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The Air We Breathe

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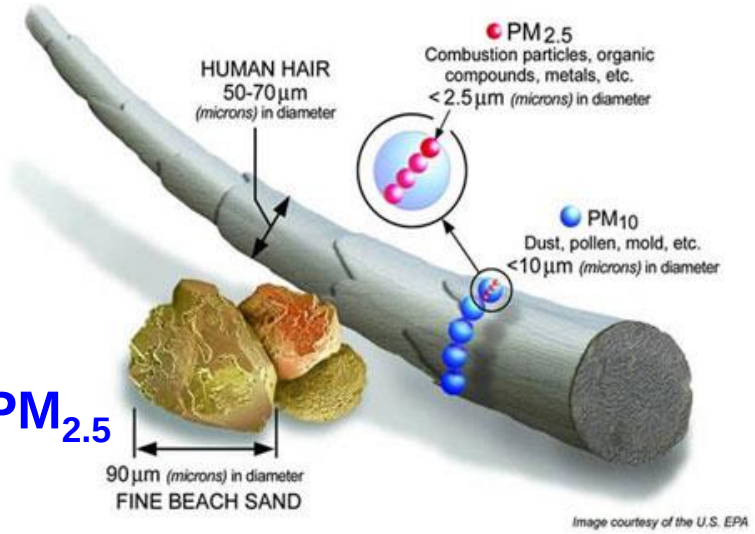
Key air pollutants

Nitrogen dioxide gas, **NO_2**

Fine Particles, **$PM_{2.5}$**



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Carbon Dioxide, CO_2

- Formed from burning fuels – wood, coal, petrol, oil…
- Not harmful to people in outside air
- Drives climate change

Sources of NO_2

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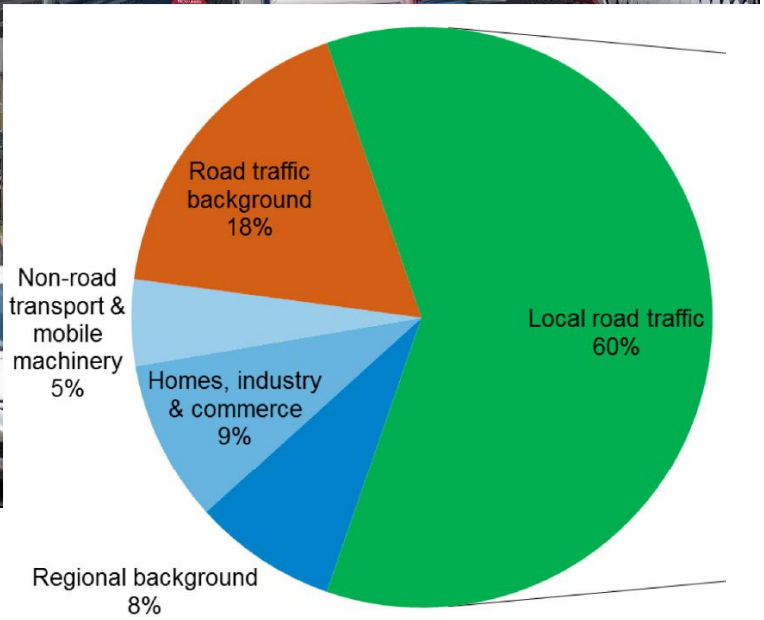
PCM analysis, DEFRA, NO_2 Strategy, 2017

Sources of NO_2



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PCM analysis, DEFRA, NO_2 Strategy, 2017

