

PART 2: USING HYPERLOCAL MONITORING TO SUPPORT YOUR GOALS

Breathe London serves as a case study for how to design a monitoring project that addresses three goals:

1. Identifying pollution hotspots
2. Measuring how well an intervention is working
3. Raising public awareness

Below, we describe how Breathe London produced the data to achieve these goals in London, as well as suggestions for how to focus your resources and links to go deeper.

1. Identifying pollution hotspots

If you want to reduce air pollution but don't know the best location in the city to start, you can use lower-cost monitoring to identify pollution hotspots. These are locations where people are exposed to unusually elevated levels of pollution.



Breathe London's approach

We wanted to use measurements from our monitoring to find pollution hotspots at locations that weren't detected by the regulatory monitoring network or identified by the city's air quality model.

Several months into monitoring, we noticed one of the Breathe London pods was consistently measuring higher NO₂ pollution levels than the rest of the network. The pod was near the entrance of a bus garage, at the end of a residential street. Interestingly, the pod was often registering significantly higher NO₂ levels than the nearest regulatory monitor located on a busy, main road approximately 1.5 km away. This highlights the ability of hyperlocal data to identify previously undetected issues.

After we shared this data, the responsible government entity immediately began working with the bus operator to find ways to reduce pollution, including stopping buses idling outside the garage and upgrading some of the bus fleet to electric power. Continuous monitoring allowed us to see which times of the day the pollution levels were at their worst, so actions could be targeted accordingly.

Data shows the measures taken at the garage were effective and pollution went down since their introduction.

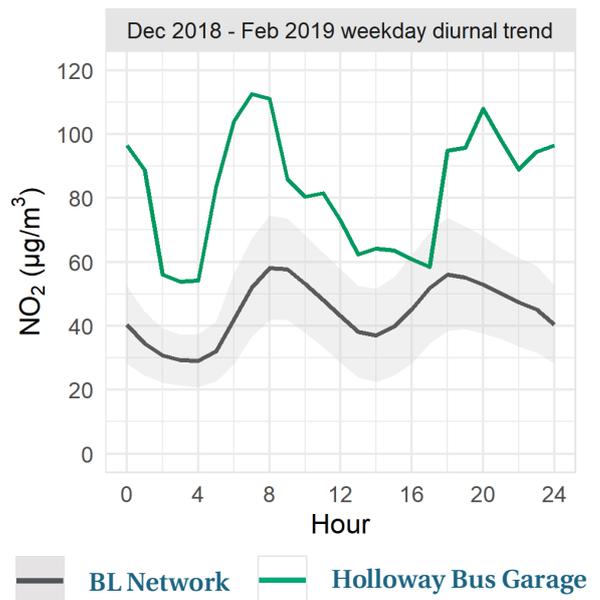
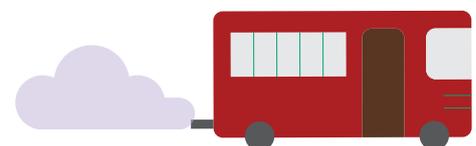


Figure 1 NO₂ levels at the Holloway Bus Garage pod were consistently higher than the Breathe London network average.



Hotspot identification is a great way to focus interventions and target resources where they will have the most benefit to your city's residents.



Focusing your resources

You don't need hundreds of monitors to get started on finding problem areas. Based on what we learned from Breathe London, here are a few suggestions for detecting hotspots with more limited resources:

- **Prioritise sensitive and suspect areas:** Are there particular areas where younger and older people live, work or play? Combine that knowledge with places where you suspect pollution might be a problem based on public complaints, poor compliance history or other local insights. You might start with monitoring these potential hotspots – like schools and hospitals near industrial facilities or busy roads – to better understand both where and when the pollution is highest.
- **Prioritise the times when people are likely exposed to pollution:** There are times when emissions are high and a large number of people could be exposed, like during a school drop-off, meal-times at restaurants, peak traffic commuting hours or nighttime industrial activities. The monitoring plan should prioritise these times so as not to miss opportunities for interventions that could most benefit people's health.
- **Go mobile:** Mobile monitoring is an effective screening tool because of the data's higher spatial coverage, so you might start by driving one monitor around to detect hotspots. Keep in mind that if mobile monitoring is limited to just a few vehicles, coverage in space comes at the expense of continuous monitoring in time.

What next?

Once you've detected a hotspot, you can work with your team to determine next steps and tackle the issue. Based on local knowledge and context of that area, you might deploy stationary monitors to measure long-term pollution levels and gather more data, or evaluate whether there are any immediate interventions you could try to lower pollution.

Using mobile monitoring to find pollution hotspots

Mobile monitoring data – like the information gathered by the reference-grade monitors in the Google Street View cars – can also provide key insights on areas where pollution levels are elevated. Analysis of the Breathe London mobile data showed areas not previously monitored, including major roads and

quieter local roads, that are likely to exceed UK legal limits for NO₂ without further interventions.

Breathe London developed methods to find hotspots using mobile data and dispersion modelling. [You can find more information here.](#)

