



Derby City Council

HEALTH AND WELLBEING BOARD

2 June 2016

ITEM 8

Report of the Derbyshire Chief Regulators
Group

Air Quality and Health in Derby

SUMMARY

- 1.1 There is a growing evidence base that demonstrates long term exposure to air pollution is harmful at levels well below current air quality targets and is causing a significant morbidity and mortality burden in Derby City.
- 1.2 The impact of air pollution affects the whole population, however disproportionately affects the young, older people, those with underlying health conditions and the most disadvantaged within our communities.
- 1.3 Emerging challenges could potentially compromise progress towards air quality improvements across the city.
- 1.4 Prioritising action on air quality would significantly improve the public health outcomes of the people in Derby City. Even modest decreases in air pollution can lead to population impacts including increase in life expectancy.
- 1.5 Interventions to address air quality will deliver wider public health benefits and support objectives within the health and wellbeing board planning and health strategy.

RECOMMENDATION

- 2.1 That the Health and Wellbeing Board receive an annual report on the state of air quality in Derby City with particular reference to trends in nitrogen dioxide (NO₂) and particulate matter (PM).
- 2.2 That the Health and Wellbeing Board recommend to local planning authorities in Derby City that they adopt a joint Supplementary Planning Document with the other Derbyshire authorities.
- 2.3 That the Health and Wellbeing Board agree to the inclusion of an 'Air Quality' chapter within the JSNA.
- 2.4 That the Health and Wellbeing Board recommend the establishment of a working group on air quality improvement.

REASONS FOR RECOMMENDATION

- 3.1 Air quality is a significant determinant of health, and is a substantial risk factor in the mortality and morbidity of the local population.
- 3.2 Improvements in air quality require joint strategic action across a range of stakeholders. Oversight by the Health and Wellbeing Board will bring additional momentum and focus to the work of local authority partners it represents.

SUPPORTING INFORMATION

4. Background

- 4.1. By far the largest disease burden attributable to environmental exposure and management of chemicals is related to exposure to air pollution. The local mortality burden attributed to particulate matter (PM_{2.5}) air pollution in Derby City is calculated as being equivalent to 131 deaths and an associated loss to the population of 1425 life-years¹.
- 4.2 The health problems resulting from exposure to air pollution have a high cost to people who suffer from illness and premature death, to our health services and to business. In the UK, these costs add up to more than £20 billion every year, on a par with those from smoking and obesity⁴.
- 4.3 Air pollution is associated with a number of effects on health including wheezing, coughing, worsening of respiratory diseases (such as asthma and chronic bronchitis), lung cancer, early-life effects, deaths and hospital admissions from respiratory and cardiovascular diseases. The most significant effect of air pollution on public health is thought to be due to long-term exposure to particulate air pollution (PM).
- 4.4 The burden of death and ill health arising from poor air quality is experienced by all within the population and occurs across the lifespan, but disproportionately affects individuals and subgroups of the population, including those living in environments close to main transport routes, the most deprived communities, children, older people and those with pre-existing medical conditions such as heart disease and respiratory conditions.
- 4.5 Current research indicates that at a population level, no thresholds of effect can be identified for the common air pollutants. This means that there are benefits to be gained from improving air quality, even below current EU and UK limits. Reductions in population exposure to air pollution yield appreciable benefits in terms of increased life expectancy.
- 4.6 Indicator 3.01 of the Public Health Outcomes Framework measures “Fraction of mortality attributable to particulate air pollution”. Predicted mortality fractions equal or exceed the East Midlands rate of 5.6% within Derby City (Table 1).

Table 1; Fraction of mortality attributable to particulate air pollution PM_{2.5} (2013): 3.01 Public Health Outcome

Local Authority	Attributable Fraction (%) [*]	Attributable Deaths (Aged 25+) ^{**}	Associated Life-Years Lost ^{***}
Derby UA	5.7	131	1425
Derbyshire County Council	5.4	402	4041
Amber Valley	5.3	67	656
Bolsover	6.2	46	440
Chesterfield	5.4	59	572
Derbyshire Dales	4.5	33	306
Erewash	5.7	61	647
High Peak	4.4	39	451
North East Derbyshire	6.1	55	529
South Derbyshire	5.4	42	439

Source; ^{*} The proportion of deaths estimated to be due to long term exposure to anthropogenic particle air pollution (2013)

^{**}Long term exposure to anthropogenic particle air pollution is estimated to have an effect on mortality risks equivalent to the number of attributable deaths. Air pollution is likely to contribute to a small amount to the deaths of a large number of exposed individuals rather than being solely responsible for the number of deaths equivalent to the calculated figure of attributable deaths (2011). ^{***}The years of life lost to the population due to increased mortality risk associated with exposure to particle air pollution (2011).

