IMPERIAL

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Low emission zones

History, myths and evidence

Belfast, May 2025

Clean Air Programme
www.ukcleanair.org/


ULEZ
STOP
ULEZ
#STOP ULEZ LIE
#STOP ULEZ TAX
#STOP ULEZ CON


anti-ulez.com
STOP THE ULEZ
UNITED WE STAND
FCUK KHAN
STOP ULEZ
STOP THE TOXIC AIR LIE
GET KHAN


NET ZERO
ULEZ LTNs
Hitting the poorest hardest
ULEZ LTNs
"15min cities"
attack our freedom
Rogue Govts in lockstep.
Resistance becomes duty.
The Telegraph


NO 2 STUNTED LUNGS
Clean Air 4 Schools
DON'T MAKE KIDS COLLATERAL DAMAGE
YOU WOULDN'T MAKE US DRINK DIRT!
LET ULEZ WORK IT'S MAGIC!
ALBION ROAD RESIDENTS CAN'T TAKE POLLUTION
NO MORE CARS ON ALBION ROAD
CLEAN AIR PLEASE!
MY AIR MY FUTURE
PROTECT SCHOOLS DON'T POLLUTE THEM!
WAIT FOR ULEZ TO WORK IT'S MAGIC
PRESS PAUSE
IT'S NO CHOKE
FOR OUR LUNGS
YOUNG LUNGS need Clean Air! stop the road closures
LESS CARS MORE CHICKENS!

Understanding low emission / clean air zones

- LEZs worked over there so they are the solution here too.
- LEZs don’t work. We should just wait for new vehicles to naturally replace old ones.
- Traffic will simply divert and move the problem.
- All the effects happen the moment the zone starts.
- It’s all a tax grab.
- Poorest people are worst affected.

Low emission zones around the UK and Europe

Started in Stockholm, Göteborg and Malmö in 1996 with bans on the oldest HGVs.

First LEZ outside Sweden was in the Mont Blanc Tunnel in 2002.

Hundreds now operate across Europe.

Atmospheric Environment 111 (2015) 161–169

Contents lists available at ScienceDirect

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journal homepage: www.elsevier.com/locate/atmosenv

Review

Review of the efficacy of low emission zones to improve urban air quality in European cities

Claire Holman [a, b, *], Roy Harrison [a, 1], Xavier Querol [c]

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[b] Brook Cottage Consultants, Elberton, Bristol BS35 4AQ, United Kingdom
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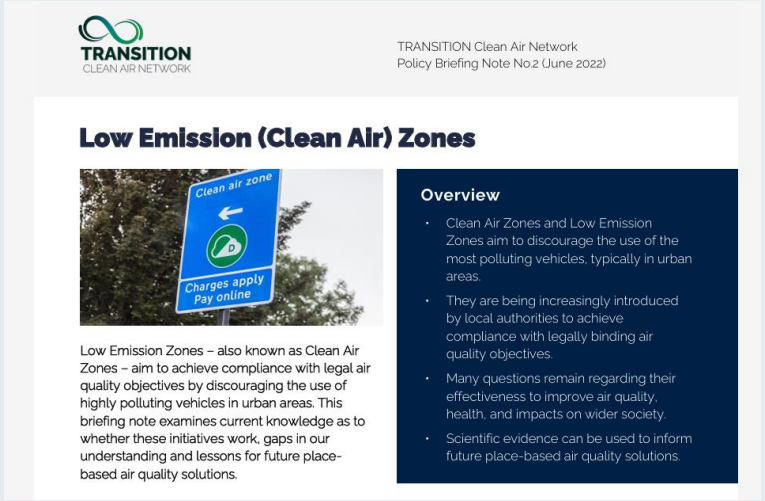


TRANSITION CLEAN AIR NETWORK

TRANSITION Clean Air Network
Policy Briefing Note No.2 (June 2022)

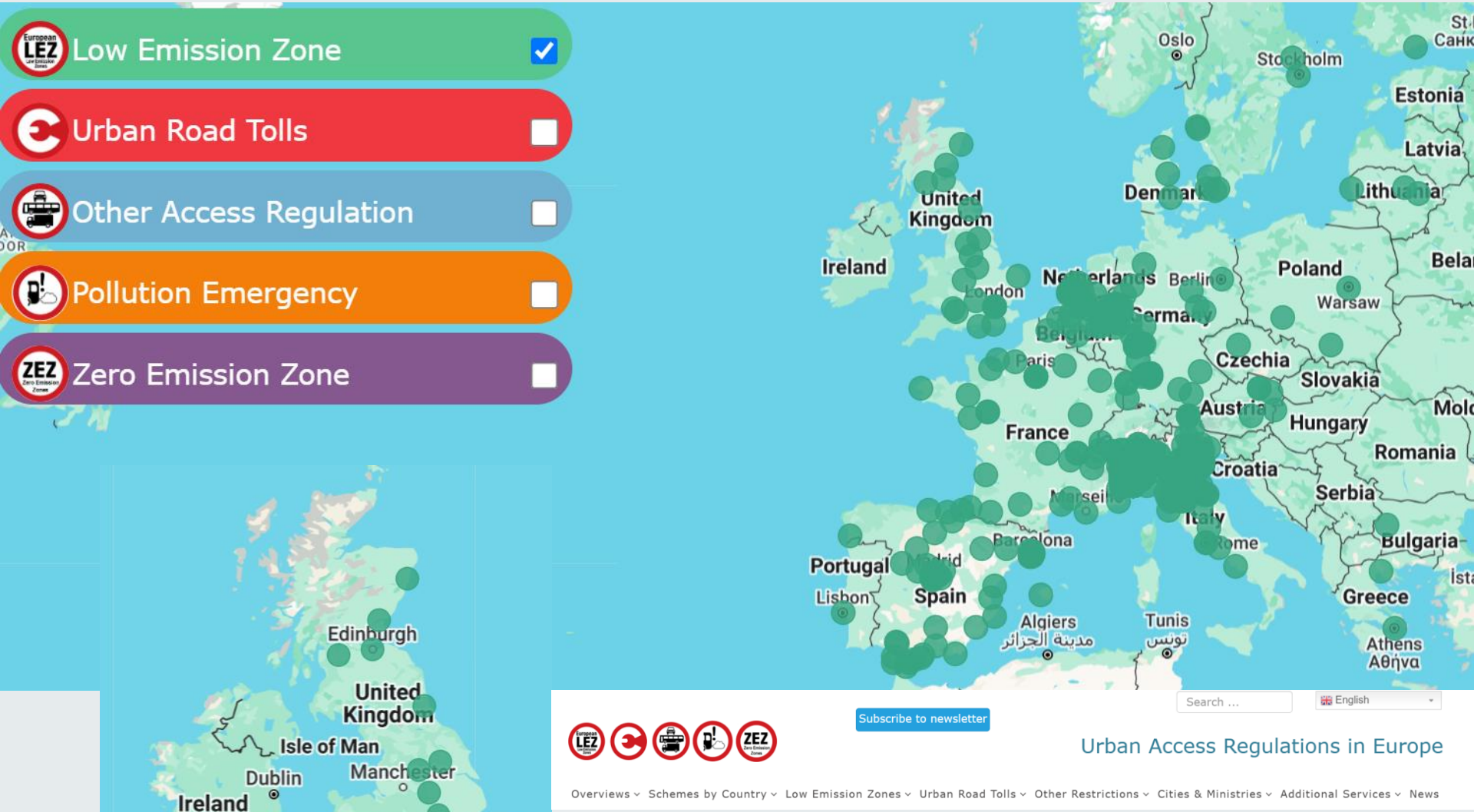
Low Emission (Clean Air) Zones

Low Emission Zones – also known as Clean Air Zones – aim to achieve compliance with legal air quality objectives by discouraging the use of highly polluting vehicles in urban areas. This briefing note examines current knowledge as to whether these initiatives work, gaps in our understanding and lessons for future place-based air quality solutions.

Overview

- Clean Air Zones and Low Emission Zones aim to discourage the use of the most polluting vehicles, typically in urban areas.
- They are being increasingly introduced by local authorities to achieve compliance with legally binding air quality objectives.
- Many questions remain regarding their effectiveness to improve air quality, health, and impacts on wider society.
- Scientific evidence can be used to inform future place-based air quality solutions.

