

**Members are reminded that they must declare all relevant pecuniary and non-pecuniary interests relating to any items of business to be discussed at this meeting**

**BIRMINGHAM CITY COUNCIL**

**HEALTH, WELLBEING AND THE ENVIRONMENT OVERVIEW AND SCRUTINY COMMITTEE**

**TUESDAY, 17 JANUARY 2017 AT 10:00 HOURS**  
**IN A JOINT INQUIRY ON THE IMPACT OF POOR AIR QUALITY ON**  
**HEALTH IN BIRMINGHAM - COMMITTEE ROOMS 3 & 4, COUNCIL**  
**HOUSE, VICTORIA SQUARE, BIRMINGHAM B1 1BB, [VENUE**  
**ADDRESS]**

**A G E N D A**

**1 NOTICE OF RECORDING**

The Chairman to advise/meeting to note that this meeting will be webcast for live and subsequent broadcast via the Council's Internet site ([www.birminghamnewsroom.com](http://www.birminghamnewsroom.com)) and that members of the press/public may record and take photographs. The whole of the meeting will be filmed except where there are confidential or exempt items.

**2 APOLOGIES**

To receive any apologies.

**3 DECLARATIONS OF INTERESTS**

Members are reminded that they must declare all relevant pecuniary interests and non-pecuniary interests relating to any items of business to be discussed at this meeting. If a pecuniary interest is declared a Member must not speak or take part in that agenda item. Any declarations will be recorded in the minutes of the meeting.

**4 INTRODUCTION BY CHAIRMAN**

<b><u>3 - 146</u></b>	5	<b><u>SESSION PLAN / TERMS OF REFERENCE / WRITTEN EVIDENCE AND BACKGROUND INFORMATION</u></b>
<b><u>147 - 166</u></b>	6	<b><u>PUBLIC HEALTH BIRMINGHAM / PUBLIC HEALTH ENGLAND</u></b>  Dr Wayne Harrison, Assistant Director of Public Health/Consultant in Public Health. Alec Dobney, Unit Head, Environmental Hazards & Emergencies Department, CRCE; Karen Exley, Senior Environmental Public Health Scientist, Air Pollution & Climate Change Unit, Environmental Change Department, CRCE.
<b><u>167 - 192</u></b>	7	<b><u>ENVIRONMENTAL PROTECTION, BIRMINGHAM CITY COUNCIL</u></b>  Mark Wolstencroft, Air Quality Lead in Environmental Protection.
<b><u>193 - 198</u></b>	8	<b><u>BIRMINGHAM FRIENDS OF THE EARTH</u></b>  John Newson.
<b><u>199 - 202</u></b>	9	<b><u>BIRMINGHAM TREES FOR LIFE</u></b>  Jane Harding (Project Manager); Simon Needle and Councillor Fiona Williams. Also attending:- Paul O'Day, Street Services Manager and Dominic Waller, Street Scene and Tree Manager, Birmingham City Council.
	10	<b><u>LEAD CABINET MEMBER FOR REDUCING AIR POLLUTION</u></b>  Councillor Lisa Trickett. Also in attendance:- Anne Shaw, Assistant Director, Transportation and Connectivity and David Harris, Transport Policy Manager, Birmingham City Council.
	11	<b><u>TRANSPORT FOR WEST MIDLANDS</u></b>  Adam Harrison, Senior Policy Officer, Transport for West Midlands.
<b><u>203 - 210</u></b>	12	<b><u>BIRMINGHAM CHILDREN'S HOSPITAL NHS FOUNDATION TRUST</u></b>  Dr Chris Chiswell, Consultant in Public Health Medicine.
	13	<b><u>CLOSING STATEMENT BY THE CHAIRMAN</u></b>

Health, Wellbeing and the Environment / Economy, Skills and Transport O&S Committees  
The Impact of Poor Air Quality on Health in Birmingham

**Tuesday 17<sup>th</sup> January 2017 @ 10.00am**  
**Committee Rooms 3 & 4, The Council House, Birmingham**

Purpose: To consider evidential links between poor air quality and poor health, the main controllable sources of emissions causing this problem and what can be done to improve air quality with a view to improving health outcomes in Birmingham.

Meeting type: Public meeting live-streamed via the internet with possible press attendance

Time	
1000-1005	Welcome & introduction by Chair, <ul style="list-style-type: none"> <li>• Purpose of the session</li> <li>• Anticipated outcomes of the day</li> </ul>
10.05-1105	Dr Wayne Harrison Assistant Director of Public Health/Consultant in Public Health  Alec Dobney and Karen Exley Public Health England
1105-1145	Mark Wolstencroft Air Quality Lead in Environmental Protection
1145-1215	Friends of the Earth <ul style="list-style-type: none"> <li>• John Newson</li> </ul>
1215-1300	Birmingham Trees for Life <ul style="list-style-type: none"> <li>• Jane Harding (Project Manager) and Simon Needle</li> <li>• Councillor Fiona Williams</li> </ul>
	<ul style="list-style-type: none"> <li>• Paul O'Day, Street Services Manager, BCC</li> <li>• Dominic Waller, Street Scene and Tree Manager, BCC</li> </ul>
1300-1400	LUNCH BREAK
1400-1440	Councillor Lisa Trickett Lead Cabinet Member for Reducing Air Pollution  Anne Shaw, Assistant Director, Transportation and Connectivity / David Harris, Transport Policy Manager
1440-1520	Adam Harrison Senior Policy Officer Transport for West Midlands
1520-1600	Dr Chris Chiswell Consultant in Public Health Medicine Birmingham Children's Hospital NHS Foundation Trust
1600-1605	Closing Statement - Chair,







# The impact of poor air quality on health in Birmingham

Health, Wellbeing & the Environment and Economy, Skills and Transport Overview & Scrutiny Committees

<b>Lead Member:</b>	Cllr John Cotton Cllr Zafar Iqbal
<b>Inquiry Members:</b>	Cllrs Uzma Ahmed, Mick Brown, Carole Griffiths, Kath Hartley, Mohammed Idrees, Karen McCarthy, Robert Pocock, Deirdre Alden, Andrew Hardie, Simon Jevon, Sue Anderson  Phil Davis, Diane Donaldson, Ziaul Islam, Josh Jones, John O'Shea, Eva Phillips, Sharon Thompson, David Barrie, Timothy Huxtable, Ken Wood, Zaker Choudhry
<b>Officer Support:</b>	Rose Kiely, Group Overview and Scrutiny Manager Gail Sadler, Research and Policy Officer Baseema Begum, Research and Policy Officer
<b>Key question:</b>	Is there an evidential link between poor air quality and poor health, what are the main controllable sources of this in Birmingham, and what can be done to improve air quality with a view to improving health outcomes in Birmingham?



## The impact of poor air quality on health in Birmingham

<b>Key lines of enquiry:</b>	<ul style="list-style-type: none"><li>• What evidence is there about air quality, emission sources, and levels of air pollution in Birmingham or in specific pollution hotspots?</li><li>• How do these rates compare to other comparable major cities in the UK and Europe?</li><li>• What are the main types of air pollution that affect people's health, where do they come from, what is that health impact, and who is most likely to suffer the effects?</li><li>• Are there any trends which can be identified in relation to air quality and public health in the city?</li><li>• For each air pollution related health problem, what is the likely nature and scale of impact on the City's health care system, and what are the likely social and economic costs of this?</li><li>• Birmingham has been ordered by the Government to impose charges in 'clean air zones' to cut pollution. What types of vehicle, driving mode, location and fuel system most contribute to the health impacts of road traffic, and what would be the most effective ways of implementing and operating a 'clean air zone' so as to minimise these burdens?</li><li>• What are the potential barriers to clean air zones being implemented widely in the city?</li><li>• Are there other measures which can be taken such as for example the planting of urban trees to absorb airborne pollutants and improve air quality and are there any plans in relation to these?</li></ul>
<b>Anticipated outcomes:</b>	<ul style="list-style-type: none"><li>• A clear understanding of the impact of poor air quality on people's health in Birmingham and the main sources of emissions causing this problem; and a set of recommendations that will support the widespread implementation of ways to improve air quality and reduce associated morbidity and mortality in the city.</li></ul>



<b>Key witnesses to include:</b>	<ul style="list-style-type: none"> <li>• Adrian Phillips, Birmingham Director of Public Health (links between poor air quality and public health implications, evidence from air quality team)</li> <li>• Public Health England (Air quality steering group)</li> <li>• Professor John Thornes, University of Birmingham (re work on levels of pollution at New Street Station and elsewhere in city who advocates installing permanent monitoring system)</li> <li>• Asthma UK</li> <li>• Dr Christopher Chiswell, Consultant in Public Health Medicine, Birmingham Children's Hospital (banning smoking from streets adjacent to BCH, interested to hear about how will this be enforced.)</li> <li>• Representative from Primary Care</li> <li>• Representative from Hospital Trust (Re hospital admissions for asthma/COPD etc)</li> <li>• Respiratory consultant</li> <li>• Jackie Homan, BCC Sustainability and Climate Change Manager, (Reducing CO2 emissions, Green Commission work on Carbon Roadmap and implementation plan, Green City Vision)</li> <li>• Anne Shaw, BCC AD Transport and Connectivity</li> <li>• Transport West Midlands</li> <li>• Paul O'Day, Street Services Manager, BCC Highways (interface with Highways PFI contract)</li> <li>• BCC Regulatory Services</li> <li>• Birmingham Friends of the Earth (relationship between air quality, the environment and health)</li> </ul>	
<b>Background information to include:</b>	Air pollution in the UK 2015, DEFRA September 2016 Background Report by Birmingham Public Health and BCC Transport and Connectivity	
<b>Inquiry Plan:</b>	Nov 2016 17 Jan 2017 Jan/Feb 2017 Feb 2017 Mar 2017 4 April 2017	TOR agreed Evidence gathering Report drafting Report agreed by Committee Members Report to Cabinet, 8 Day Rule Final Report submitted to City Council





# Health, Wellbeing & the Environment / Economy, Skills and Transport O&S Committees

## Scrutiny Inquiry: The Impact of Poor Air Quality on Health in Birmingham

### Written Evidence and Background Information

January 2017



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**THE IMPACT OF POOR AIR QUALITY ON HEALTH IN BIRMINGHAM  
BIRMINGHAM CITY COUNCIL OVERVIEW & SCRUTINY INQUIRY  
SUBMISSION OF WEST MIDLANDS CAMPAIGN FOR BETTER TRANSPORT**

## Introduction

1. The Campaign for Better Transport is a national campaign promoting the use of sustainable transport such as walking, cycling and the use of public transport such as buses, rail and Metro. We want to see the creation of a transport system that is a real alternative to the private car. There is a network of local groups around the country, and this document is submitted on behalf of the group for the West Midlands area.
2. This document forms our submission to the joint inquiry by the Health, Wellbeing & Environment and Economy, Skills and Transport Overview & Scrutiny Committees of Birmingham City Council into the impact of poor air quality on health in Birmingham.

## **Is poor air quality caused by transport emissions an issue with public health in Birmingham?**

3. The answer to this question is undoubtedly “yes”. Research by Public Health England conducted in 2014 suggested that exposure to fine particles from road transport emissions was contributing to 1,460 premature deaths per annum in the West Midlands conurbation and 520 within the city of Birmingham.<sup>1</sup> That is a significant number and warrants both local and national government taking action to reduce this.
4. Emissions also contribute to exacerbation of asthma, effects on lung function and increased hospital admissions for cardiovascular and respiratory disease (Committee of Medical Effects of Air Pollution 1998, 2001; WHO 2006).
5. The health benefits of active modes of transport (walking and cycling) are well known<sup>2</sup> and the city council and local health agencies in Birmingham have rightly worked to promote and encourage the use of these modes. Poor air quality however may lead to a perception that walking and cycling has a greater risk of exposure to air pollutants as pedestrians and cyclists as they are physically unprotected compared to occupants of vehicles. However, there is some evidence that in slow moving rush hour traffic car occupants can be exposed to higher pollutant levels<sup>3</sup>. Other research has claimed that:

*“cars offer little or no protection against the pollutants generated by vehicle traffic. Road users can be exposed to significantly elevated levels of pollutants as they are, in effect, travelling in a ‘tunnel’ of pollution. Those road users travelling closest to the centre of this tunnel tend to experience higher concentrations of pollutants than those nearer to the roadside”.*<sup>4</sup>

<sup>1</sup> “Estimating Local Mortality Burdens Associated with Particulate Air Pollution”, Public Health England, 2014.

<sup>2</sup> “Cycling and Health – A Briefing Paper for the Regional Cycling Development Team” 2003

<sup>3</sup> van Wijnen, J. Verhoeff, A., Jans, H. and van Bruggen, P. 1995. Exposure of cyclists, car drivers and pedestrians to traffic-related air pollutants, *International Archives of Occupational and Environmental Health*, 67(3), pp. 187-193

<sup>4</sup> Institute for European Environmental Policy/Environmental Transport Association, 1997 Road user exposure to air pollution: Literature review, Weybridge: Environmental Transport Association

6. The conclusion from this is that as well as encouraging modal shift, there needs to be a reduction in traffic volumes. However, it is important that it is a reduction, not an opportunity to grow traffic. Research has shown that providing extra road capacity simply leads to traffic growth and the return of congestion (SACTRA 1994). We would not support any attempt by the council to remove bus lanes or priority measures in order to speed up traffic flow by providing additional capacity. We would point out that since the decision of the council to remove bus priority lanes on Tyburn Road in 2004 reliability of the service along the corridor (the 67) has declined which has led to the operator revising the timetable to allow for a longer travel time. This suggests no benefit in terms of improving traffic flow, and a worse experience for all road users.