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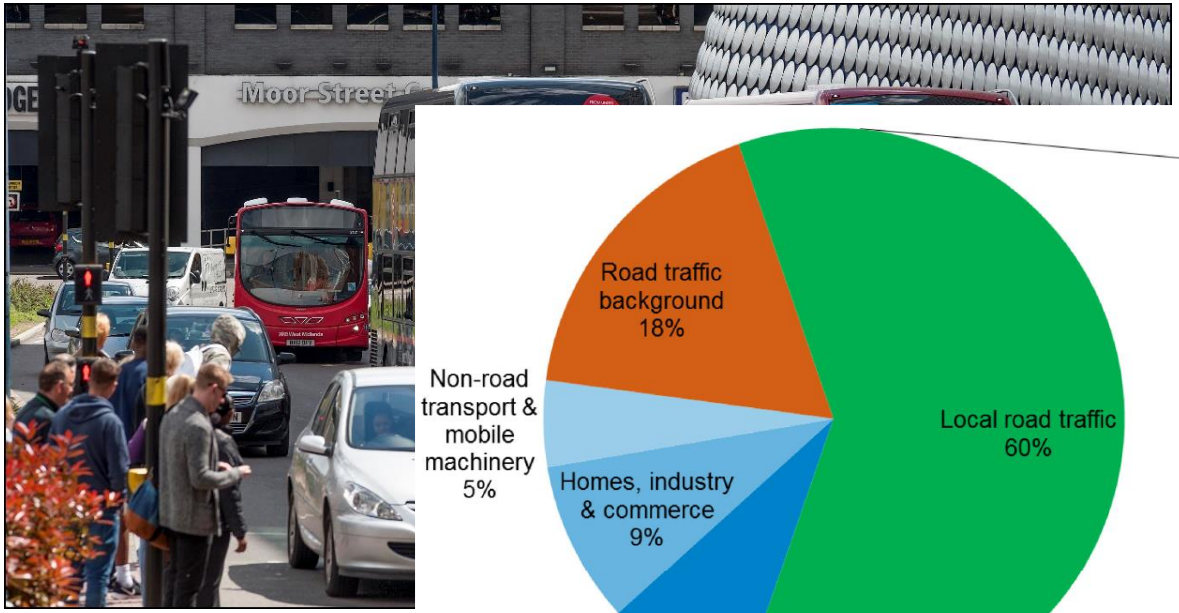

