



Engineering Cleaner Air

Context and key facts for London

Institution of Civil Engineers
London Air Quality Taskforce
2 October 2017

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WEST END FINAL

HEAD'S CRY FOR HELP OVER POLLUTION BLIGHTING LONDON

PROTECT MY PUPILS FROM TOXIC AIR DANGER



Asthma attacks: pupil Lola Chattam, 9, says it's hard to breathe

Nicholas Cecil and Sophia Singh

A LONDON head teacher today issued a heartfelt "cry for help" to protect her pupils from toxic air which has blighted the capital for days.

Ellie Demetrios of Boves Primary School, next to the North Circular, begged Sajid Khan and Transport Secretary Chris Grayling to act and cut local pollution. "The level can escalate high and it affects our pupils' health," the asthmatic head teacher told the Standard.

"The only way to reduce air pollution is to reduce traffic. That's a cry for help primarily for our pupils but also for all local families and our staff."

One pupil at the Bounds Green primary school,

nine-year-old Lola Chattam, has been taken to hospital five times for asthma attacks since she was five. Her family feared she would die after an especially severe one two years ago. "It gets quite overwhelming sometimes and quite hard to breathe," Lola says.

Continued on Page 2

May warns Trump: US cannot lead the world on its own

Joe Murphy
Political Editor

Theresa May will today make a heartfelt appeal to Donald Trump to build alliances and warn that he cannot and should not "try to lead the world alone."

The Prime Minister will deliver her remarks in a historic speech at a gathering of senior US Republicans where President Trump will also be making an address.

"An America that is strong and prosperous at home is a nation that can lead abroad," she will tell the Republicans before Mr. Trump.

"But you cannot — and should not — do so alone. You have said that it is time for others to step up. And I agree."

Endorsing his call for other countries to shoulder a bigger burden on the world stage, Mrs May will go on to say: "This is something Britain has always understood."

"It is why Britain is the only country other than the US to have committed to spend two per cent of GDP on defence, and to invest 20 per cent of that in upgrading equipment."

"Why Britain is the only G7 country to spend 0.7 per cent of gross national income on overseas development. And it is why my first act as Prime Minister last year was to lead the debate in Parliament that ensured the renewal of Britain's independent nuclear deterrent."

During her talks with Mr Trump, Mrs May will urge him not to weaken American support for the

Continued on Pages 4 & 5



DREE HEMINGWAY
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AS POLLUTION BLACKSPOTS IN THE SQUARE MILE ARE NAMED, CHIEFS WARN:

AIR TOO TOXIC TO JOG IN CITY

Nicholas Cecil Deputy Political Editor
CITY chiefs today issued an unprecedented warning to joggers to avoid pollution hotspots in the Square Mile. They warned Londoners to avoid Upper Thames Street into Lower Thames Street, Bank Junction, Bishopsgate into Gracechurch Street and Farringdon Street into New Bridge Street on high pollution days. Joe

Armes, the City of London Corporation's public protection director told The Standard: "During very hot pollution episodes, even a normally fit and healthy person can experience issues. "Strenuous exercise means deeper breathing and more particles inhaled into the lungs, so we are calling on

Continued on Page 4



Open season
The guests, DJs, venues, drinks and dress codes you need to know about for summer parties
Pages 20 & 21

WEST END FINAL



EDDIE'S SUPPORT ACT FOR HIS INJURED WIFE

Ready for a weekend of Sport

FOOTBALL CHAMPIONS LEAGUE FINAL
Liverpool aim to stop might of Barcelona's Messi, Suarez and Neymar

TENNIS FRENCH OPEN
The battle to be king and queen of clay

RACING THE DERBY
Top jockey's verdict on the runners at Epsom

On the mend: Eddie Hemingway, who is due to star in a Harry Potter spin-off, attends a dinner in Mayfair with his wife Hannah Bagshaw. She had her left arm in a plaster cast after reportedly falling off a horse

FULL STORY Page 7

PAGES 62-72

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WEST END FINAL

LONDON LIFE TECH
GET SMART: HOW TO BUILD YOUR OWN COMPUTER
PLUS WHY YOU NEED A BIKE HELMET WITH BENEFITS » STARTS ON PAGE 35