### **“Clean Air Zones”**

7. The Government has rightly decided that Birmingham, given the levels of air pollution here and their contribution to air problems, should have a “clean air zone”. However, for this to work it should discourage the use of the more polluting vehicles and encourage a switch to more environmentally friendly ones.
8. For the zone to be credible it will need to include private motor vehicles as well as buses, lorries, taxis and vans. This is especially so given the penetration by both the M6 and M5 within the boundaries of the City of Birmingham, which carry huge volumes of traffic and which forms part of the national strategic road network which, we expect would not be included in the boundaries of the zone.
9. We also know that many of the diesel vehicles currently on the road are not meeting the emissions requirements set down in law, following the emergence of the emissions scandal in summer 2016<sup>5</sup>. It has been suggested that a mass recall of these vehicles will be needed, in order to make software adjustments to reduce emissions to acceptable levels.
10. Introducing charges for the most polluting cars to enter a “clean air zone” could act as a “nudge”, to get car drivers to either switch to other modes of transport or to change from using more polluting petrol and diesel vehicles to ones that will result in less air pollution, such as electric or hybrid vehicles. There is evidence that “nudges” can influence behaviour and lead people to make positive choices, for example the car scrappage scheme was successful in removing elderly vehicles from the roads and replacing them with more environmentally friendly cars with lower emissions of CO<sub>2</sub> and NO<sub>x</sub>.
11. A charge for diesel vehicles, including cars, accessing parts of the capital has been proposed by the Mayor of London in order to tackle air quality issues in the city. Given the situation in Birmingham is just as bad and is leading to huge public health problems it should be introduced here. There will be claims by some of “more taxes on the motorist”; however the reality is that as vehicles with lower or zero emissions are purchased by motorists and the older more polluting vehicles are scrapped revenue will fall. It will not be a cash cow for a local authority. Any revenue from a clean air zone charging scheme should be hypothecated for transport investment.
12. Taxis and private hire vehicles should also be included in the zone. However, there is an issue here in that while Birmingham City Council as a licensing authority can set standards for taxis/private hire vehicles licensed in its area including age and emissions standards, taxis/private hire vehicles in other areas can be licensed to different standards. A taxi/private hire vehicle licensed by another authority (e.g. Solihull) could be driven into the clean air zone and not be compliant? Who would then pay the charge? The taxi/private hire operator, or the hirer?

<sup>5</sup> <https://www.theguardian.com/technology/2016/sep/19/many-car-brands-emit-more-pollution-than-volkswagen-report-finds> 2



13. There need to be consistent standards for taxis/private hire vehicles across the West Midlands county. It may be better and more effective for taxi/private hire licensing to be transferred to be a function of the West Midlands Combined Authority. If that is not possible, there should be a co-ordination of standards across the districts of the West Midlands conurbation, taking into account the proposed “clean air zone”.
14. It would be beneficial for all taxis/private hire vehicles within the West Midlands county to be of consistent quality and low/zero emission vehicles.

## **Buses**

15. Much progress has been made in recent years in improving the quality of bus services within the West Midlands. A “bus alliance” has been established, a partnership between the majority of bus operators in the area including the two largest, National Express West Midlands and Diamond, the West Midlands Combined Authority, the Local Enterprise Partnerships, local authority highways/transportation departments and Transport Focus. The alliance key objective is to improve the quality of bus services in the West Midlands, both in terms of the passenger experience and providing a more modern fleet.
16. A Statutory Quality Partnership Scheme (SQBS) has been established in Birmingham City Centre, which has included a requirement that the majority of buses going into the city centre should have a minimum emissions requirement of Euro V or newer. This has improved things in the city centre and has removed the older, more polluting vehicles from key routes into Birmingham (particularly those run by smaller operators. However, many of these vehicles have now been displaced onto routes in the outer suburbs, such as the Outer Circle. The alliance has an aim for all bus services in the West Midlands county (Birmingham, Sandwell, Solihull, Walsall, Wolverhampton, Dudley and Coventry) to be operated by Euro V or newer vehicles by 2020<sup>6</sup>. Given the air quality issues within Birmingham, it may be desirable for the city council and WMCA to accelerate this for routes within the city. In any event it is important the 2020 target is delivered for the whole West Midlands.
17. It is also disappointing that the vast majority of routes in Birmingham are still operated by diesel powered buses. Only one corridor at present, the 22 and 23 Harborne route, is operated by hybrid buses. We note the plans of National Express West Midlands to introduce 19 fully electric single deck buses onto the Birmingham – Bearwood – Dudley corridor by 2018, together with 22 fuel cell buses<sup>7</sup>. Kings Heath High Street has been recorded as an air pollution hotspot, and it is also used by the 50 bus which is the most intensive and well used service in Birmingham. NXWM use Euro V engine buses on this route at present, but these are still diesel powered. Given the air pollution along the A435 corridor and the district centres of Moseley and Kings Heath we think that the 50 should be operated by greener vehicles and it may be worth introducing the fuel cell buses onto the 50 route. The committee may find it helpful to obtain evidence from National Express West Midlands regarding their future plans.

## **Birmingham New Street Station**

18. The air quality at Birmingham New Street Station has been a concern for a number of years. The research by Professor Thornes of the University of Birmingham has demonstrated just how bad matters are.

<sup>6</sup> “Introduction to the West Midlands Bus Alliance”, West Midlands Combined Authority 2016.

<sup>7</sup> <http://nxbus.co.uk/west-midlands/news/olev-low-emission-bus-scheme-july-2016>

19. Although New Street Station has been redeveloped over the last few years, the superstructure of the station and its platform and track layout is unchanged from its previous iteration. New Street is effectively an “underground” station (indeed it is legally defined as such in accordance with legislation made following the Kings Cross fire of 1987); the concourse and facilities are above platform level. The station does have some open air at both the Bull Ring and Navigation Street sides before the tunnels bringing the lines in under Birmingham City Centre; however these do not provide much relief. When the 1960’s station was built many Inter-City and regional services were operated with a diesel locomotive at one end which would normally be “stopped in the open”. These days the vast majority of diesel powered services are operated by “Diesel Multiple Units” – even Inter-City services operated by the Cross Country franchise, which have diesel engines under each carriage and exhausts spewing emissions at platform level underground. The result is a rail passenger who has made a positive choice to travel into Birmingham by rail is being exposed to dangerous levels of air pollution which could affect their health.
20. We understand the committee will be receiving a detailed submission from Professor Thornes, whose research work was featured in a Channel 4 *Dispatches* programme on air pollution broadcast in February 2016.
21. Clearly action needs to be taken to remove the health risk caused by diesel fumes. This will require the replacement of a number of fleets of trains to take place over the next 7-10 years as new franchises serving Birmingham New Street station come into operation. The technology is now available to the railway industry to build bi-mode trains, battery trains (which take power from the overhead line on electrified railways but uses batteries on non-electrified sections), or locomotives which can use diesel engines and overhead power (a design is being introduced at present by Direct Rail Services – a class 88).
22. Electrification will help; the electrification of the Chase Line between Rugeley and Walsall will remove one source of diesel trains as the Rugeley – Birmingham New Street service will be converted to EMU’s. However, there are a number of other routes such as Birmingham - Shrewsbury where electrification may not happen for a number of years, so it would be desirable for battery trains to replace the current diesel fleet used to operate these services.
23. The Cross Country franchise will be re-let in 2020. These services are currently operated by the Voyager series of Diesel Multiple Unit trains, introduced in 2002. They have poor levels of passenger comfort and do not meet the more stringent emissions regulations introduced in recent years. The city council and the West Midlands Combined Authority should lobby the Department of Transport for the replacement of the Voyagers with more modern trains (such as bi-modes) as a priority in the new Cross Country franchise; in order to remove the fumes from New Street bi-mode trains could take power from the electrified overhead which is on the approaches to New Street in all directions and is also within the station complex.

### **Birmingham Snow Hill lines**

24. These rail services are currently operated by class 172 units. These are relatively modern and have been built to stringent emissions regulations, but it would be desirable in the medium term for the lines operated by the class 172’s to be electrified. This would allow the units to be cascaded elsewhere to replace older diesel trains, with their replacement by electric units on the Snow Hill lines. We have also made clear in our response to the councils Snow Hill masterplan published in 2015 that we do not support the burying underground of Snow Hill in the style of New Street, and given the health issues caused by diesel trains at New Street it would not be desirable for a similar situation to be permitted at Snow Hill.

## **Freight**

25. The freight sector can also assist in improving air quality and minimising emissions. Much better use of rail freight needs to be made. The New Street Station gateway project made use of trains being tripped in to bring construction materials into the site from a depot in Bordesley, and remove rubble and waste back out again. This helped to minimise lorry movements. The shopping centre that is over the station brings in most of its goods by road. Surely there is a big opportunity here for retailers to have their goods shipped in over-night by train, when no passenger services are running into New Street?
26. Birmingham City Council has also made the suggestion in the past of a Freight Consolidation Centre, where companies would deliver goods to the centre rather than their own sites and these would then be tripped from the FCC to the site using low/zero emission vehicles. Given the concerns about air quality these proposals should be re-visited, although it would need a partnership between the council, LEP and private sector to move forward.

***Kevin Chapman***  
***Chair, West Midlands Campaign for Better Transport***  
***January 2017***

## **THE IMPACT OF POOR AIR QUALITY ON HEALTH IN BIRMINGHAM**

*Written submission from Councillor Victoria Quinn.*

**Is there an evidential link between poor air quality and poor health, what are the main controllable sources of this in Birmingham, and what can be done to improve air quality with a view to improving health outcomes in Birmingham?**

“In 5 years my casework load has evidenced considerable levels of respiratory difficulties emanating from “housing” related issues – mainly to do with inappropriate heating/mould/damp within properties – and these are also evidenced in medical testimonies regarding constituents and their housing situations.”

**What evidence is there about air quality, emission sources, and levels of air pollution in Birmingham or in specific pollution hotspots?**

“I would say none. No one knows publically who or where the sample sites are or the frequency with which they are taken.”

**How do these rates compare to other comparable major cities in the UK and Europe?**

“Interestingly, 20 years ago when I lived in France both capital and provincial cities – All cities had daily “air quality” / “pollution” barometers reported in the same way as we, latterly began to have in the UK in regard to “pollen levels” with the weather forecasts. This was on a “city” level – and 20 years ago. Already, as long ago as 2000 Paris had begun to introduce traffic management within the city based on licence plate numbers and whether they were “even” or “odd” digits, to implement days in which traffic was precluded from driving within the city. This was in addition to regular measures which are widespread, and have been for a number of years within inner city areas across Europe whereby, on Sundays “all traffic” is banned from key areas of the city centre / promoting alternative “re-claim” the streets days.”

**What are the main types of air pollution that affect people’s health, where do they come from, what is that health impact, and who is most likely to suffer the effects?**

“Traffic pollution is by far the most publically “visible”. The tunnels within the city centre are brilliant barometers of this (where within months of the “re-paint” the tone had darkened very visibly.) Similarly in inner city areas without wide pavements adjacent to carriageways, there is always an appearance of “more grime”. Bus shelter hoardings are also good indicators as are most other bits of public realm furniture, whereby simply touching them reveals black grime.

It's not rocket science to know that those who are physically nearest to the source of emissions (e.g. the smallest people, and those in push-chairs or disability chairs) are going to be the most directly vulnerable to them. Also those living in environments where those pavements are smaller or there is less / no green, together with those who have the most vulnerability to the receipt of such pollutants in the first place:- elderly or those with existing respiratory vulnerabilities."

**Are there any trends which can be identified in relation to air quality and public health in the city?**

"Entirely expect the incidences of respiratory and other pollutant effects to be concentrated in areas reflecting the IMD map – principally because these areas from a highways and public realm perspective as well as high population densities tend to correspond:- "not" in terms of economics."

**For each air pollution related health problem, what is the likely nature and scale of impact on the City's health care system, and what are the likely social and economic costs of this?**

"Broadly would expect the costs NOT to impact most notably upon NHS related services until their "unfettered" effects have had critical mass time to accumulate to the point that they become acute issues, but they will disproportionately be having effect on those non directly "health" related areas, in terms for example of rise in sickness/absence, school days lost, housing demand – e.g. if there are even the slightest of respiratory effects, these disproportionately lead to the rest. It might be useful in this regard to interrogate simply the number of salbutamol prescriptions ... and not asthma diagnoses ... as well as GP presentations for respiratory tract related presentations. This also has to be set against trends which can disassociate other, non-air pollutant factors, such as decrease in asbestos/smoking bans etc."

**Birmingham has been ordered by the Government to impose charges in 'clean air zones' to cut pollution. What types of vehicle, driving mode, location and fuel system most contribute to the health impacts of road traffic, and what would be the most effective ways of implementing and operating a 'clean air zone' so as to minimise these burdens?**

"Is well known that diesel vehicles are the most prevalent contributors. Birmingham as "motor city" would be expected to demonstrate a higher than average concentration of all licensed diesel vehicles. (This could be easily interrogated via the DVLA to Birmingham postcode registrations). Then in addition to this, there is the fact that the secondary arterial road network serving the city, cuts through and

between local high street/shopping/school areas in such a way that is arguably disproportionately higher to other cities. This means that commercial diesel vehicles are also regularly over concentrated in areas of the city and at all times of day, again potentially disproportionately to other places and with a greater effect. One of the quickest win reductions would be to discourage all commercial diesel and HGV vehicles from “school time” / peak hour transit through and along such areas – also contributing to the road safety challenge and congestion issues within such areas, whereby, congestion also singularly increases emission levels. The diesel issue for all other private vehicles, being a matter more directly for taxation and central government intervention.”

**What are the potential barriers to clean air zones being implemented widely in the city?**

“Without a doubt the impact on small and micro businesses and taxis – unless there are alternative transportation axis developed and worked up.”

**Are there other measures which can be taken such as for example the planting of urban trees to absorb airborne pollutants and improve air quality and are there any plans in relation to these?**

“One of the best examples of this is the living wall planted along the central reservation of Bristol Street by the Southside BID (very low cost – very high economic and health return). This same example is evidence on every major central reservation and carriageway roadside on major carriageways across every major city in China. The particular plant species is highly important though as different greens provide different rates of absorption, some not assisting at all. Public awareness is also really crucial – and linking this to widespread localised information so as to how behaviour helps – for example, on electronic road signs:- providing “pollutant level” indices, along with advice to reduce this; cut your speed / change your gear ... Making information to help shift behaviour and inform, normalised alongside “prevent” measures is crucial, but because this is “invisible” and can’t be felt or seen, it needs to be “de-coded” and people invited in, to own the problem before they can all be involved in reducing it.”

## **THE IMPACT OF POOR AIR QUALITY ON HEALTH IN BIRMINGHAM**

*Written submission from Nigel Cripps.*

The scrutiny committee's enquiry is welcome and I hope the following comments are helpful.

Vested interest – I have respiratory problems and do experience breathing difficulties on the platforms at Birmingham New Street Station.

Background – I have always lived in North Birmingham. In 1991 I moved to my present house to have easy access to the Cross City line which I have used for work and leisure purposes. I am a chartered engineer and spent most of career in the National Health Service in the West Midlands County.