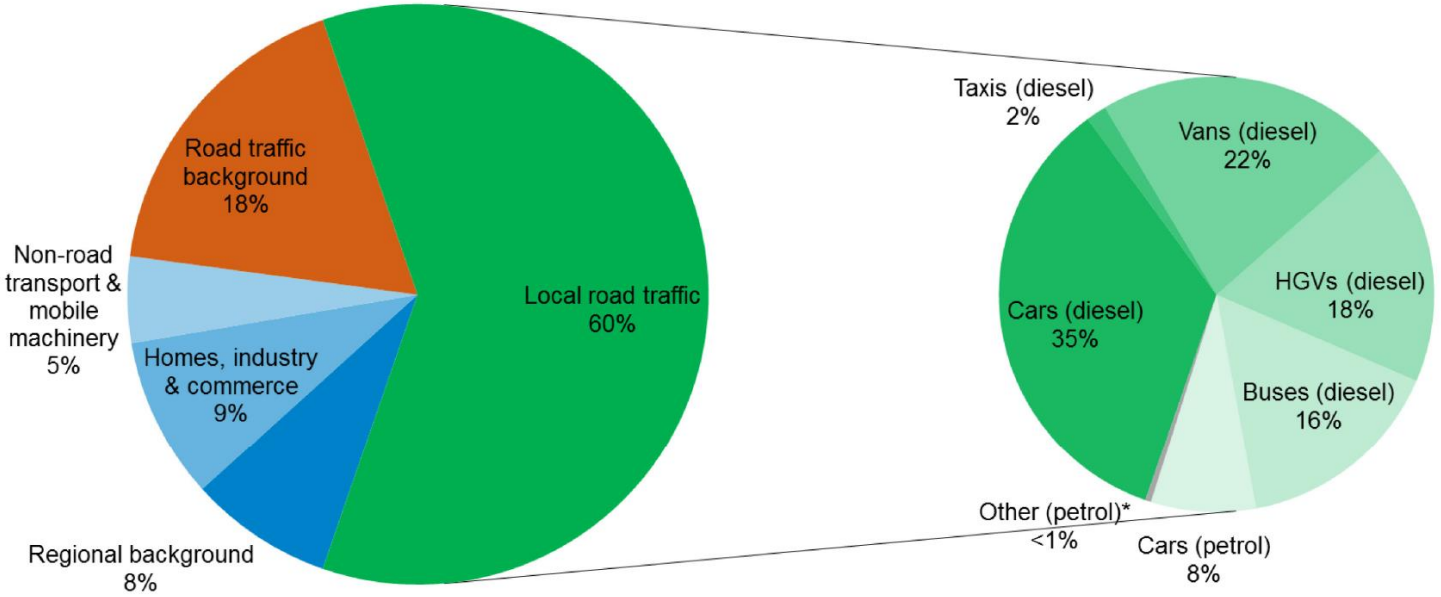

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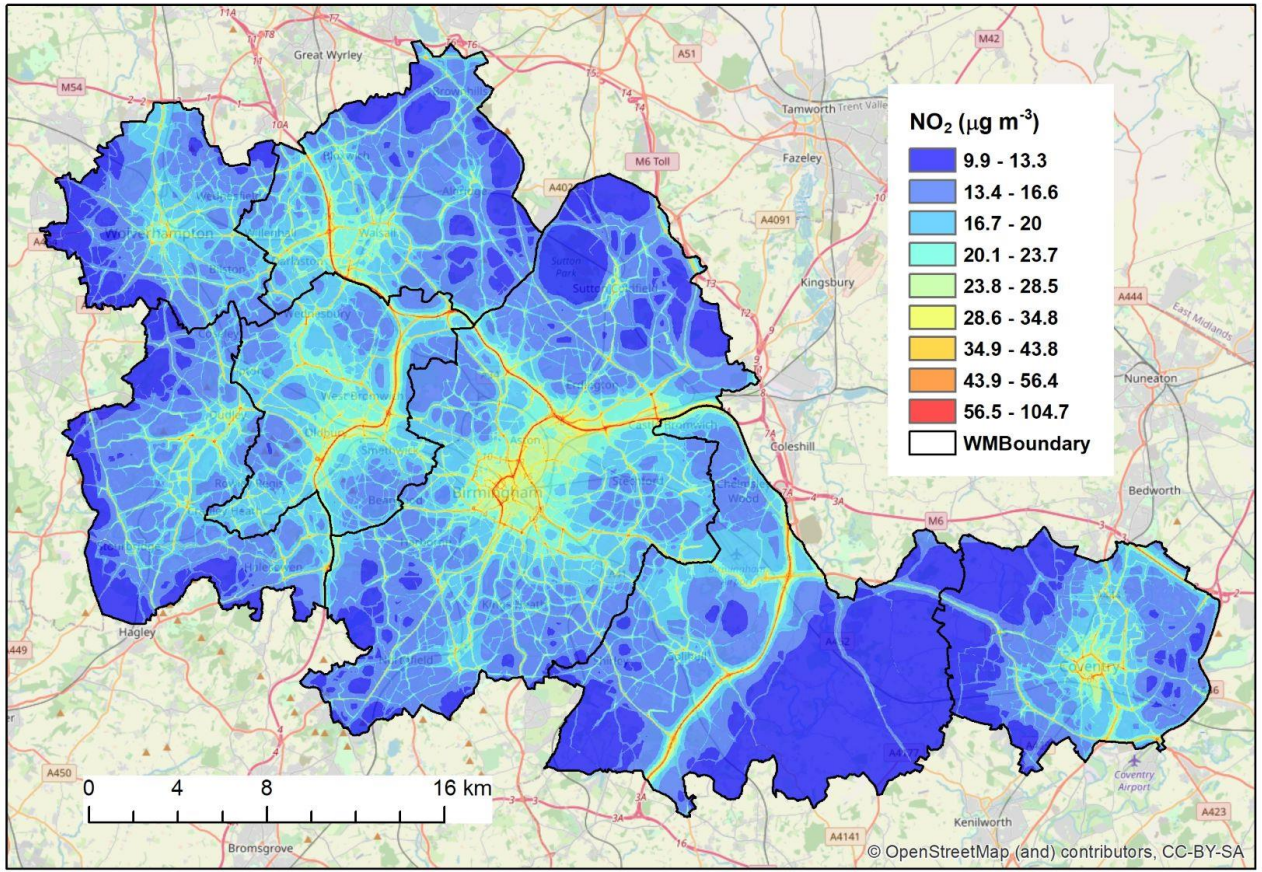
PCM analysis, DEFRA, NO_2 Strategy, 2017