Low emission zones around the UK and Europe

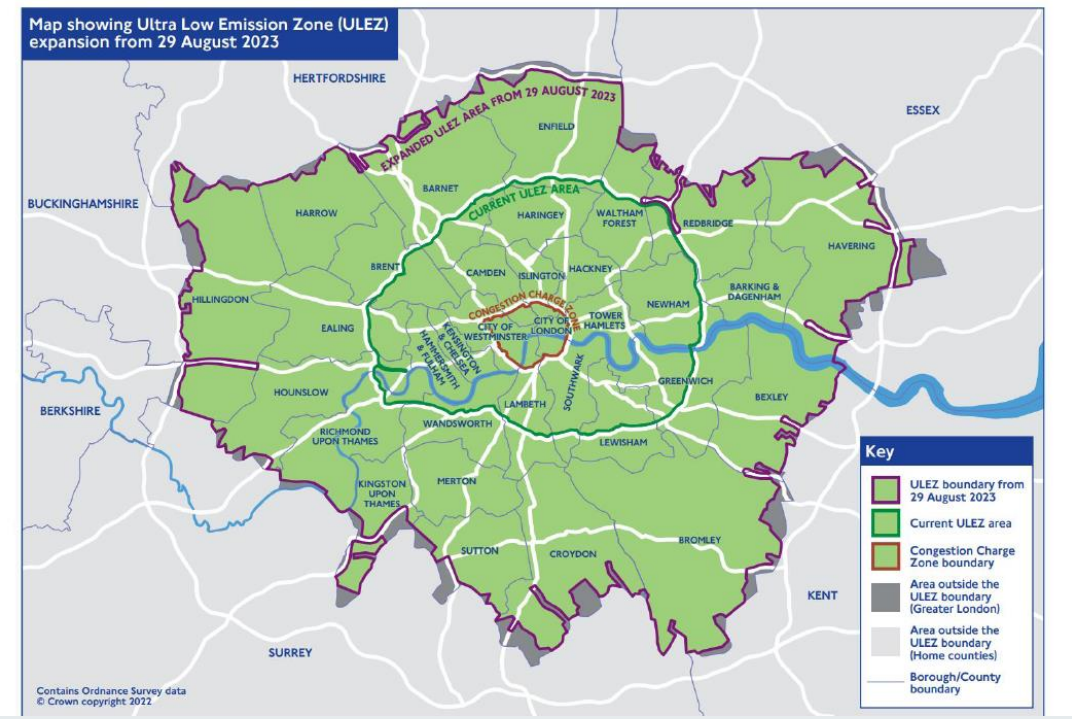


https://urbanaccessregulations.eu/ - Lucy Sadler

London’s low emission zone story

2003 CONGESTION CHARGING SCHEME
2008 LONDON LOW EMISSION ZONE*
2017 CENTRAL LONDON T CHARGE
2019 LONDON ULTRA-LOW EMISSION ZONE
2022 INNER LONDON ULEZ
2023 OUTER LONDON ULEZ

* Has been tightened several times



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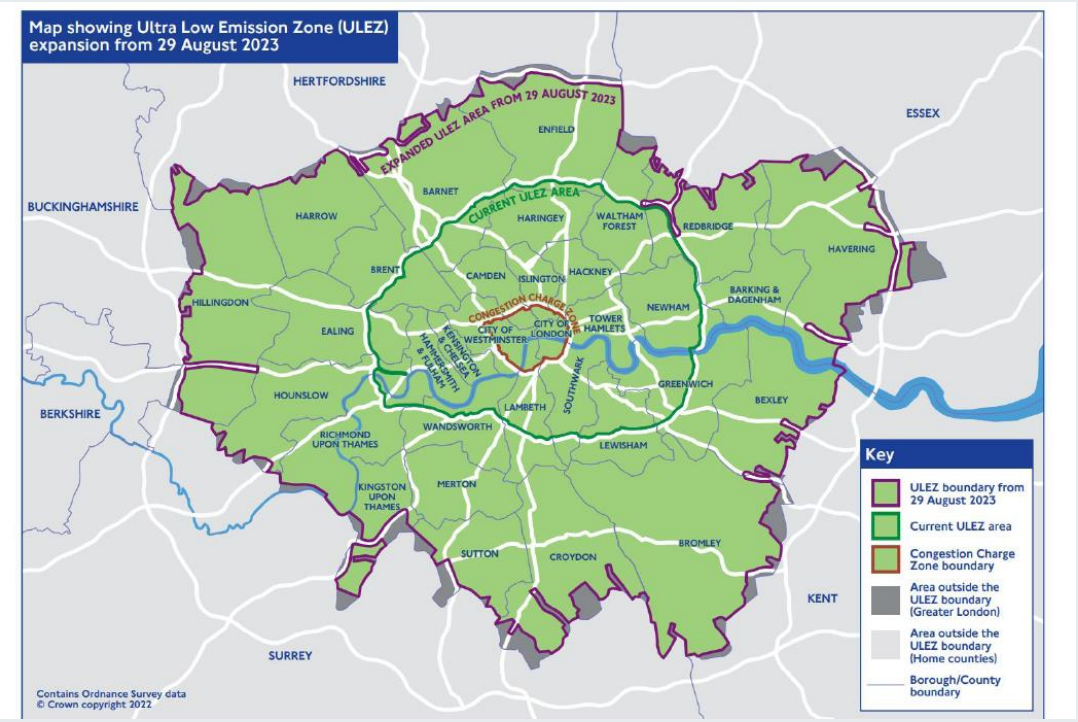
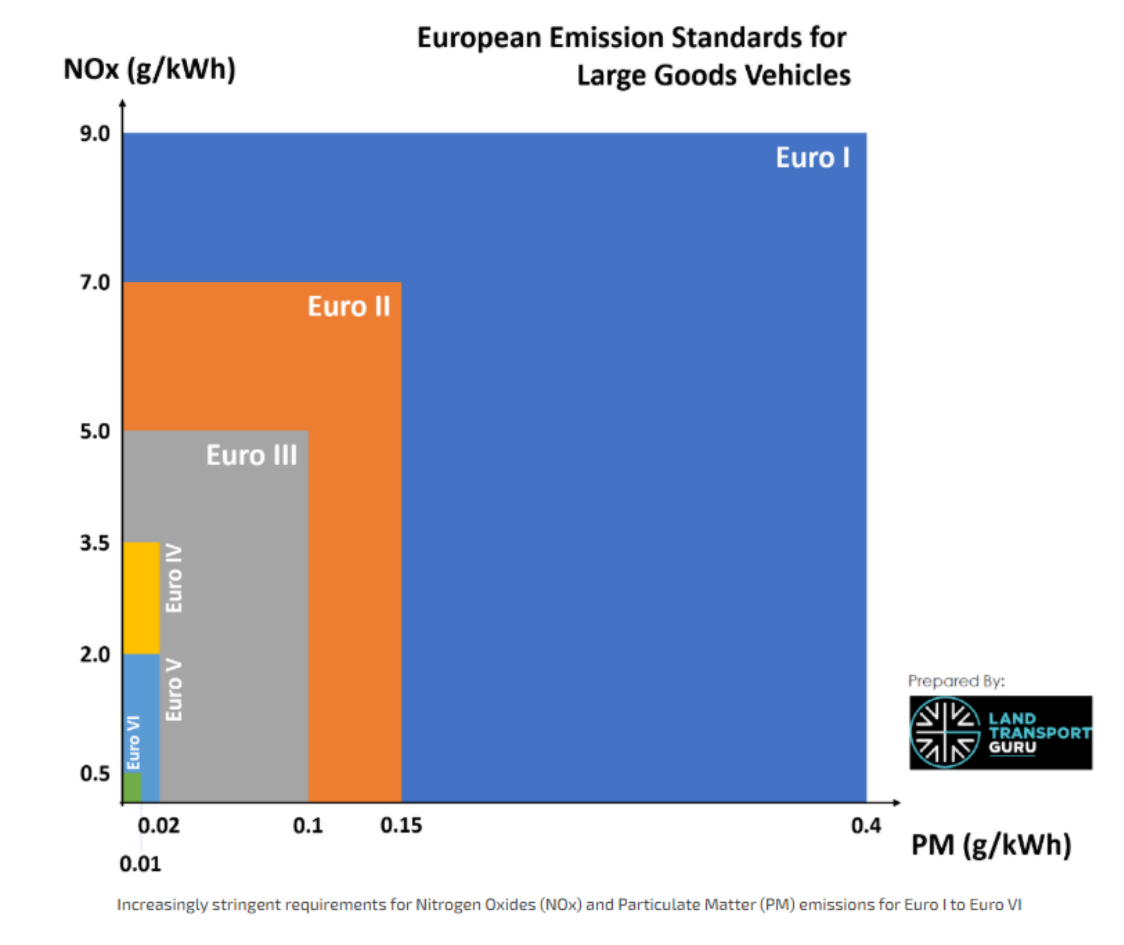


London's 2008 low emission zone

Phase 1 - February 2008 required HGVs >12t to achieve Euro III (2000) PM emissions

Phase 2 - July 2008 and extended scope to include HGVs >3.5t, buses and coaches.