Evidence of pollution – At the public enquiry into the Aston, Newtown and Lozells Area Action Plan the inspector challenged the City about the removal of housing in the East Aston area with no replacement proposed while the infrastructure for housing, schools etc. is available. The City Planner stated that this was due to air quality. No evidence was presented but more recently there has been new housing construction adjacent to Spaghetti Junction which I have noted in recent press reports has the worst air pollution in the country. The committee may wish to learn from this apparent conflict in City policy.

Evidence of air pollution – an anecdote. I recall in the late 90s the then Regional Medical Officer being unsure if he was a hero or a villain. He considered himself a hero for purchasing a diesel car with its lower fuel consumption but was not so sure because within days one of his staff at Birmingham University published a pioneering paper describing the harmful effect of diesel fumes on public health.

A pollution black spot – I experience respiratory problems on the platforms at Birmingham New Street Station. The replacement of loco hauled trains by multiple units with power packs under the floor has made Birmingham New Street Station a smelly and noisier place. It is particularly bad in the evening when units are being formed into longer trains to run empty to the depot. I come across references about the business case for the electrification of the Great Western line out of London Paddington which mentioned but did not quantify cutting costs to the taxpayer (NHS) due to the absence of diesel fumes.

A programme in the Channel 4 Dispatches series broadcast in February this year looked at the issue of air quality and included research conducted by the University

of Birmingham at Birmingham New Street Station. A major redevelopment of the station has recently been completed by Network Rail. However, the Dispatches programme stated:

“One place of particular concern are train platforms, such as the platforms at the newly renovated Birmingham New Street Station – with over 1,000 trains travelling through the station per day, commuters waiting in the tunnels could be faced with very high levels of pollution, including both nitrogen dioxide and particulates.

The EU stipulates that particulate levels – averaged over a year – shouldn’t go above a specific limit. Birmingham University have measured the particulates at Birmingham New Street, and their preliminary sampling results, not yet peer reviewed, indicate high-levels of pollution that are a cause for concern. They have discovered levels on some platforms that appear to be four times the EU limit. On other platforms they appeared to be more than six times and on some nearly seven times. Channel 4 Dispatches carried out their own sampling measurements, which again indicate a cause for concern.

Researchers at Birmingham University, led by Professor John Thornes, tell Dispatches have tried to tell Network Rail about their concerns and findings – in particular about the NO<sub>2</sub> levels.”

Network Rail have now told Dispatches they’re keen to understand ‘... the quality and make-up of the air at Birmingham New Street Station ... We will be asking Birmingham University to investigate this for us in more detail.’ They want the station to be ‘... a safe and healthy environment’ and say in the coming years they will shift to ‘less polluting electric trains’.

<http://www.channel4.com/info/press/news/dirty-secrets-whats-really-in-our-air-channel-4-dispatches>

May I suggest the Committee seeks evidence from Professor Thornes and details of the Network Rail Action Plan.

Removing a pollution black spot – a little history. New York (USA) City banned steam trains at the beginning of the 20<sup>th</sup> century and forced the railway industry to electrify. New York is the USA’s second City so what about Birmingham 100 years later? Radical Change? No.

Banning diesel trains from New Street Station is not as unachievable as it may seem. At the beginning of the 20<sup>th</sup> century electric traction was replacing steam on

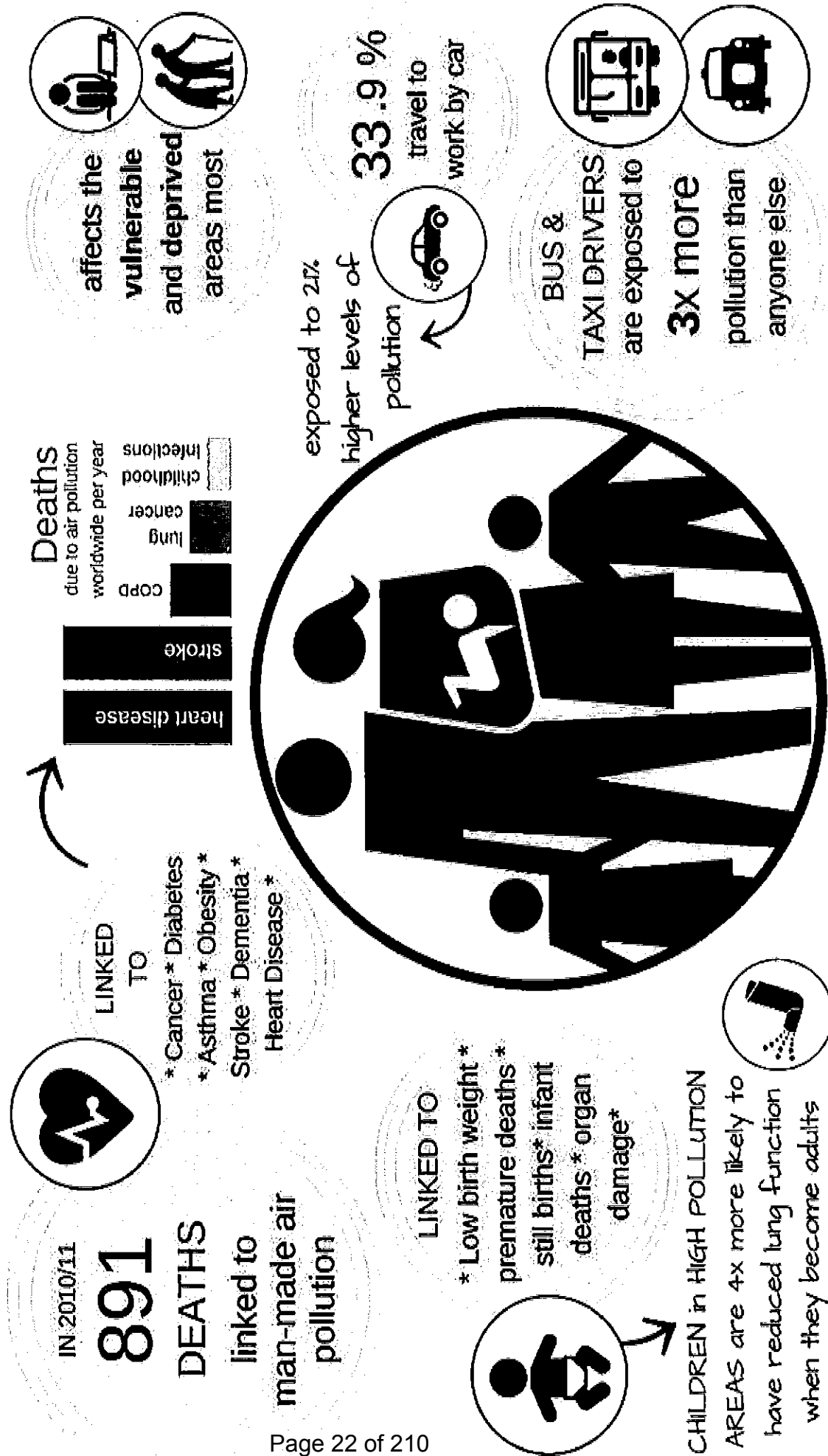


suburban railways and was seen to be the future. Street tramways were being converted from steam to electric traction and early motor buses were petrol with electric drives a hybrid in modern parlance. New York accelerated an evolutionary change. In the last few years the railway industry has successfully experimented with battery powered trains and the major polluters in Birmingham New Street (Voyager trains) have electric drives and with additional battery power could have the engines turned off in tunnels and Birmingham New Street and at other poorly ventilated underground stations.

For further information please do not hesitate to contact me.

(Contact details provided).

### EFFECTS OF AIR POLLUTION





House of Commons  
Environment, Food and Rural  
Affairs Committee

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# Air quality

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## Fourth Report of Session 2015–16





# House of Commons

## Environment, Food and Rural Affairs Committee

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# Air quality

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## Fourth Report of Session 2015–16

*Report, together with formal minutes  
relating to the report*

*Ordered by the House of Commons  
to be printed 20 April 2016*

**HC 479**

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by authority of the House of Commons

## Environment, Food and Rural Affairs Committee

The Environment, Food and Rural Affairs Committee is appointed by the House of Commons to examine the expenditure, administration, and policy of the Department of Environment, Food and Rural Affairs and associated public bodies.

### Current membership

[Neil Parish MP](#) (Conservative, Tiverton and Honiton) (Chair)

[Chris Davies MP](#) (Conservative, Brecon and Radnorshire)

[Jim Fitzpatrick MP](#) (Labour, Poplar and Limehouse)

[Simon Hart MP](#) (Conservative, Carmarthen West and South Pembrokeshire)

[Dr Paul Monaghan MP](#) (Scottish National Party, Caithness, Sutherland and Easter Ross)

[Rebecca Pow MP](#) (Conservative, Taunton Deane)

[Ms Margaret Ritchie MP](#) (Social Democratic and Labour Party, South Down)

[David Simpson MP](#) (Democratic Unionist Party, Upper Bann)

[Angela Smith MP](#) (Labour, Penistone and Stocksbridge)

[Rishi Sunak MP](#) (Conservative, Richmond (Yorks))

[Valerie Vaz MP](#) (Labour, Walsall South)

### Powers

The Committee is one of the departmental select committees, the powers of which are set out in House of Commons Standing Orders, principally in SO No 152. These are available on the internet via [www.parliament.uk](http://www.parliament.uk).

### Publication

Committee reports are published on the Committee's website at [www.parliament.uk/efracom](http://www.parliament.uk/efracom) and in print by Order of the House.

Evidence relating to this report is published on the [inquiry publications page](#) of the Committee's website.

### Committee staff

The current staff of the Committee are David Weir (Clerk), Sian Cooke (Second Clerk), Sarah Coe (Senior Committee Specialist), Anwen Rees (Committee Specialist), Ellen Bloss (Senior Committee Assistant), Holly Knowles, (Committee Assistant) and Nick Davies (Media Officer).

### Contacts

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## Summary

Poor air quality is damaging the UK's environment and harming the nation's health: emissions have declined significantly over many decades, but not far enough to prevent the early deaths of 40-50,000 people each year from cardiac, respiratory and other diseases linked to air pollution. The Government must act now to tackle this public health emergency: the Cabinet Office should set out before the summer recess how it will ensure that all government policies take air quality impacts into account; the Department for Environment, Food and Rural Affairs (Defra) must publish by the end of 2016 an overarching strategy for tackling all air pollutants, produced by all sectors from transport and industry to energy and farming. The Government must update Parliament annually on progress in delivering the strategy's objectives.

### Clean Air Zones

Defra's plans for new Clean Air Zones to cut nitrogen dioxide pollution give councils insufficient control over implementation: 'one size fits all' Zones must not be imposed on cities from Southampton to Leeds. Communities must be able to tailor controls to meet their own circumstances, for example to charge vehicles to access Zones at certain times of day or to target specific bus routes. Defra proposes to allow only London and five other cities to charge polluting vehicles: dozens of areas elsewhere in England exceed EU limits so legislation must give charging powers to councils for use by any community which supports the approach. The Government must also devolve to councils greater flexibility over how they can use powers over traffic movement and new development and provide them with adequate funding to take the best action for their communities, inside and outside the Zones.

### Cutting transport emissions

Volkswagen apologised for using software to cheat EU vehicle emissions tests. But it has not given transparent explanations or taken effective remedial action so as to regain consumer trust. The Government must ensure that vehicle company marketing claims are fully accurate and must work with the EU to establish tougher standards that cut vehicle emissions on the road.

Government incentives are needed now to establish a self-sustaining low-emissions vehicle market. Funding for new refuelling infrastructure and grants to help buy cleaner vehicles is welcome but currently insufficient to get polluting diesel vehicles off the road quickly. The Government should develop proposals now so that at the next Budget it can introduce a scheme to give those scrapping diesel vehicles over about 10 years old a discount on buying an ultra-low emissions vehicle.

### Agricultural emissions

Defra must help farmers to adopt modern practices that cut emissions of greenhouse gases and local air pollutants including ammonia. Defra should survey farmers about their needs and target support where it is most needed—for example, to improve manure and nutrient management and cut methane emissions through improved feed for livestock. Better use could be made of Common Agricultural Policy money to achieve air quality improvements: a combination of financial pressure on farm incomes, such support will achieve more than additional regulation and save farmers money.

# 1 Our inquiry

1. Poor air quality has environmental and health impacts.<sup>1</sup> Each year air pollution causes 3.3 million deaths worldwide; the World Health Organisation has called this a public health emergency.<sup>2</sup> In the UK, two air pollutants alone (particulates and nitrogen dioxide) contribute to the early deaths of between 40,000 and 50,000 people.<sup>3</sup> Air pollution also threatens biodiversity and ecosystems and has economic impacts on farming.

2. To minimise impacts, EU Directives set limits on the levels of key chemicals permissible in outdoor air,<sup>4</sup> but the UK is in breach of nitrogen dioxide (NO<sub>2</sub>) limits in 38 out of its 43 areas. In September 2015, the Department for Environment, Food and Rural Affairs published draft plans in response to a Supreme Court ruling that the Government must submit new plans to the EU Commission setting out how the UK would achieve compliance at the earliest date.<sup>5</sup> In October 2015, we invited evidence on these plans as well as on the adequacy of Defra's approaches for tackling wider air pollution.

3. We have not considered emissions of all pollutants or from all sources, such as from industry and domestic and commercial buildings; we focused on transport emissions in view of their central role in Defra's plans to cut NO<sub>2</sub> pollution, and on agricultural emissions in light of the Department's responsibility for the sector. We also considered greenhouse gas emissions from agriculture as Defra has lead responsibility for this issue.

4. This report has three main strands: a) the Government's overarching approaches for tackling air pollution from all sectors; b) cutting transport pollution;<sup>6</sup> and c) cutting agriculture's emissions of air pollutants and greenhouse gases. We are grateful to all who provided written and oral evidence.<sup>7</sup>

1 See Annex for description of selected key pollutants affecting health and the environment.

2 Note: Public Health England, Estimating local mortality burdens associated with particulate air pollution, April 2014, para 2.2.2, explains the basis on which mortality figures are cited; "long-term exposure to air pollution is understood to be a contributory factor to deaths...ie unlikely to be the sole cause of death to individuals...it is likely that air quality contributes a small amount to the deaths of a larger number of exposed individuals rather than being solely responsible for a number of deaths equivalent to the calculated figure".