NO_2 across the West Midlands



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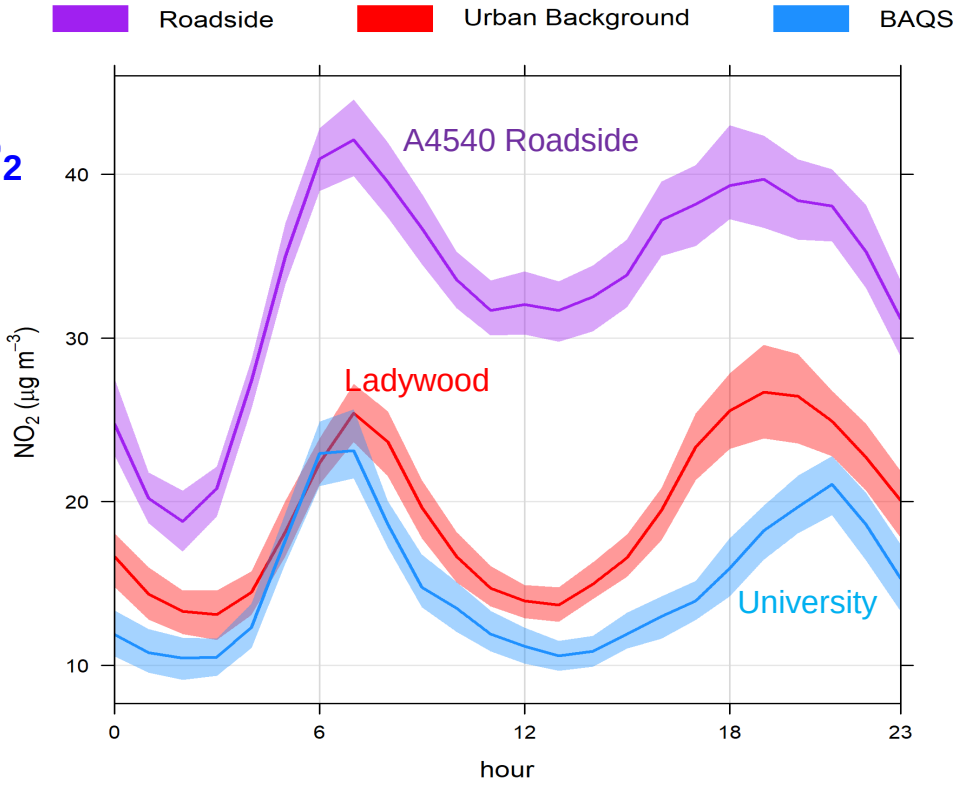
How do levels change with time of day ? NO_2