~60 % reduction Euro I to IV

NOx - NO2 non-linearity

95 % Euro I (1992) to IV (2005)

London's 2008 low emission zone

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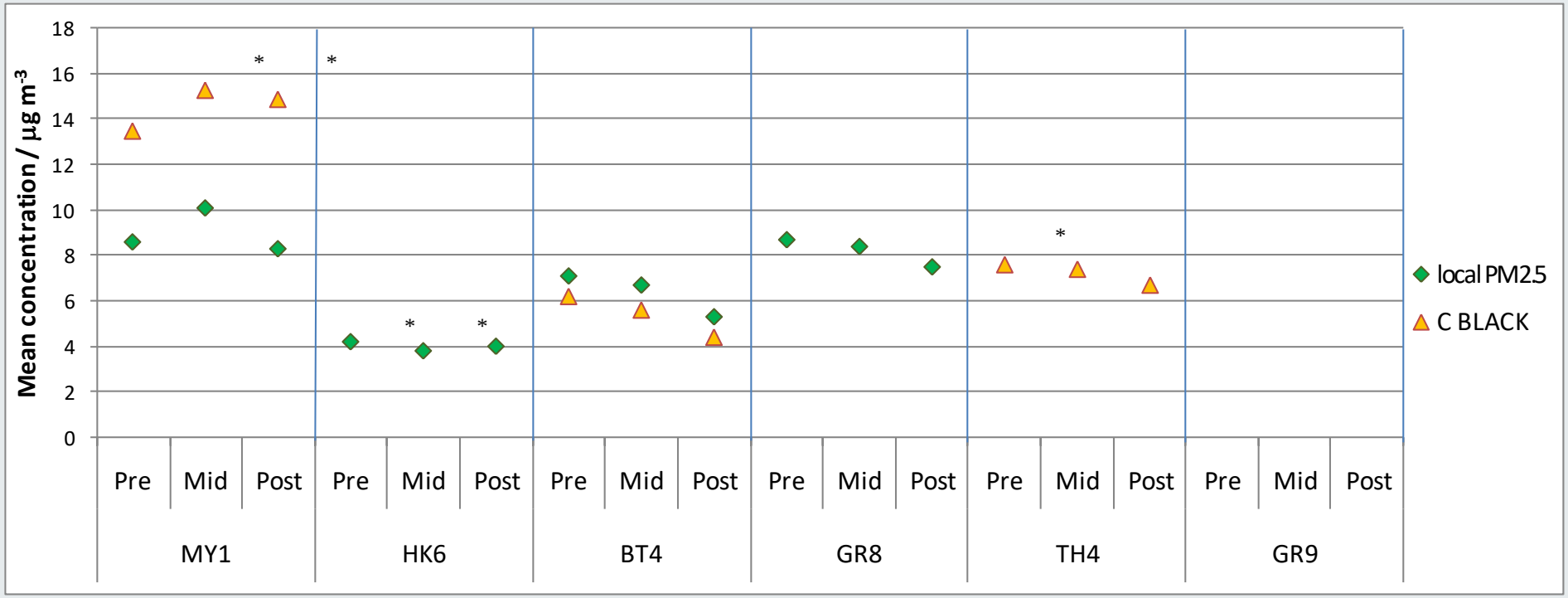

Analysis – Ben Barratt, Gary Fuller, David Green – then at King's College London

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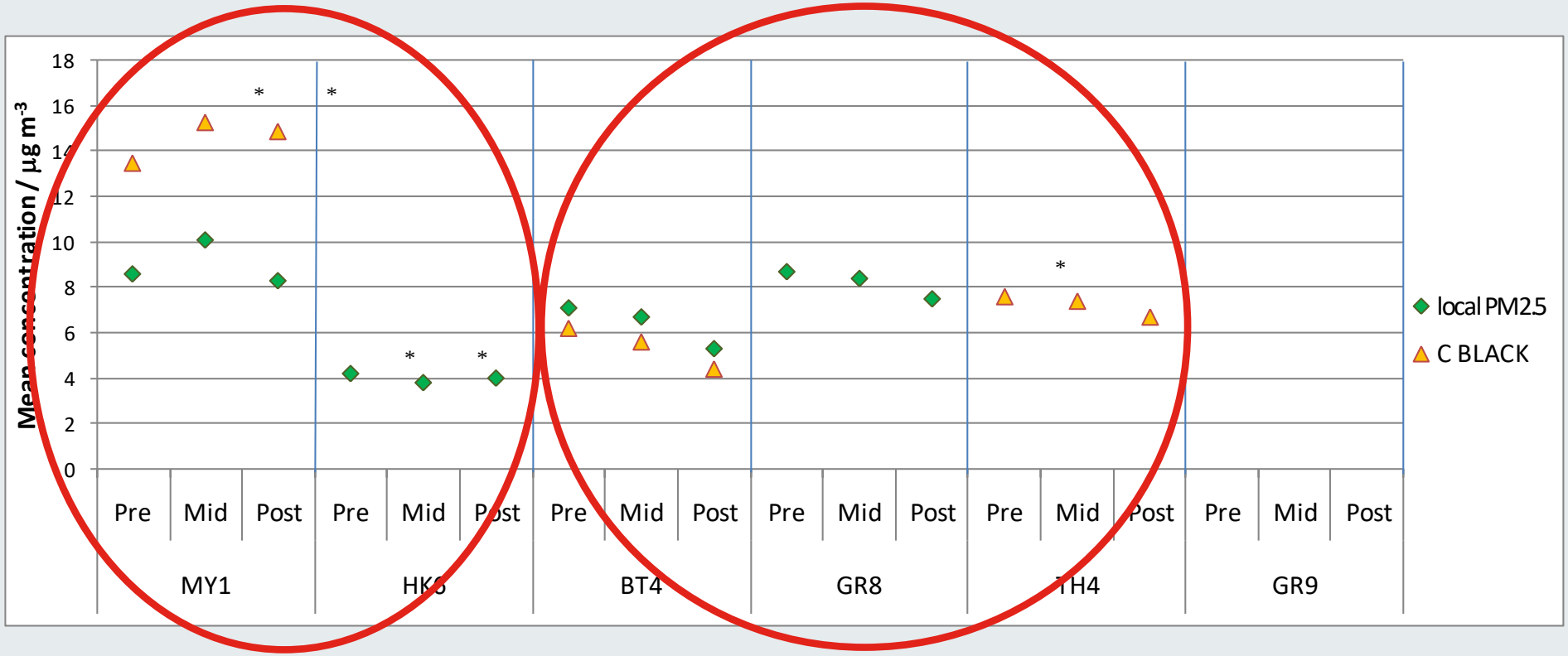
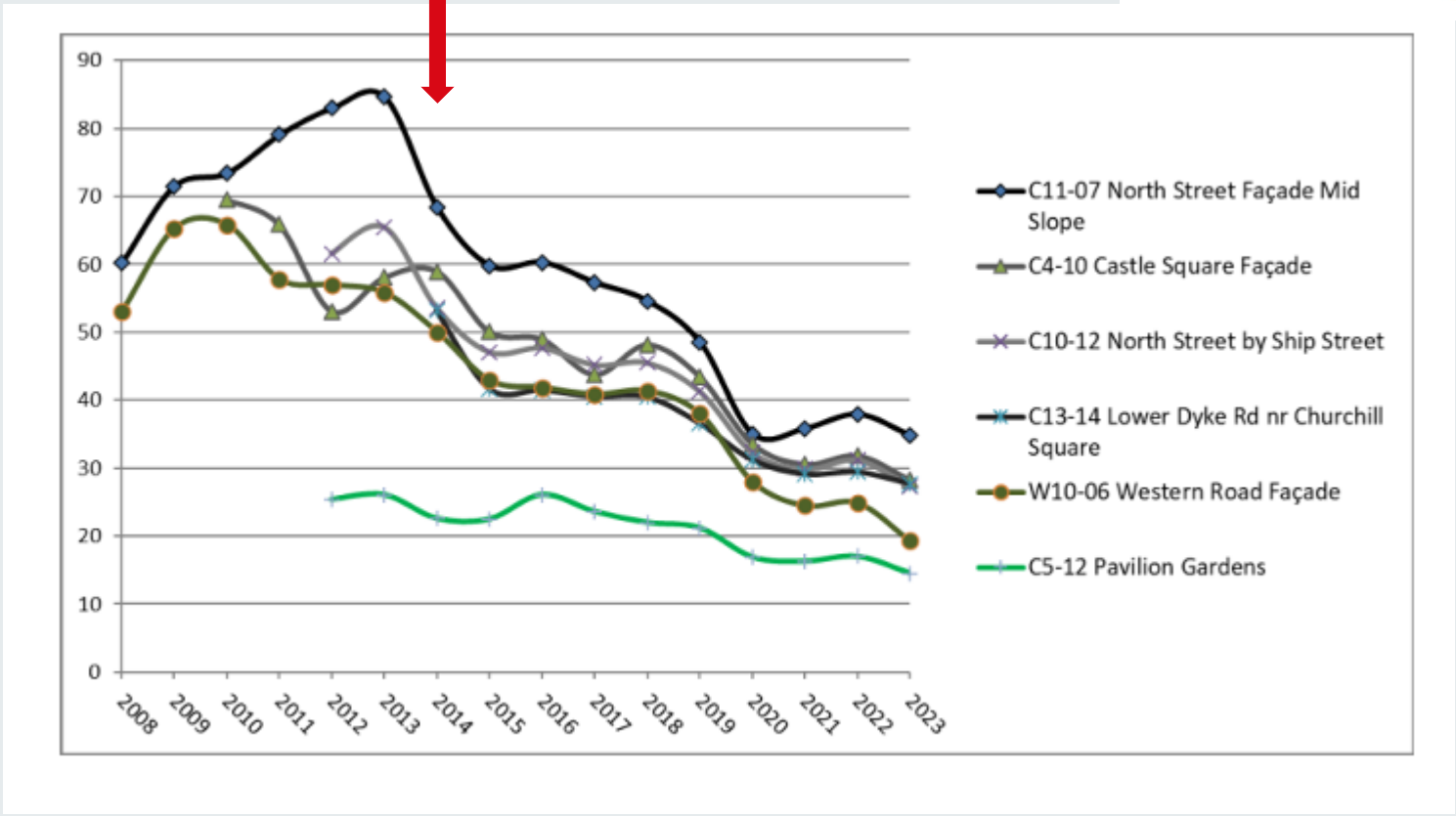


