



Traffic-Related Air
Pollution,
Health Burdens and
Inequality,
Policies and
Interventions

Dr Malcolm White



CleanAirDay

Clean Air Day is the UK's largest air pollution campaign, bringing together communities, businesses, schools and the health sector.

A nighttime photograph of a residential street. In the foreground, a large, leafless tree stands on the left. Behind it is a two-story brick house with white window frames and a porch. To the right, a street lamp illuminates a sidewalk covered in fallen leaves. In the background, a tall, modern building with many lit windows is visible against the dark night sky.

Everyone in urban areas can
breathe clean air

OUR LIVES. OUR PLANET.

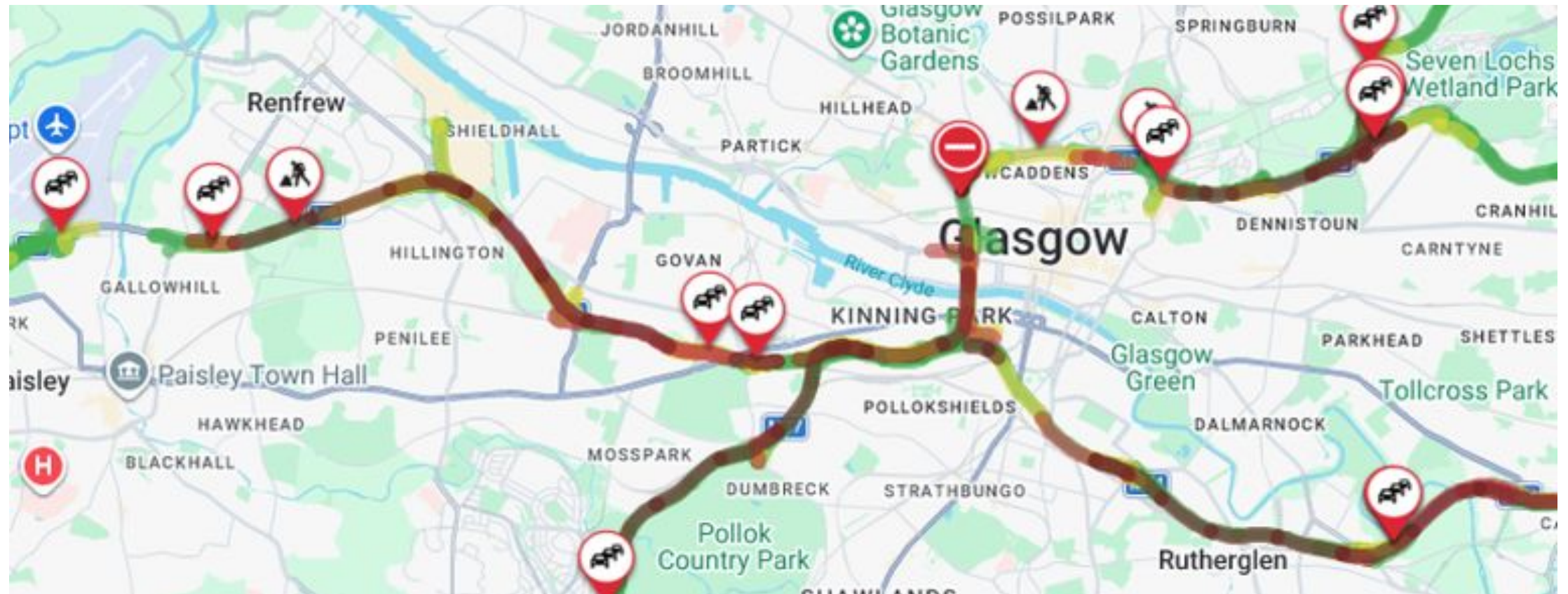
Traffic-Related Air Pollution

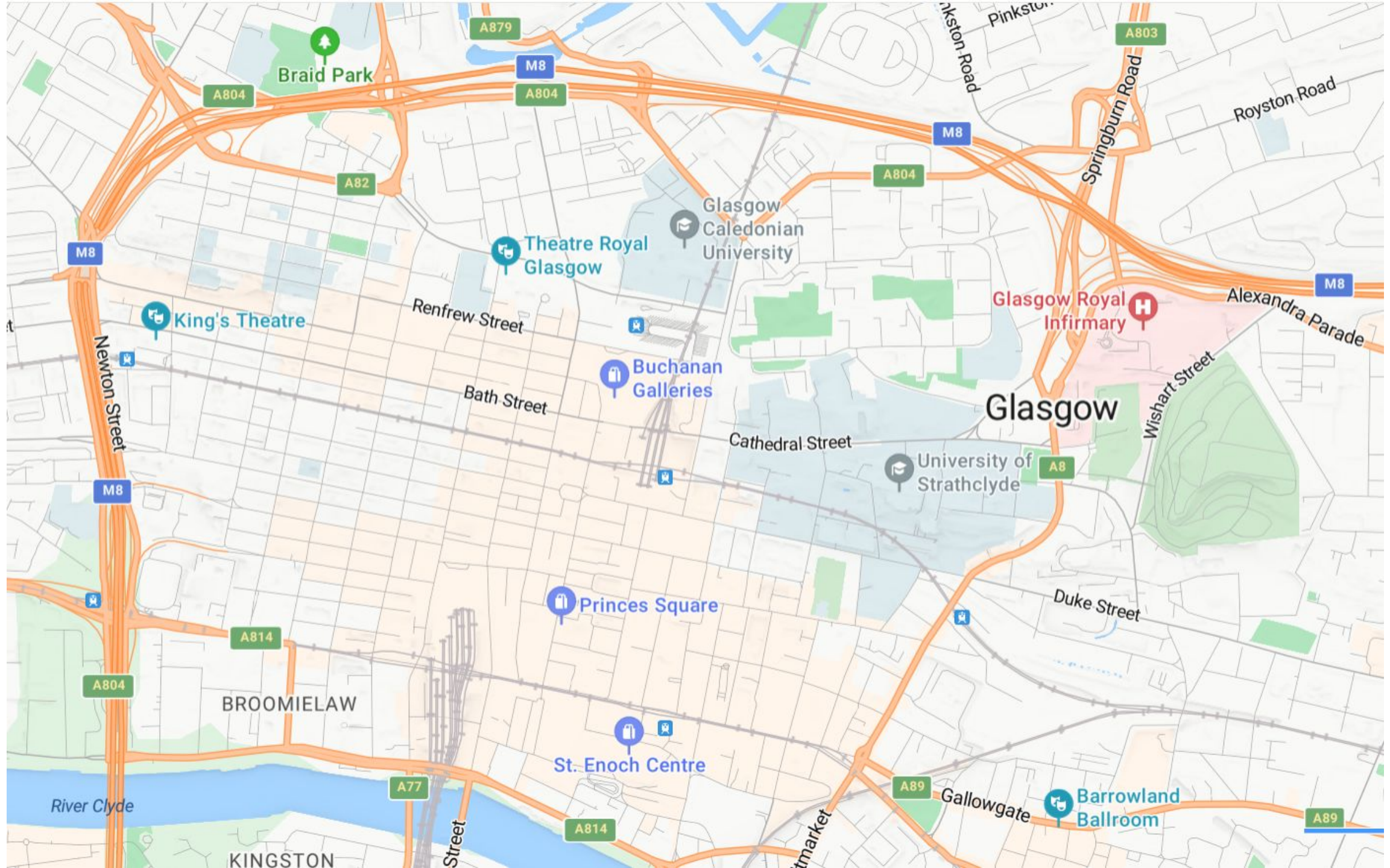


My Context



Glasgow





M8 Woodside Viaducts

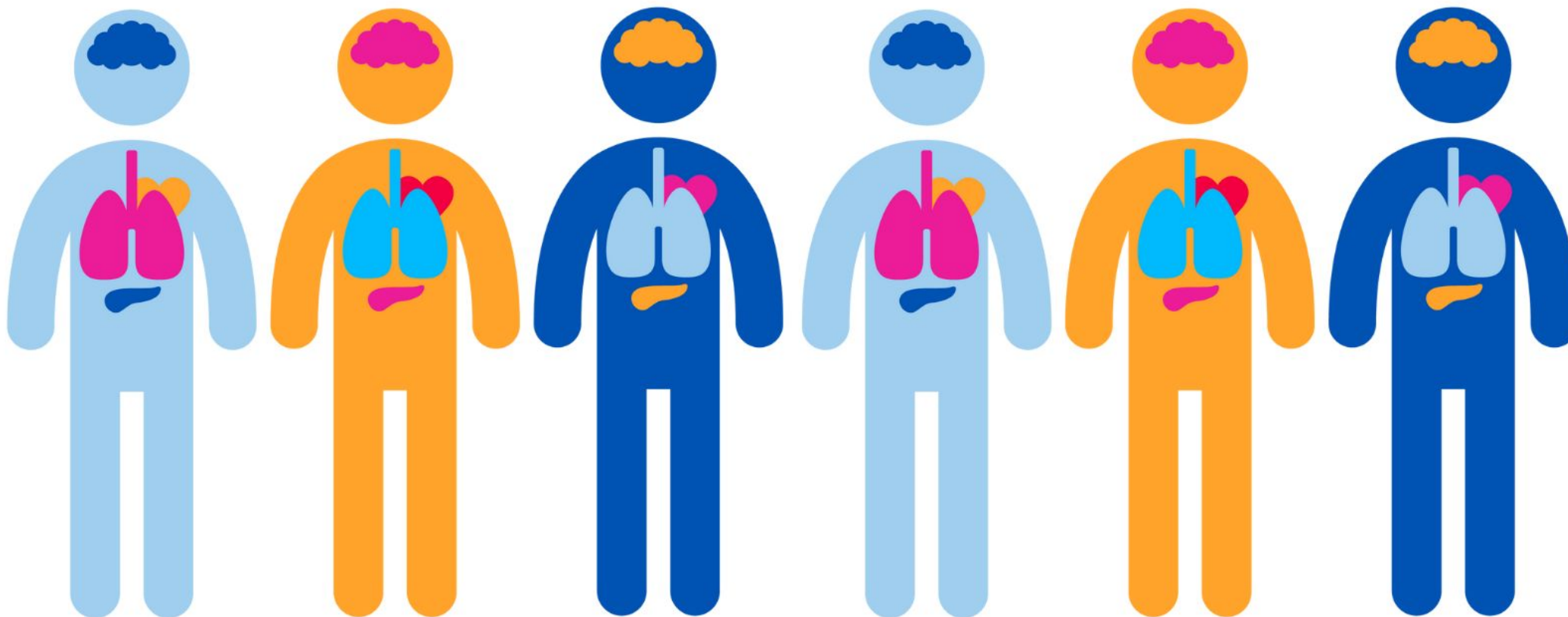
**CHOOSE
OPTION:
REMOVE...**

...to improve

Consultation
DEADLINE:
25 March
2026



Air pollution impacts us all



In the UK, air pollution....

Causes between **29,000-43,000** deaths each year

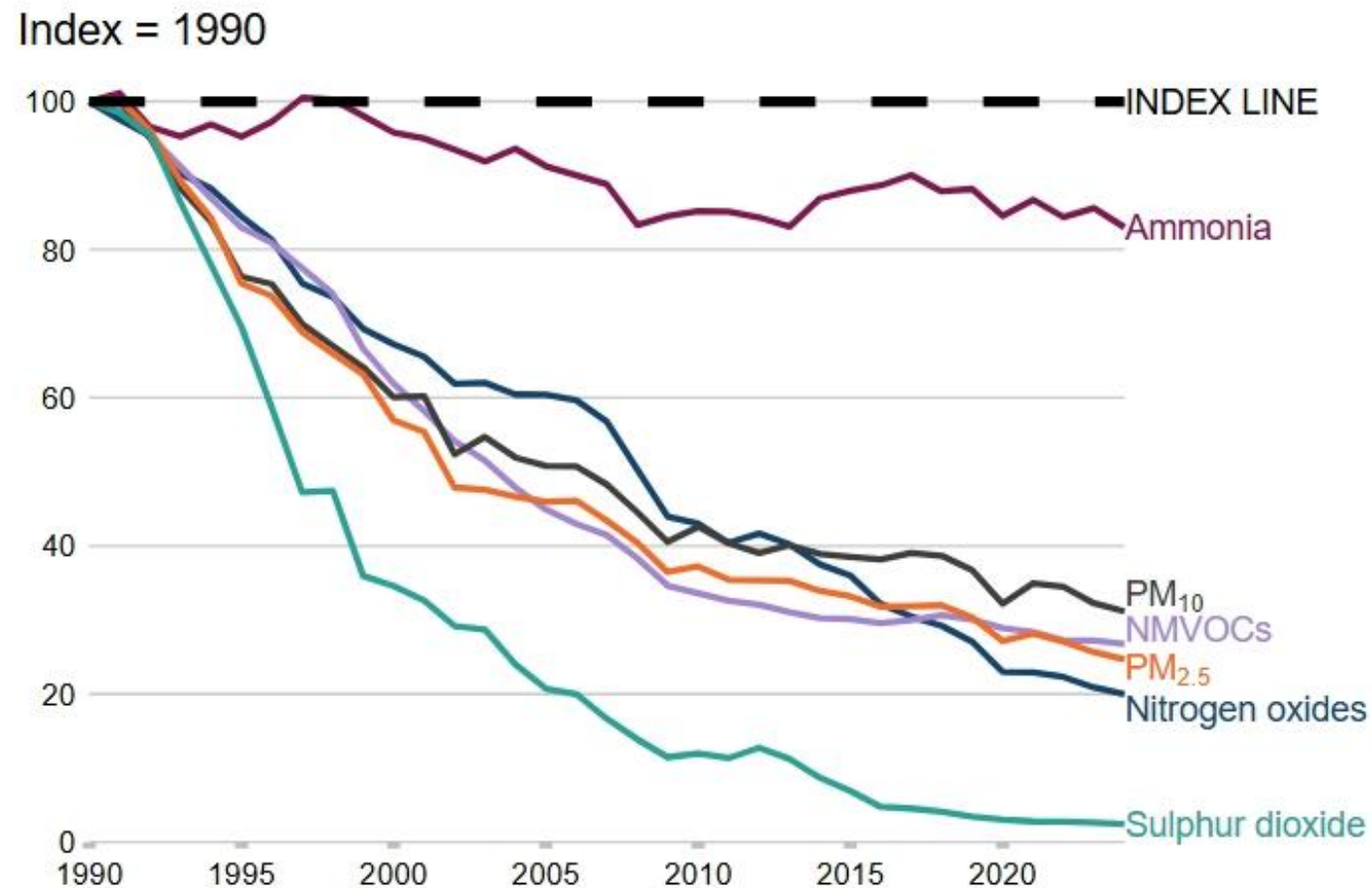
Causes over 6 million sick days each year

