

# Air quality and Clean Air Zones

Dr Jo Barnes

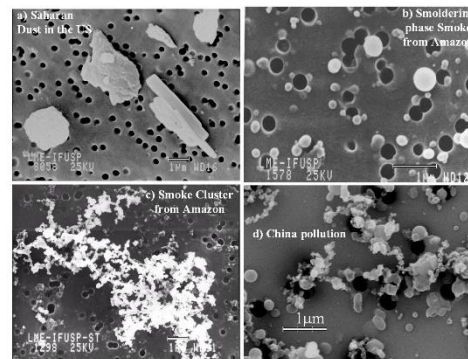
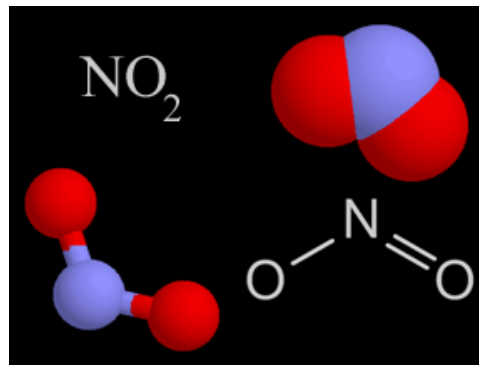
Travelwest Travel Awards 2018  
UWE Bristol Exhibition and Conference Centre

# Key pollutants

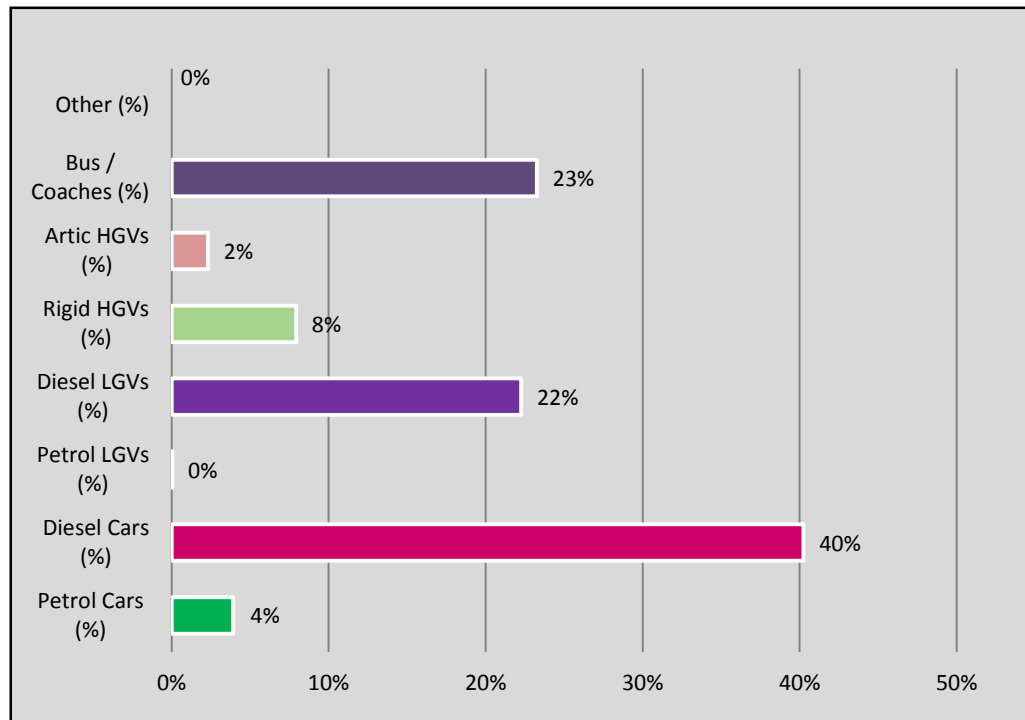
- *Clean air is an essential ingredient of a good quality of life. People have the right to expect that the air they breath will not harm them*

National Air Quality Strategy, 2007

- In UK towns and cities:
  - Gases e.g. Nitrogen dioxide ( $\text{NO}_2$ )
  - Particulate Matter e.g.  $\text{PM}_{10}$ ,  $\text{PM}_{2.5}$
- Primarily from road transport

