

Why is this issue important?

Air pollution has short and long-term health effects including worsening the condition of those with cardiovascular¹ and respiratory disease (COPD Chronic Obstructive Pulmonary Disease) potentially inhibiting the growth of lung tissue in infants; aggravating asthma in those already diagnosed with the condition and in the longer term, reducing life expectancy at a population level.² Some people with cardiovascular and respiratory diseases (especially older people) can be adversely affected by day-to-day changes in air pollutants, including an increased risk of hospital admission and mortality.³

Long-term exposure to air pollution has a lasting effect on health, though the effects vary depending on where people live and the type of pollutant mixture that people are exposed to. Across the UK as a whole it is estimated that for those born in 2008 the average loss of life expectancy from man-made air pollution is approximately six months.⁴ The impact of long-term exposure on vulnerable groups is likely to be more significant. Exposure to local airborne pollutants is more prevalent at recognised roadside locations that are recommended for designation in a new Air Quality Management Area (AQMA),

Key outcomes

- ***Air pollution (Public Health Outcomes Framework).***

Impact in Brighton & Hove

Airborne fine particles (PM_{2.5}) are monitored in Preston Park as part of the UK monitoring network. The site is classed as urban background and is therefore not a roadside monitoring location.

Observed annual concentrations of PM_{2.5} have not exceeded target levels defined by Defra (however there were some daily spikes in measured concentrations). Policy to monitor and reduce regional PM_{2.5} is made at a national and international level. Compared with background concentrations mapped by Defra, higher

concentrations of fine particulate are expected within the AQMA in close proximity to diesel emissions.

The Public Health Outcomes Framework assesses all-cause adult mortality attributable to long-term exposure to recent levels of anthropogenic particulate air pollution.⁵ This relates the fraction (%) of all-cause adult mortality attributable to long-term exposure to levels of anthropogenic particulate air pollution. The indicator is an estimated proportion that takes account of Defra background monitors, but not local roadside concentrations. It represents the estimated annual mortality attributable to fine particles in the population aged 30+, as a proportion of total deaths of those aged 30+.

The value of the indicator for Brighton & Hove for 2010 is 5.40%.

PM₁₀ (particulate matter with diameter less than ten microns) is monitored adjacent to the A23 in Brighton. The average value during 2011 and 2012 was close to 27µg/m³ compared with a limit value of 40 µg/m³. In 2013 new PM₁₀ monitoring started on North Street and results are expected in 2014.

Our local monitoring locations are currently under review in accordance with the needs of Local Air Quality Management Duties (LAQM) and those of our transport partners.

Ground level ozone concentrations are monitored against limit values at Stanmer and Preston Parks. Higher concentrations of ozone are most likely to be recorded in rural areas during sunny conditions.

Concentrations of Nitrogen Dioxide (NO₂) continue to exceed national limits in certain streetscapes⁶ in Brighton, Portslade and Rottingdean High Street. NO₂ monitoring records suggest that average concentrations were higher in 2011 and 2012 than 2008 and show little improvement during the past ten years. However, a longer-term improvement is indicated by monitors outside of worse-case streets⁷ e.g. at Hove Town Hall, Preston Park and South Downs.

¹ COMEAP. Cardiovascular Disease and Air Pollution; 2006.

² Health Protection Agency. Health Protection in the 21st Century; 2005.

³ COMEAP. The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom; 2010.

⁴ DEFRA. Valuing the Overall Impacts of Air Pollution; 2010.

⁵ Public Health Outcomes Framework <http://www.phoutcomes.info/public-health-outcomes-framework#gid/1000043/par/E12000008/ati/102/page/6/>

⁶ Area immediately parallel (10m either side) of an urban transport corridor.

⁷ Refers to levels 40 to 80 µg/m³ NO₂ as a long-term mean. Between one and two times the legal limit under EU and English Law.

Within the city, road transport is the primary cause of breaches of the NO₂ limit value, but commercial and domestic heating such as wood and coal burning could be increasingly important contributors. Roadside breaches of the NO₂ limit value occur predominantly within nine metres of certain road carriageways. At many locations the residential façade is one to seven metres from the road kerb. Stop-start traffic, heavy vehicles, acceleration of diesel vehicles and the proximity of building enclosure adjacent to traffic are factors which can result in the air quality limit value being exceeded.

Recent work carried out by Brighton & Hove using 2013 address gazetteer data in combination with dispersion model results estimates the number of people affected by traffic related air pollution. A tally of: 21.6 km of road length exceed the NO₂ standard at the parallel building line. It is estimated that between 2,000 and 2,500 residential dwellings are exposed to concentrations above the standard of 40 µg/m³ over durations of a year or more.

It is estimated that private cars contribute no more than half of roadside NO₂ pollution in the most affected transport corridors, with trucks, vans, taxis and buses contributing up to three quarters. There is considerable variability between different roads, and on some streets the contribution from one vehicle type can be negligible to small, e.g. there are no bus routes along Viaduct Road and few private cars on sections of North Street and Western Road.