The economic losses of air pollution are estimated at **£27 billion**

Causes 20,000+ hospital admissions for lung and heart problems

3. Long-term trends in emissions of air pollutants

Figure 1: Trends in annual emissions of particulate matter (PM10 and PM2.5), nitrogen oxides, ammonia, non-methane volatile organic compounds, and sulphur dioxide, 1990 - 2024



FARMS
Agriculture and farming

BUILDING
Construction and building sites

FACTORIES
Industrial processes and energy generation

BOATS AND TRAINS
Other transport - shipping and rail

CARS AND VANS
Road transport

DOMESTIC
Wood and coal burning

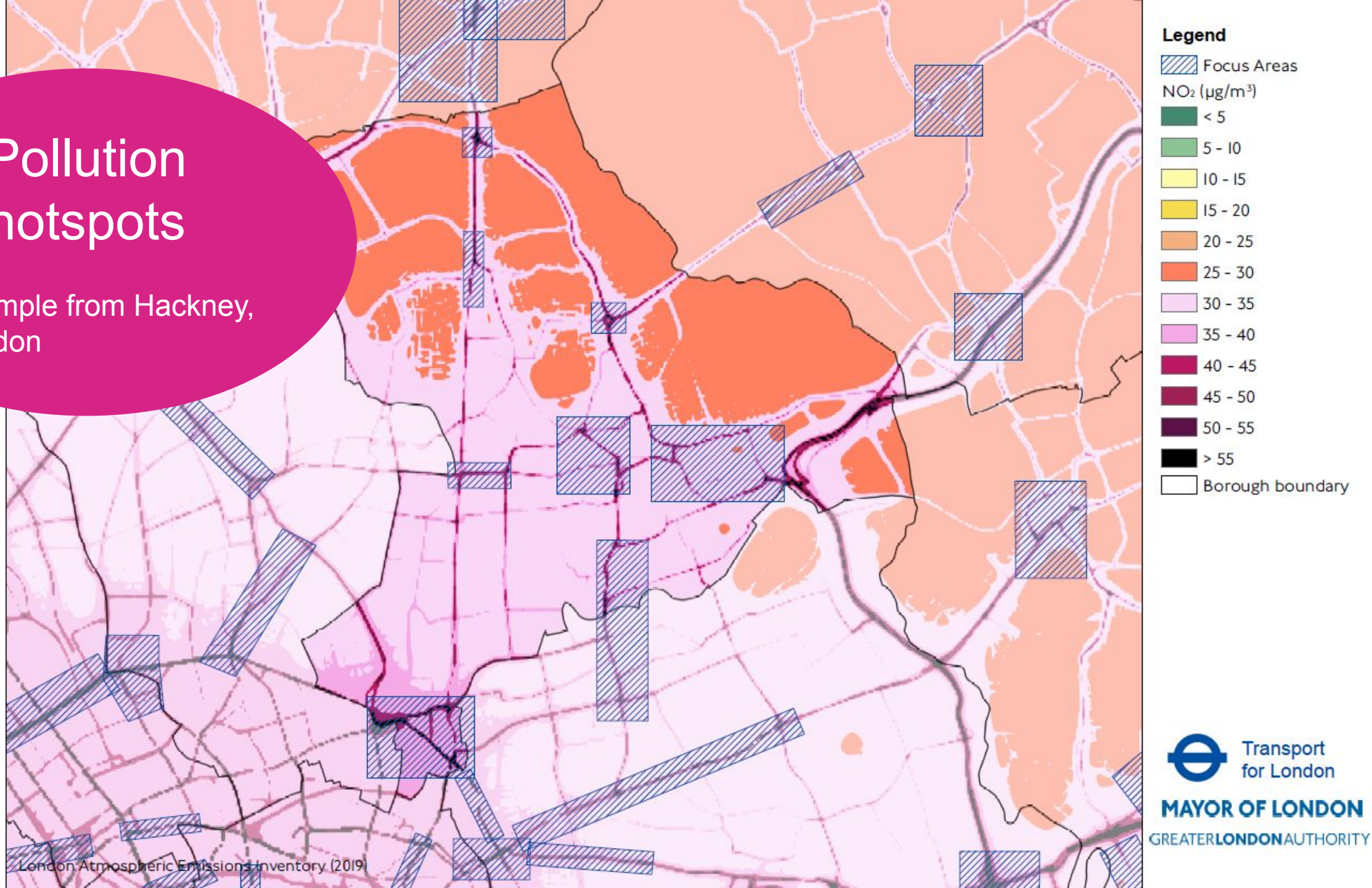
DOMESTIC
Household cleaning and personal care products