RED ALERT OVER TOXIC AIR CLOUD

MILLIONS URGED TO REDUCE ACTIVITY AND AVOID BUSY ROADS IN LONDON-WIDE WARNING

Clean London

Nicholas Cecil Deputy Political Editor
A TOXIC air "red alert" was issued across London today, with millions of people urged to consider taking it easy to protect their health. Mayor Sajid Khan raised the alarm about a filthy cloud of pollution for the first time this year as thousands of his wages and all the stations. City chiefs advised commuters, cyclists, joggers, drivers and pedestrians to avoid busy, pollution-charged roads. Mr Khan said: "The extent of our air quality crisis means that I have triggered a city-wide alert, ensuring Londoners have all the information possible. It's crucial that Londoners who are vulnerable, such as asthma sufferers, are able to take appropriate measures to protect themselves." Pollution was predicted to reach "high" — the same as red — in other areas including the City as a cloud of toxic air from Germany's industrial heartland was set to sweep in, according to a review of central air quality London. Scientists at King's College London said: "There is a good chance that particularly polluted air will continue to hit the high threshold across London." The particulate pollution



WHY JOHNNY'S SPEECH?

Inside
30 missing in Italy after avalanche hits hotel
PAGE 5
"COMMUNIST" THOUGHTS
HOMELIFE
Dining Standard
Why I fight so hard for success
PAGE 20

Overview

- Why are we here today?
- Jargon – local air pollution and greenhouse gases
- Historical perspective
- Jargon – health
- Sources
- Legal
- Solutions: Civil engineers...
- Remember: Health and safety includes health!
- Opportunities

Air pollution – jargon

- One Atmosphere: Greenhouses gas and air pollutants
- Particles (PM_1 , $PM_{2.5}$ and PM_{10}) and gases (NO_2)
- Many air pollutants. Visible and invisible
- Short and long-term inputs and outputs
- Emissions and concentrations
- Health exposures, impacts and outcomes
- Local (NO_2 and PM_{10}), regional ($PM_{2.5}$) and transboundary pollution e.g. tropospheric ozone (O_3)

London: 15 March 2012



London Air Quality Network - Episodes

LAQN Pollution Episodes

🔍

Select a monitoring site to view: ▼

All Species ▼

Include closed sites:

Show Authorities (OS Data):

Show WHO standards: ([More Information](#))

Peak air pollution levels recorded during episode

Low
(1-3)

Moderate
(4-6)

High
(7-9)

Very High
(10)

Predicted

No Index

Closed

Bulletins
Site Details
Statistics

Pollution Episodes

Episode *PM10 mid January 2017*

Location *London*

Pollutant(s) *PM10*

Dates *17/01/2017 to 26/01/2017*

This map shows the peak readings recorded across the region during the episode you have selected. Note that you can see each daily bulletin using the archive on the bulletin tab, and can also see animations and text explanations (if available) by selecting a different map view.

You can find out more information about levels recorded at each location (monitoring site) by clicking on its dot. Alternatively, select a different map view by using the drop down box below:

Change view:

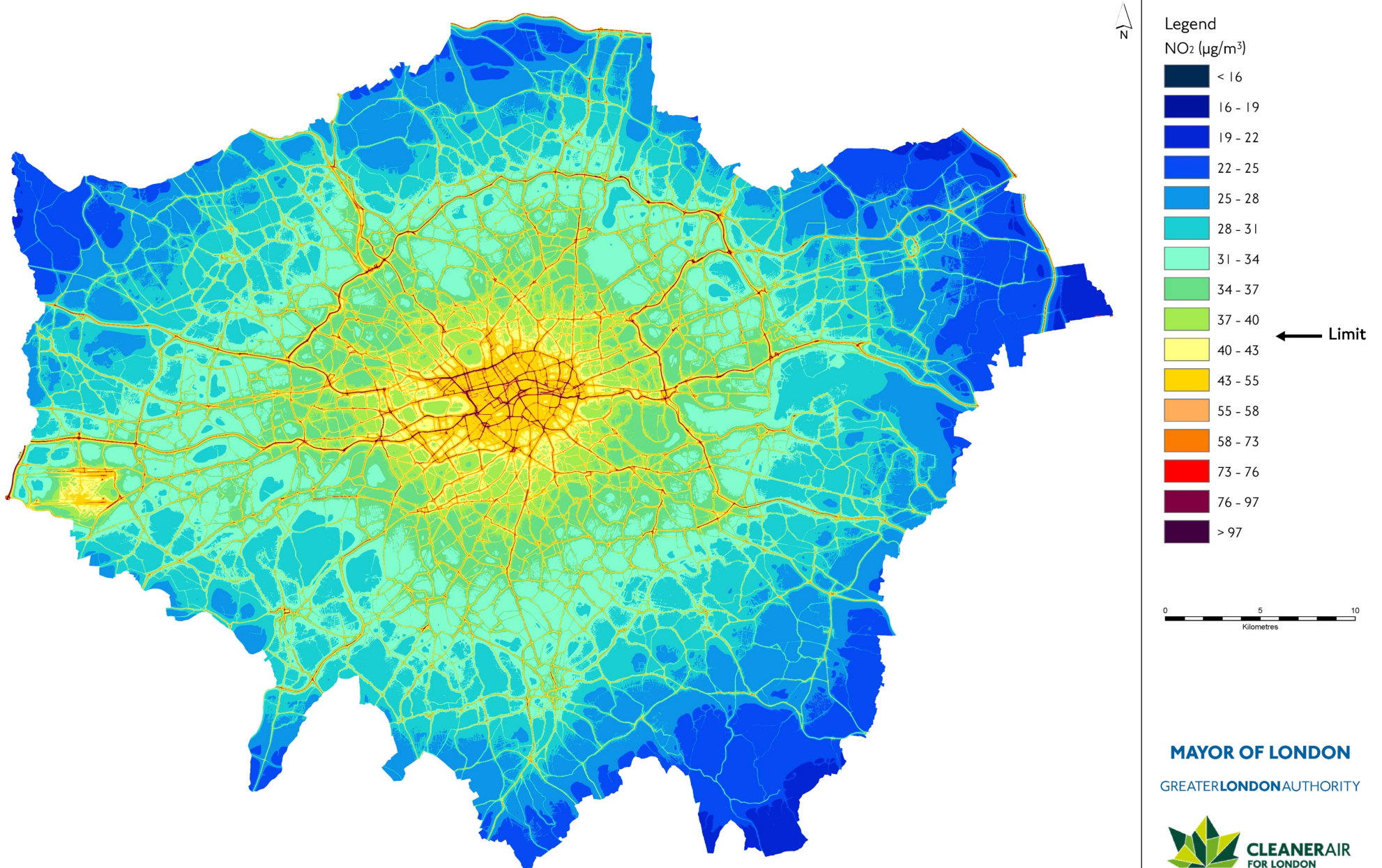
peak values
▼

Go

Change episode:

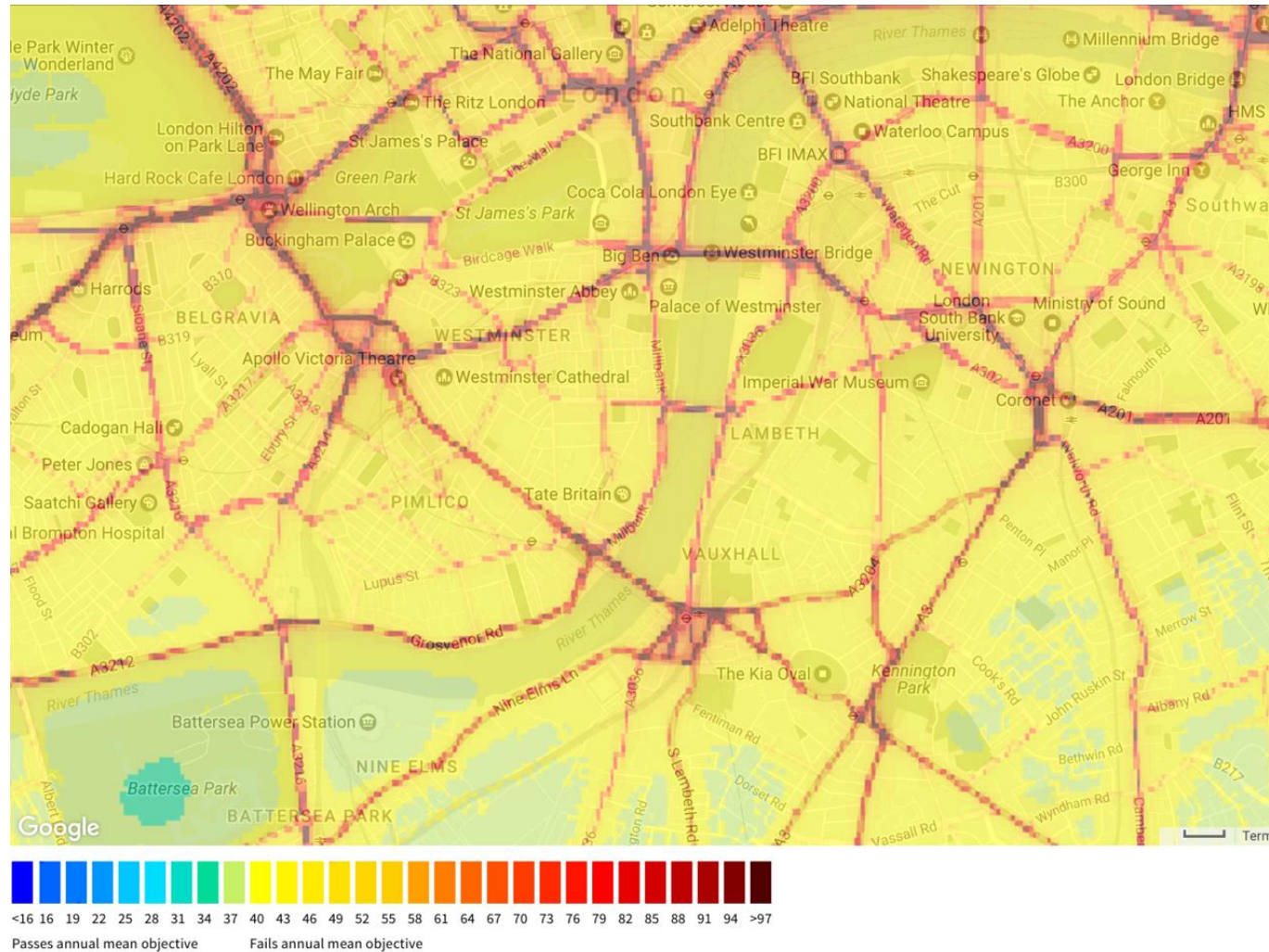
PM10 mid January 2017
▼

Go



Annual mean NO₂ in 2013

Credit: London Air Quality Network and TfL



Historical perspective

- Great Smog 1952 and Clean Air Act 1956
- Scientific focus on short-term respiratory effects despite evidence of cardiovascular deaths in 'time series' studies
- 'Cohort studies' identified long-term effects of PM_{2.5}
- Myopic focus in UK since 1990 on CO₂ and fuel efficiency
- Many roads in Central London tend (today) to have the highest NO₂ concentrations in the world. Blame diesel
- 68th World Health Assembly. First debate on air pollution!
- Back where we thought we were 60 years ago