The council has approved in principle a smaller Air Quality Management Area (AQMA) in which it is considered that English and EU limits for NO₂ are not likely to be met. The new AQMA includes a small section close to the junction between Preston Road and The Drove and a separate area along Rottingdean High Street. Three quarters of the 2008 AQMA is to be revoked. A new air quality action plan will target the remaining AQMA (243 hectares).

Where we are doing well

After an increasing trend in traffic for many years, decreases in traffic numbers have been recorded

on some road links since 2007/08.⁸ It is thought this is influenced by active measures to reduce traffic and a slowdown in the economy. A notable shift towards cycling and walking can be attributed to both. However, there is an increasing trend in the number and proportion of diesel vehicles and older petrol cars on the road and this is unlikely to be beneficial for roadside air quality in most affected areas.

The airAlert service provides real time information on pollution episodes across Sussex with messages relating to the potential for predicted pollution levels to impact on population health, targeted at those with asthma and other respiratory conditions.

The Local Sustainable Transport Fund has given Brighton & Hove City Council £4 million to invest in improving the Lewes Road, an area affected by air quality issues. The primary aims are carbon reduction and job creation; it is also hoped that the project will benefit local air quality at the roadside.

Local inequalities

National research⁹ has shown that higher relative concentrations can be observed in the most deprived populations in England. For NO₂ and PM₁₀, this distribution can largely be explained by road transport sources in urban areas, and the proportion of deprived communities in some urban areas.

An equalities impact assessment was submitted with the 2011 Brighton & Hove Air Quality Action Plan. The AQMA includes a mix of land use at roadside including a high proportion of flats above commercial premises, town house conversions, houses in multiple occupation, accommodation for students and private sector housing. We do not know for sure how some groups are affected more than others. Some parts of the city centre are desirable well connected areas to live in with high rental/purchase prices, so areas of poorer air quality locally are not always concurrent with deprived neighbourhoods.

⁸ Brighton & Hove City Council. Air Quality Action Plan. 2011. Available at: <http://www.brighton-hove.gov.uk/index.cfm?request=b1000293> [Accessed 12/08/2013]

⁹ DEFRA. Air Quality and Social Deprivation in the UK: an environmental inequalities analysis; 2006.

6.4.9 Air quality

Predicted future need

Recent monitoring suggests little or no improvement in NO₂ levels at most affected locations over longer durations.

What we don't know

We do not have a local estimate of the attributable impact on health from air pollution in the city that takes account of roadside concentrations and the mixture of multiple pollutants.

The air quality action plan is to explore alternative vehicle technologies in order to reduce emissions where reduction is needed most. Uncertainties exist regarding future emission performance in the AQMA where stop-start drive circuits with hill climbs are the norm.

Key evidence and policy

The key objective in the city's Local Air Quality Action Plan is to reduce the number people living in the area above NO₂ limit values. The improvement needed is challenging and the measures multifaceted. They are not listed in their entirety but include:

- actions to encourage switches to alternative fuels (including bio-gas and electric) and vehicles with lower emissions in urban settings
- improvements in traffic flows and road surfaces
- educational initiatives to encourage behaviour change, supported by measures such as car clubs and providing information on traffic flow

Other national evidence includes:

- Committee on the Medical Effect of Air Pollutants <http://www.comeap.org.uk/>
- COMEAP (2010) The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom and COMEAP (1998) The quantification of the effects of air pollution on health in the United Kingdom <http://comeap.org.uk/documents/reports.html>
- DEFRA (2008) UK Air Quality Strategy for <http://www.defra.gov.uk/environment/quality/air/air-quality/approach/>

Recommended future local priorities

1. Determine the contribution to poor air quality from different vehicle categories at various locations
2. Establish a new air quality action plan
3. Influence bus, taxi, waste, council and emergency vehicle fleet procurement and look to reducing dependence on diesel
4. Discussion and shared information with the bus companies regarding emission improvement of oxides of nitrogen and particulate
5. Ongoing discussions with taxi licensing policy regarding oxides of nitrogen and particulate emission improvement and checks in place to insure good upkeep of abatement kit; exhaust particulate filters and catalysts
6. Development Control linked with National Planning Policy Framework (NPPF) and Sussex Guidance; architecture, design and ventilation strategy encouraged to mitigate residential exposure to ambient pollution

Key links to other sections

- Transport and active travel
- Coronary heart disease
- Respiratory disease
- Maternal and infant health

Further information

Brighton & Hove City Council Air Quality Action Plan <http://www.brighton-hove.gov.uk/index.cfm?request=b1000293>

Sussex Low Emission Strategy http://www.lowemissionstrategies.org/sussex_region.html

Sussex-Air <http://www.sussex-air.net/>

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