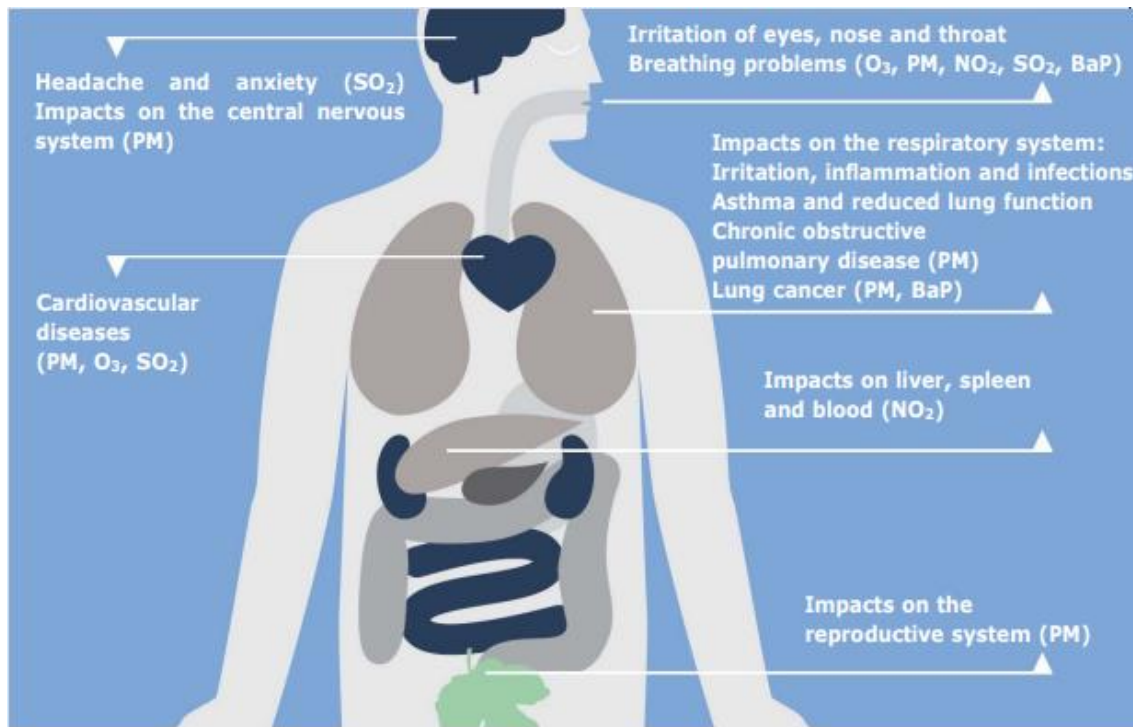


# NO<sub>2</sub> Source Apportionment



Source: Jacobs (calculated from 2015 traffic flows in BCC's GBATS traffic model using the latest version of the EFT (v8.0.1a))

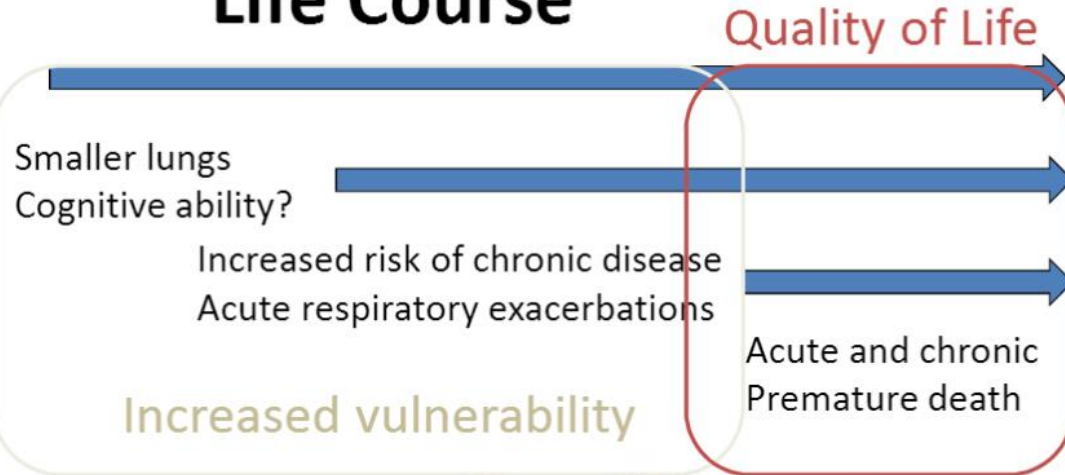
# Schematic overview of health impacts



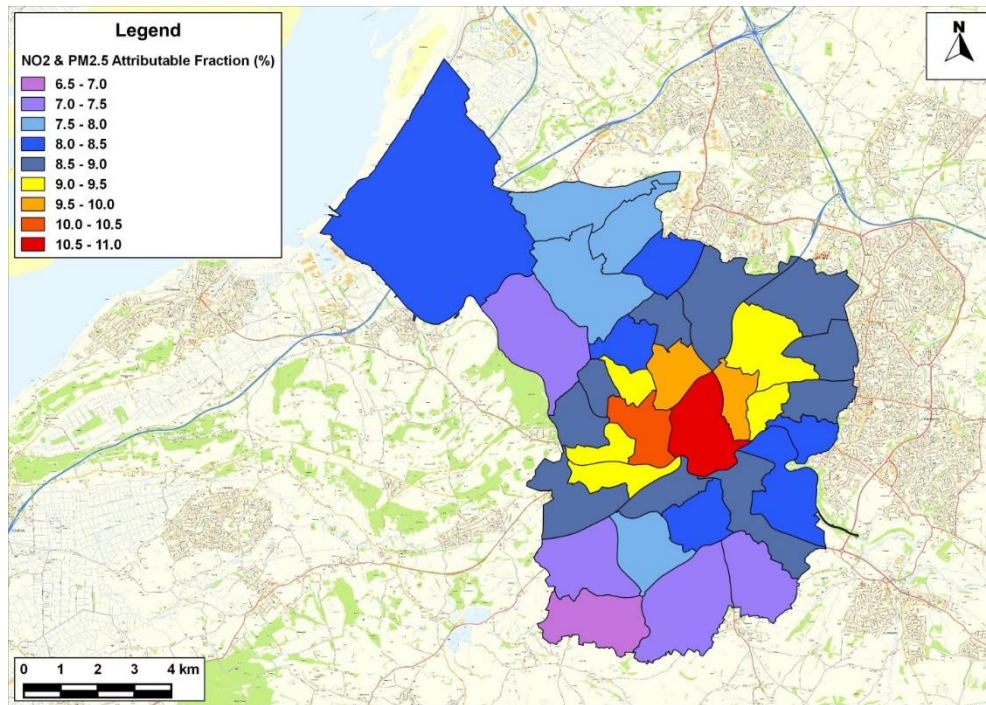
- Short-term exposure = acute effects
- Long-term exposure = chronic effects
- No 'safe' thresholds for  $\text{PM}_{2.5}$  and  $\text{NO}_2$