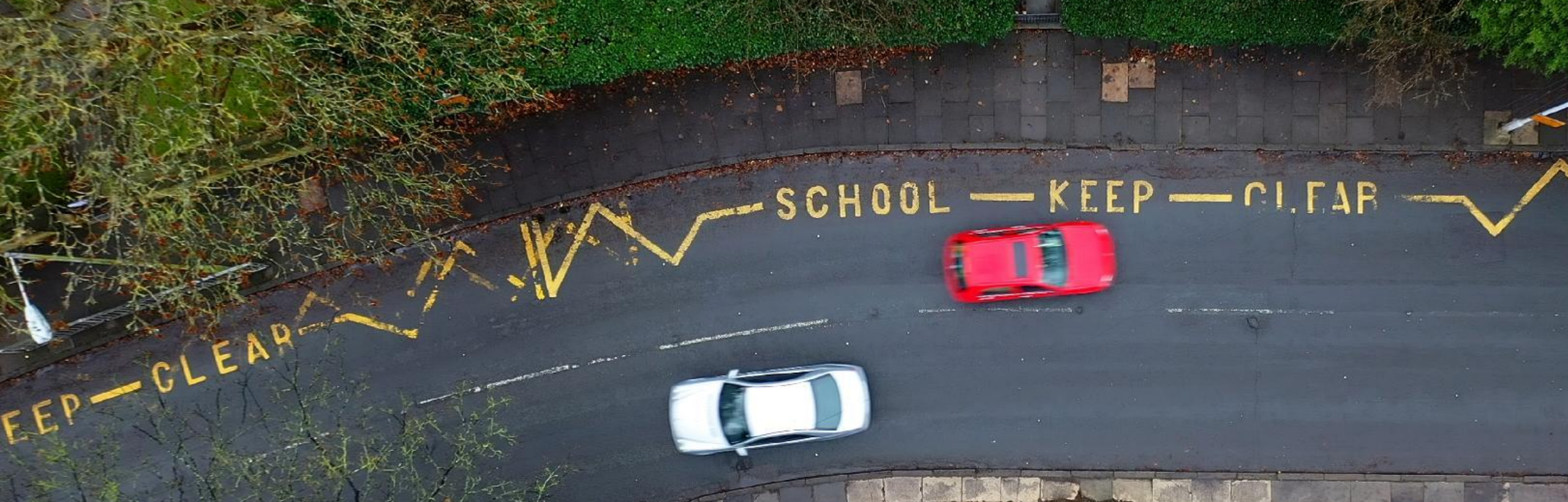
Air Pollution from road transport

- **Nitrogen Oxides**
 - Internal Combustion Engines
- **Particulate Matter** (and ultrafine)
 - Black carbon, metal, tyres, dust
- NMVOCs, Sulphur Dioxide, Ozone, Secondary Pollutants

Pollution hotspots

- Example from Hackney, London





Almost all schools in the UK are in areas with air pollution above safe levels, exposing young people to dangerously high levels in their daily lives.

(based on WHO limits, 2021)

Does hourly variation in ambient nitrogen dioxide increase the risk of acute asthma hospitalisations? A time-series study of Birmingham and Solihull, UK

 Nidhi Shukla^{1, 2}, Alan Kwok³, Alexander Topham³, Suzy Gallier^{3, 4, 5},  Elizabeth Sapey⁵, Andrew Percy³, Mark Bayliss³, Prasad Nagakumar⁴,  Anna L Hansell^{2, 6, 7},  Suzanne E Bartington⁸, Tim CD Lucas¹

Correspondence to Dr Tim CD Lucas; tim.lucas@leicester.ac.uk

Poorest children in England 40% more likely to be hospitalised for lung infections

Exclusive: Analysis of NHS England data reveals stark impact of air pollution in deprived areas



📷 Young children walk to school next to a congested road in London. Photograph: Jonathan Goldberg/Alamy

Health Inequalities and air pollution

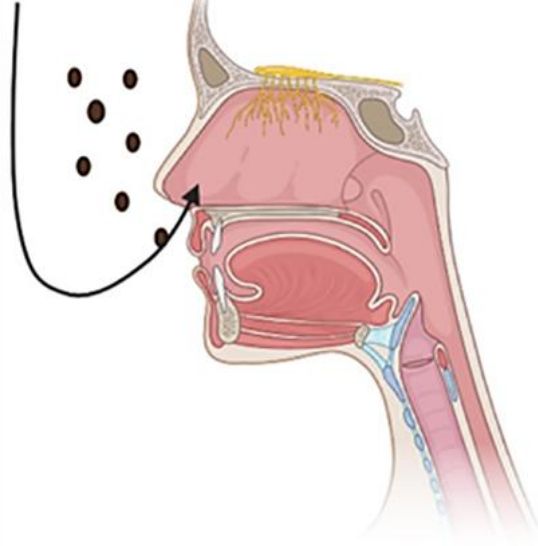
The negative impacts of air pollution are unequal.

- Some individuals are exposed to higher levels of air pollution:
 - Those living in deprived areas
 - Racialised communities
- Some groups are disproportionately affected by the health harms:
 - Children
 - Older people
 - People with existing health conditions

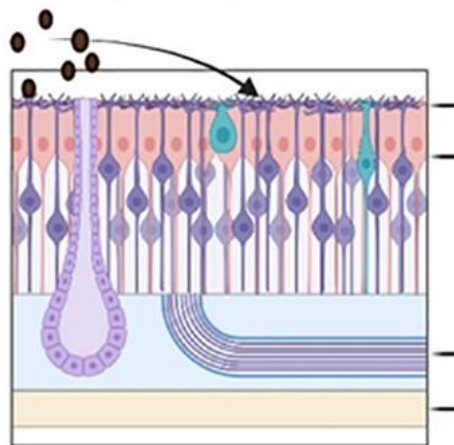


Direct Exposure

Pollutant to Nose



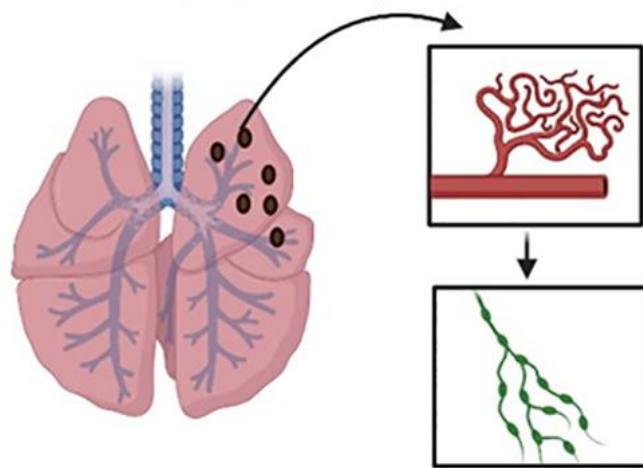
Pollutant to Cilia and Olfactory Receptors