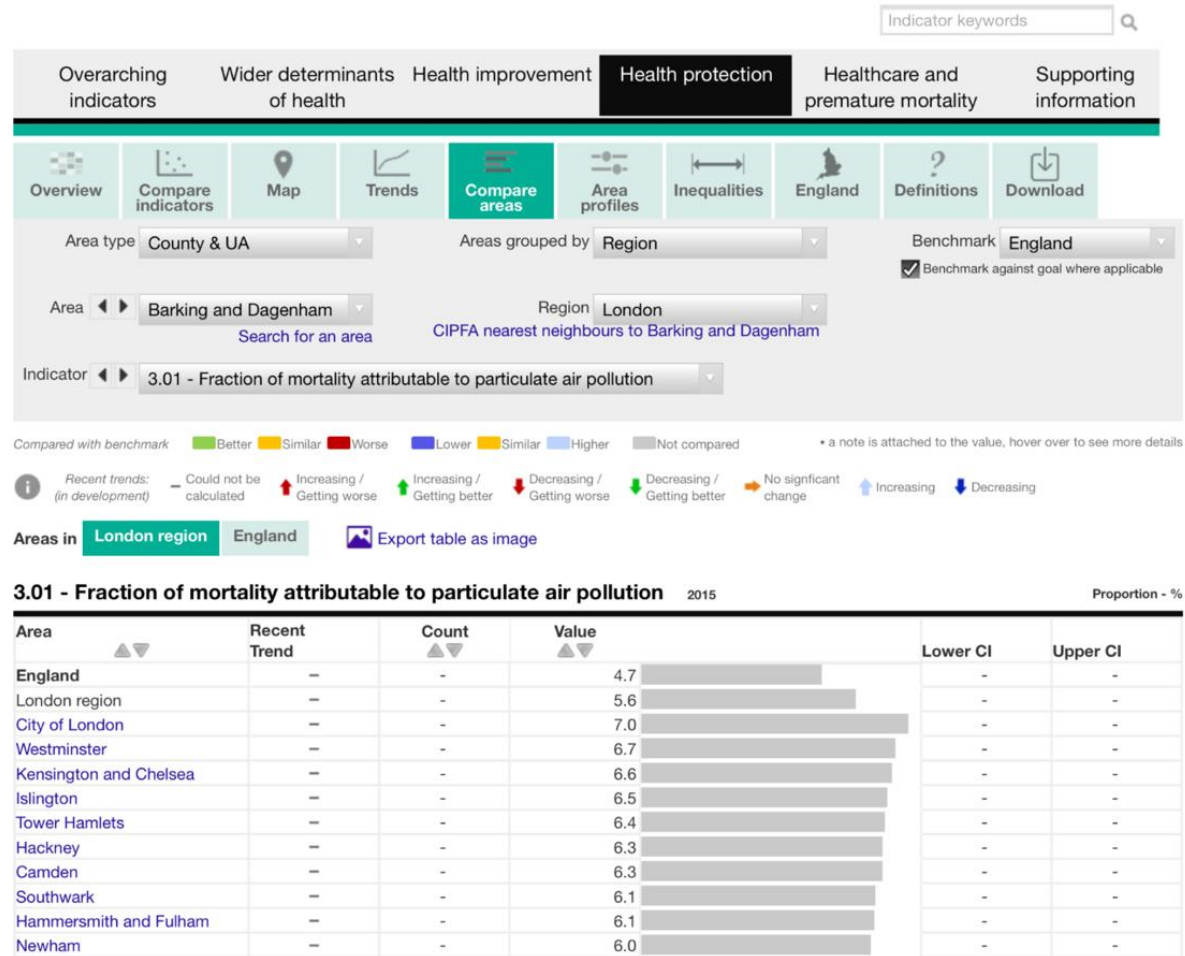
Air pollution – health

- Everyone affected to some extent
- Many exposures, impacts and outcomes
- Short and long term. Time series and cohort studies
- Morbidity (chronic, sickness)
- Mortality (acute, death)
- Statistical versus actual impacts
- Emerging problems: PM_{2.5}, NO₂, TRAP, ozone and nanoparticles. More pollutants/outcomes
- Air pollution is the biggest environmental risk