# Impacts of Air Pollution across the Life Course

Low birth weight



# Proportion of Deaths (%) Attributable to PM<sub>2.5</sub> and NO<sub>2</sub>

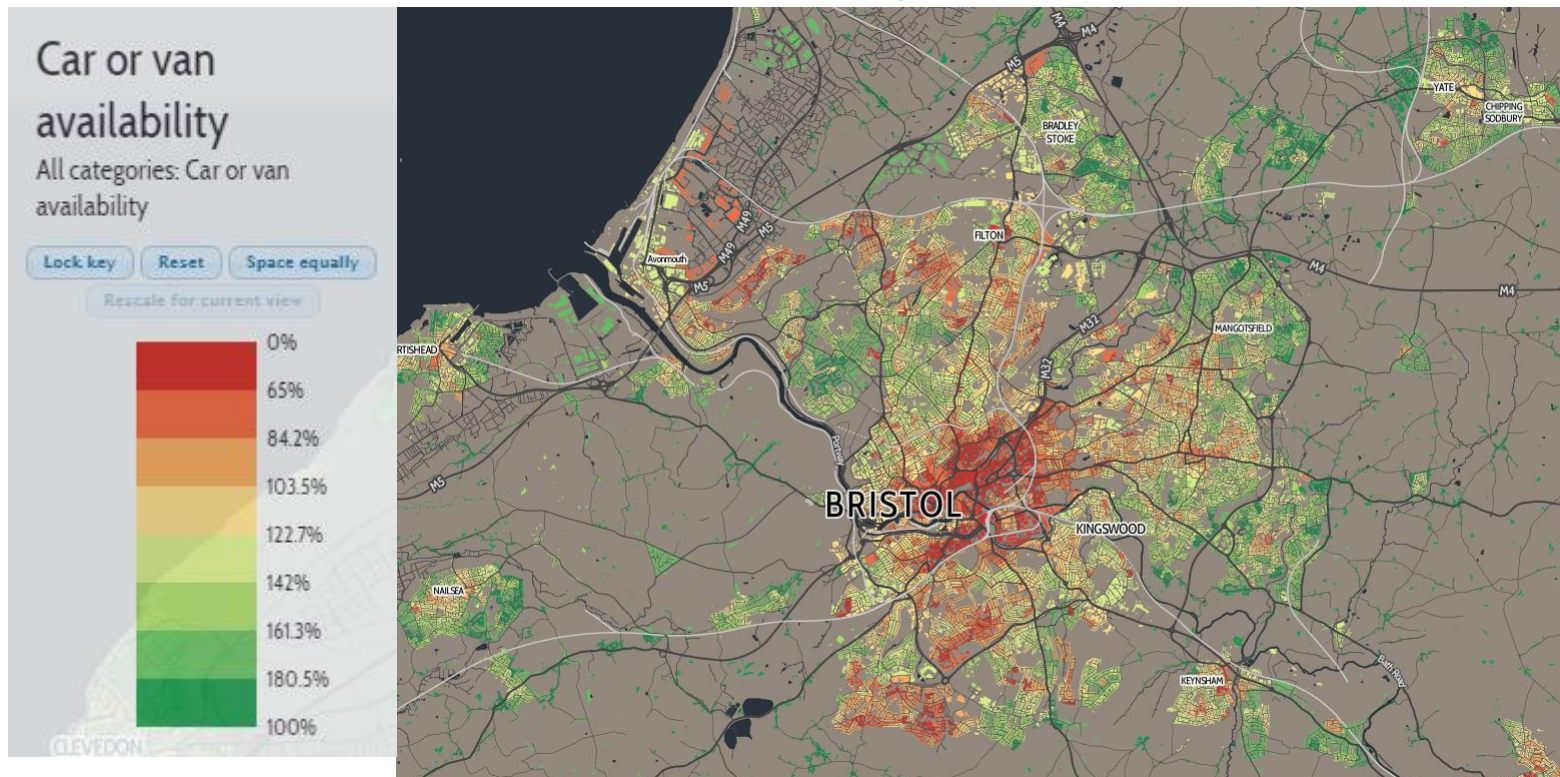


In Bristol there are ~300 additional deaths a year in total (~8.5%), compared with 12 people killed in road traffic collisions in the city (2013).