Analysis – Ben Barratt, Gary Fuller, David Green – then at King's College London

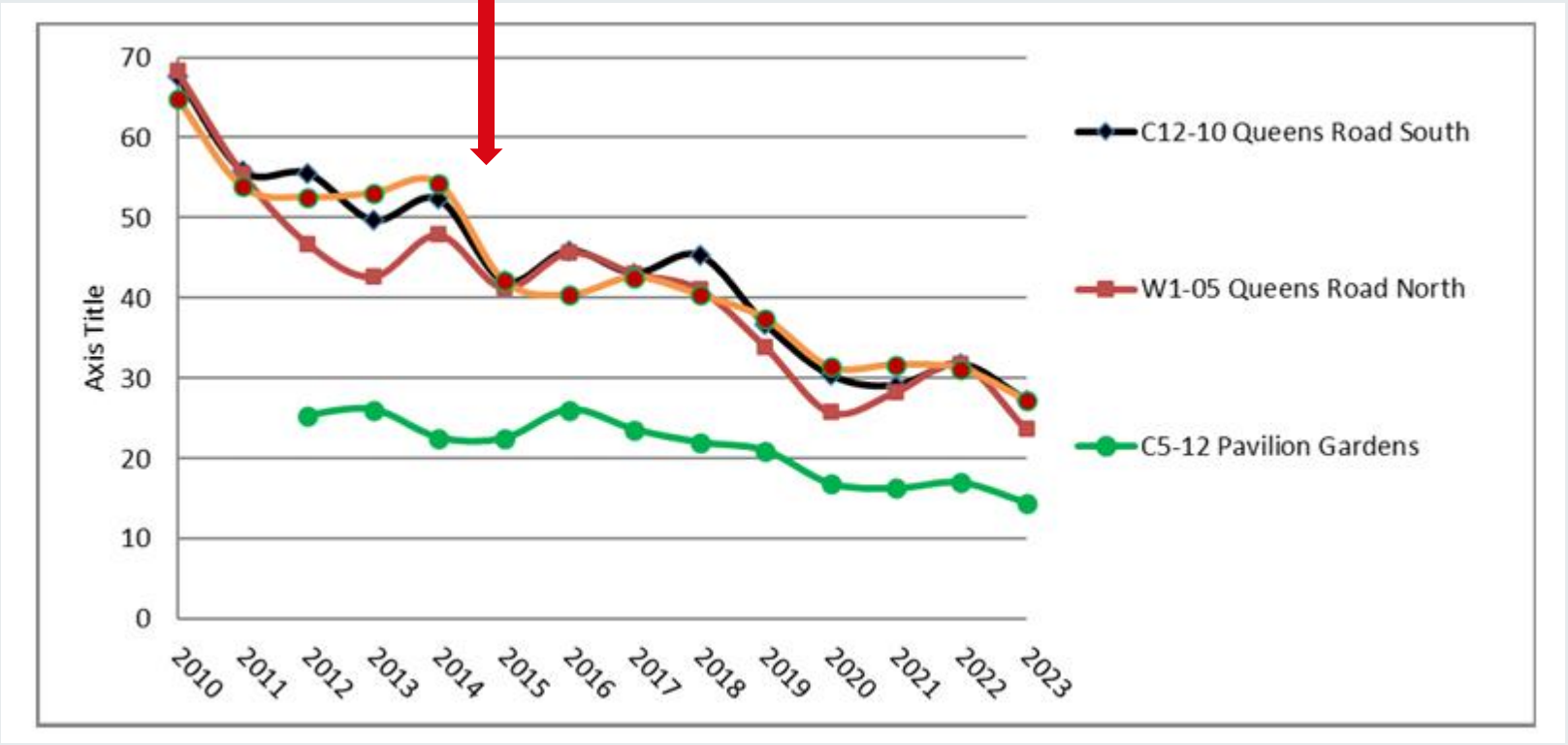
Pre = 2 years before, Post = 1 year after.

Inside Brighton's bus only LEZ



NO2 annual mean – diffusion tubes

And on the feeder roads - the benefit spreads



NO2 annual mean – diffusion tubes

Berlin another example of spreading benefits (2008 -2011)

- Traffic stations within the LEZ experienced a significant reduction of 15.0% [PM10}
- Stations located outside the Berlin LEZ also reduce by 9.1%
- this is substantially larger than the (insignificant) average reduction of 3.6% for all German outside-LEZ traffic stations

The Economic Journal, **124** (*August*), F481–F512. Doi: 10.1111/ecoj.12091 © 2013 Royal Economic Society. Published by John Wiley & Sons, 9600 Garsington Road, Oxford OX4 2DQ, UK and 350 Main Street, Malden, MA 02148, USA.

KEEP YOUR CLUNKER IN THE SUBURB: LOW-EMISSION ZONES AND ADOPTION OF GREEN VEHICLES*

Hendrik Wolff

Spatial distribution and leakage effects are of policy concern and increasingly discussed in the economics literature. We study Europe's most aggressive recent air pollution regulation: low-emission zones (LEZs) are areas in which vehicular access is allowed only to vehicles that emit low levels of PM_{10}. Using new administrative data sets from Germany, we assess the effect of LEZs on air pollution and the spatial substitution effects in green *versus* dirty vehicles. Back of the envelope calculations suggest that health benefits of roughly 2 billion dollars have come at a cost of 1 billion dollars for upgrading the fleet of vehicles.