Nitrogen dioxide gas, **NO_2**



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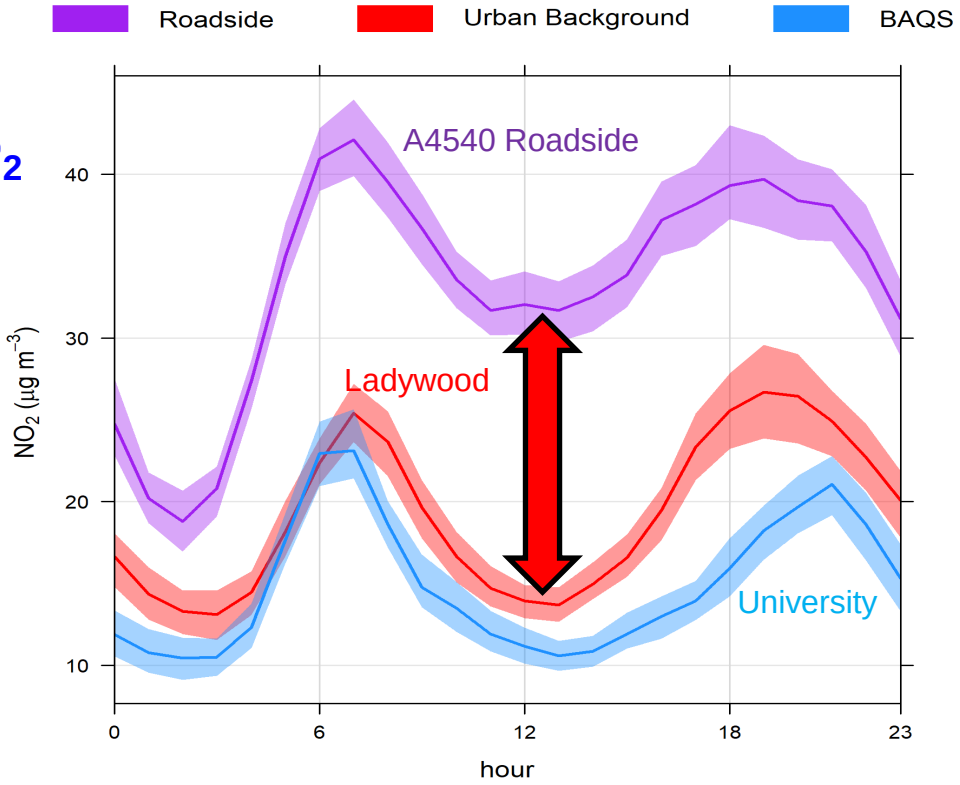

Key air pollutants

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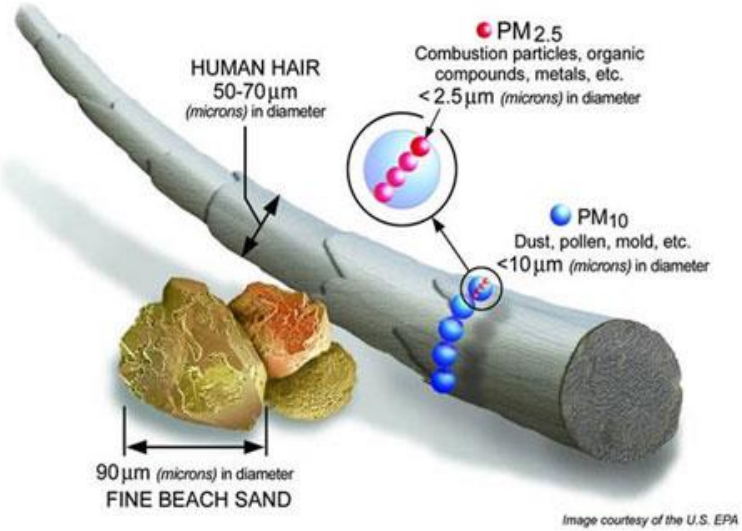
Fine Particles, **$PM_{2.5}$**



