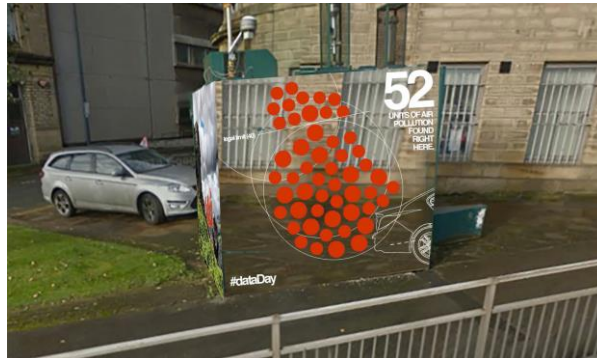


3.4.01 Air Quality

Introduction: why is this important?

Rural areas of Bradford enjoy some of the best air quality in Europe, however, our urban centres, and areas near to the strategic road network, are affected by elevated concentrations of pollutants that have a significant impact on health, particularly amongst our most socially disadvantaged communities. The two components of exhaust gases that are of most concern in terms of the impact on human health are nitrogen dioxide (NO₂) and particulate matter (PM).



Monitoring Station, Shipley Airedale Road, Bradford. Infographic produced by Dr Catherine Stones – Leeds University (produced for Bradford Council in June 2015).

Whilst the very highest concentrations are found adjacent to busy roads, both of these pollutants can also be attributed to other sources of pollution such as domestic heating, industrial processes and open burning.

It is estimated that the effects of NO₂ on mortality are equivalent to 23,500 deaths annually in the UK¹. Many of the sources of NO_x (NO₂ and NO) are also sources of particulate matter and the impact of exposure to particulate matter pollution (specifically PM_{2.5}) is estimated to have an effect on mortality equivalent to nearly 29,000 deaths in the UK². The combined impact of these two pollutants represents a significant public health challenge, not just in terms of early deaths, but also reductions in quality of life and the associated health costs of treating residents whose health is being affected by pollutant inhalation.

A Public Health England report³ in 2010 estimated that there were 222 early deaths in Bradford due to particulate matter alone, this is 1 in 20 of all early deaths. This number will rise when the impact of nitrogen dioxide is added.

In Bradford we have a unique understanding of the impact of air quality because a section of the largest research study in the world currently taking place is being undertaken here in Bradford through the *Born In Bradford (BiB)* health research study.

Research at BiB, and elsewhere, has concluded that air pollution doesn't just make us cough, it also causes the following, much more serious, conditions:

- premature death
- respiratory problems such as Chronic Obstructive Pulmonary Disease and the development of asthma in children
- heart attacks and strokes
- cancer
- low birth weight and pre-term birth
- developmental problems in children and reduced IQ in affected populations

The BiB study identified strong links in Bradford between PM_{2.5} and some of these conditions, particularly low birth weight.

What do the facts and figures tell us?

The Low Emission Zone (LEZ) study informs us that an improvement in air quality in Bradford will reduce the number of early deaths, and improve the quality of life for all of its citizens, especially those in deprived areas which currently experience the poorest air quality. The study also highlights the significant health based cost savings that could be delivered every year. In Bradford, through local health research studies, we understand the health impacts better than most cities and this provides an impetus to take action to achieve significant improvements.

We must also consider that Bradford currently has areas where pollution exceed the legal limits set in the Air Quality (England) Regulations 2007. The UK is now in breach of the EU Air Quality Directive and infraction proceedings have commenced. The level of fines could reach 400 million Euros and under the reserve powers of the Localism Act 2011⁴ these fines can be passed on to any public authority whose act or omission has contributed to these breaches.

What strategies, policies and best practice have been developed locally and nationally?

Air pollution does not respect boundaries, so Bradford Local Authority is working with the other West Yorkshire Local Authorities and the West Yorkshire Combined Authority to develop a regional Low Emission Strategy, and this will improve air quality across the region⁵.

In addition, Bradford has its own 'Bradford Low Emission Strategy' (Bradford LES) which was adopted in 2013. Bradford was only the second Local Authority in the UK to adopt a Low Emission Strategy and Bradford is now viewed as an example of best practice in the UK for its action to improve air quality.

Through the implementation of the Bradford LES, the following initiatives are improving air quality in Bradford:

- 1) A LEZ feasibility study has been completed. The Council are now considering the practical implementation of a LEZ
- 2) Since 2013 every relevant planning application that the Council processes incorporates conditions designed to improve air quality, including:
 - Every new single property (commercial and residential) incorporate electric vehicle charging points
 - Construction emissions management
 - Emission standards for commercial fleets
 - Low emission travel planning
 - Site specific mitigation such as cycle paths, electric minibuses for staff, Metrocards and bus stops
 - All applications are assessed to ensure that there is no risk of exposure to unacceptable levels of pollution
- 3) There are trials of low emission vehicles where they are a considered a practical alternative to traditional more polluting types. We now have procurement policies which consider the whole life costs of vehicles (including the damage they cause) rather than just buying the cheapest on the market
- 4) The Council procurement team are using the monies that the Council spends to encourage private companies to improve air quality through the terms of the contracts that we offer for tender
- 5) There is a commitment to support the improvement of public transport and we have successfully worked with our local bus companies to fund the retrofit of 25 City Centre buses, reducing emissions by 90%, using a grant from the Department of Transport. We have also worked with the West Yorkshire Combined Authority to reduce emissions from all the yellow school buses in the District