3 "[Air pollution is now a public health emergency](#)" The Independent, 19 January 2016. Note: Defra cites increased mortality of 23,500 from nitrogen oxides (NO<sub>x</sub>) and 29,000 from particulate pollution in its current [plans](#). A recent [study](#) by the Royal College of Physicians and the Royal College of Paediatric and Child health attributes 40,000 deaths each year to poor air quality.

4 For example [Directive 2008/50/EC](#) on Ambient Air Quality and [Directive 2001/81/EC](#) on National Emissions Ceilings for certain pollutants. The [1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone](#) also sets national emission ceilings for 2010–2020 on four pollutants (sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOCs) and ammonia (NH<sub>3</sub>).

5 R (on the application of ClientEarth) (Appellant) v Secretary of State for the Environment, Food and Rural Affairs (Respondent) [2015] UKSC 28. On appeal from [2012] EWCA Civ 897, See Supreme Court [Press Summary](#), 29 April 2015.

6 In a short inquiry and in light of work by other Committees on aviation issues we did not focus on air quality issues specific to air travel or airport expansion.

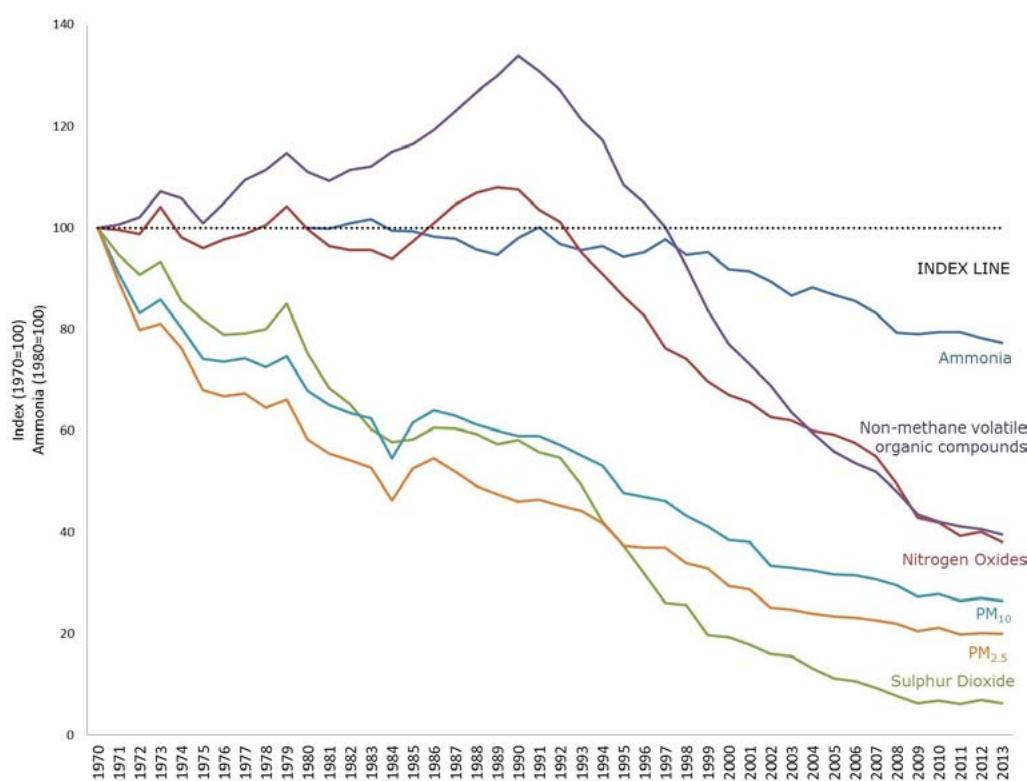
7 Oral and written evidence submitted to this inquiry can be found on the Committee's Air quality inquiry [webpage](#).

## 2 Strategy for improving air quality

### Air quality problems

5. Everyday activities create a wide range of air pollutants from many different sources. Generating and using energy in homes, businesses and vehicles, and industrial and farming activity produces pollutants such as sulphur dioxide, nitrogen oxides, particulates, and volatile organic compounds.<sup>8</sup> The UK has made significant progress in improving air quality over a number of decades; emissions have declined steeply, although the rate of reduction is levelling off. With the exception of NO<sub>2</sub>, pollutant levels are low enough to meet legal limits, but emissions remain sufficient to cause health problems as well as harming the environment.

**Figure 1: Trends in UK sulphur dioxide, nitrogen oxides, non-methane volatile organic compounds, ammonia and particulate matter (PM<sub>10</sub>, PM<sub>2.5</sub>) emissions 1970–2013**



Source: Defra, Draft plans to improve air quality in the UK: Tackling nitrogen dioxide in our towns and cities, UK overview document, September 2015

### Health impacts

6. Scientific evidence has been mounting for a number of years on the impacts of air pollutants on people's health. The harmful impacts of pollution from diesel in particular have been more definitively determined; in 2012 the World Health Organisation (WHO)

<sup>8</sup> Nitrogen oxides (NO<sub>x</sub>) includes both nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>).

unequivocally classified it a carcinogen.<sup>9</sup> Health impacts of all air pollutants cost the UK economy some £15-20 billion a year.<sup>10</sup> More importantly many thousands of people bear the human costs associated with damaged cardiac and respiratory systems and life-limiting diseases. Defra states that NO<sub>2</sub> and particulates,<sup>11</sup> contribute to the early deaths of more than 50,000 people in the UK annually;<sup>12</sup> the Royal College of Physicians and the Royal College of Paediatric and Child Health put the figure at 40,000. The Colleges consider that neither UK government nor WHO guidelines set levels of air pollution that are “entirely safe for the whole population”. The bodies state that “when our patients are exposed to such a clear and avoidable cause of death, illness and disability, it is our duty as doctors to speak out”.<sup>13</sup>

### Environmental impacts

7. Pollution in the air directly damages biodiversity and impedes crop growth. Once deposited into water and onto soil, it has further harmful impacts such as depleting oxygen in water bodies and killing fish and other aquatic life. England’s air and water is sufficiently polluted in 96% of sensitive habitats to pose risks to their ecosystems. The economic impacts of pollution on agriculture are also significant. For example, ground level ozone produced by nitrogen oxides reacting with other atmospheric pollutants lowers crop yields, at an estimated annual cost to UK farmers of £180 million.<sup>14</sup>

### Joining up government action

8. Many witnesses, including the Local Government Association (LGA), considered that Defra failed to take a “coherent, cross-government approach”, which, if true, would be a critical omission given the range of sectors including transport, energy and agriculture which contribute to poor air quality. The LGA cited Defra’s lack of dialogue with the Department for Transport as particularly problematic.<sup>15</sup> Although Defra is the lead department for air quality policy, the Cabinet Office has a key role in co-ordinating government action: Rt Hon Oliver Letwin MP, Chancellor of the Duchy of Lancaster, is Chair of the inter-ministerial Clean Growth Group tasked with pulling together Government approaches for tackling, amongst other things, poor air quality. Commentators consider that Group to be secretive; it does not publish information on its meetings, outcomes or action plans.<sup>16</sup> Mr Letwin told us that, although details of meetings were not normally made public, the Group met regularly and would continue to do so for a “very considerable period” since challenges would not be overcome rapidly. The Group

9 [“UN health agency re-classifies diesel engine exhaust as ‘carcinogenic to humans’”](#), UN news centre press release, 12 June 2012

10 The Scottish Government, *Cleaner Air for Scotland, the road to a healthier future*, November 2015, is the source for the £15 billion figure. The £20 billion figure comes from the Royal College of Physicians and Royal College of Paediatrics and Child Health report, *Every breath we take*, February 2016.

11 Particulate matter (PM) is particles, including dust, dirt, soot, smoke, and liquid droplets, found in the air. Some particles are large or dark enough to be visible, others can only be detected with an electron microscope. Particles less than 10 micrometers in diameter (PM<sub>10</sub>) can be inhaled and can accumulate in the respiratory system. Fine particles less than 2.5 micrometers in diameter (PM<sub>2.5</sub>) are believed to pose the greatest health risks as they can lodge deeply in lungs.

12 Defra, *Defra plans to improve air quality in the UK: tackling nitrogen dioxide in our towns and cities*, UK overview document, September 2015, para 8

13 Royal College of Physicians and Royal College of Paediatrics and Child Health, *Every breath we take*, February 2016

14 Joint Nature Conservation Committee, [\(AQU12\)](#), paras 3.3-3.6

15 Local Government Association [\(AQU 27\)](#) para 2

16 [“Amber Rudd declines to reveal details of secret clean growth committee”](#) Business Green, 5 February 2016

aimed to ensure Defra policies were co-ordinated with other government departments' actions, for example on Clean Air Zone implementation and on the EU vehicle emissions testing regime.<sup>17</sup>

**9. *Despite mounting evidence of the costly health and environmental impacts of air pollution, we see little evidence of a cohesive cross-government plan to tackle emissions. The Cabinet Office must establish clearly with all government departments their duty to consider air quality in developing policies. Furthermore, Ministers must tell the public more clearly how it is co-ordinating action since the work of the inter-ministerial Clean Growth Group is opaque; we recommend that the Cabinet Office report to Parliament before 21 July 2016 on the actions it plans over the coming year to join up effective action across government.***

## Defra's air quality strategy

10. In December 2015 Defra published plans for tackling NO<sub>2</sub> emissions, principally from the transport sector.<sup>18</sup> Defra's previous comprehensive air quality strategy covering all sectors was published a decade ago. Witnesses criticised this narrow focus on NO<sub>2</sub> emissions and highlighted gaps in policies for specific areas; for example Calor Gas Ltd considered that the use of biomass to heat homes had "gone under the radar" despite it having a "considerable" impact on life-spans.<sup>19</sup> Furthermore, indoor air pollution is not included in recent plans; the Building Engineering Services Association called on Defra to rectify this omission since pollution levels in air worsen when air enters a building.<sup>20</sup> Harmful emissions can be created indoors too, from heating systems for example, or from the use of household cleaning products, and these can be concentrated by poor ventilation in modern, well-insulated buildings.<sup>21</sup>

11. Many witnesses called for an over-arching strategy for tackling pollutants from all sectors; the Joint Nature Conservation Committee considered that this would "set a common vision and a framework for delivery".<sup>22</sup> Emerging scientific evidence on the impacts on health has also strengthened calls for such a strategy. Public health expert Professor Paul Wilkinson told us that, as epidemiological and other evidence accumulated, it would be prudent to consider all air pollutants together rather than focusing on individual constituents in isolation.<sup>23</sup>

12. We questioned Parliamentary Under-Secretary of State for Environment and Rural Affairs, Rory Stewart MP, about Defra's approach. He referred only to the specific NO<sub>2</sub> plans published in December 2015.<sup>24</sup> After we finished taking evidence, in February 2016 Defra published its Departmental Plan for 2015–20. This states that Defra will invest in

<sup>17</sup> Qq 292,293

<sup>18</sup> Defra, [Improving air quality in the UK; Tackling nitrogen dioxide in our towns and cities: UK overview document](#), December 2015

<sup>19</sup> Calor Gas Ltd ([AQU 08](#)) para 9. Note: the company acknowledges there is limited data on mortality linked to smaller particles produced by biomass boilers.

<sup>20</sup> Building Engineering Services Association ([AQU 22](#))

<sup>21</sup> Royal College of Physicians and Royal College of Paediatrics and Child Health, *Every breath we take*, February 2016

<sup>22</sup> Joint Nature Conservation Committee, ([AQU12](#)), para 5.4

<sup>23</sup> Professor Paul Wilkinson ([AQU 29](#)), see also evidence from the Joint Nature Conservation Committee ([AQU12](#))

<sup>24</sup> Q291

cleaner air and will monitor levels of two pollutants, NO<sub>2</sub> and fine particulates. However, it makes no reference to a broader strategy or timescales for action, and it does not include indicators for measuring progress on tackling other pollutants such as ammonia.<sup>25</sup>

**13. Defra's plans focus too narrowly on nitrogen dioxide pollution, principally from traffic. If the full health and environmental benefits of cleaner air are to be achieved, Defra must set out plans to cut emissions of all air pollutants and from all sources, including from the transport, industry, energy and farming sectors. Plans must aim to clean up indoor as well as outdoor air.**

**14. *We recommend that the Department publish by the end of 2016 a comprehensive strategy for improving air quality and report annually to Parliament on progress in delivering its objectives.***

### Cost-benefit analysis

15. Pollutants such as NO<sub>2</sub> have health impacts in concentrations below legal limits and, as Professor Wilkinson noted, “the lower the concentrations, the greater the health benefits”.<sup>26</sup> The Chartered Institution of Water and Environmental Management (CIWEM) stated more strongly that there was no concentration limit at which exposure was considered safe, and noted that the EU set upper limits not targets.<sup>27</sup> Many witnesses urged the Government to speed up action to reduce pollution beyond current plans, but provided limited data on the costs of achieving this. Defra has published data on the impact of its current NO<sub>2</sub> plans but not on the cost-benefits of more radical approaches, such as banning diesel cars or limiting new building in city pollution hot-spots, which might bring emissions down to levels well below legal limits.<sup>28</sup> Neither, in the absence of a recent over-arching strategy, does Defra provide up-to-date information on the cumulative cost-benefits of policies to tackle air pollution across a range of sectors. This makes it difficult for us to reach a judgement on the implications of more ambitious plans.

16. It is also currently difficult to assign accurate and consistent values to the economic impacts of environmental problems. Witnesses, such as the Joint Nature Conservation Committee, urged the Government to establish the full environmental costs of pollution and the savings to biodiversity, farming and the countryside of reducing it since this evidence would spur greater action.<sup>29</sup> The Natural Capital Committee is currently looking at how to identify and assign values to the benefits that a healthy environment provides to society; this information will give policy-makers the potential to better evaluate the economic as well as social and environmental impacts of policies on air quality.