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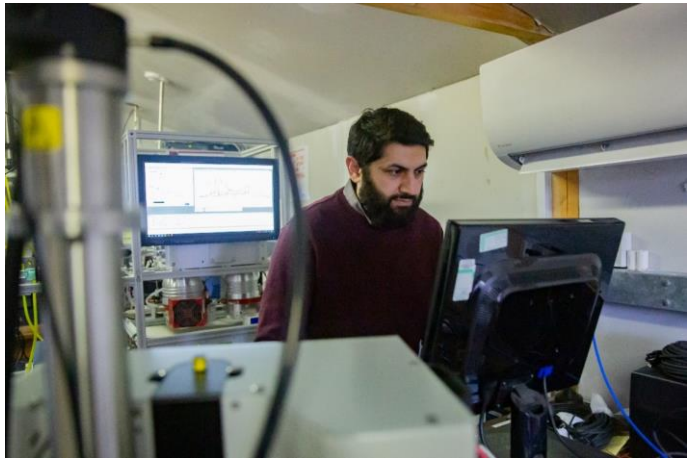
Sources of $PM_{2.5}$

How do levels change with time of day ? $PM_{2.5}$

Fine Particles, **$PM_{2.5}$**



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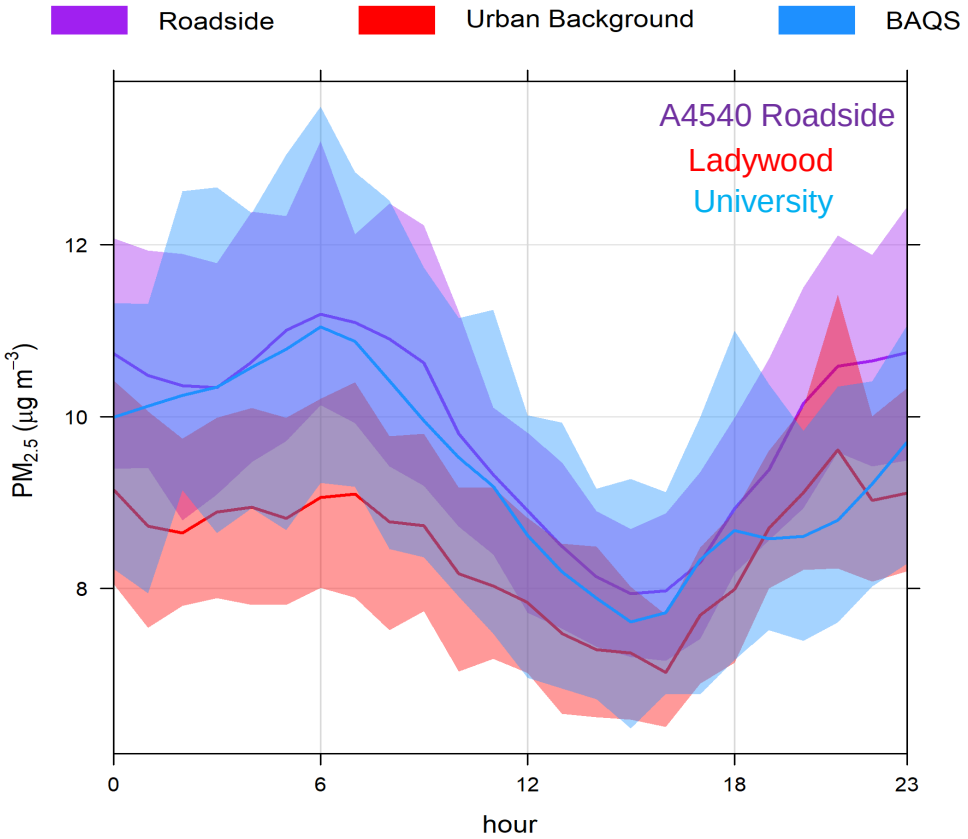

What are the air quality targets?