6) The Council is working with BiB, the NHS and Public Health England, and local Universities on health research projects, providing air quality data and using their data to support our ongoing work

7) In partnership with Public Health England we are raising awareness of the detrimental health effects of air pollution and the benefits of driving cleaner vehicles and reducing vehicle use

8) Air quality is monitored across the Bradford District and we report the data here;

http://www.bradford.gov.uk/bmdc/the_environment/pollution_noise_and_nuisance/air_quality_review

9) The Council continues to encourage people to walk and cycle as an alternative to using vehicles through the provision of facilities and incentives

What challenges have been identified in a local context?

In partnership with other health professionals and health economists, we have carried out ground breaking research into the impact of our local transport emissions and the positive health benefits of a number of Low Emission scenarios, including cleaning up the bus fleet and lorries, reductions in car use and replacing diesel vehicles with petrol variants.

The data from the study illustrates how much Bradford could improve health and reduce health costs:

Cost per condition in (£) (in NHS cost and quality adjusted life years)	Bradford LEZ Modelled Scenario			
	All pre-euro 4 HGVs and buses upgraded to euro6 by 2016	All pre-euro 5 buses upgraded to euro 6 by 2021	Reduction in number of diesel cars from 50% to 20% (as in the year 2000)	10% reduction in number of car journeys by 2021
	Health benefit across the Bradford population			
Deaths (PM _{2.5}) (£168,000)	2 (0-2.3)	3 (0.3-5)	3 (0.3-5)	3 (0.3-5)
Cardiopulmonary deaths (PM _{2.5}) (£168,000)	1 (0-2)	2 (1-3)	2 (1-3)	2 (1-3)
Coronary events (PM _{2.5}) (Bradford only) (£50,160)	24 (0-53)	45 (0-99)	45 (0-100)	45 (0-99)
Low birth weight babies <2500g (PM _{2.5}) (£2,325)	2 (1-4)	3 (1-6)	3 (1-6)	4 (1-7)
Pre-term births (PM _{2.5}) (£28,109)	0.4 (0.4-0.4)	0.7 (0.6-0.7)	0.7 (0.6-0.7)	0.7 (0.6-0.7)
Low birth weight babies <2500g (NO ₂) (£2,325)	8 (0-17)	18 (0-38)	21 (0-45)	17 (0-36)
Childhood asthma development <18yrs (NO ₂)* (£17,016)	82 (18-152)	181 (40-335)	212 (47-393)	173 (38-320)
Annual years of life gained for newborns (all births combined)	42	64	6	76
Annual Health Cost Saving	£1,574,334	£2,829,701	£2,836,676	£2,943,768
One-off Health Cost Saving – cases of childhood asthma*	£1,395,312	£3,079,896	£3,607,392	£2,943,768
* Childhood asthma development is a 'one-off' health impact and is not additive on an annual basis				

The Executive of Bradford Council are keen to see these benefits in Bradford and have requested that more is done to improve air quality, including detailed consideration of the practical implications of a Low Emission Zone for Bradford. This will include consultation with external stakeholders and will conclude in 2016.

What do our stakeholders tell us?

In November 2015 an extensive public consultation exercise was carried out to identify what all our stakeholders felt about air quality. The responses indicate that people in Bradford have increasing awareness of the health impacts of air quality, they would like to see more done about it and they would like to see the improvement commitments made in our strategies strengthened with practical action taken to secure improvements.

Recommendations: What do we need to do? How do we ensure this remains a priority?

Bradford Council has developed a Low Emission Strategy for the District, setting out the multidisciplinary approach required to improve air quality. The Council must ensure this document is kept up to date and that the principles within it are followed whenever decisions are made which have potential to impact on air quality. There must also be continuation of our work with health partners to increase public awareness and the provision of the data they require to research the latest impacts and identify the impacts that improvements will deliver.

We must ensure that the policies in our strategies are translated into local action to drive change. Not all of the solutions that improve air quality are equally palatable and some require significant investment (for example in cleaner vehicles, and infrastructure for low emission vehicles). Everyone has a role to play and the strategy asks for everyone in Bradford to do their bit to help reduce air pollution, including residents, businesses, Local Authorities, other public sector organisations such as the police, the ambulance service, bus and train companies, taxis and even visitors to the region.

References

1. DEFRA analysis using interim recommendations from COMEAP's working group on NO₂. The working group made an interim recommendation for a coefficient to reflect the relationship between mortality and NO₂ concentrations (per µg/m³). COMEAP has not yet made any estimates of the effects of NO₂ on mortality. Any analysis will be subject to change following further analysis by the working group and consultation with the full committee.
2. The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom
3. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/332854/PHE_CRCE_010.pdf
4. <http://www.legislation.gov.uk/ukpga/2011/20/contents/enacted>
5. https://www.bradford.gov.uk/NR/rdonlyres/17194ADB-3A10-4C38-94F4-6DF704A56E68/0/WYLES_consultationversion_V4_14Oct2016.pdf