- 4.7 Further evidence and understanding of the impacts of air pollution continue to emerge. The impact of poor air quality lasts far into the future, however improvements made now will also deliver long lasting benefits in children and help older people to stay independent and well, benefiting individuals and easing the pressure on our NHS and social services.
- 4.8 Action around air quality can have far reaching benefits and could indirectly deliver improvements in a range of indicators within the Public Health Outcomes and NHS Outcomes Framework.

5. Sources of air pollution

- 5.1. The main anthropogenic (man-made) sources of outdoor air pollutants are traffic, fossil fuel power stations, industrial activities and cement kilns. Road transport is estimated to be responsible for up to 70% of the harm associated with air pollution⁴.
- 5.2 Nitrogen dioxide (NO₂) is a product of combustion from engines, boilers and furnaces. At relatively high concentrations, NO₂ acts as an irritant causing inflammation of the airways and, can increase susceptibility to respiratory infections, increase the sensitivity of asthmatics to allergens and increase the likelihood of asthma attacks and

respiratory illnesses in children⁵.

- 5.3 Air pollutant particles or particulate matter (PM) are arguably the most important component of ambient air with regards to health. The main sources of particles are motor vehicles and non-nuclear (e.g. coal fired) power stations. Particles found in ambient air are generally divided up on the basis of size. Smaller particles such as those represented by PM_{2.5} (particles smaller than 2.5 micrometres) are thought to have greater effects on health as they can be carried deeper into the lungs. Knowledge of the effects of particles on health comes from studies that relate short-term or long-term exposure of PM₁₀ and PM_{2.5} to population level mortality (death), and increased admissions to hospital of people suffering from cardiovascular (heart) disease and respiratory (lung) disease⁵.

6. Targets and Standards

- 6.1. Under the Environment Act 1995, local authorities in the UK are required to assess air quality within their administrative areas and report annually. When potential breaches of the Air Quality Standards (AQS) occur, an Air Quality Management Area (AQMA) is declared and an Air Quality Action Plan (AQAP) developed.
- 6.2 There are currently 3 AQMAs in Derby City due to exceedences of the AQS for NO₂.
- 6.3 A recent supreme court ruling has led to the UK government being required to submit a revised Air Quality Plan to the European Commission. The plan sets out how the UK intends to avoid infraction proceedings for its failure to comply with EU Air Quality Directive 2008/50/EC. The government has already intimated that any fines arising from infraction proceedings may be directed to Councils.

7. National Prediction of Air Quality Trends and Local Predictions

- 7.1. Improvements in air quality have stalled since the start of the decade, largely because the predicted improvements in emissions from road traffic have not materialised.
- 7.2 Following the Supreme Court ruling, Defra has carried out air quality modelling of the main UK road network. This concluded that all of the UK will comply with the AQS for NO₂ by 2020 with the exception of six cities, which includes Derby.
- 7.3 There are concerns among local air quality experts that the Defra model predictions could underestimate the true presence of NO₂ and fail to fully recognise the risks posed by particulate matter (PM). Detailed monitoring at local level is anticipated to show local 'hot-spots' of non-compliance which are not identified within the macro-scale Defra model. This could result in a situation where Councils are showing local level breaches of the AQS which are not reflected in national reporting.

- 7.4 Officers consider it important that the Board remains informed on air quality compliance for NO₂ and PM and also on whether local air quality trends reflect the reductions predicted in the Defra air quality model.
- 7.5 The Royal College of Physicians (2016) recommends local government should track exposure to harmful pollutants in major urban areas and near schools and should communicate this information proactively to the public and ensure vulnerable individuals are aware of how to protect themselves.

It is therefore proposed that the Health Protection Board receives annual progress reports on air quality trends for both NO₂ and PM in order to provide a detailed local picture of air quality risk and ensure a mechanism for monitoring the effects of any implemented mitigation measures. In order to retain sufficient profile within local council service planning over the next five to ten years, we propose that air quality be included within the Joint Strategic Needs Assessment.