- Current **UK government limits** (Air Quality Objectives)

NO_2	**40** $\mu g\ m^{-3}$	
$PM_{2.5}$	20 $\mu g\ m^{-3}$	New Env Act: 10 $\mu g\ m^{-3}$ (by 2040)

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- Current **UK government limits** (Air Quality Objectives)

  NO_2 **40** μg m^{-3}

  $PM_{2.5}$ 20 μg m^{-3} New Env Act: 10 μg m^{-3} (by 2040)

- **World Health Organisation** Air Quality Guidelines (not legal limits)

  NO_2 **10** μg m^{-3}

  $PM_{2.5}$ **5** μg m^{-3}

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Air Quality & Climate Change

- Air pollutants harmful to health: **NO_2, $PM_{2.5}$** …
- Greenhouse Gases: **CO_2**

- Common sources:

  Fossil Fuel Combustion (transport, power, heating, industry)

  Agriculture

Reducing our emissions…

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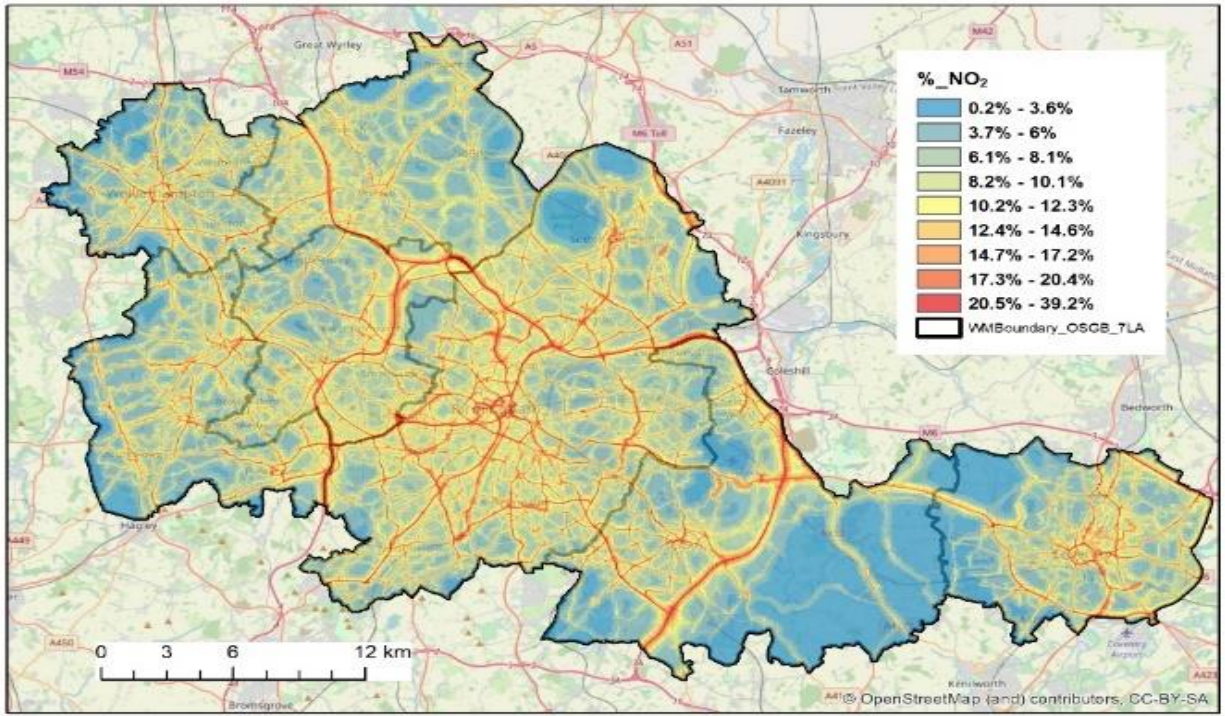
Net Zero / Carbon & Air Quality **Co-Benefits**