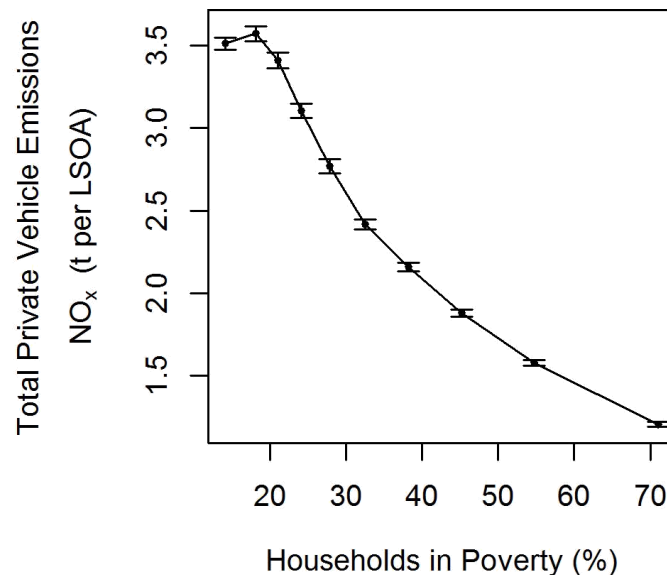
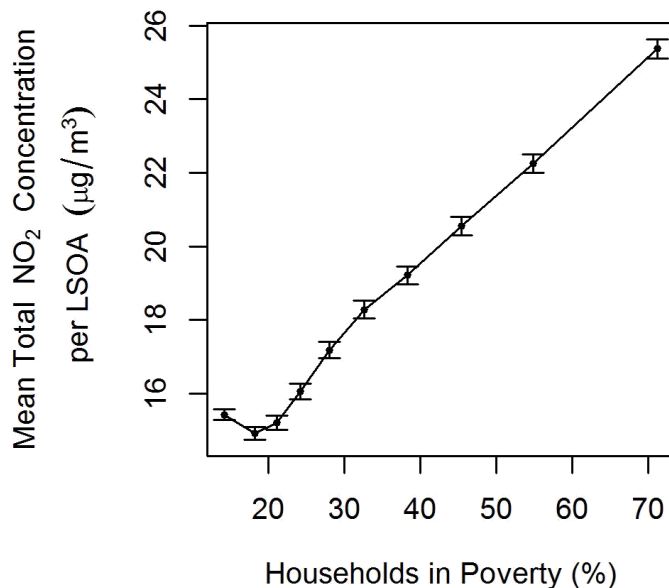
Source: BCC



# Car/van availability in Bristol



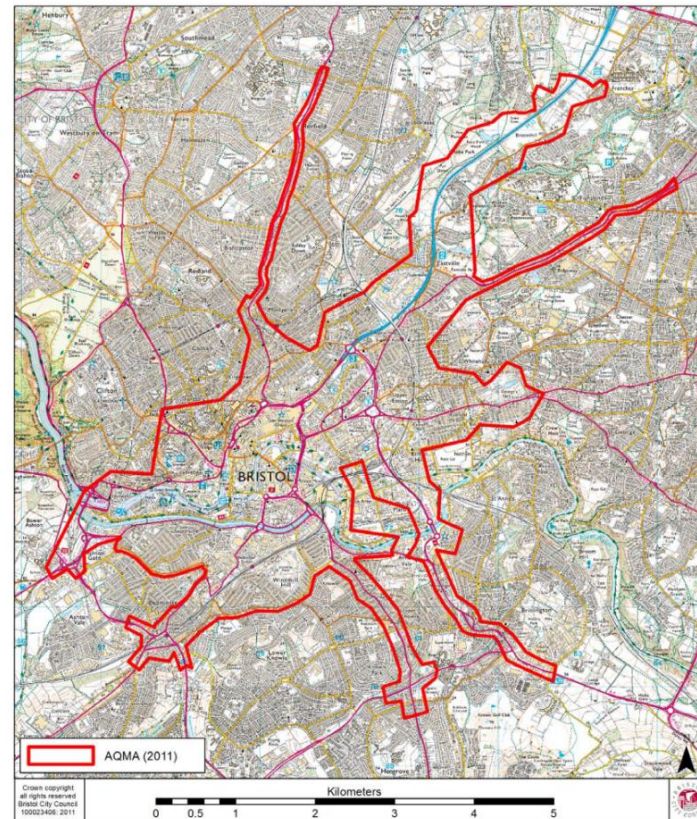
# NO<sub>2</sub> concentrations vs NO<sub>x</sub> emissions against poverty