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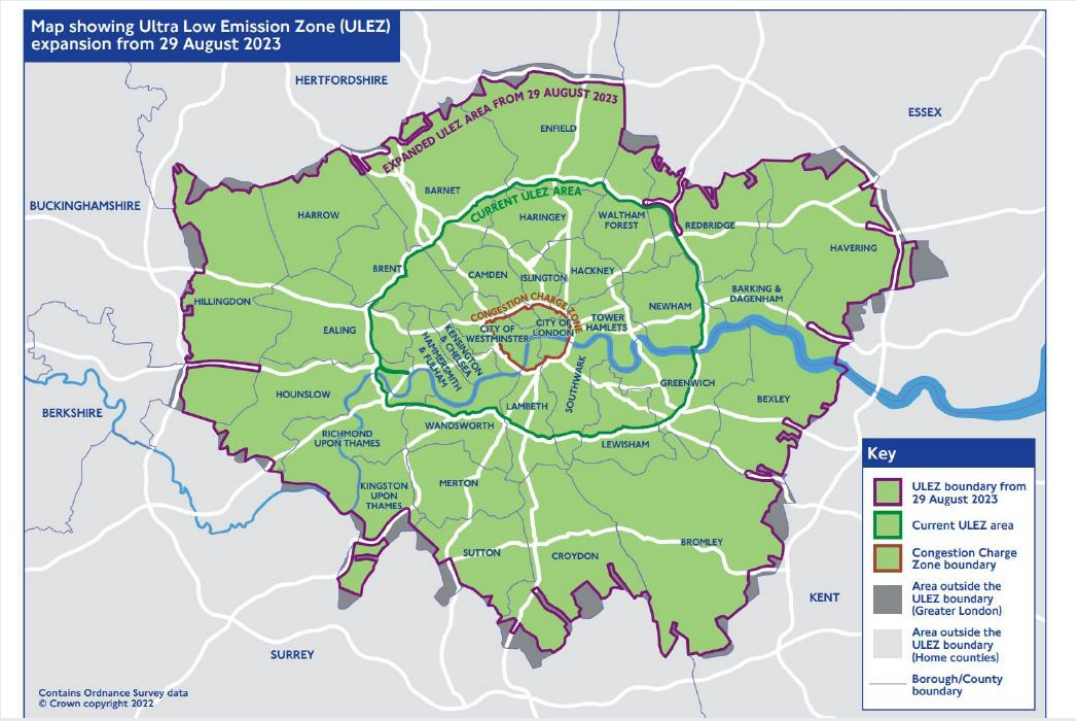


More lessons from London – the ULEZ

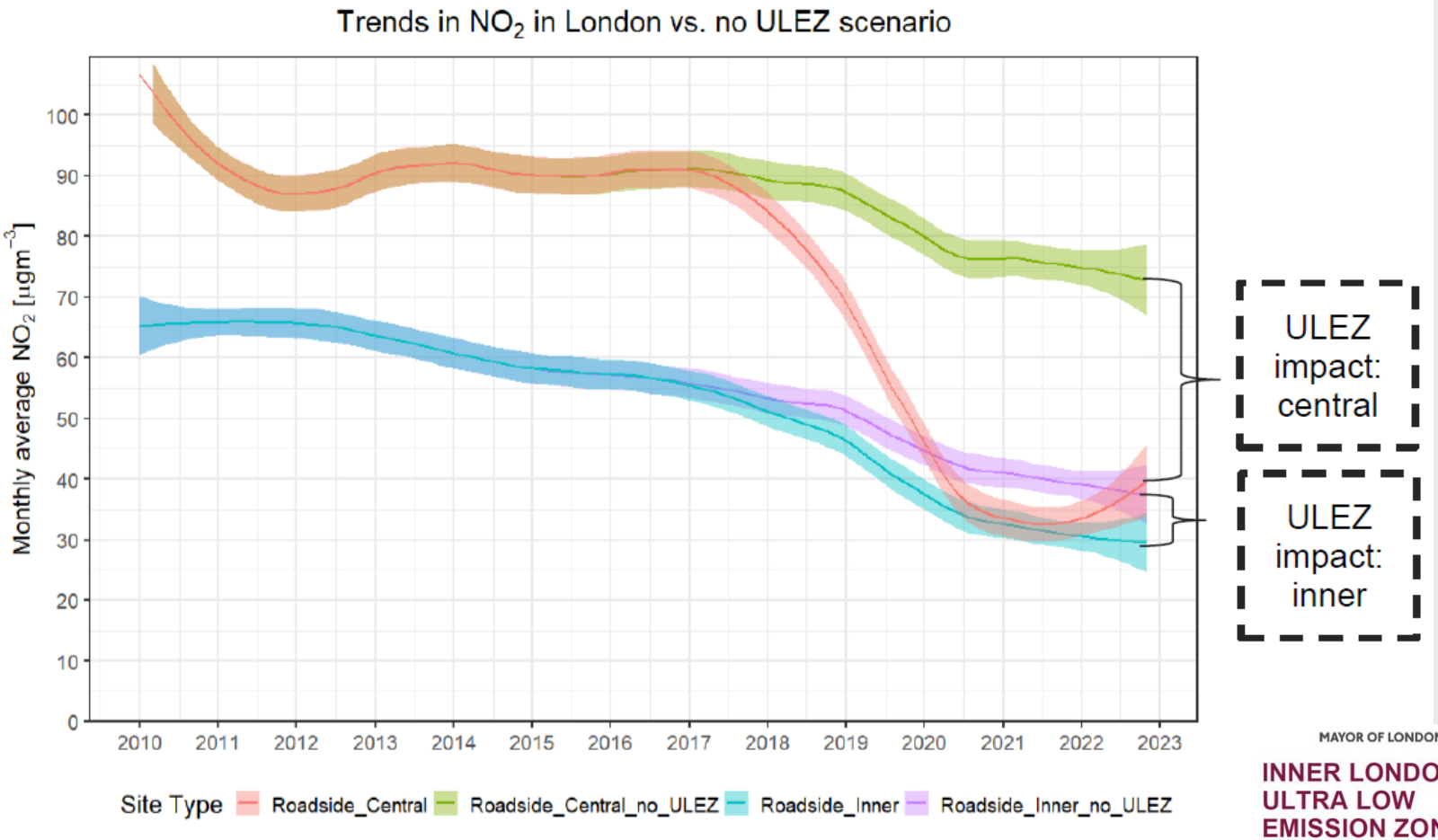


Figure 16: Trends in monthly average NO_2 concentrations with and without ULEZ policies

MAYOR OF LONDON

INNER LONDON ULTRA LOW EMISSION ZONE – ONE YEAR REPORT

February 2023

Counterfactual to account for natural turnover and weather effects
Many vehicles driven in the centre are also driven in inner London
- Analysis of data from > 159 reference grade measurement sites

More lessons from London – the ULEZ – boundary roads got better too!

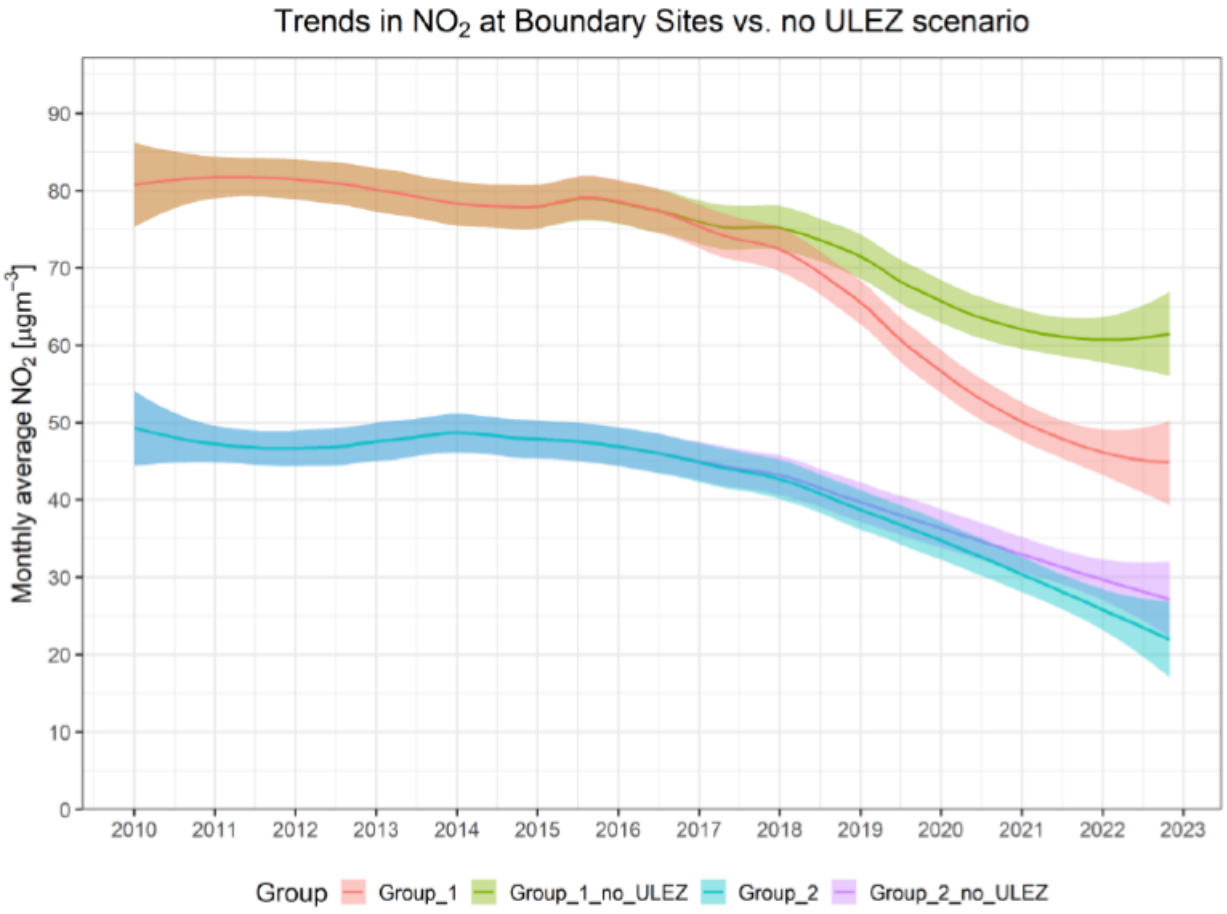
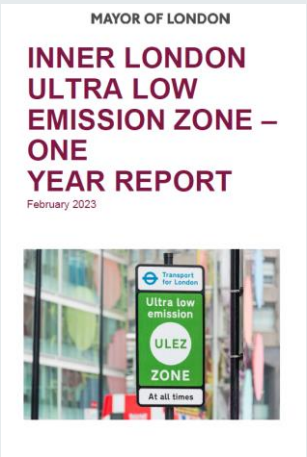