Indirect Exposure

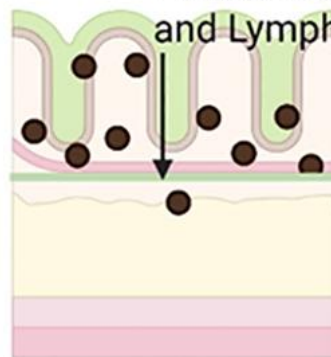
Lung Epithelium

Pollutant to Bloodstream and Lymphatic System

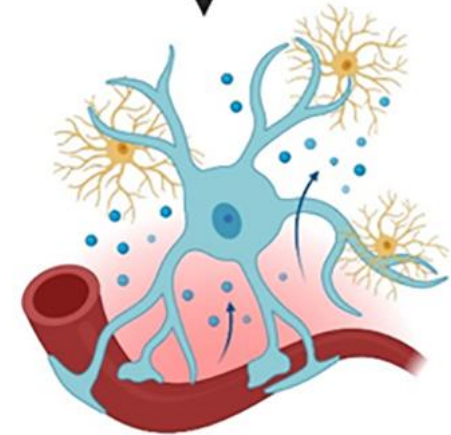


Intestinal Epithelium

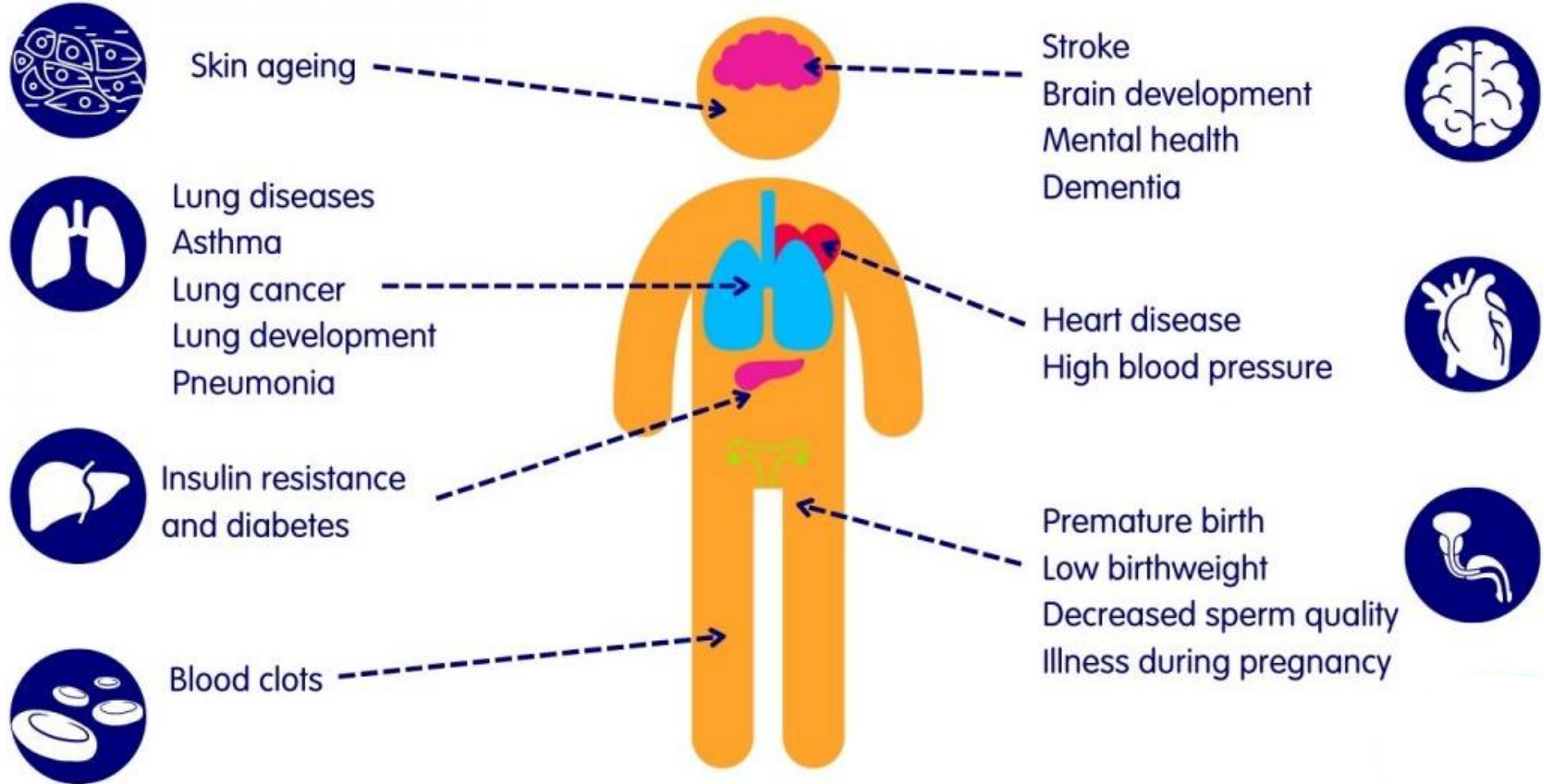
Pollutant to Bloodstream and Lymphatic System



Blood Brain Barrier Permeation



How air pollution impacts the body



Background vs Acute Air Pollution

- **Effects development in-utero and in childhood**
- **Long-term exposure contributes to developing chronic disease/illness**
- **Changing circumstances changes exposure levels**
- **High exposure event can flare or exacerbate chronic conditions
OR can trigger NCD event**

Case study

Carol

- From her 30's, Carol struggled to control her asthma, having to use steroids and being admitted to hospital on multiple occasions
- When she retired and moved out of Glasgow city centre to the countryside her asthma started to improve.
- Her HCP suggested this could be due to the improved air quality where she is now living
- On reflection, her previous home in the city was often damp, and was right next to a busy bus route.
- She had never previously heard of the impact of air pollution from any HCP. If she had she might have been able to improve her asthma earlier

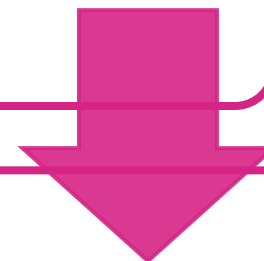
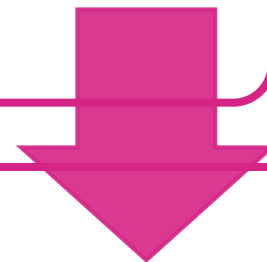
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Air Pollution and Health Training



Reflections

- Healthcare staff are willing to learn
- When you teach them...
- Time!
- Many patients want to know
- Integration across all healthcare education



Actions we can all take to breathe cleaner air _____

Make travel choices for cleaner air

Walk or wheel to work or school, using **greener routes** with less traffic when you can.

Consider switching to an **electric vehicle** or **leaving the car at home**.

If you need to drive, **turn the engine off** when you are not moving and it is safe to do so.