**17. *Defra's policies aim to cut air pollution to achieve legal limits yet threats to health and the environment remain even at lower levels. Defra must calculate whether cost-effective means can be developed for meeting tougher targets. This calculation must be based on robust evidence about the benefits of cleaner air against the costs of policies needed to achieve it, such as constraints on new development.***

<sup>25</sup> Defra, *Single Departmental Plan 2015–2020*, para 1.2

<sup>26</sup> Q2

<sup>27</sup> Chartered Institution of Water and Environmental Management ([AQU16](#)) para 11

<sup>28</sup> Defra, *Defra plans to improve air quality in the UK: tackling nitrogen dioxide in our towns and cities*, Technical report, September 2015

<sup>29</sup> Joint Nature Conservation Committee ([AQU17](#))



18. ***Better information is needed; we welcome the Natural Capital Committee's work to identify and place a value on the contribution of clean air to society. Defra must develop, as soon as possible after the Natural Capital Committee produces its findings, practical tools for policy-makers to use in evaluating the costs and benefits of air quality proposals and ensure that the reasoning base for these tools is made publicly available.***

19. Whilst supporting further action on air quality, some witnesses were none the less concerned about the additional costs of regulation. The Mineral Products Association considered that its members bore increased burdens because the Environment Agency had 'gold-plated' EU environmental regulations. The Association preferred voluntary action; investment had cut cement plant emissions of dust by 83% and of oxides of nitrogen by 62% since 1998, but only a "small proportion" of this was a result of regulatory requirements.<sup>30</sup>

20. **Defra's policies must provide incentives for voluntary action as a first option before additional regulation is considered. Voluntary approaches can lower pollution in the most cost-effective ways since industry can focus its efforts on actions that work best for specific activities rather than on demonstrating compliance with rules.**

## Reinvigorating government policy

21. This chapter has outlined a number of recommendations to address weaknesses we consider are hampering the Government's ability to take action to cut air pollution. In summary, **the Government must accord poor air quality a priority commensurate with the toll on the nation's health and environment. Emission reduction targets must be based on scientific evidence and strategies for pollution reduction based on effective cost-benefit analyses. Ministers must set out with absolute clarity the actions required across government if the public is to be reassured that the Government is committed to improving air quality quickly and substantially.**

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30 Mineral Products Association ([AQU15](#)) para 13.3, "Emission reduction targets per tonne of cement produced."

### 3 Defra's nitrogen dioxide plans

22. Our inquiry was triggered in part by Defra's plans,<sup>31</sup> published in draft in September 2015 and in final form in December 2015,<sup>32</sup> for meeting EU limits on NO<sub>2</sub>.<sup>33</sup> These limits are currently exceeded in 38 out of 43 UK areas.<sup>34</sup> The EU extended its deadline for compliance to 2015 but most English cities will not achieve compliance until 2020. Five cities—Birmingham, Leeds, Southampton, Derby and Nottingham—will not achieve the limits until 2025 if additional measures are not introduced. London is projected to comply by 2030 without additional measures. Defra's plans therefore set out additional measures which will enable those five cities to meet limits by 2020 and show how London will meet them by 2025.

#### Clean Air Zones

23. Some 80% of NO<sub>x</sub> in areas exceeding EU limits comes from road transport so Defra's plans focus on this sector through the introduction of statutory Clean Air Zones (CAZs). Defra intends that CAZs in the five cities will discourage older, more polluting buses, taxis, coaches and lorries by charging them to access key areas. Councils will only be able to charge enough to recover scheme costs, not to raise additional revenue. Other municipal areas may introduce voluntary CAZs but councils there will not have the power to charge drivers.

24. Councils will scope out the details of schemes, including geographical extent, for local community consultation, but Defra will set national standards on vehicle emissions, and legislation will define the types of vehicle to which controls will apply. There will be four categories of Zone applying controls to:

- category A: buses, taxis and coaches only;
- category B: buses, taxis, coaches and heavy good vehicles (proposed for Southampton, Derby and Nottingham);
- category C: buses, taxis, coaches, heavy goods and light goods vehicles (proposed for Birmingham and Leeds);
- category D: buses, taxis, coaches, heavy goods and light goods vehicles and cars.

#### London

25. Defra's remit for the capital is principally to support and monitor the delivery of plans made by the Mayor for London; the Mayor has specific duties and powers over air

31 Defra, *Defra plans to improve air quality in the UK: tackling nitrogen dioxide in our towns and cities, UK overview document*, September 2015

32 Defra, *Improving air quality in the UK; Tackling nitrogen dioxide in our towns and cities: UK overview document*, December 2015

33 The EU Ambient Air Quality Directive sets legally binding limits for ambient concentrations of certain pollutants in the air. For NO<sub>2</sub> there are two limit values for the protection of human health. These require Member States to ensure that: (i) annual mean concentration levels of NO<sub>2</sub> do not exceed 40µg/m<sup>3</sup>; and (ii) hourly mean concentration levels of NO<sub>2</sub> do not exceed 200µg/m<sup>3</sup> more than 18 times a calendar year.

34 Defra's plan acknowledges that addressing background concentrations and therefore other key pollution sources is also important. For example, emissions from industry (including energy, manufacturing, construction industry and processes) are the largest overall source of NO<sub>x</sub>, accounting for 49% of UK NO<sub>x</sub> emissions in 2013.



quality which do not apply in other cities. London already has an extensive Low Emission Zone, operative all day, every day; vehicles including vans and lorries must meet emission standards or pay a daily charge to drive in the Zone. Since 2015 buses have had to meet tougher standards within the Zone. From 2020, a new Ultra Low Emission Zone (ULEZ) covering a narrower area of the capital (the current congestion charge area) will apply to all vehicles including cars.<sup>35</sup> The Mayor's plans also include retro-fitting buses and licensing only zero emission-capable taxis from 2018.<sup>36</sup>

## Views of Defra's NO<sub>2</sub> plans

26. Campaign group ClientEarth, which brought the 2015 case leading to the production of Defra's plans, has rejected the plans as insufficient since they do not aim to achieve UK compliance before 2025; the organisation has announced new legal action against the Government.<sup>37</sup> Witnesses criticised Defra's plans as offering too little, too late: the plans proposed action to deliver only the minimum improvements required to meet EU limits and had been produced only in response to a Supreme Court judgment.<sup>38</sup> Witnesses considered that even the plan's limited emission reduction aims would not be achieved because of several deficiencies:

27. **First, an absence of effective new measures:** the LGA considered the proposals offered "no additional options of value" and had missed an opportunity to introduce measures to cut car emissions.<sup>39</sup> Some witnesses, including Friends of the Earth, recommended that Zones limit access by both petrol and diesel cars.<sup>40</sup> Defra does not propose that any of the five cities in current plans would adopt measures for cars, although London's Ultra-Low Emission Zone coming into force from 2020 includes charges for cars.<sup>41</sup>

28. **Secondly, insufficient local powers:** a widespread complaint was that the plans did not devolve sufficient powers to councils. Local authorities' air quality responsibilities date back more than 20 years: in the opinion of the Institute of Air Quality Management (IAQM), "if local authorities were able to solve air quality problems using their own powers ... they would have done so already".<sup>42</sup> Witnesses identified planning and transport as specific areas requiring stronger local powers: CIWEM for example recommended amending planning rules to allow councils to designate "air quality neutral zones" within which any new development must meet certain benchmarks for both building and transport emissions.<sup>43</sup> The Royal College of Physicians and the Royal College of Paediatrics and Child Health concluded that local authorities should have the power to close or divert roads to reduce traffic levels when air pollution exceeded limits.<sup>44</sup> Councils have certain powers to close roads temporarily, using Traffic Regulation Orders for example, for air quality purposes but, as the House of Commons Library notes, it is "not a simple thing to make an Order and can often be expensive. A local authority is unlikely to make [an Order]

35 Greater London Authority (AQU45)

36 "The Government announces plans to improve air quality in cities", Defra news release, 17 December 2015.

37 "ClientEarth takes government back to court over killer air", ClientEarth news release, 18 March 2016

38 Friends of the Earth (AQU50)

39 Local Government Association (AQU27) para 3.18

40 Friends of the Earth (AQU50)

41 See Transport for London ULEZ webpages, accessed 11 April 2016

42 Institute of Air Quality Management (AQU14)

43 Chartered Institution of Water and Environmental Management (AQU16) para 19

44 Royal College of Physicians and Royal College of Paediatrics and Child Health, *Every breath we take*, February 2016, recommendation 6

unless it has a significant problem and substantial local support”.<sup>45</sup> The GLA also noted that councils needed more powers to be able to enforce air pollution controls.<sup>46</sup> Powers to charge vehicles to enter Zones are to be limited to the five most polluted cities (plus London which already has charging powers); other cities, even those currently exceeding EU pollution limits, will be able to adopt only “voluntary” Zones.

29. **Thirdly, weak national leadership:** many witnesses, while supporting local action, told us that this needed to be within the framework of a sufficiently robust national approach. The Government needed to provide councils with not only the right powers but also national leadership and vision. Nottingham City Council told us that, in putting the “majority” of the emphasis on local authorities, the Government had not achieved the right balance between national and local responsibilities.<sup>47</sup> The IAQM considered the emphasis on local action was unlikely to lead to success without leadership at a national level.<sup>48</sup>

30. **Fourthly, insufficient flexibility:** a major criticism made by many witnesses was that Defra’s plans provided local communities with little flexibility to respond to local circumstances.

31. The GLA called for flexibility to determine details of Clean Air Zones locally so that access could be restricted not only based on vehicle type but on parameters such as congestion and road user safety.<sup>49</sup> The LGA was concerned that setting rigid categories to determine the types of vehicles over which access controls would apply could lead to perverse actions.<sup>50</sup> Nottingham City Council was also concerned about unintended consequences of blanket approaches: bus fares would have to rise to cover Zone charges and higher fares meant more people would use their cars, thus worsening pollution. This could be avoided if councils had the freedom to set local emissions standards for buses.<sup>51</sup> The Freight Transport Association considered Defra’s plans to be a “blunt” tool which targeted heavy vehicles ahead of cars even though cars produced half of all traffic NO<sub>x</sub>.<sup>52</sup>

32. Ministers countered some of these arguments in oral evidence. Rory Stewart said that although only the five identified cities would be required to adopt Clean Air Zones, Defra would work with other cities that wanted to be more “ambitious” in cutting emissions below legal levels. He conceded that no NO<sub>2</sub> threshold was considered “safe”, and welcomed work by cities such as Oxford and York to lower emissions below the 40 micrograms per cubic metre legal limit.<sup>53</sup> The Minister explained that Defra’s role was to “lay out what we believe [is] the most straightforward way” to meet legal limits by 2020 and to provide technical expertise. He said that councils would, however, have many detailed instruments at their own disposal giving them flexibility on how to administer Zones. The Minister invited local authorities with “ingenious, more cost-effective, smarter local

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45 *Roads: Traffic Regulation Orders*, Standard Note [SN6013](#), House of Commons library, November 2014

46 Greater London Authority ([AQU45](#))

47 Nottingham City Council ([AQU53](#))

48 Institute of Air Quality Management ([AQU14](#))

49 Greater London Authority ([AQU45](#))

50 Local Government Association ([AQU27](#)) para 3.18

51 Nottingham City Council ([AQU53](#))

52 Freight Transport Association ([AQU17](#))

53 Q308

ways” or who “wanted to go further” to work with Defra.<sup>54</sup> He said that, provided local authority areas were compliant by 2020, how they achieved compliance was “basically up to them”.<sup>55</sup>

**33. Defra’s plans for Clean Air Zones will impose a ‘one size fits all’ model on cities from Southampton to Leeds. The Department must give local authorities greater flexibility in order that they can tailor measures to best meet their local circumstances. For example, cities may find it more effective to limit vehicle access at certain times of day or to target specific bus routes rather than adopt blanket access proposals.**

**34. Charging powers are planned for only the five cities with the worst pollution yet dozens of areas breach EU limits: we recommend that Defra extends these powers to other councils in its Clean Air Zone legislation so that communities which wish to do so can tackle pollution hot-spots in this way.**

**35. We further recommend that Defra consults interested parties including local authorities and publishes revised proposals by 21 July 2016 which address concerns raised in this report. Alongside these, the Government must publish proposals to make it easier for local authorities to use powers over traffic movement and new development to tackle air pollution as and when the need arises, whether inside or outside Clean Air Zones.**

## Funding for local action

36. Potential measures to cut transport emissions include encouraging people to use public transport rather than their private vehicles or to walk or cycle where possible. Many cities outside the UK, such as Oslo and Bordeaux, have adopted more direct approaches by prohibiting city-centre car use, often helping city inhabitants to adapt to restrictions through introduction of better public transport, more pedestrianised areas, and efficient urban layouts with homes and businesses located in the same areas. Witnesses were concerned that funding constraints were limiting UK councils’ ability to adopt such approaches and to deliver the effective local action on which Defra’s plans rely.

37. Nottingham City Council, one of the designated Clean Air Zone cities, called on the Government to provide more targeted funding to speed up delivery of local measures. The Council drew attention to cuts in government funds for Local Transport Plans and the termination of the Sustainable Transport Fund in March 2016.<sup>56</sup> The GLA said it could comply with EU limits sooner if it had more funding. It noted that grant programmes, such as the Defra Air Quality Grant, had reduced over time with no government commitment to its continuation in the long-term.<sup>57</sup>

38. Those outside the sector were also concerned about council finances. The IAQM considered councils’ “diminishing financial resources” to be a barrier to the establishment of Clean Air Zones,<sup>58</sup> and CIWEM called for appropriate funding for local authorities, in proportion to the cost of poor air quality.<sup>59</sup> Commentators calculate that this year’s

54 Q294

55 Q295

56 Nottingham City Council ([AQU53](#))

57 Greater London Authority ([AQU45](#))

58 Institute of Air Quality Management ([AQU14](#))

59 Chartered Institution of Water and Environmental Management ([AQU16](#)) para 4

grants of £500,000 for council air quality monitoring were a quarter of the level in 2011–12 and 2012–13. Some 12 projects run by eight councils have been approved for 2015–16 compared to 42 projects run by 36 councils three years ago.<sup>60</sup>

39. We put the figures on funding cuts to Defra Minister Rory Stewart during oral evidence. He rejected claims of “that kind of decline” in investment and told us that the Government was spending around £600 million over five years on “big ticket” work including cycling, walking, and electric vehicles.<sup>61</sup> However, ClientEarth calculated that Clean Air Zones would cost councils £24 million to establish while government grants represented a small fraction of that.<sup>62</sup> Councils in the five cities covered by Defra’s plans will be permitted to set charges for Clean Air Zones so as to recoup costs, although not to raise additional revenue, but no assessment is available as to what level of charge would fully cover costs or be acceptable to local communities.