Figure 18: Trends in monthly average NO_2 concentrations at ULEZ boundary roads, with and without ULEZ. Group 1 is Brent Ikea and Hanger Lane. Group 2 includes the other 4 boundary sites.



Confusingly the same colours were used but red is not central this time and blue is not inner! Both Red and blue are on the N and S Circulars

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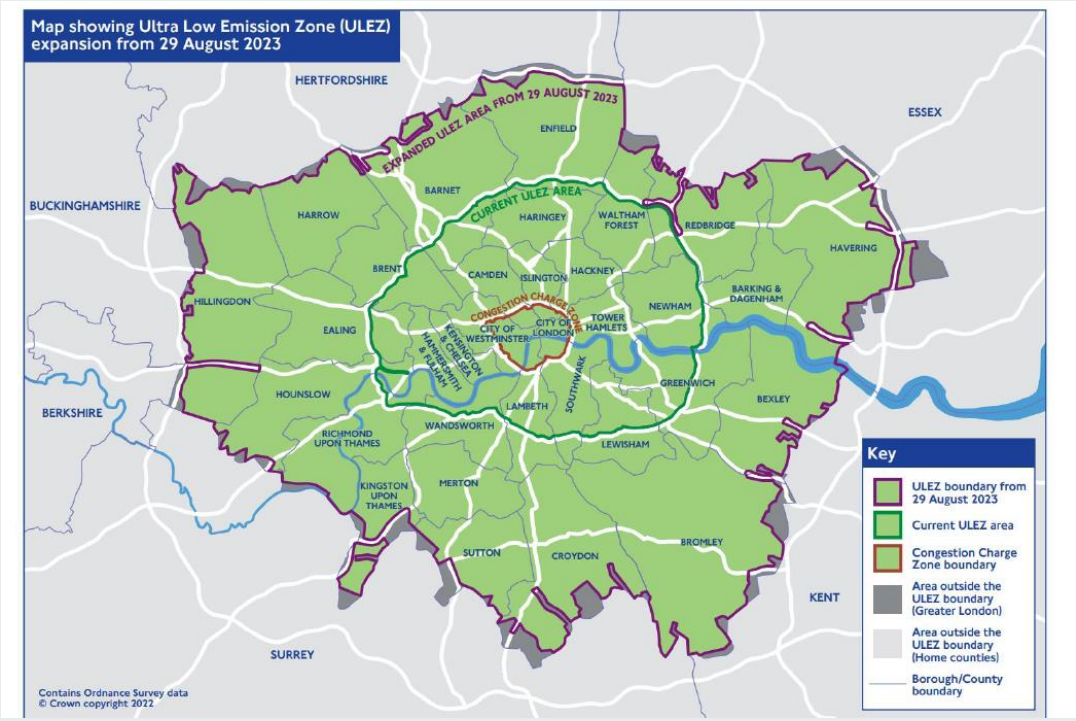


London-wide ULEZ -2023

Due to the London-wide ULEZ expansion:
In the **first year** of operation, roadside NO2 concentrations in outer London .. on average up to **4.8 per cent lower than would have been expected without the London-wide ULEZ expansion**.

All phases of the ULEZ…In 2024, compared to **a scenario without the ULEZ**, and its expansions.

- **54 per cent lower in central London**
- **29 per cent lower in inner London**

Benefits of each expansion spread to the areas around


LONDON-WIDE ULTRA LOW EMISSION ZONE – ONE YEAR REPORT

LONDON-WIDE ULTRA LOW EMISSION ZONE – ONE YEAR REPORT

March 2025

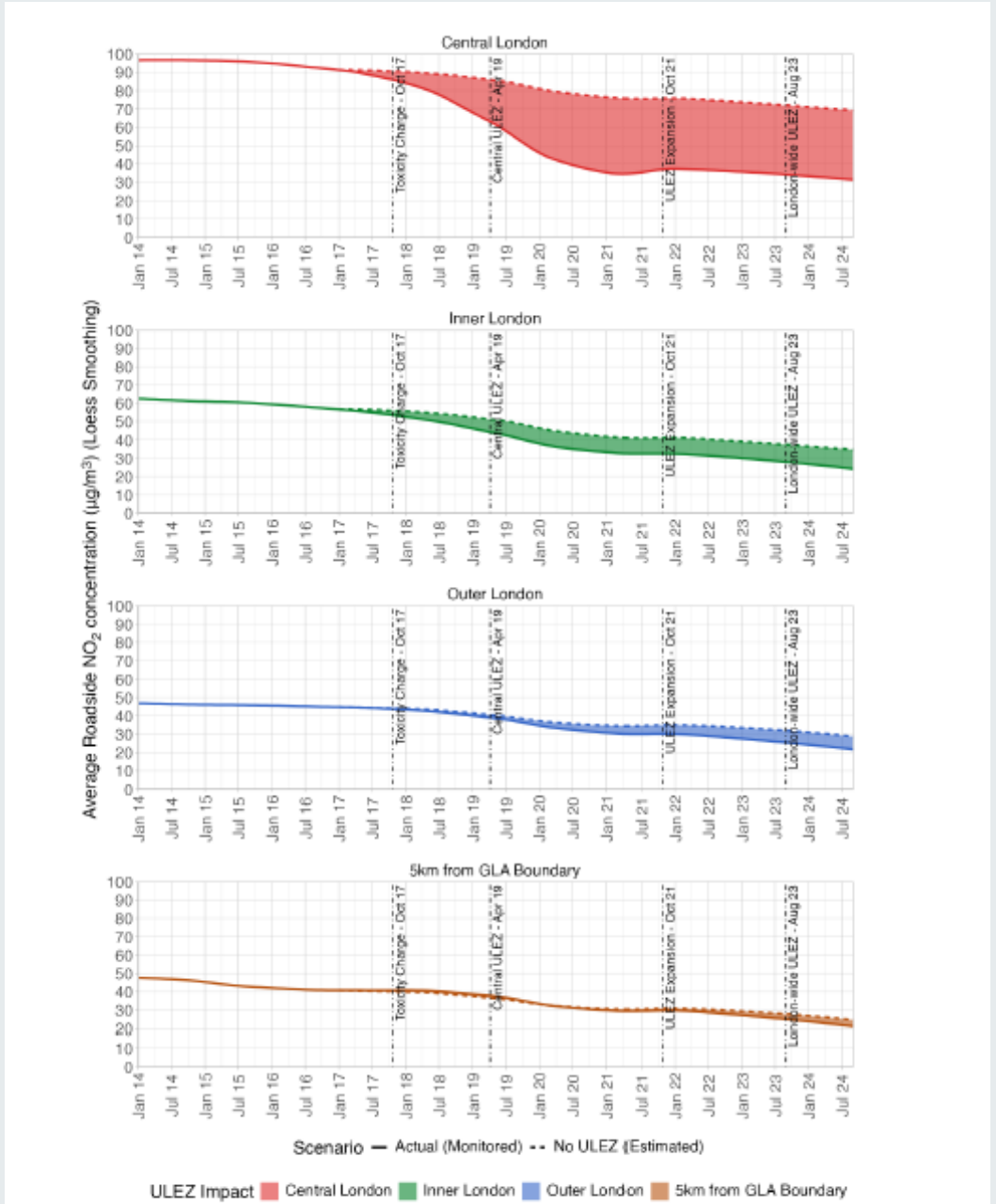


Figure 13: Trends in monthly average NO_2 concentrations in London zones with and without the ULEZ

Counterfactuals of a 5 to 40 km doughnut used for outer London

Pre-compliance – when did the central London ULEZ start?