Find out what air quality is like in your local area.

Make cleaner air decisions in the home

Use **fragrance-free**, milder cleaning products and avoid plug-in fragrances.

When decorating, choose safer paints and varnishes that are labelled '**low VOC**'.

Ask people **not to smoke** or vape in your home.

Avoid home burning (e.g. log burners, coal fires, or candles).

Open windows that are away from main roads to ventilate your home.





**1 minute of a
car's engine idling**

**= 150 balloons of
harmful emissions**

Turn off your engine to reduce air pollution and protect health

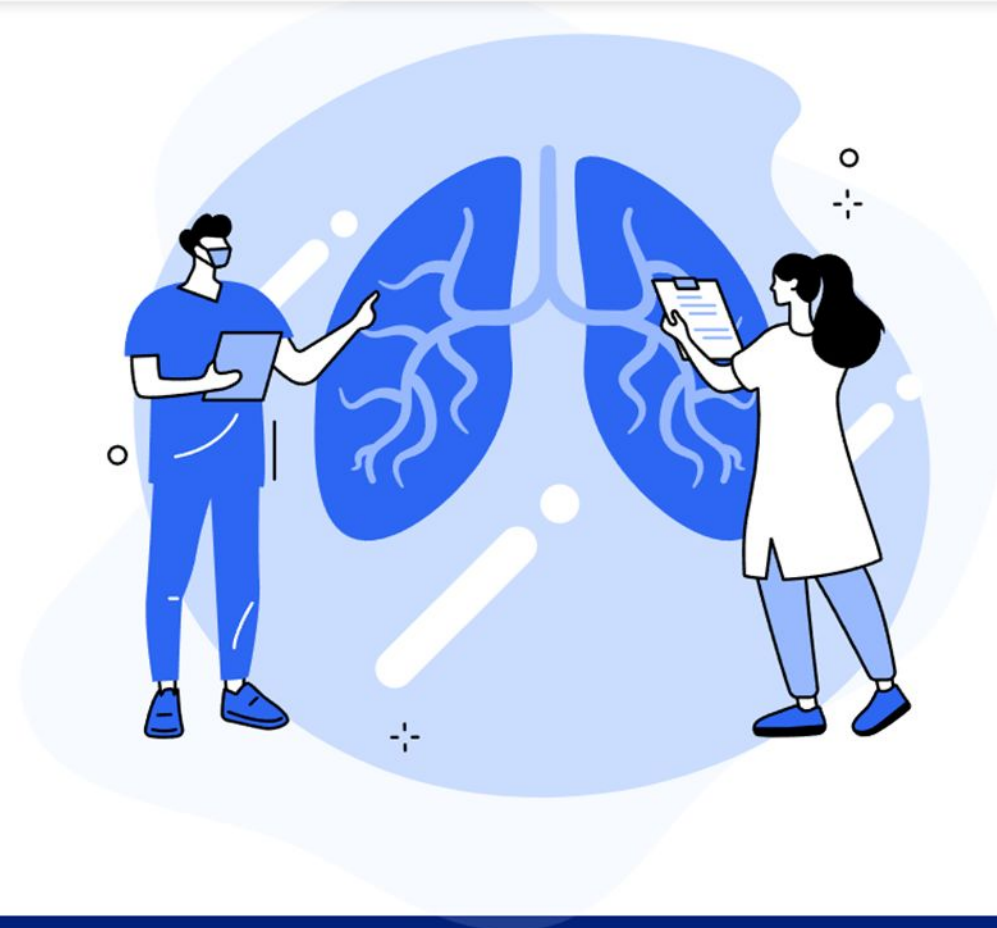
Working with
**global
action
plan**

Source: TfL, report for City of London corporation
Designed by Bart Heath NHS Trust

Welcome to the Clean Air Academy

From informative resources to comprehensive courses, the Clean Air Academy serves as a trusted hub for healthcare practitioners seeking to enhance their expertise in air pollution.

Understanding the hazards of air pollution is crucial and equally significant is the ability to implement effective strategies for patient protection. Our comprehensive course goes beyond imparting in-depth knowledge; it also provides healthcare practitioners with the essential tools to identify, tackle, and alleviate the adverse health effects linked to air pollution.



Want to know more?

Discover our full range of resources and course material.

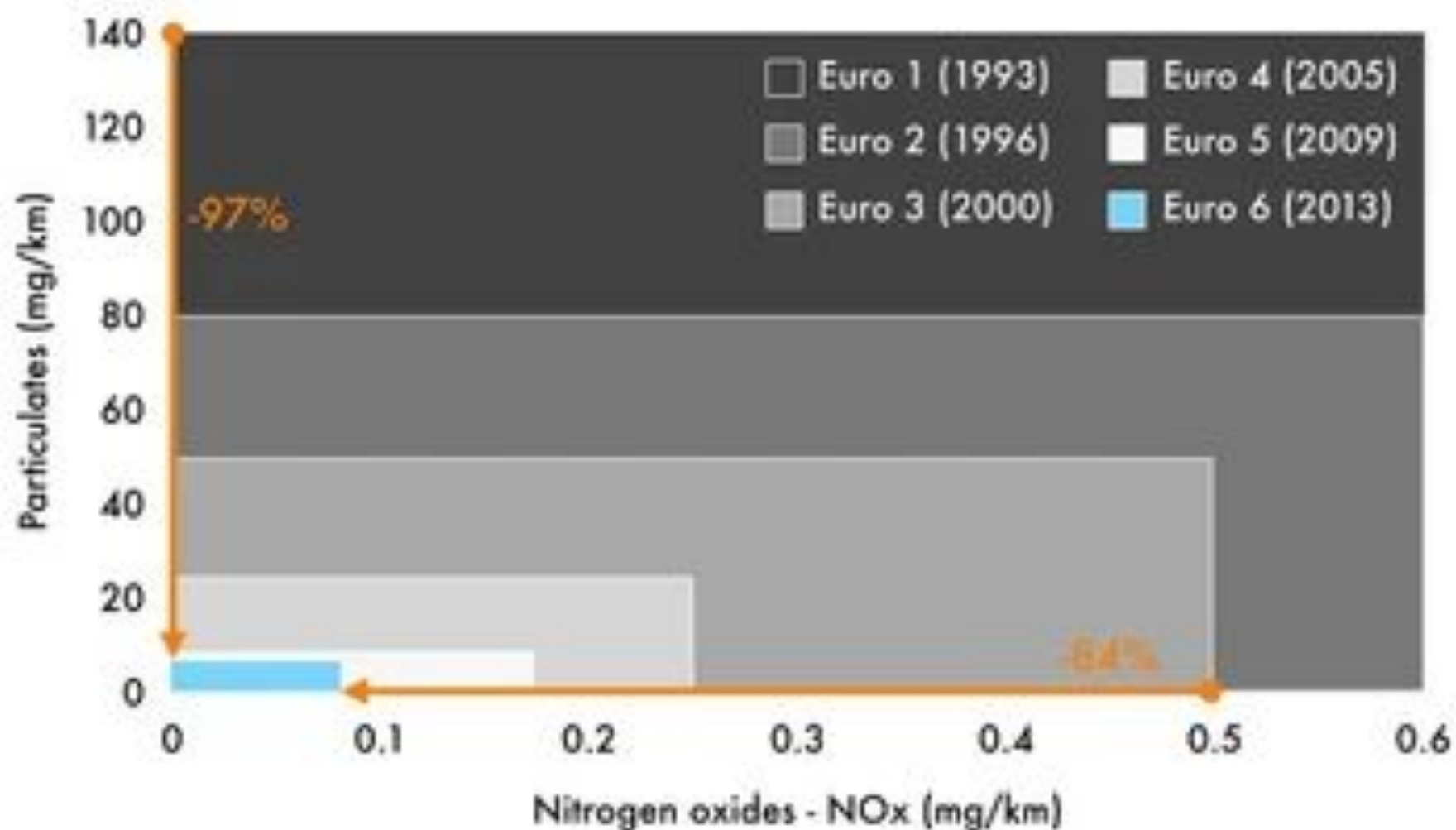
[Register or login here](#)