% deaths attributable to air pollution

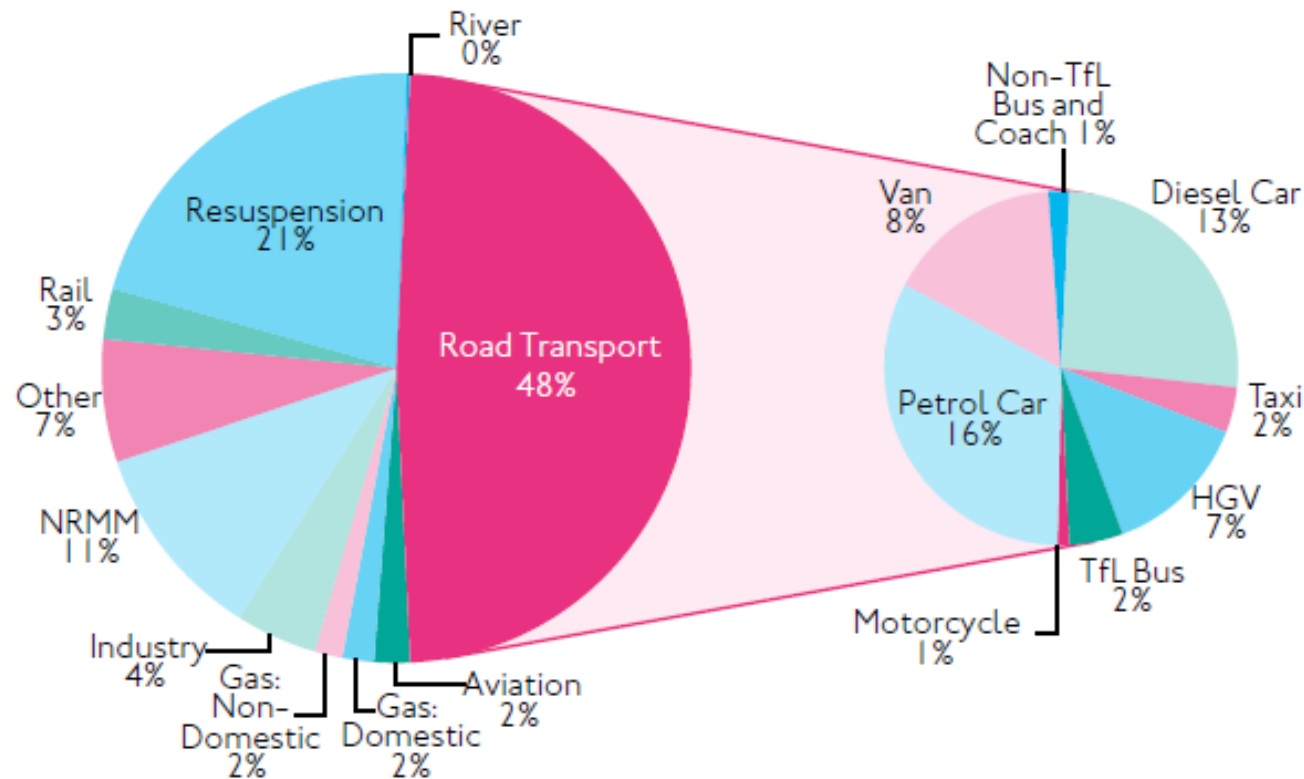
Credit: Public Health England (2015)