- TfL's original analysis assumed that the central ULEZ start date was linked to the announcement by (Sir) Sadiq Khan - Jan 2017.
- Start date effects the apparent gains from the zone and was hotly contested.
- Undertook an agnostic Pettitt Test on roadside NOX = Mar 2017

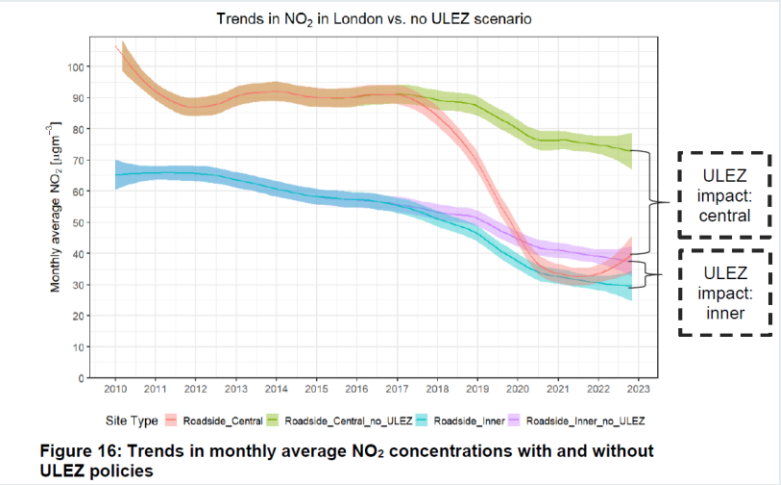
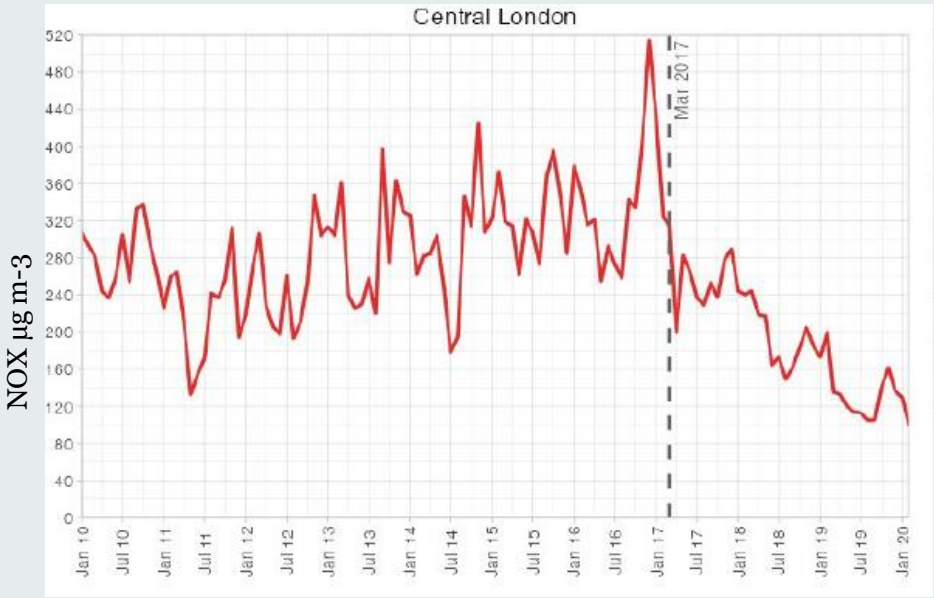


Figure 16: Trends in monthly average NO_2 concentrations with and without ULEZ policies

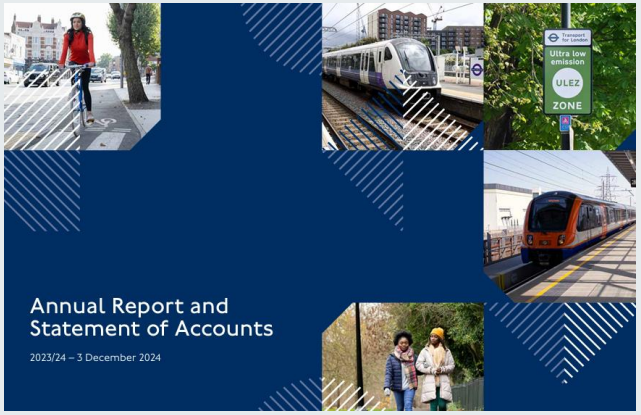


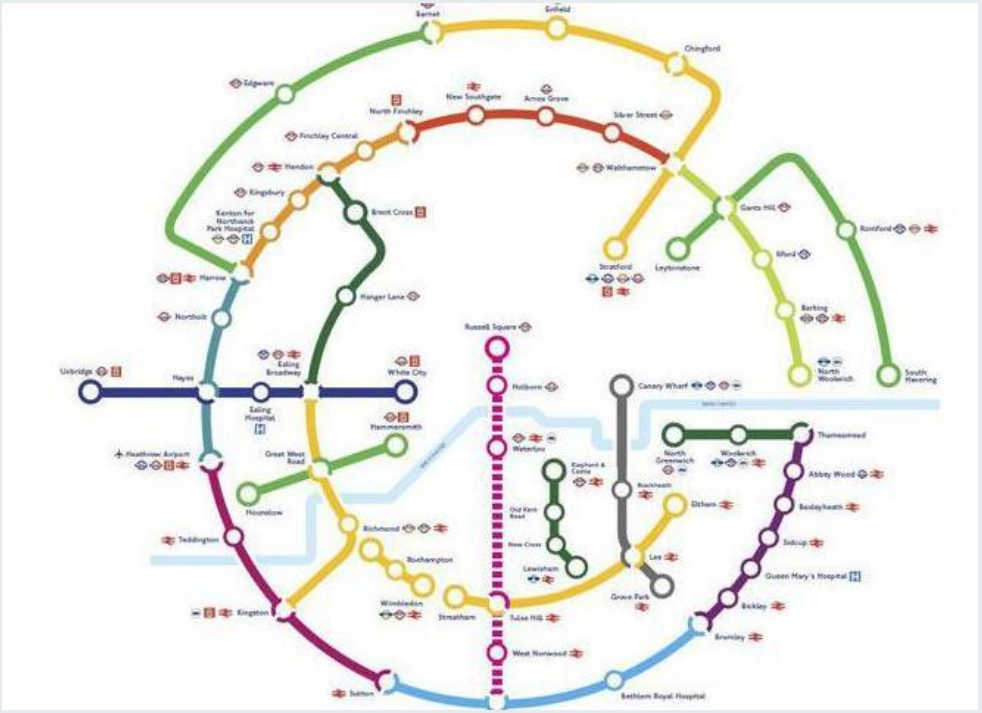
Revenue – “a tax con?”

TfL accounts reveal the net revenue from the ULEZ and LEZ

2022/23 £208 m – 2.5%
2023/24 £170 m – 1.9%

Ring fenced for transport / air pollution





Inequalities

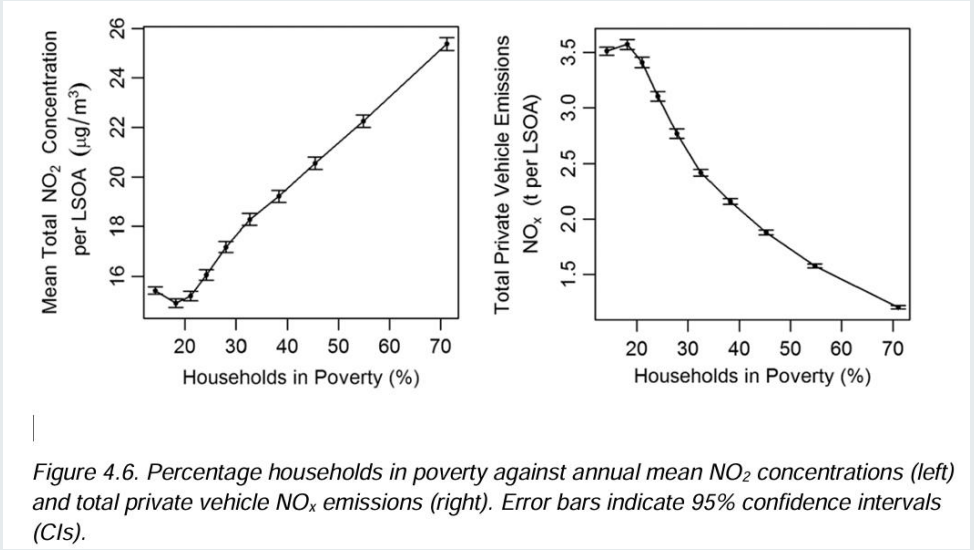


Figure 4.6. Percentage households in poverty against annual mean NO_2 concentrations (left) and total private vehicle NO_x emissions (right). Error bars indicate 95% confidence intervals (CIs).