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Policy & Interventions



EUROPEAN EMISSION STANDARDS - DIESEL



Delhi plans to ban petrol rickshaws and scooters in effort to cut toxic fumes

Government hopes for 30% of city's fleet to be electric by 2030, in move hailed as 'gamechanger' on air pollution



📷 Vehicle emissions from Delhi's auto rickshaws and other petrol vehicles count for an average of 23% of pollutants in the air. Photograph: DB Pictures/Alamy

Sickness to prevention

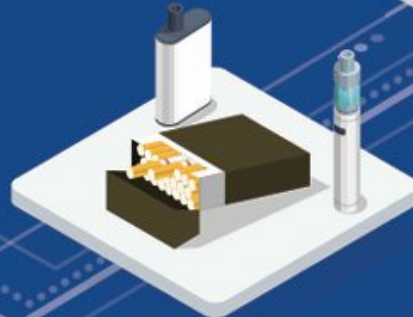
Tackle childhood obesity through **new junk food advertising restrictions** and improving food in schools



Ensure people have the information they need to **make healthier choices** on alcohol



Refresh the government **ambition on air quality** to protect everyone from the health impacts of air pollution



Create the first **smoke-free generation** and crackdown on vaping amongst children



Millions more people will be encouraged to move and exercise regularly through a new national campaign



Work with **businesses** to help children and families make the healthy choice

New air quality alerts service launched

New opt-in alerts will warn people when air pollution is high, or expected to be high, in their local area

Air Pollution Awareness Coalition (APAC)

The Air Pollution Awareness Coalition (APAC) is a cross-sector coalition to improve public understanding of air pollution and support action to reduce harm.

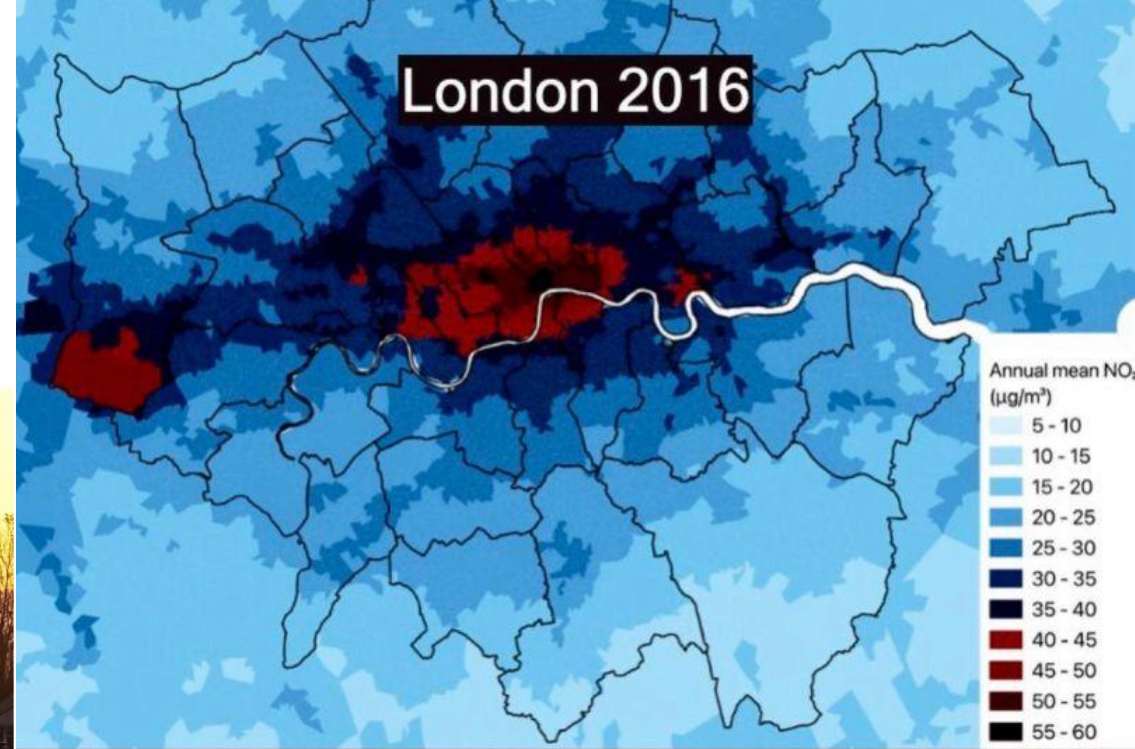
From: [Department for Environment, Food & Rural Affairs](#), [Department of Health and Social Care](#) and [Department for Transport](#)

Low Emission Zones



Emergency hospital admissions fell after introduction of London's T-charge and Ulez, study suggests

Imperial College scientists analysed health records before and after introduction of air pollution reduction zones