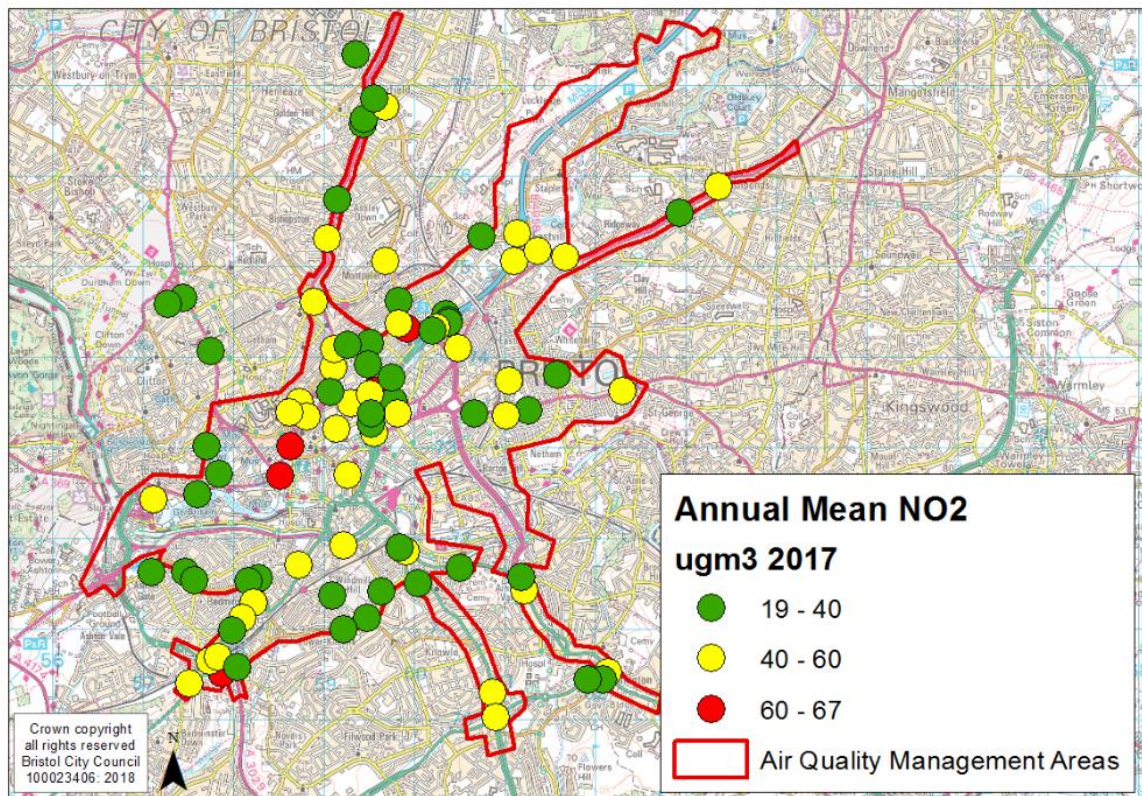


# Bristol Air Quality Management Area (AQMA)

- Nitrogen dioxide (annual and hourly mean objectives)
- PM<sub>10</sub> (daily mean)
- Came into force 2003
- Amended 2008 and 2011