40. *Since Defra’s plans rely on local action to cut pollution, councils must be given support to implement programmes to encourage people to drive less and use public transport and cycle and walk more. Defra must ensure that councils are recompensed for any costs of implementing new Clean Air Zones which they are not able to recoup from reasonable charges on drivers. Defra and the Department for Communities and Local Government must also preserve funding for wider programmes, such as those supported by the Local Sustainable Transport Fund, which can demonstrate they deliver benefits in a cost-effective manner.*

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60 [“Defra further slashes local air quality funding,”](#) ENDS, 27 January 2016

61 Q300

62 Q60

## 4 Vehicle emissions testing

### EU emissions tests

41. Before a new vehicle is licensed for sale in the EU, a manufacturer must demonstrate in laboratory tests that the model emits less than a set level of key pollutants, including NO<sub>x</sub> and particulates. These limits are set under a 'Euro' regime, in place since 1992.<sup>63</sup> Limits are revised periodically and standards for the latest vehicles (Euro 6) have tightened considerably. They may emit only a small fraction of pollutants permitted under the 1992 'Euro 1' standards. Limits have tightened since the previous 2011 (Euro 5) standards: for example, diesel vehicles must emit 56% less NO<sub>x</sub>.<sup>64</sup>

42. However, there are long-standing concerns that EU laboratory tests significantly under-estimate emissions on the road. This has meant Member States' plans to meet EU NO<sub>2</sub> limits have been thrown off course since they assumed much higher reductions in emissions from the newer vehicles licensed under tougher standards than have been achieved in practice. Prolonged discussions between the EU and the automotive industry on introducing better tests were given impetus following US regulators' discovery in 2015 that Volkswagen (VW) had been fitting vehicles with illegal software ('defeat devices') to enable vehicles to pass laboratory tests. However, manufacturers have in any case been able to use legal means to prepare vehicles to pass the tests even though their performance would not then be replicated on the road in a consistent manner. To date only VW has been identified as using illegal methods, but disparities between laboratory and real world emissions from other manufacturers' vehicles have also consistently proved considerable. On average across all makes of vehicle, emissions on the road are 400% higher than those measured in the lab under EU tests.<sup>65</sup>

43. The EU is introducing new real-world tests from 2017. Commentators have criticised the EU for setting initial limits under the new tests which are twice as high as the previous laboratory test levels and for setting limits into the 2020s which are 50% higher.<sup>66</sup> The EU proposals state that this is to allow for the less accurate measurements gathered by tail-pipe monitors under real-world as opposed to laboratory conditions. However, as MEPs on the Brussels Environment Committee noted, the maximum discrepancy from the new method of measuring emissions is 30%.<sup>67</sup>

44. Although Defra Minister Rory Stewart said that the UK had pushed since 2011 for real-world driving tests,<sup>68</sup> witnesses were unconvinced about the Government's commitment to securing lower EU limits. According to the Guardian, the UK Government supported a level 40% above current limits to apply even as far ahead as 2021.<sup>69</sup> ClientEarth accused Ministers of "double speak", in blaming the EU system for failing to reduce pollution whilst supporting less robust action from Brussels.<sup>70</sup> Some MEPs and commentators such as the International Council on Clean Transport criticise EU institutions for, in their

63 There is a parallel Euro regime for heavier vehicles.

64 Society of Motor Manufacturers and Traders, Euro-6 What is it? [Webpages](#) accessed 11 April 2016

65 "EU car emissions test proposals a 'disgraceful stitch up'", Air Quality News, 28 October 2015

66 As above

67 "Environment MEPs oppose relaxing diesel car emission test limits", European Parliament News, 14 December 2015

68 Evidence by Rory Stewart MP to Environmental Audit Committee inquiry into Diesel emissions and air quality regulation, 27 October 2015, HC 506, [Q161](#)

69 "UK pushing for air pollution limits to be relaxed, documents reveal" the Guardian, 13 December 2015

70 Q77

view, watering down final limits in response to lobbying from the automotive industry.<sup>71</sup> However, witnesses such as VW told us that the automotive industry agreed that the emissions testing regime needed to be improved.<sup>72</sup>

45. **Although it has taken far too long to agree, we welcome the adoption of a new EU real-world vehicle testing regime since current laboratory tests have routinely and significantly under-estimated emission levels. However, the new limits allow a generous leeway for measurement error and are set above current levels.**

46. ***The UK Government must in future negotiations argue robustly for lower EU limits which will deliver reductions on the road equal to, or better than, current laboratory limits. Tougher limits are needed to drive urgent action by the automotive industry to both improve monitoring and to reduce emissions as fast as technically possible.***

### Impact of EU test inaccuracies on Defra plans

47. Uncertainty over the content and timing of the future EU emissions regime led witnesses to question the validity of the models Defra used to develop its NO<sub>2</sub> proposals. The Environmental Protection Association considered emissions models were based on over-optimistic assumptions,<sup>73</sup> and Gatwick Airport told us that the Government model “systematically” under-estimated emissions.<sup>74</sup> The LGA recommended that Defra remodel its data to reflect real-world emissions levels.<sup>75</sup> In contrast the GLA noted that, although Euro 6 standards had not been in place long enough to produce a mass of real-world emissions data, Defra should have been able to apply correction factors to the laboratory results from a database of ‘real world’ emissions results.<sup>76</sup> Defra said that it adopted caution in its assessment of the emissions levels which would be achieved in practice under new EU standards.<sup>77</sup>

48. **We note that Defra models are based on cautious assumptions about the extent to which the new EU vehicle testing regime would deliver NO<sub>2</sub> reductions on the road. However, a history of failure to translate theoretical standards into cleaner air in practice means that Defra must keep its assumptions under review.**

49. ***We recommend that Defra publishes: first, by the end of 2016 an analysis of the impact on UK air quality of Euro 6 vehicle emissions standards; and secondly, by the end of 2018, an analysis of the impact of new real-world driving emissions tests being introduced from 2017. Should either of these reports show that EU standards are in practice failing to have the impact assumed under current plans, Defra must issue revised plans including stronger measures to tackle vehicle emissions.***

71 [“EU caves in to auto industry pressure for weak emissions limits”](#) The Guardian, 28 October 2015

72 Volkswagen (AQU 46) para 15

73 Environmental Protection UK (AQU 38)

74 Gatwick Airport Ltd (AQU13)

75 Local Government Association (AQU27) para 3.9

76 Greater London Authority (AQU45)

77 Defra, *Improving air quality in the UK; Tackling nitrogen dioxide in our towns and cities: UK overview document*, December 2015



## Dieselgate: Volkswagen 'defeat devices'

50. We asked VW whether its use of so-called 'defeat devices' to cheat EU emission tests had affected individual vehicle performance or pollution levels. VW apologised for its actions but argued that the use of the devices did not affect on-the-road NO<sub>x</sub> emissions, or fuel consumption so compensation was not warranted.<sup>78</sup> Compensation is the subject of complex legal discussion in various countries including the US where, unlike in the UK, the company is giving customers vouchers as a goodwill gesture.<sup>79</sup> Paul Willis, VW UK's Managing Director, failed to answer many of the questions we put to him during an oral evidence session in January 2016, explaining that he was awaiting the outcome of a company review of events.<sup>80</sup> The EU is conducting a separate inquiry into the use of defeat devices and wider problems with the emissions testing regime, to report within a year.<sup>81</sup>

51. Commentators link VW's use of illegal software to wider concerns about whether consumers are being misled by manufacturers' claims about their vehicles' emissions and performance. Press coverage of research published in February 2016 highlighted the significant discrepancy in the amounts of CO<sub>2</sub> emitted on the road by a range of manufacturers' vehicles compared to marketing claims.<sup>82</sup>

**52. Volkswagen's use of illegal devices has rightly caused consumers to be sceptical about its claims on vehicle performance. The company's different treatment of UK and US customers is also unlikely to be seen as fair. Volkswagen's evidence did not persuade us that the company had fully learnt lessons about the need to be completely transparent if it is to regain customers' trust in its products.**

**53. *The Government must assess whether systems are sufficiently rigorous to give customers confidence that a claim about a vehicle's performance is true. Where proven to have misled customers, the company should pay appropriate compensation. The Government must act on the findings of the EU's review of emissions testing and the outcome of Volkswagen's review of its use of defeat devices to remedy any deficiencies in consumer protection regulation. The Government must also seek at a European level a review of the penalties applicable if deliberately cheating the emissions testing system, and work to ensure that these penalties are robust enough to provide a meaningful deterrent for manufacturers.***

78 Qq133-137

79 "[VW offers US customers \\$1000 vouchers as gesture of goodwill](#)", BBC News, 9 November 2015

80 Q127

81 "[Car emissions inquiry members and remit approved](#)", European Parliament News, 21 January 2016

82 "[One in five cars fail to match emission and fuel claim](#)", BBC News, 17 February 2016

## 5 New road transport technologies

54. New technologies can cut vehicle emissions: alternatively-fuelled vehicles can almost eliminate emissions in some cases. For example vehicles running on hydrogen or electricity have no harmful tail-pipe emissions, although there may be emissions generated in the course of producing the fuel. Fuels such as liquid petroleum gas (LPG) and compressed natural gas (CNG) produce lower levels of tail-pipe NO<sub>x</sub> compared to petrol or diesel. Although diesel produces the highest NO<sub>x</sub> levels of mainstream fuels, manufacturers are installing technologies such as selective catalytic reduction systems using AdBlue and lean NO<sub>x</sub> systems, to cut emissions from many of their newer vehicles substantially.<sup>83</sup>

55. Policies have in recent years incentivised diesel over petrol as diesel vehicles' higher efficiency cuts CO<sub>2</sub> emissions, but diesel vehicles produce higher NO<sub>x</sub> emissions per mile. The Government now recognises that policies need to take into account both types of pollution. Organisations such as the Low Carbon Vehicle Partnership are working to ensure that policies tackle both greenhouse gas and local air pollution in tandem.<sup>84</sup>

56. Cabinet Office Minister Oliver Letwin MP was very optimistic about the potential of new technologies, including electric vehicles, to reduce emissions.<sup>85</sup> However, currently there are few low emission vehicles on the road. Although double the number of electric cars were sold last year compared to the year before, overall they make up only 3% of the UK car market,<sup>86</sup> and more than 45% of cars registered last year were diesel.<sup>87</sup> In a 2015 Department for Transport survey, only 5% of drivers said that they were thinking of buying an electric car or van, while 56% said they had not really thought about it. These results had not changed significantly over the past year even though 40% of those surveyed considered environmental issues an important factor when buying a new vehicle. The most common deterrents to buying electric were difficulties in recharging, the distance that can be travelled with each charge, and the vehicle cost.<sup>88</sup> Against this backdrop, witnesses considered that policy interventions were needed to establish a self-sustaining market with sufficient numbers of alternatively-powered vehicles to support widespread refuelling infrastructure and affordable vehicle production.<sup>89</sup>

57. Policy responses to develop a market for all cleaner vehicles could include:

- **Fiscal policies:** lower fuel duty rates can be effective incentives to buy less polluting vehicles. However many organisations considered that more use could be made of fuel duty policy to support alternative fuels such as LPG.<sup>90</sup> The Vehicle Excise Duty regime has also been used to influence vehicle choice but the GLA wanted the regime revised to take account of air pollution as well as CO<sub>2</sub> emissions from vehicles. At local

83 Such technologies aim to enable vehicles to meet Euro 6 diesel vehicle NO<sub>x</sub> limits.

84 The Low Carbon Vehicle Partnership launched a communique on 1 March 2016 to demonstrate joint working to tackle air quality and climate change together. See LowCVP [webpages](#)

85 Q315

86 Q178

87 "[Have diesel cars been unfairly demonised for air pollution?](#)" The Guardian. Diesel cars made up over 34% of all cars on the road in 2013 (10.1 million) compared to just around 7.5% in 1994

88 Department for Transport, [Public attitudes towards electric vehicles](#), June 215

89 Low Carbon Vehicle Partnership ([AQU56](#))

90 UK LPG Gas Ltd ([AQU41](#))



level, the GLA offers Londoners a fiscal incentive by waiving the congestion charge for vehicles emitting less than 75g/km of CO<sub>2</sub> (only plug-in electric/hybrid electric vehicles currently meet this standard).<sup>91</sup>

- **Grants to buy vehicles:** Newer-technology vehicles can cost more to buy than conventional vehicles although in time greater production volumes may help to reduce costs. The Government offers some grants for low emissions vehicles. However, the GLA called for grants such as the Plug-in Grant for electric vehicles to be reviewed regularly so that consumers and the industry did not become dependent on subsidy. The GLA also noted that programmes should last at least 10 years to allow time for the vehicle market to become mature and become “suitably competitive”.<sup>92</sup>
- **Diesel scrappage:** Diesel vehicles coming off the production line in 2006 were licensed under Euro 4 standards permitting three times the levels of NO<sub>x</sub> that current models may emit under the Euro 6 standards which came into force from 2014.<sup>93</sup> The GLA was one of a number of organisations backing a diesel scrappage scheme which would give a discount on the cost of a new low-emission vehicle to an owner scrapping their older, more polluting vehicle. Such a scheme could be designed in many different ways but the Authority calculated that it could be introduced at no cost to the public purse since increased VAT revenues would cover the cost of the discounts.<sup>94</sup>
- **Grants to convert vehicles:** government grants can cut the costs of converting fleets to run on cleaner fuels; the GLA recommended that the government provide subsidies for converting buses to run on electricity.<sup>95</sup>
- **Support for refuelling infrastructure:** funding to establish networks of plug-in points for electric vehicles and/or refuelling stations for hydrogen or gas-powered vehicles were recommended by some witnesses.<sup>96</sup>

58. The Government’s current package of support includes investment in a network of natural gas refuelling stations, grants to incentivise the purchase and development of alternatively fuelled commercial vehicles, and differential fuel duty rates at current levels for road fuel gases such as compressed natural gas, liquid natural gas and biomethane until March 2024. Defra invested £400 million over the last Parliament to support the market for ultra-low emission vehicles (ULEVs) with another £500 million to be spent up to 2020. The Chancellor’s 2015 autumn statement announced £600 million to provide grants of up to 35% off the cost of a low CO<sub>2</sub> emission car and 20% off the cost of a van, up to £8,000.<sup>97</sup> The March 2016 Budget included £38 million of funding for UK-wide research and development into low-emission technologies, with another £15 million specifically for such work in the Midlands.<sup>98</sup>

91 Greater London Authority ([AQU45](#))

92 As above

93 See AA [webpages](#) on Euro emissions standards, accessed 11 April 2016

94 Greater London Authority ([AQU45](#))

95 As above

96 UK Hydrogen Fuel Cell Association ([AQU25](#))

97 HM Treasury, [Spending Review and Autumn Statement 2015](#), November 2015

98 HM Treasury, [Budget 2016 documents](#), March 2016

59. At the current rate of change it will be many years before ultra-low emissions vehicles replace all the types of vehicles currently causing pollution. Faster progress could be made if further measures were introduced to encourage people to buy newer, unfamiliar, and in many cases more costly, technologies.