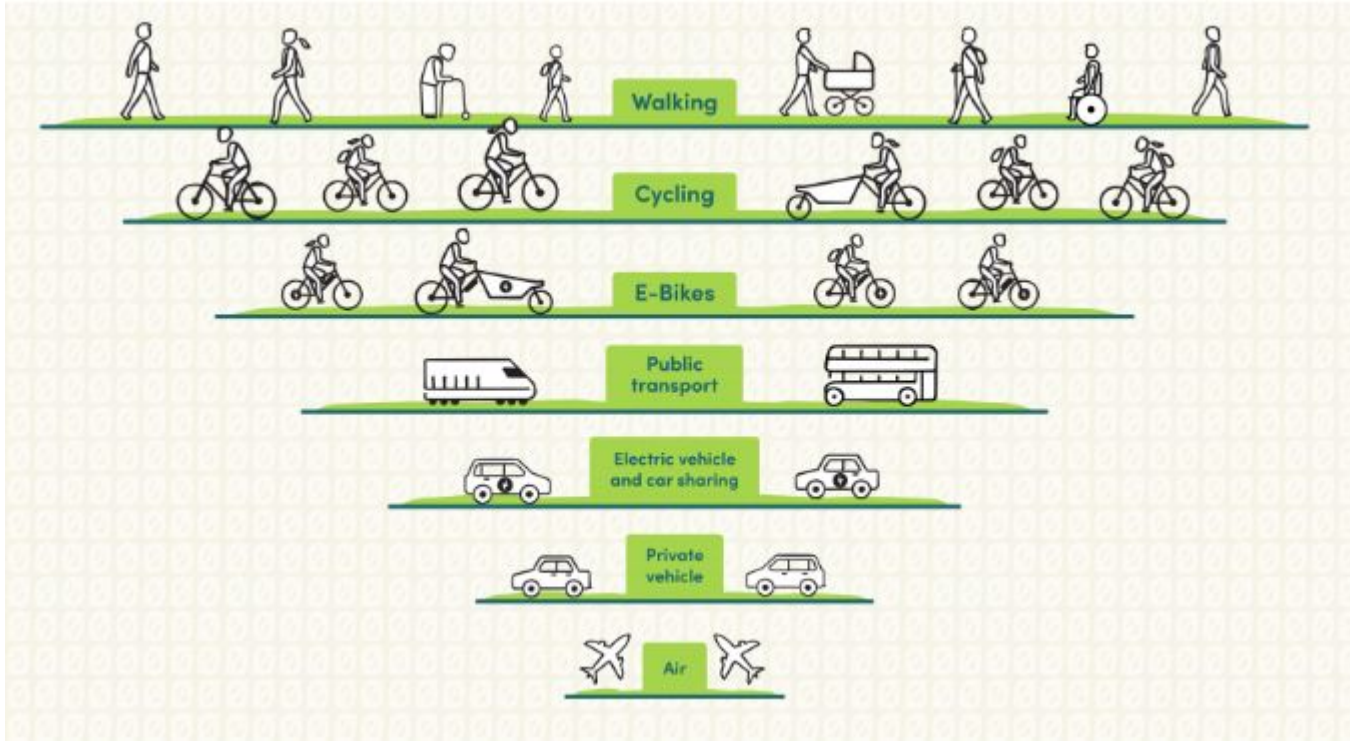


News

Introducing London's ULEZ linked to improved child lung growth







Bus journeys in west of Scotland to be capped at £2 from Monday



Burnham reintroduces £2 bus fare cap reversing Starmer increase

The Prime Minister said 'no-one should be priced out' of using public transport.



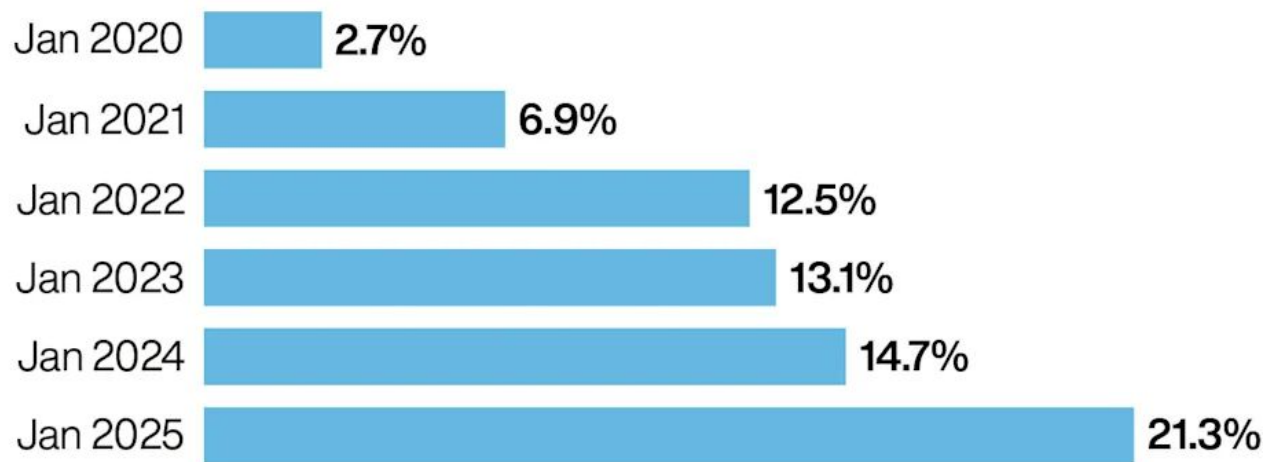
EVs now one in four sales in Europe

↗ Share

Edited by Edson Caldas, Editor at LinkedIn News ⓘ

Registrations of battery electric vehicles (BEVs) across 16 European markets increased 13.6% year-on-year to 224,266 vehicles in July, with electric cars now accounting for a 25.7% market share, according to E-Mobility Europe. The Nordic

Proportion of UK new car sales that are battery electric vehicles



PA graphic. Source: SMMT

Local Authority Policies

Regularly review and assess air quality in every district and unitary authority.

Where standards not being met, authorities must produce action plans to improve air quality.



NHS commitments on air pollution

- Halve contribution to poor air quality within a decade, while reducing health inequalities.
- Healthcare staff training to include the health effects of air pollution, how to minimise these, and communicate this with patients.





Onsite energy production: Solar

Eco-friendly cleaning products

Less pollution

Electric boilers

Offsite energy production: Wind

Electric delivery vehicles

Engaging with the community

Electric vehicle charging points

Cycling & walking encouraged

Local transport links

Green space

Bicycle parks

Last mile delivery

What I'd love to see!

- Hyper-localised AQ measurement with affected communities
- AQ at primary care, care homes, nurseries, etc
- Strong Leadership for ambitious policies
 - Local, Regional, National
- Public Health Campaign
- Research that informs decision makers by design
- Decision makers that embed research as standard!



GAP Clean Air Ambition:

Everyone in urban areas can breathe clean air

Domestic transport: Reduce the number of vehicles miles travelled on UK roads by 30% by 2030

Source reduction is key
Evidence is vital, but it needs
policy and legislative support



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Thankyou!

Malcolm.white@globalactionplan.org.uk

Please also find me on LinkedIn!