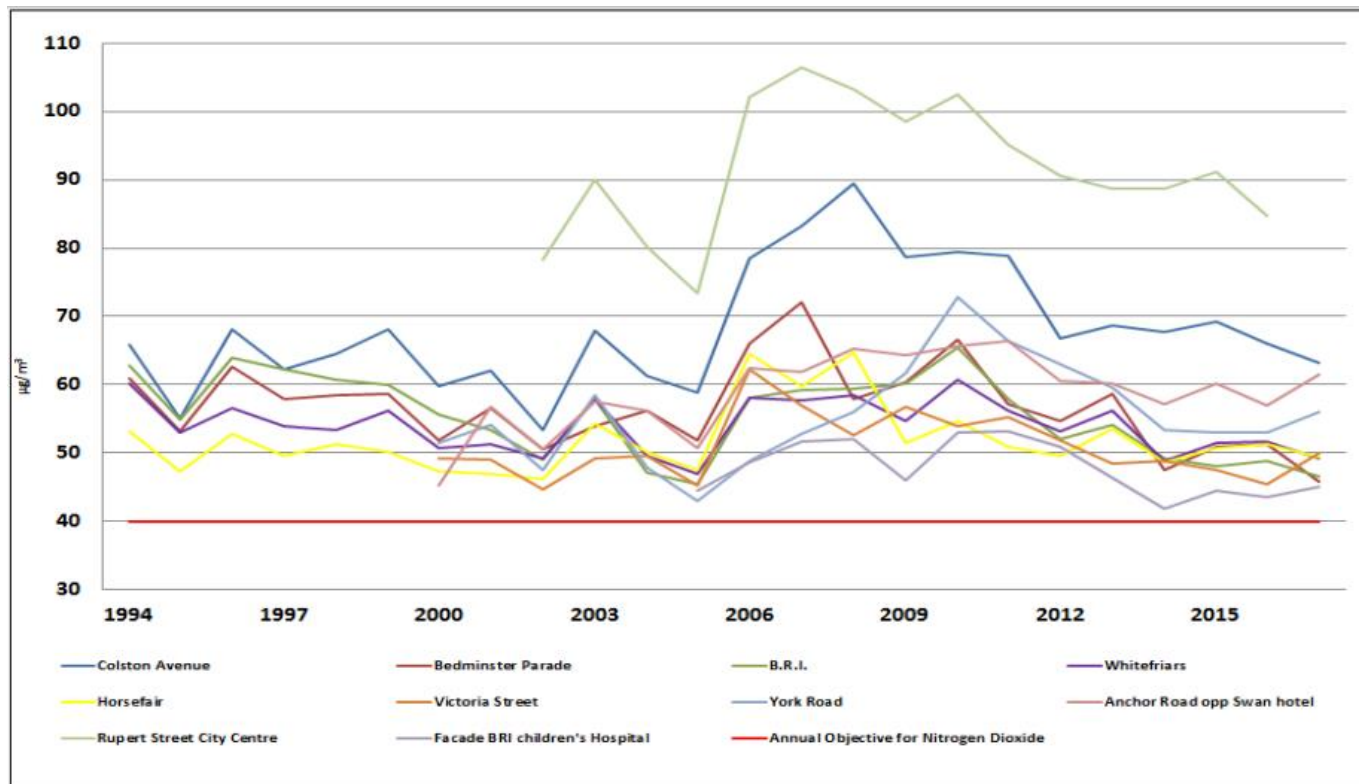


# Nitrogen dioxide in Bristol



- Map shows annual average NO<sub>2</sub> concentrations at street locations monitored during 2017.
- The legal limit is 40 µg/m<sup>3</sup> as an annual mean (i.e. measured across a year).
- Without any action, Bristol will not meet legal limits until 2025, at the earliest.

# Trends in city centre NO<sub>2</sub>

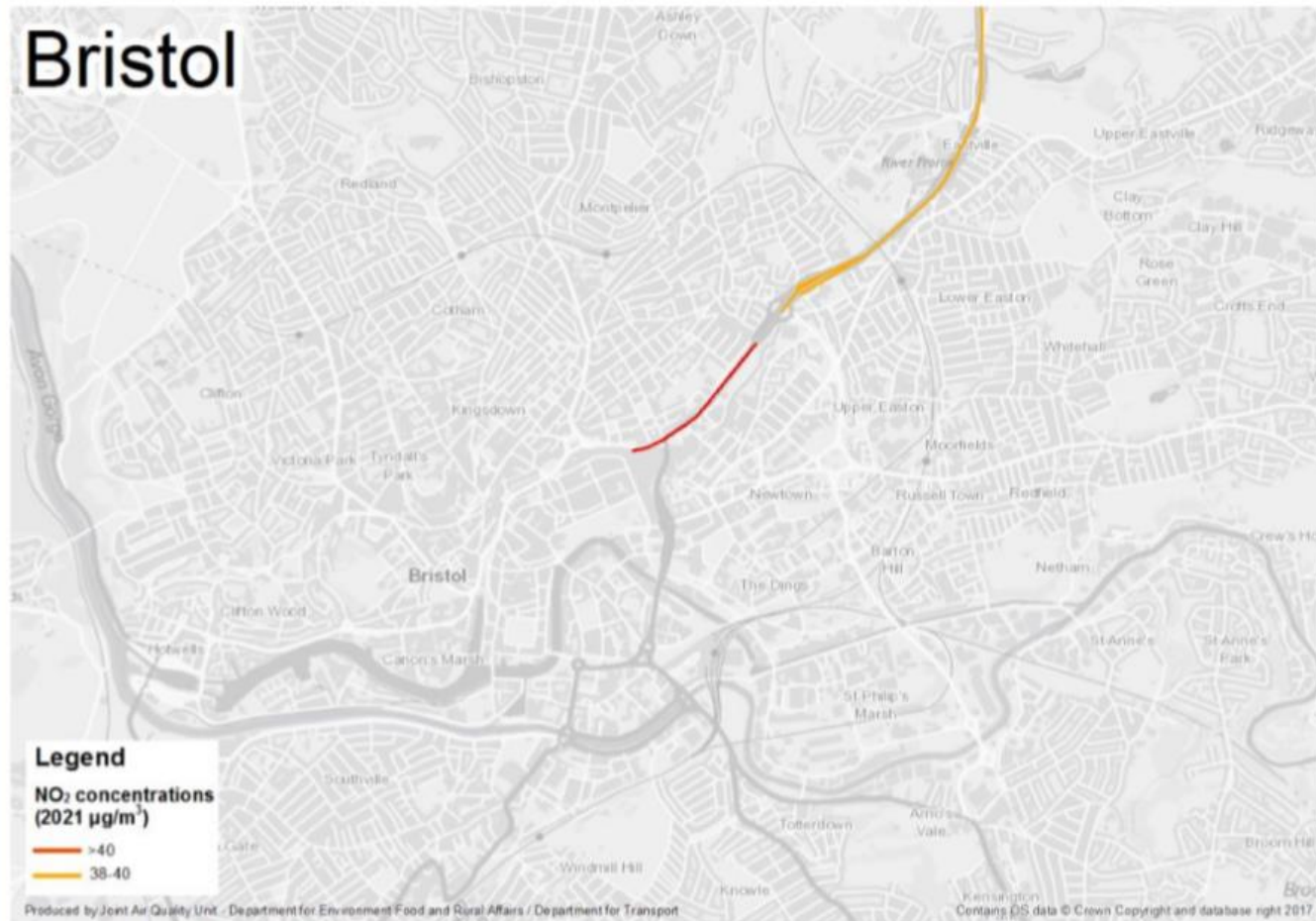


# Forecast Exceedances

- Locally assessed exceedances expected to continue until beyond 2021 at the following locations:
  - Newfoundland Way
  - Stokes Croft
  - Bedminster Down Road / Parsons Street
  - Ashley Road, St Pauls
  - Rupert Street
  - West Street, Bedminster