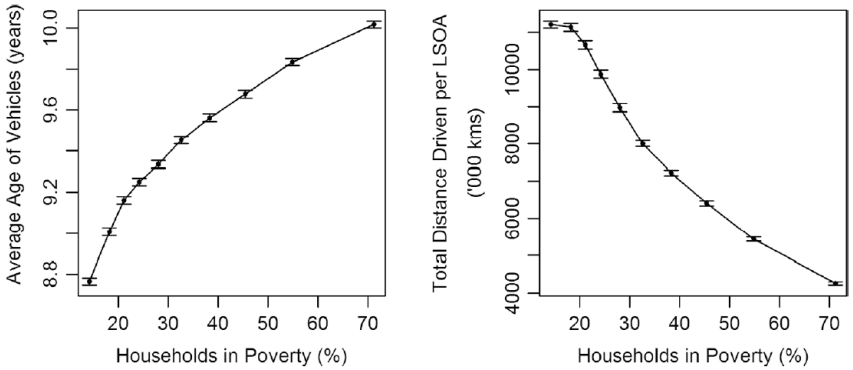


Fig. 9. Households in poverty against the average age of private vehicles per LSOA (left) and total distance driven per LSOA (right). Error bars = 95% CIs.

Poorer households experience most pollution but emit least by driving

Poorer households own fewer cars per household and drive less.

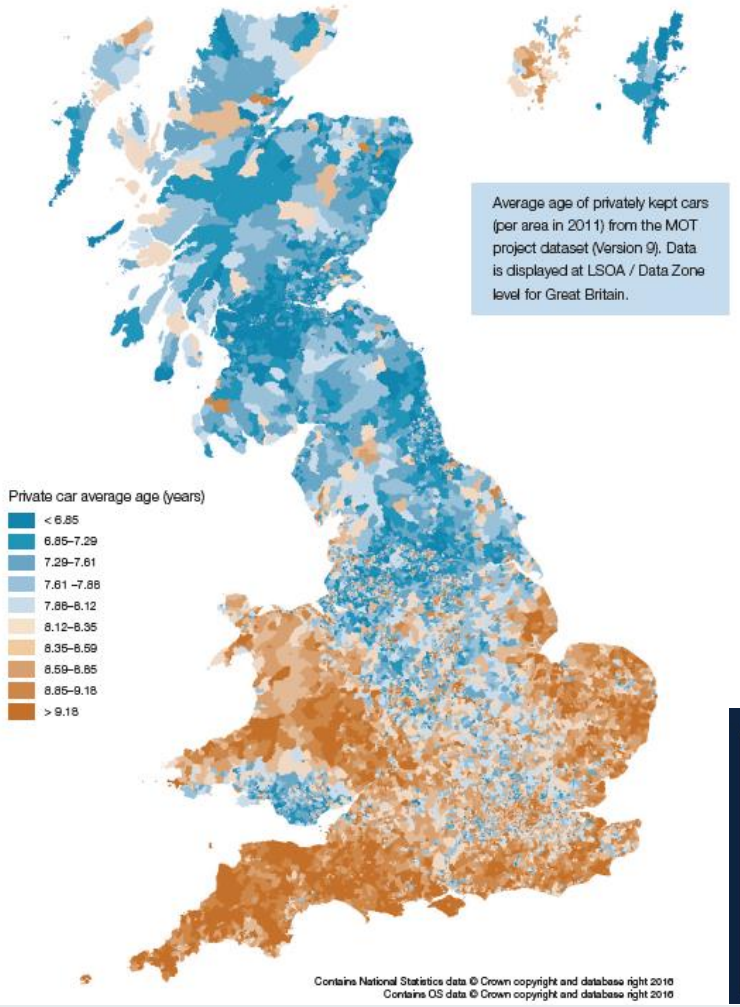
Average age of vehicles shows only a small difference (~1.2 years) – thought to be due to older 2nd and 3rd cars owned by wealthy households.

Data from 2010 – Barnes et al – England and Wales.

Vehicles owned vary across the country

(Sorry no NI data in this)

Figure 7: Average age of private cars



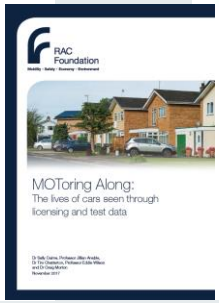
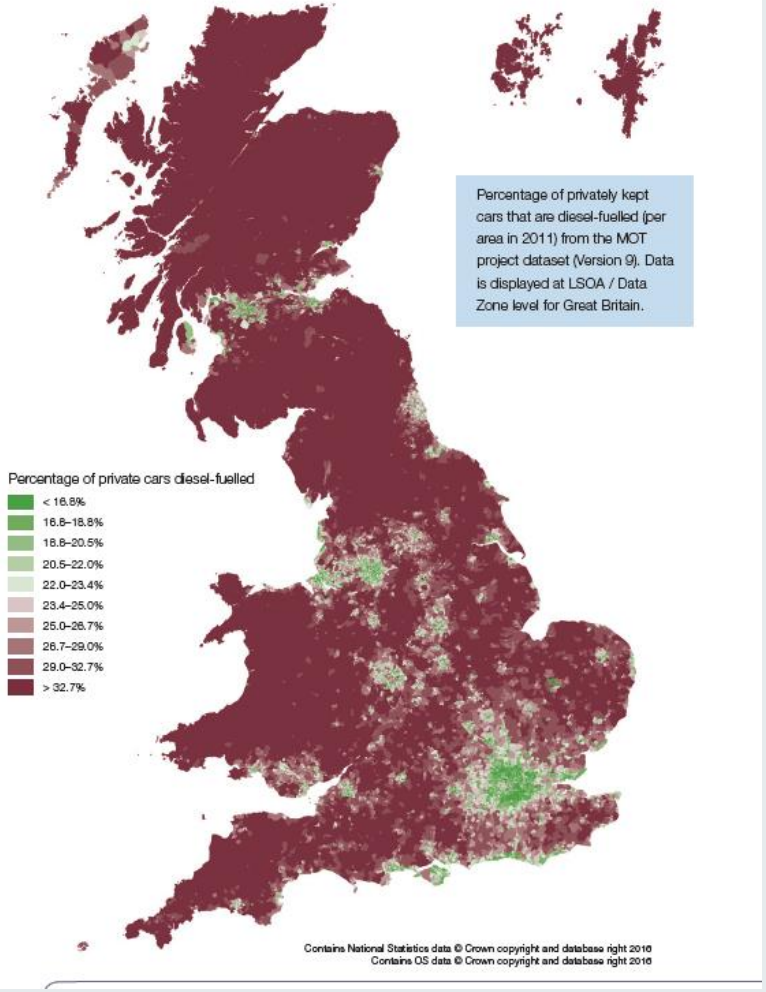


Figure 10: Percentage of private cars that are diesel-fuelled



Understanding low emission / clean air zones

- LEZs worked over there so they are the solution here too – *They are very local fleet dependent and depend on the Euro class emission standards at the time.*

- LEZ don't work. We should just wait for new vehicles to naturally replace old ones – *LEZs effectively accelerate this, bringing cleaner air sooner.*

- Traffic will simply divert and move the problem – *Cleaner vehicles are used in areas around the zone too, spreading the benefit.*

- All the effects happen the moment the zone starts – *Pre-compliance is a big part of the improvement.*

- It's all a tax grab – *Money is reinvested in transport / air pollution.*

- Poorest people are worst affected – *they experience most air pollution but emit least owning fewer cars and using them less. The average age of cars between wealthy and less well off-house-holds appears similar (many multi-car households own older 2nd and 3rd cars) but these are averages and will not be the case oof everyone.*

Low carbon, smog free, socially inclusive, bio-diverse, healthy cities, towns and countryside

Butterfly photo Denis Thorpe / The Guardian

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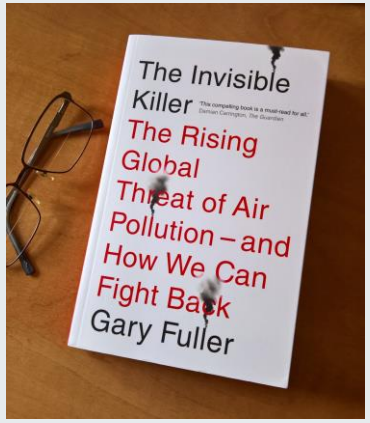
Belfast, May 2025



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