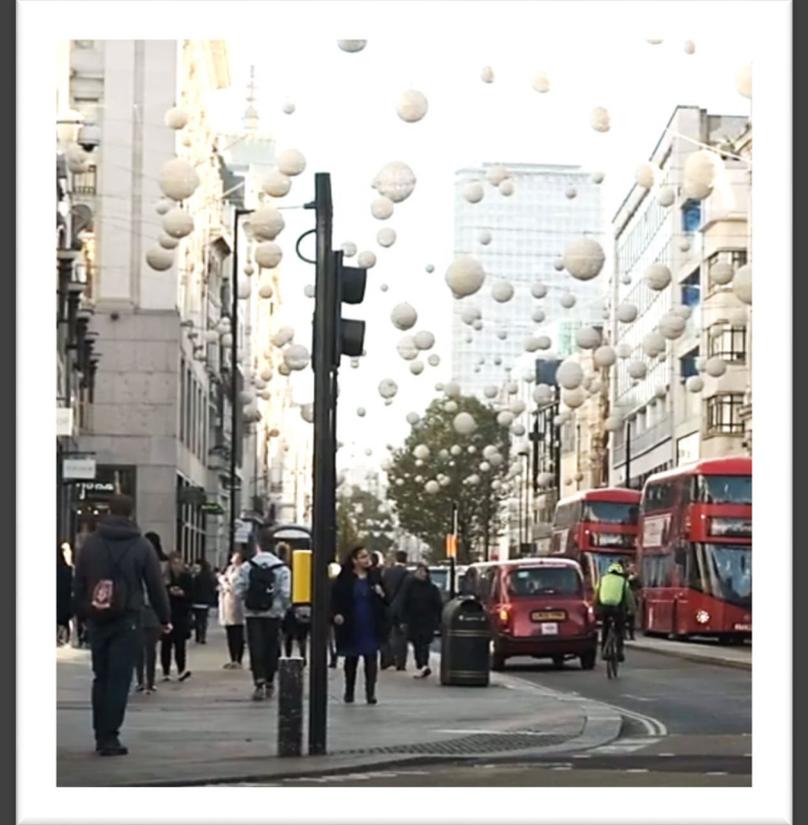


- Testing accuracy of lower-cost sensors
- Testing new Quality Assurance/Quality Control (QA/QC) methods
- Using data to improve source apportionment



Preliminary findings

- Over 40% of network monitors are set to exceed the annual legal limits for NO₂
- Four out of five pods, including 90% of schools in the network, are on track to exceed WHO annual PM_{2.5} guidelines
- Hotspot identified at bus garage in residential area
- NO₂ is on average over 50% higher on major through roads than quieter, local roads



What's next?

Additional pollutants

**Refining scientific
methods**

**Raising public
awareness**

**Turning data into
action**



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