8. Monitoring and Strategic direction

- 8.1 A key driver of improving air quality over the past 30 years has been the extensive network of air quality monitoring data collected by local authorities. Although generally the levels of air pollution in the City have continued to reduce over the last 10 to 15 years, the 3 AQMAs show that the national objective for NO₂ is still being breached at some busy roadside locations.
- 8.2 Derby City Council actively monitors NO₂ against national Air Quality Objectives (AQOs). They also annually report on compliance with the AQS for PM as well as other ambient pollutants such as benzene, sulphur dioxide (SO₂), carbon monoxide (CO) and lead, however currently none of these pollutants are monitored.
- 8.3 The need for budget savings creates increasing challenges on authorities' ability to maintain investment in air pollution monitoring. Reductions in monitoring could compromise the data necessary to evidence the need for intervention, and significantly impact the authority's ability to manage improvements in air quality and reduce inequalities.
- 8.4 Air Quality Action Plans to date have predominantly focused on controlling NO₂. There will be growing demand from the public and increasing need from the medical community for action on PM reduction. Ultimately it is beneficial to reduce emissions of, and exposure to, all common air pollutants.
- 8.5 Other than through the delivery of AQAPs there is currently no mechanism locally to promote reductions in air pollutant emissions or people's exposure, or to join-up working to maximise the wider health or climate change benefits associated with air pollution actions. Environmental health, health, social care, transport, housing, planning and public health all have a role to play. Development of a cross directorate and organisational working group could enable strategic oversight and drive of actions on air quality, including promoting alternative fuels; ensuring polluters take accountability, act when limits are exceeded, promotion of healthy workplaces and encouraging active transport.

9. Air quality improvements and economic growth

- 9.1 Good air quality and economic growth and prosperity are not mutually exclusive. However, increases in traffic and proliferation of combustion plant for energy production associated with new development, without adequate control could result in air quality deterioration specifically in the most disadvantaged groups in our community.
- 9.2 To support and promote the growth agenda, whilst delivering improvement to local air quality, development will need to include sufficient consideration and inclusion of sustainable air quality mitigation measures.

Local plans can impact air quality in a number of ways, including type of developments, location and encouragement to sustainable transport. National Planning Practice Guidance states local plans must take into account Air Quality Management Areas and risk factors, and planning decisions should consider appropriate and proportionate source reduction and exposure reduction measures within the environmental impact assessment process.

- 9.3 Measures detailed in the Local Transport Plan will not be sufficient on their own to solve the air pollution/air quality challenge faced in Derbyshire. It is therefore considered that local policy guidance in the form of a Supplementary Planning Document (SPD) would enable a consistent and proportionate approach across the City and County and ensure consideration of the relevant evidence and guidance within planning decisions. The SPD would support Derby City's duty to cooperate on planning and health, as well as delivering of some of the Air Quality Plan measures. It would also enable Councils to promote the reduction of air pollutants when concentrations are below the relevant AQS but continue to present a potential impact to the health of the most vulnerable such as near schools or care homes.

REFERENCES

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3. Every breath we take – The lifelong impact of air pollution. Royal College of Physicians (2016) <https://www.rcplondon.ac.uk/projects/outputs/every-breath-we-take-lifelong-impact-air-pollution>
4. Statistics on obesity, physical activity and diet: England, 2014, Information Centre for Health and Social care (2014)
5. Fine-Particulate Air Pollution and Life Expectancy in the United States, C. Arden Pope III, Ph.D., Majid Ezzati, Ph.D., and Douglas W Dockery, Sc.D., New England Journal of Medicine, 2009: 360:376-86,
6. <http://uk-air.defra.gov.uk/library/ageg/publications>
7. <http://webarchive.nationalarchives.gov.uk/20140505104700/http://www.comeap.org.uk/introduction-to-air-pollution/117-oxides-of-nitrogen.html>

This report has been approved by the following officers:

Legal officer Financial officer Human Resources officer Estates/Property officer Service Director(s) Other(s)	
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For more information contact: Background papers: List of appendices:	Karl Suschitzky 01332 641958 karl.suschitzky@derby.gov.uk None Appendix 1 – Implications
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IMPLICATIONS

Financial and Value for Money

- 1.1 No current financial implications

Legal

- 2.1 No current legal implications. Legal involvement will be required in the event of development of planning guidance.

Personnel

- 3.1 None

IT

- 4.1 None

Equalities Impact

- 5.1 Poor air quality is known to disproportionately impact the health of the young, older people, those with underlying conditions and the most disadvantaged communities. Addressing air quality will support work to reduce health inequalities.

Health and Safety

- 6.1 None

Environmental Sustainability

- 7.1 None

Property and Asset Management

- 8.1 None

Risk Management

- 9.1 None

Corporate objectives and priorities for change

- 10.1 Work to address air quality could directly and indirectly support corporate objectives including strategies to reduce health inequalities, increase physical activity, air quality management plans, area plan, and transport strategies.