Public Health Outcomes Framework



Pollution sources

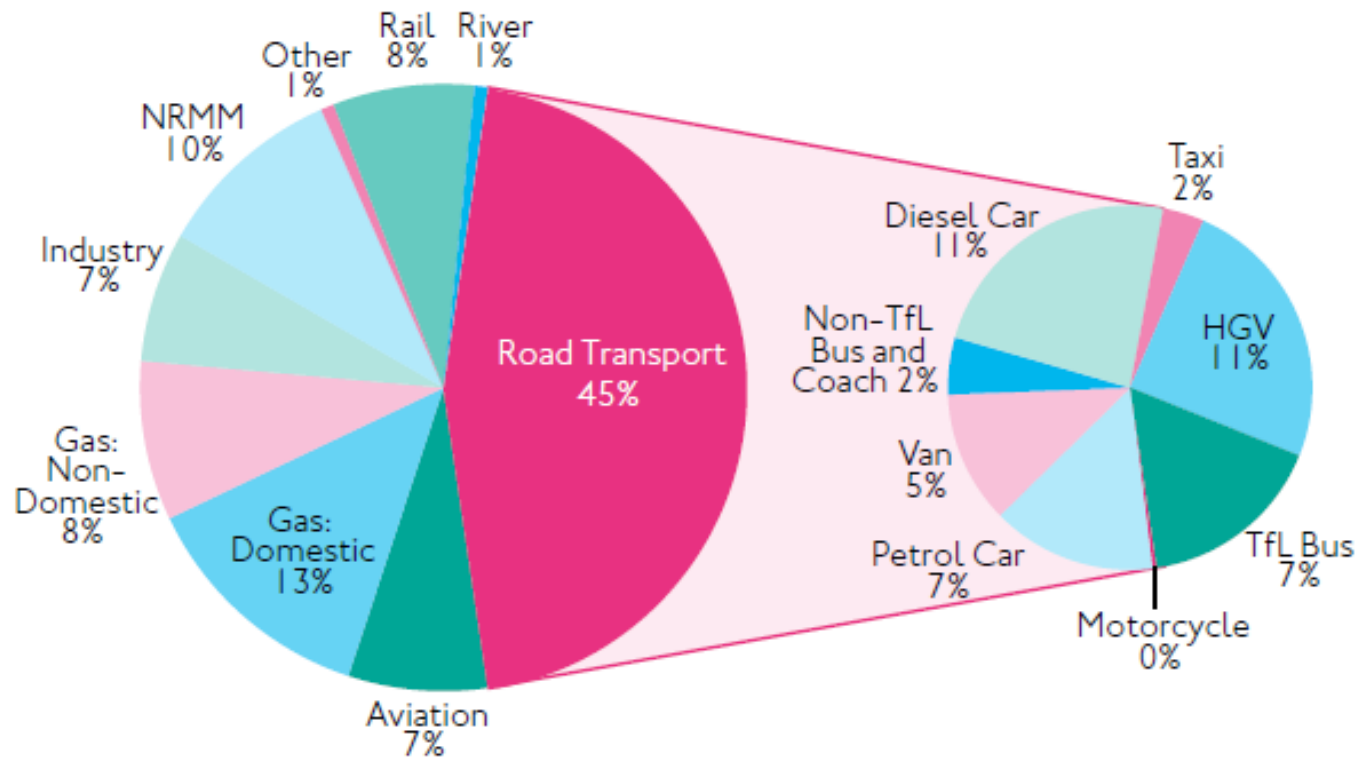
Figure 2.9: Breakdown of PM₁₀ Emissions in Greater London in 2010, by Source⁸⁷



Source: Policy Exchange, Up in the Air Report, 2015

Pollution sources

Figure 2.7: Breakdown of NO_x Emissions in Greater London in 2010, by Source⁸⁴



Source: Policy Exchange, Up in the Air Report, 2015

Legal – London and Europe

- Governance e.g. Freedom of Information
- Tiers
 - European infraction escalated to ‘Reasoned Opinion’ for NO₂
 - National courts. ClientEarth’s wins have implications across Europe. Government must produce new NO₂ plans by July
 - Planning decisions including neighbourhood planning
- New laws in Europe e.g. National Emissions Ceilings Directive to target sources. NRMM
- Need new Clean Air Act to address modern fuels and technologies
- Brexit? Heathrow expansion? Gatwick?
- Remember: health and safety includes health!