- Change in NO_2: Make all buses + 50% of light goods vehicles electric



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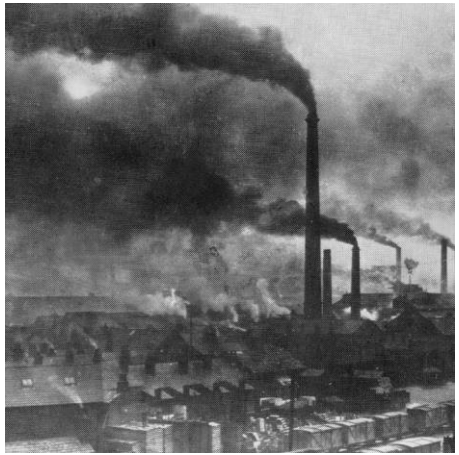
How should we decide what to do ?

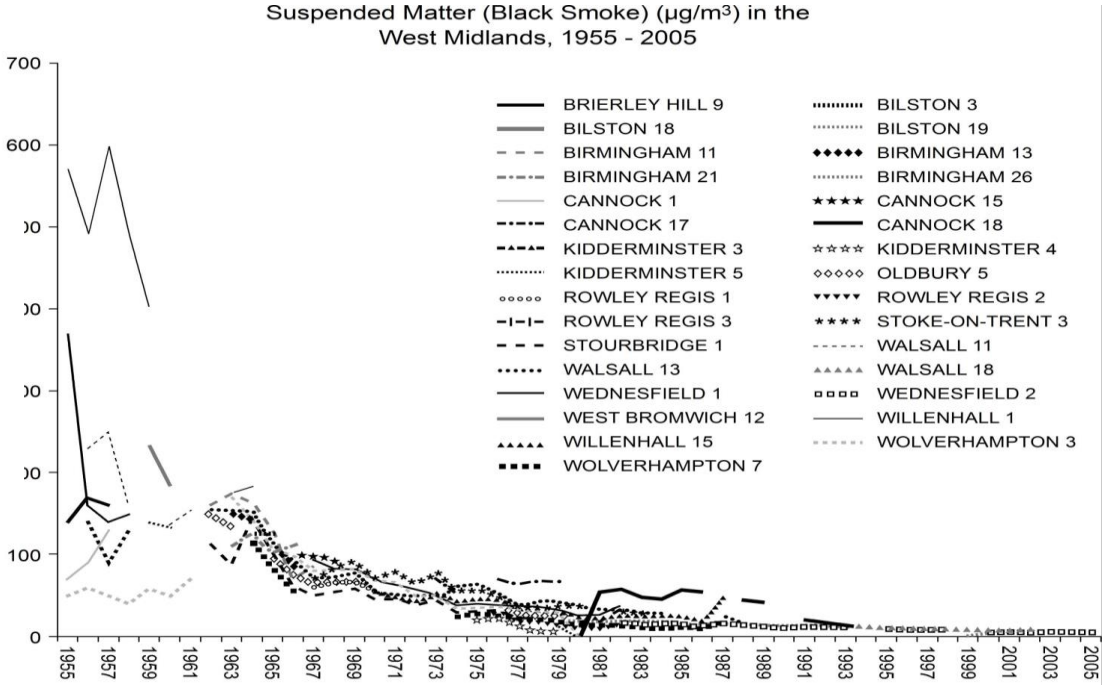
Reduce – Extend – Protect (in that order)

- **Reduce** emissions
- **Extend** the distance from emission to people
- **Protect** people from air pollution

We are making progress !



"Black Smoke"



1955 Year 2005

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Some conclusions…

- NO_2: Road transport, especially older diesel; industry/power generation

  Newer vehicles, EVs (affordability, fairness, non-exhaust emissions); travel choices

- $PM_{2.5}$: Combustion: domestic, industry, coal / wood; agriculture, transport

  Domestic and commercial heating and burning; transport / travel; agriculture

- Climate: Carbon and Air Quality reduction co-benefits

  Local action to reduce local emissions brings local health benefits

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