# Defra modelled roadside NO<sub>2</sub> 2021



# Direction from Defra

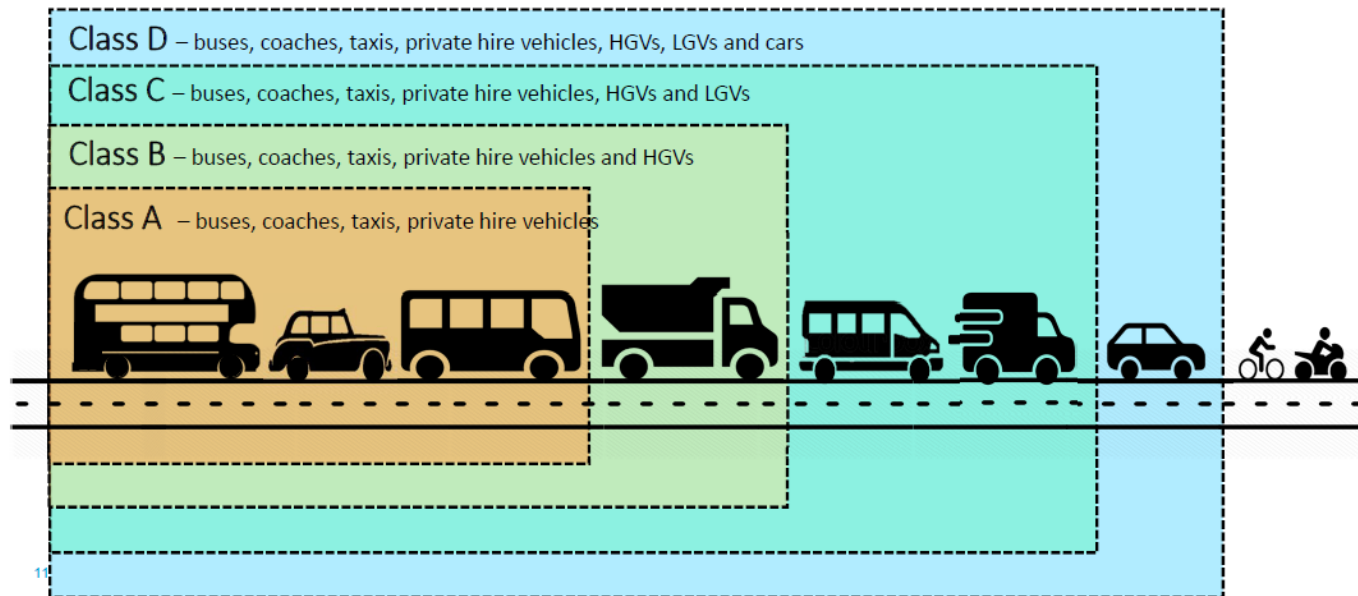
- BCC directed to produce a Clean Air Plan to achieve compliance with European Limit Values for Nitrogen Dioxide (NO<sub>2</sub>) in the shortest possible time due to forecast exceedences in Newfoundland Way.
- Objectives:
  1. To deliver a scheme that leads to compliance with NO<sub>2</sub> concentration EU Limit Values in the shortest possible time. (Newfoundland Way)
  2. To deliver a scheme which leads to compliance with the UK Air Quality Objectives in the shortest possible time. (+ Stokes Croft; Bedminster Down Road / Parsons Street; Ashley Road, St Pauls; Rupert Street; West Street, Bedminster)