ClientEarth wins

Supreme Court in 2015. High Court in 2016 and 2017



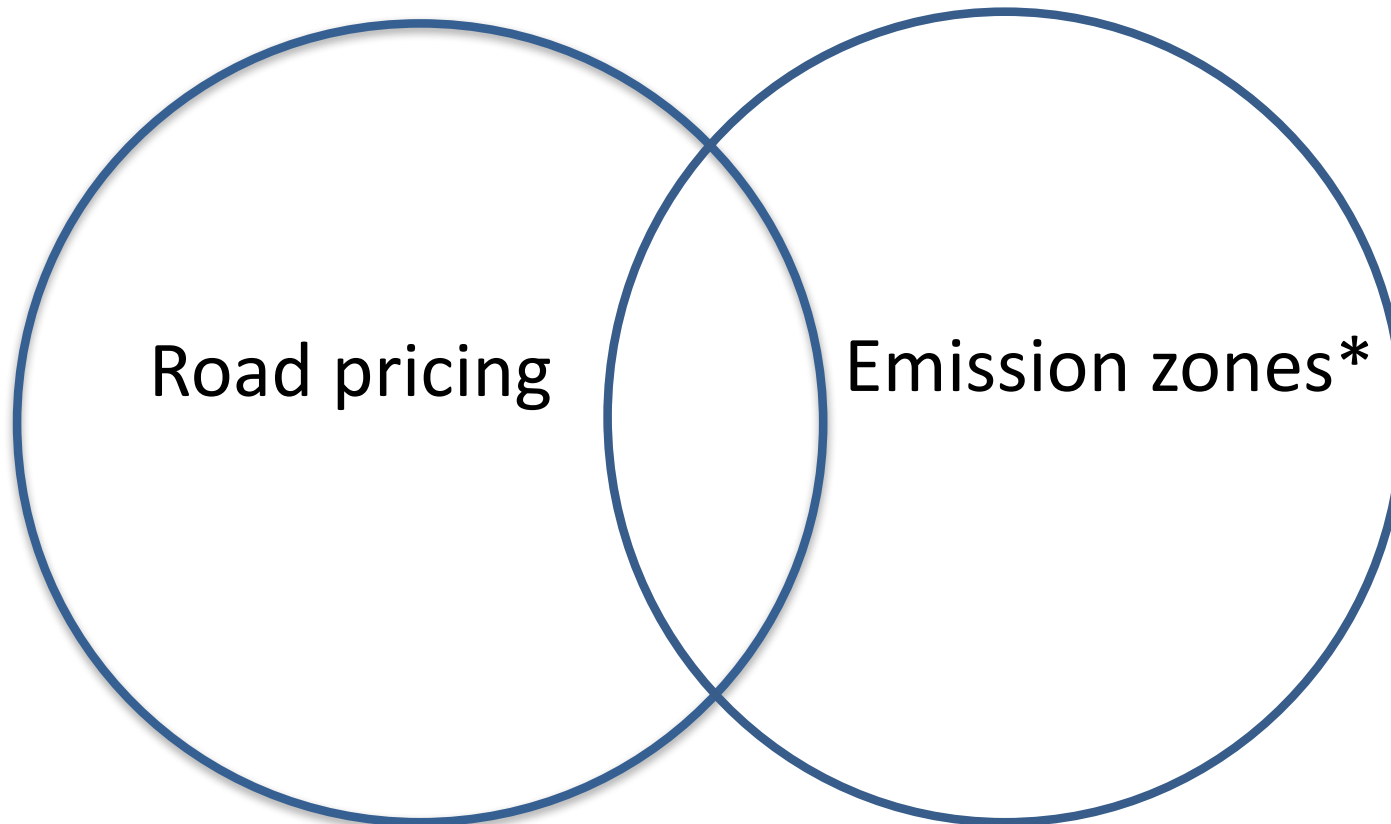
Civil engineers...

Many pollution sources to consider

- Particles and gases
- Local, regional and transboundary
- Road vehicles: exhaust, tyres/brakes and loads
- Non Road Mobile Machinery (yellow plant)
- Rail, river and shipping
- Demolition and construction
- Remote: cement, steel making and energy

The London Circles

Transport measures address congestion and/or emissions



* 'Clean Air Zones'

Many sources of air pollution



Remember: Health and safety includes health!



London: 19 February 2013



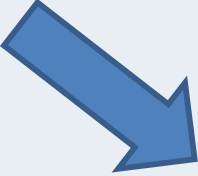


Civil engineers...

Needs and opportunities for you everywhere

- Buildings, cities, energy, transport and utilities
- Construction and demolition
- Consider construction with design not later
- Zero air emissions from buildings
- Indoor air quality
- Modelling, technology and planning
- Working practices

Opportunities

	Air pollution	Climate change
London	Success	
Rest of world		

Engineering cleaner air



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