60. *We recommend that the Government launches a diesel scrappage scheme giving grants to cut the cost of a low-emission vehicle for an owner scrapping their diesel car or van. We think it sensible to target vehicles more than 10 years old because of their high pollution levels but HM Treasury should undertake in the next six months a study to establish the details of the scheme. The study must establish in time for measures to be brought forward in the next Budget: first, the emissions levels of vehicles eligible to be bought or scrapped so the scheme achieves sufficient air quality improvements, and secondly, the level of grant necessary to incentivise sufficient take-up at the lowest cost to the public purse.*

61. Government policy supports a range of technologies but this can mean that competition from different sectors dilutes the impact of schemes and could confuse the public. Witnesses such as those representing the hydrogen,<sup>99</sup> and gas-powered vehicle sector argue that government support must not focus on one technology.<sup>100</sup> Developing an affordable range of options allows drivers to select the right technology for the type of journeys they are undertaking; for example those mostly driving short distance in cities might choose an electric car, whereas long-distance drivers might choose a hybrid or LPG vehicle.

62. We endorse the Government's support for a wide range of technologies, including the provision of fiscal incentives such as lower fuel duty rates for a variety of cleaner fuels. Different technologies, such as gas-powered or hybrid vehicles on the one hand or fully electric vehicles on the other, will offer the optimum solution for different transport needs. However, the Government should not allow the need to maintain technologically neutral approaches to inhibit policy support for the research, development and implementation of low-emission technologies, particularly where there is a strong scientific case for such support.

63. Government policy focuses on developing technology to reduce emissions from exhaust systems but vehicles' tyre and brake wear also cause pollution; 75% of transport-generated particulates are from this source.<sup>101</sup> Academics urge that greater attention be given to these emissions since they contain smaller particles known to be especially harmful because of their ability to penetrate the lungs and bloodstream.<sup>102</sup>

64. *Defra's policies must support technological developments to reduce particulates generated by the wear of vehicle brakes and tyres; the Government must commission by 21 July 2016 an assessment of any policy or research gaps on the level of emissions from these causes and methods for reducing them. The Department must ensure that EU and UK regulations reflect emerging scientific evidence on pollution from wear and tear of vehicle operation.*

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99 UK Hydrogen Fuel Cell Association ([AQU25](#))

100 Calor Gas Ltd ([AQU60](#))

101 Greater London Authority ([AQU45](#))

102 Presentation to the European Commission by the Institute for Energy and Transport, *Particle emissions from brake and tyre wear: literature review*, 8 January 2016

## Shipping emissions

65. We received evidence highlighting the contribution of shipping emissions to pollution; although legal limits on sulphur levels in marine fuels have had some success, witnesses considered the Government had failed to adopt some effective measures to reduce NO<sub>x</sub> emissions.<sup>103</sup> Ministers noted the small percentage of all NO<sub>x</sub> emissions which came from shipping.<sup>104</sup> Nevertheless in pollution hot-spots such as London, NO<sub>x</sub> from shipping adds to problems in achieving EU pollution limits. The National Planning Policy Framework and associated guidance sets out broad requirements that planning decisions have regard to air quality impacts but witnesses argued that planning decisions on new ports or their expansion should specifically require provision of infrastructure so that ships at berth limit their emissions by running on electricity rather than their engines.<sup>105</sup>

66. We questioned Ministers Oliver Letwin MP and Rory Stewart MP and the GLA about these points in the context of port development at Enderby Wharf on the Thames in the London Borough of Greenwich. Ministers told us that planning decisions were a matter for the local planning authority. Defra set overall thresholds for NO<sub>x</sub> levels in the air which local authorities must meet and had advised Greenwich council on mitigation measures. Defra said that local authorities should ensure that new development was “appropriate for its location and unacceptable risks are prevented”.<sup>106</sup> Rory Stewart told us that he wished to encourage the Borough to work to have in place the right electricity generating stations to power ships at berth.<sup>107</sup> The GLA told us that £400,000 had been provided to fund mitigation measures.<sup>108</sup>

***67. Shipping is responsible for producing only a small proportion of emissions, but in pollution hot-spots such as London action is needed to tackle emissions from all sources. Local authorities must calculate the additional impact on air quality of all new development; planning permissions for new shipping facilities must require appropriate mitigation measures from developers. This should include, where practicable, a requirement to provide infrastructure to supply electricity to ships at berth.***

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103 Q44

104 Q301

105 Ralph Hardwick ([AQU31](#)) Q44 (Professor Wilkinson)

106 Defra ([AQU62](#))

107 Q297

108 Q211

## 6 Tackling air pollution from agriculture

68. Emissions from agriculture affect local air quality and contribute towards climate change. Emissions have declined in recent years but are still produced in sufficient quantities to harm human health and the environment, both near to their point of production and further away in urban areas.

69. Ammonia is a key pollutant produced by agricultural activity. It affects human health and ecosystems at an estimated annual cost across the EU of 70-320 billion euros.<sup>109</sup> UK emissions have declined by 28% since 1990 but the trend has been levelling off recently and predictions are of a 1% increase between 2010 and 2020.<sup>110</sup> Agriculture was responsible for 82% of the UK's ammonia emissions in 2012, of which fertilisers account for around a fifth with the pigs, poultry and cattle sectors contributing the remainder.<sup>111</sup>

70. Witnesses told us that there were a wide range of available technical options to reduce emissions such as improved systems for fertilizer application and manure handling and storage. For example, emissions could be reduced by avoiding the use of urea in fertilizer, by optimising the level of nitrogen in feed and by injecting slurries or ploughing manures into soils rapidly.

### Regulation of emissions

71. The regulatory regime for agricultural emissions is patchy. Permissible levels of some pollutants are determined by various EU regulations, principally the National Emissions Ceiling Directive (NECD) which sets binding emission ceilings for each Member State for four pollutants: sulphur dioxide, NO<sub>x</sub>, non-methane volatile organic compounds and ammonia.<sup>112</sup> However, proposals to add methane emissions from agriculture in the recent revision of the NECD were first watered down in Brussels and ultimately vetoed by the Council of Ministers. Direct regulations on the source of emissions apply only to larger pig and poultry units covered by the Industrial Emissions Directive (IED), but ammonia emissions from most agricultural activity are not regulated.

72. Last year the EU proposed stronger NECD targets on ammonia to reduce UK levels by 21% by 2030.<sup>113</sup> Witnesses took opposite views about the level of challenge this revised limit represented. For example, the IAQM considered it modest,<sup>114</sup> and academic expert Professor Sutton told us that the goal would be “easy to meet” technically.<sup>115</sup> In contrast, the NFU considered the target to be “at the limit of technical feasibility” and argued for a “more realistic and achievable” 2030 target which was “affordable to the agricultural

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109 Professor Mark Sutton ([AQU20](#))

110 Q23

111 Q8

112 EU national emission ceilings are upper limits for total emissions of certain air pollutants that Member States will have to respect by a certain date, to push down background concentrations and limit transboundary air pollution. Existing ceilings are in place for 2010, as set out in the UNECE Gothenburg Protocol in 1999 and the EU National Emission Ceilings Directive, NECD (2001/81/EC). New ceilings (which are called national emission reduction commitments) for 2020 were agreed recently in a revised Gothenburg Protocol, and are proposed for 2020 and 2030 in a revised NECD as part of the clean air policy package.

113 Professor Mark Sutton ([AQU20](#)) The 21% figure is a reduction from 2005 levels and represents a 14% UK reduction between 2010 and 2030.

114 Institute of Air Quality Management ([AQU14](#))

115 Professor Mark Sutton ([AQU20](#))

sector, allows for growth but also protects the environment”.<sup>116</sup> There are potential savings as well as costs from reducing ammonia emissions; an estimated 2.5 billion euros could be saved annually across the EU if the nitrogen lost to the air in those emissions was instead retained to fertilise soils.<sup>117</sup>

## Use of best practice

73. Witnesses argued that the agricultural sector had taken effective action to tackle air pollution. The NFU noted that emissions had reduced in recent years, largely due to a fall in livestock numbers but also through increasing the efficiency with which nitrogen was used.<sup>118</sup> The Ulster Farmers’ Union (UFU) highlighted many initiatives by farmers in Northern Ireland to reduce emissions. Initiatives include the Manure Efficient Technology Scheme which has improved efficiency by 39% and the Nitrates Action Programme which has improved fertiliser spreading practices.<sup>119</sup>

74. However, some witnesses were critical of the agricultural sector’s progress to date. Academics lamented the sector’s lack of action compared to other sectors’ successes. Professor Williams noted that while NO<sub>x</sub> emissions from transport and power generation had reduced by 64% in recent years, agricultural emissions of ammonia had reduced by just 21%. He considered that there was “still a lot to do” to cut ammonia emissions.<sup>120</sup> The NFU explained that farming emissions of ammonia, nitrous oxide and methane were harder to control compared to industrial sector emissions since biological processes were the source of most of the problem.<sup>121</sup>

75. Emissions may be failing to fall because many farmers do not use the best and latest technologies; Professor Sutton told us that farmers were using out-of-date technologies; some were using techniques from the 1950s.<sup>122</sup> There are a wide range of programmes to support the use of modern techniques; the UFU referred for example to a scheme in Northern Ireland to help farmers invest in equipment to manage manure and slurries better but noted that the programme had been oversubscribed.<sup>123</sup> The NFU and NFU Cymru referred to the Tried and Tested programme to support English and Welsh farmers in adopting better methods.<sup>124</sup> However, some witnesses such as Professor Sutton considered that while academia had “a really good understanding” of the problem areas there was more limited information on how and where best practice approaches were being used by farmers.<sup>125</sup>

76. Witnesses had differing views on whether voluntary adoption of best practice was sufficient or whether further regulation was required. Professor Sutton recommended new legislation to remedy a lack of UK regulation on ammonia concentrations. He also referred to regulatory approaches in the Netherlands and Denmark which, despite farmers’ complaints, had changed the sector’s thinking and driven successful use of best practice.

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116 National Farmers’ Union and NFU Cymru ([AQU49](#))

117 Professor Mark Sutton ([AQU20](#))

118 National Farmers’ Union and NFU Cymru ([AQU49](#))

119 Ulster Farmers’ Union ([AQU47](#))

120 Q23

121 National Farmers’ Union and NFU Cymru ([AQU49](#))

122 Professor Mark Sutton ([AQU19](#))

123 Ulster Farmers’ Union ([AQU47](#))

124 National Farmers’ Union ([AQU49](#))

125 Q10

Farmers reaped the financial rewards of the better use of nutrients and these countries were now in a position to export their technologies.<sup>126</sup> The NFU noted that both good practice and regulation had played a part in reducing emissions and expected farmers to continue to adopt good practice provided actions were both manageable and affordable.<sup>127</sup> The NFU urged the Government to support research and development, data collection and monitoring and knowledge exchanges.<sup>128</sup> The UFU argued strongly that the outcomes were best achieved through a focus on efficiency gains and improved margins rather than compulsory limits.<sup>129</sup>

**77. The agricultural sector must step up action to reduce its contribution to national air pollution. At a time of financial pressure, support for farmers to adopt improved farming methods will be more effective than additional regulation. Decreased emissions are a win-win for the environment and for farmers, who can cut their bills by minimising nitrogen losses.**

**78. *We recommend that Defra surveys by the end of 2016, and in partnership with the National Farmers' Union, the extent to which the most effective air pollution approaches are being used on English farms. The Department should publish the data and report to this Committee on how it will use the information to better target, and if necessary increase, best practice support for farmers. This research will also facilitate constructive dialogue between the NFU and Defra on the technical feasibility of the current EU National Emissions Ceiling Directive targets for ammonia reduction.***

79. Witnesses argued that financial incentives were likely to spur action; some recommended for example that existing payments under the Common Agricultural Policy (CAP) could be better used to tackle air pollution. The Joint Nature Conservation Committee considered that competition with other CAP priorities was hampering this approach although, as the current CAP scheme was new, its effectiveness in reducing emissions was not yet known.<sup>130</sup> The NFU called for more support from Defra through agri-environment schemes, rural development funding and catchment-sensitive farming schemes.<sup>131</sup> Professor Sutton considered Natural England's work to develop Site Nitrogen Action Plans to be a "very useful start" in linking up with the CAP scheme but that budget constraints had limited its development such that it remained a demonstration tool.<sup>132</sup>

**80. *Relatively low-cost interventions can reduce emissions. With finances tight, farmers are more likely to take action if Defra can provide incentives for action. The Department must publish plans by September 2016 for using CAP funds more effectively to achieve air pollution objectives. In developing this plan, Defra should identify any EU constraints on directing funds in the optimum way and, where necessary, argue in Brussels for the removal of such barriers under the next CAP reforms.***

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126 Q23

127 National Farmers' Union and NFU Cymru ([AQU49](#))

128 As above and Q272

129 Ulster Farmers' Union ([AQU47](#))

130 Joint Nature Conservation Committee ([AQU12](#)) para 4.8

131 National Farmers' Union and NFU Cymru ([AQU49](#)) CAP pillar 2 funds may be used to support such schemes

132 Professor Mark Sutton ([AQU19](#))



## Greenhouse gas emissions

81. The agricultural sector produces around 10% of total greenhouse gas emissions (both methane and nitrous oxide combined). Since 1990, emissions from this sector have declined due to a reduction in livestock numbers, changes in the management of manure and restrictions in the use of synthetic fertiliser. However, emissions are projected to level off in future decades. Furthermore, as the NFU notes, with other sectors making faster progress to reduce their greenhouse gas emissions, even if agricultural emissions remain static they will form an increased proportion of emissions—potentially contributing a fifth of all UK emissions by 2050.<sup>133</sup>

82. The NFU told us that “addressing these longer term challenges will require a concerted effort and a willingness to consider new and novel approaches”. In 2011 the sector launched a Greenhouse Gas Action Plan to meet the climate change challenge without compromising domestic production. The Plan promotes a range of voluntary initiatives to help farmers reduce emissions whilst producing more food by using resources more efficiently.<sup>134</sup>