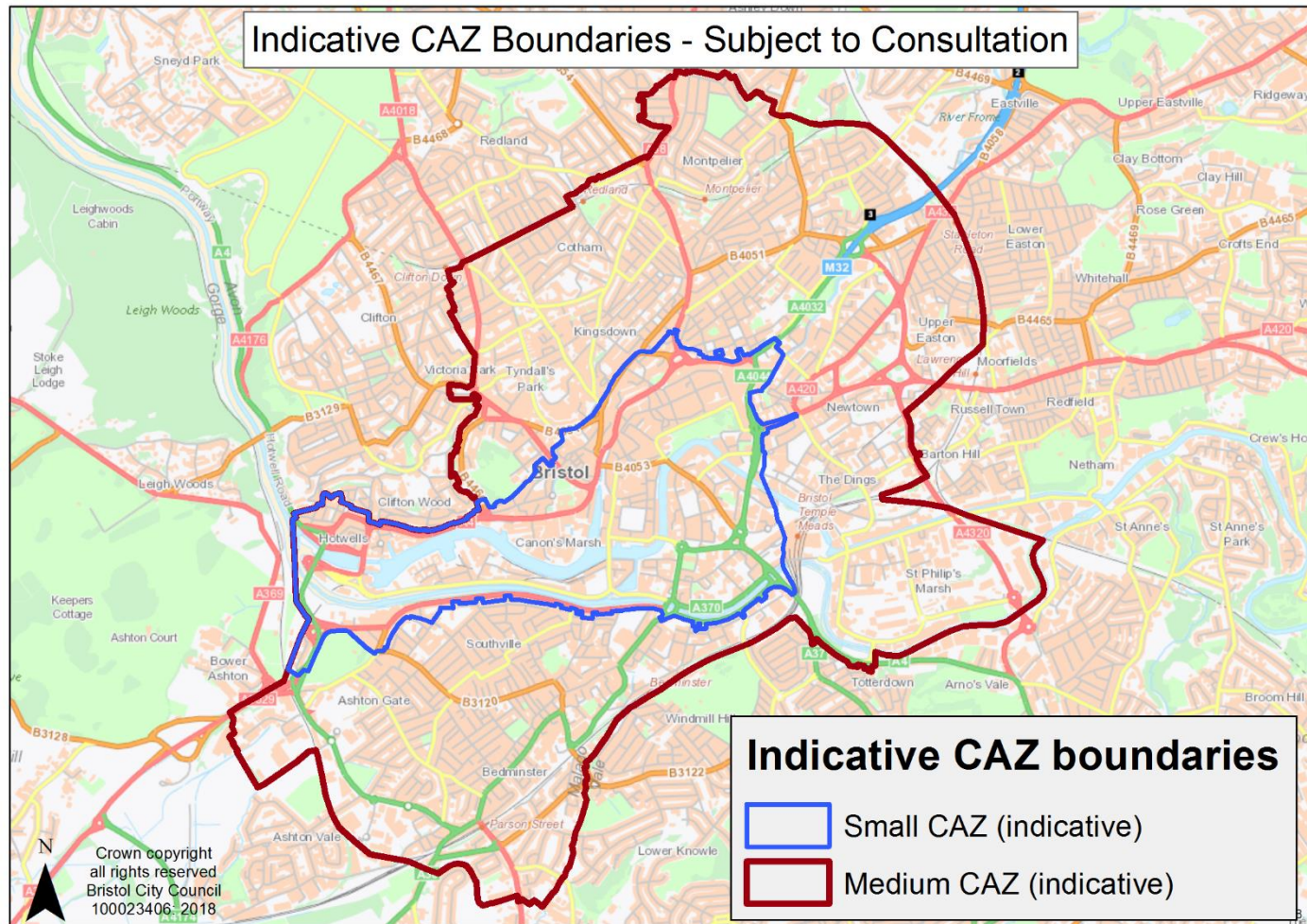
# Bristol Clean Air Plan

- There are three key phases of the Plan.
  - Strategic Outline Case (Shortlisting options): ended March 2018;
  - Outline Business Case (Detailed study of options) – 2019
  - Full Business case (Preferred Scheme and mitigations) – 2019
- Strategic Outline Case: <https://www.cleanairforbristol.org/bristols-clean-air-plan/>
- Outline Business Case “preferred scheme” due late 2018.

# Clean Air Zone - classes



**Whichever class is chosen, Euro 4 petrol (approx. 2006) vehicles or a Euro 6 diesel (approx. 2015) vehicles would not be charged, nor would electric or hydrogen powered vehicles.**



# Clean Air Zone Assessment

- Strategic Outline Case recommended five packages of measures to take forward for further study
  - Option 1 – package of complementary measures
  - Option 2 – Medium CAZ (C) with complementary measures
  - Option 3 – Medium CAZ (D) with complementary interventions
  - Option 4 – Small CAZ (C) with complementary measures
  - Option 5 – Small CAZ (D) with complementary measures
- Compliance expected to be achieved in 2021 with:
  - Small zone, Class C and D CAZ
  - Medium zone, Class C and D CAZ
- **A large CAZ is unlikely to be deliverable before either a small or medium zone could achieve compliance**

# How will it work?

- If a charging CAZ is introduced, implementation will begin in 2019 and the measures in the Plan should be in place in 2020, dependent on the scheme selected.
- Enforced using Automatic Number Plate Recognition (ANPR) cameras placed at entry/exit points and within the CAZ.
- Likely to be an online, centralised charging system. Level of charge under discussion/consultation – stated preference surveys.
- BCC are holding drop in events, workshops, surgeries and a formal consultation period throughout the year to engage businesses and public.
- BCC intend to apply for grant funding to support businesses transition to using low-emission vehicles.
- Adopting an integrated West of England approach through Joint Spatial Plan, Joint Local Transport Plan and Energy Strategy.
- Further information: <https://www.cleanairforbristol.org>

Air Quality  
Management  
Resource Centre,  
UWE, Bristol

Travelwest Travel  
Awards 2018

29 November 2018

Thank you

E: [jo.barnes@uwe.ac.uk](mailto:jo.barnes@uwe.ac.uk)

T: @jobarnes\_uwe

S: jo5.barnes

P: 0117 32 81626