## Methane

83. Limits on methane emissions were proposed for the revised EU NECD Directive in 2015 but were not in the event adopted. Although such limits were supported by environmental groups, some EU agriculture groups were concerned they would place unfair cost burdens on the sector.<sup>135</sup> However, action can be taken to cut emissions. Academics in Nottingham as well as in countries such as the Netherlands and New Zealand, where emissions from livestock are a key greenhouse gas contributor, have looked at approaches such as modifying animal feed, using genetics and managing gut microbiology to reduce livestock emissions.<sup>136</sup> McDonalds has run a partnership study to investigate the potential for reducing greenhouse gas emissions from the beef sector which concluded that reductions of around 11% could be achieved through best practice in feed use, pasture management and other approaches easily adoptable at farm level.<sup>137</sup> However, some commentators and campaign groups such as Friends of the Earth have argued that policies are also needed to reduce meat eating in order to reduce emissions from livestock.<sup>138</sup>

84. ***The farming sector must step up action to cut methane emissions. The livestock sector in particular must do more if it wishes to resist arguments that reducing meat consumption is necessary to protect the environment. Whether through improved feed to cut methane emitted by cows or better manure spreading techniques, all farmers need to minimise their impact on climate change. Defra, learning from successful international approaches, should roll out by the end of 2016 a programme to support the spread of best practice to all farmers.***

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133 National Farmers' Union and NFU Cymru ([AQU49](#))

134 As above

135 “EU National Emissions Ceilings short of the mark”, Air Quality News, 16 December 2015

136 European research media centre, [The case for low methane-emitting cattle](#), 10 January 2014

137 McDonald's, *Beef Carbon Report*, 2016

138 “[Cut meat consumption or lose the fight on climate change](#)”, Friends of the Earth blog, 26 November 2013

## 7 Taking action forward

85. This report has identified areas for action in both the short and longer term if air quality is to be improved to the benefit of health and the environment. The key agents for delivering this action include:

- **Local government:** local authorities are best placed to develop plans that meet local needs, provided they have the right support and the Government trusts communities with the necessary levers to take meaningful action. A 'one size fits all' approach will not deliver pollution reductions in city hot-spots as effectively as a range of powers and duties which can be applied flexibly. In return for these freedoms councils must work closely with their communities, including NGOs, and be transparent in the outcomes;
- **Private sector:** industry is central to delivering the technological solutions to make air pollution a problem of the past. The automotive sector, which generates revenues of £60 billion in the UK each year, is a key investor in developing cleaner vehicles.<sup>139</sup> It must both respond to regulation and work pro-actively to minimise emissions if governments are to trust the sector and consumers are to have confidence to buy its products. National and EU institutions enforce emissions rules but where companies such as Volkswagen have breached trust the onus is on these companies to prove their products live up to their claims. Farmers must play their part in cutting emissions, in particular of ammonia and methane.
- **National government:** Defra has the lead role in setting out a clear, overarching air quality strategy; the Cabinet Office is pivotal in linking together action by all government departments to achieve its aims. HM Treasury is key to the Government developing effective means of calculating environmental and social costs and benefits of policies and ensuring these are borne fairly and in such a way as to drive the most sustainable approaches. Departments, in particular the Departments for Communities and Local Government, for Transport, and of Energy and Climate Change are responsible for supporting local authorities by devolving the right powers, flexibilities and funding. Transport and Environment Ministers must work in Brussels to ensure regulations spur the automotive and other industries to deliver the fastest technological improvements to cut emissions.

<sup>139</sup> UK Trade and Investment, [Automotive industry in the UK: investment opportunities](#) web guidance, accessed 11 April 2016



The table below summarises our key recommendations with timescales for government action:

ACTION	GOVERNMENT DEPARTMENT	TIMESCALE
<b>Chapter 2: Strategy for improving air quality</b>		
1. Report actions planned to join up Government air quality action in 2016–17. (para 9)	Cabinet Office	Rise of House for summer recess–21 July 2016
2. Publish comprehensive strategy for improving air quality. (para 14)	Defra	31 December 2016
3. Annual report to Parliament on progress against air quality strategy. (para 14)	Defra	Annually (by 31 December)
4. Develop practical tools for policy-makers to evaluate costs and benefits of air quality proposals. Publish the reasoning behind these tools. (para 18)	Defra	As soon as possible after relevant Natural Capital Committee outcomes are published
<b>Chapter 3: Defra's nitrogen dioxide plans</b>		
5. Consult on and publish revised proposals for Clean Air Zones addressing concerns in this report including flexibility for council implementation and extension of charging powers to other cities. (para 35)	Defra	21 July 2016
6. Publish proposals to make it easier for local authorities to use traffic movement and development controls. (para 35)	Defra	21 July 2106
7. Recompense councils for costs of implementing Clean Air Zones, preserve sustainable transport funding. (para 40)	Defra	Ongoing
<b>Chapter 4: Vehicle emissions testing</b>		
8. Negotiate tougher EU vehicle emissions limits. (para 46)	Department for Transport, Defra	Ongoing ahead of future EU revisions
9. Publish an analysis of Euro 6 emissions standards' impact on UK air quality. (para 49)	Defra	31 December 2016
10. Publish an analysis of EU real-world driving emissions tests on UK air quality. (para 49)	Defra	31 December 2018
11. Assess rigour of consumer protection system over vehicle manufacturers' emissions claims and act on outcomes of EU and Volkswagen reviews. (para 53)	UK Government (Department for Business, Innovation and Skills, Department for Transport, Defra)	Ongoing and in response to EU review findings expected early 2017 and Volkswagen internal review expected spring 2016

ACTION	GOVERNMENT DEPARTMENT	TIMESCALE
<b>Chapter 5: New road transport technologies</b>		
12. Undertake study of potential for a diesel scrappage scheme. (para 60)	HM Treasury	Study completed by 30 September 2016, measures to be included in next Budget.
13. Commission assessment of policy or research gaps in particulate emissions from vehicle brake and tyre wear. (para 64)	Department for Transport, Defra	21 July 2016
<b>Chapter 6: Tackling air pollution from agriculture</b>		
14. Survey with National Farmers' Union approaches to minimise farm air pollution, report to Committee on use of the information to improve best practice. (para 78)	Defra	31 December 2016
15. Publish plans for better use of CAP funds for air quality improvement. (para 80)	Defra	September 2016
16. Roll out programme to support best practice in farm methane emission reduction	Defra	31 December 2016

86. We expect Defra's forthcoming Clean Air Zone legislation and wider policies to reflect this report's recommendations so as to best improve air quality to the benefit of the nation's health and environment.

# Conclusions and recommendations

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## Joining up government action

1. Despite mounting evidence of the costly health and environmental impacts of air pollution, we see little evidence of a cohesive cross-government plan to tackle emissions. The Cabinet Office must establish clearly with all government departments their duty to consider air quality in developing policies. Furthermore, Ministers must tell the public more clearly how it is co-ordinating action since the work of the inter-ministerial Clean Growth Group is opaque; we recommend that the Cabinet Office report to Parliament before 21 July 2016 on the actions it plans over the coming year to join up effective action across government. (Paragraph 9)

## Defra's air quality strategy

2. Defra's plans focus too narrowly on nitrogen dioxide pollution, principally from traffic. If the full health and environmental benefits of cleaner air are to be achieved, Defra must set out plans to cut emissions of all air pollutants and from all sources, including from the transport, industry, energy and farming sectors. Plans must aim to clean up indoor as well as outdoor air. (Paragraph 13)
3. We recommend that the Department publish by the end of 2016 a comprehensive strategy for improving air quality and report annually to Parliament on progress in delivering its objectives. (Paragraph 14)

## Cost benefit analysis

4. Defra's policies aim to cut air pollution to achieve legal limits yet threats to health and the environment remain even at lower levels. Defra must calculate whether cost-effective means can be developed for meeting tougher targets. This calculation must be based on robust evidence about the benefits of cleaner air against the costs of policies needed to achieve it, such as constraints on new development. (Paragraph 17)
5. Better information is needed; we welcome the Natural Capital Committee's work to identify and place a value on the contribution of clean air to society. Defra must develop, as soon as possible after the Natural Capital Committee produces its findings, practical tools for policy-makers to use in evaluating the costs and benefits of air quality proposals and ensure that the reasoning base for these tools is made publicly available. (Paragraph 18)
6. Defra's policies must provide incentives for voluntary action as a first option before additional regulation is considered. Voluntary approaches can lower pollution in the most cost-effective ways since industry can focus its efforts on actions that work best for specific activities rather than on demonstrating compliance with rules. (Paragraph 20)

### Reinvigorating government policy

7. The Government must accord poor air quality a priority commensurate with the toll on the nation's health and environment. Emission reduction targets must be based on scientific evidence and strategies for pollution reduction based on effective cost-benefit analyses. Ministers must set out with absolute clarity the actions required across government if the public is to be reassured that the Government is committed to improving air quality quickly and substantially. (Paragraph 21)

### Defra's nitrogen dioxide plans

8. Defra's plans for Clean Air Zones will impose a 'one size fits all' model on cities from Southampton to Leeds. The Department must give local authorities greater flexibility in order that they can tailor measures to best meet their local circumstances. For example, cities may find it more effective to limit vehicle access at certain times of day or to target specific bus routes rather than adopt blanket access proposals. (Paragraph 33)
9. Charging powers are planned for only the five cities with the worst pollution yet dozens of areas breach EU limits: we recommend that Defra extends these powers to other councils in its Clean Air Zone legislation so that communities which wish to do so can tackle pollution hot-spots in this way. (Paragraph 34)
10. We further recommend that Defra consults interested parties including local authorities and publishes revised proposals by 21 July 2016 which address concerns raised in this report. Alongside these, the Government must publish proposals to make it easier for local authorities to use powers over traffic movement and new development to tackle air pollution as and when the need arises, whether inside or outside Clean Air Zones. (Paragraph 35)

### Funding for local action

11. Since Defra's plans rely on local action to cut pollution, councils must be given support to implement programmes to encourage people to drive less and use public transport and cycle and walk more. Defra must ensure that councils are recompensed for any costs of implementing new Clean Air Zones which they are not able to recoup from reasonable charges on drivers. Defra and the Department for Communities and Local Government must also preserve funding for wider programmes, such as those supported by the Local Sustainable Transport Fund, which can demonstrate they deliver benefits in a cost-effective manner. (Paragraph 40)

### EU emissions tests

12. Although it has taken far too long to agree, we welcome the adoption of a new EU real-world vehicle testing regime since current laboratory tests have routinely and significantly under-estimated emission levels. However, the new limits allow a generous leeway for measurement error and are set above current levels. (Paragraph 45)

13. The UK Government must in future negotiations argue robustly for lower EU limits which will deliver reductions on the road equal to, or better than, current laboratory limits. Tougher limits are needed to drive urgent action by the automotive industry to both improve monitoring and to reduce emissions as fast as technically possible. (Paragraph 46)

### Impact of EU test inaccuracies on Defra plans

14. We note that Defra models are based on cautious assumptions about the extent to which the new EU vehicle testing regime would deliver NO<sub>2</sub> reductions on the road. However, a history of failure to translate theoretical standards into cleaner air in practice means that Defra must keep its assumptions under review. (Paragraph 48)
15. We recommend that Defra publishes: first, by the end of 2016 an analysis of the impact on UK air quality of Euro 6 vehicle emissions standards; and secondly, by the end of 2018, an analysis of the impact of new real-world driving emissions tests being introduced from 2017. Should either of these reports show that EU standards are in practice failing to have the impact assumed under current plans, Defra must issue revised plans including stronger measures to tackle vehicle emissions. (Paragraph 49)

### Dieselgate: Volkswagen 'defeat devices'

16. Volkswagen's use of illegal devices has rightly caused consumers to be sceptical about its claims on vehicle performance. The company's different treatment of UK and US customers is also unlikely to be seen as fair. Volkswagen's evidence did not persuade us that the company had fully learnt lessons about the need to be completely transparent if it is to regain customers' trust in its products. (Paragraph 52)
17. The Government must assess whether systems are sufficiently rigorous to give customers confidence that a claim about a vehicle's performance is true. Where proven to have misled customers, the company should pay appropriate compensation. The Government must act on the findings of the EU's review of emissions testing and the outcome of Volkswagen's review of its use of defeat devices to remedy any deficiencies in consumer protection regulation. The Government must also seek at a European level a review of the penalties applicable if deliberately cheating the emissions testing system, and work to ensure that these penalties are robust enough to provide a meaningful deterrent for manufacturers. (Paragraph 53)

### New road transport technologies

18. At the current rate of change it will be many years before ultra-low emissions vehicles replace all the types of vehicles currently causing pollution. Faster progress could be made if further measures were introduced to encourage people to buy newer, unfamiliar, and in many cases more costly, technologies. (Paragraph 59)
19. We recommend that the Government launches a diesel scrappage scheme giving grants to cut the cost of a low-emission vehicle for an owner scrapping their diesel

car or van. We think it sensible to target vehicles more than 10 years old because of their high pollution levels but HM Treasury should undertake in the next six months a study to establish the details of the scheme. The study must establish in time for measures to be brought forward in the next Budget: first, the emissions levels of vehicles eligible to be bought or scrapped so the scheme achieves sufficient air quality improvements, and secondly, the level of grant necessary to incentivise sufficient take-up at the lowest cost to the public purse. (Paragraph 60)

20. We endorse the Government's support for a wide range of technologies, including the provision of fiscal incentives such as lower fuel duty rates for a variety of cleaner fuels. Different technologies, such as gas-powered or hybrid vehicles on the one hand or fully electric vehicles on the other, will offer the optimum solution for different transport needs. However, the Government should not allow the need to maintain technologically neutral approaches to inhibit policy support for the research, development and implementation of low-emission technologies, particularly where there is a strong scientific case for such support. (Paragraph 62)
21. Defra's policies must support technological developments to reduce particulates generated by the wear of vehicle brakes and tyres; the Government must commission by 21 July 2016 an assessment of any policy or research gaps on the level of emissions from these causes and methods for reducing them. The Department must ensure that EU and UK regulations reflect emerging scientific evidence on pollution from wear and tear of vehicle operation. (Paragraph 64)

### Shipping emissions

22. Shipping is responsible for producing only a small proportion of emissions, but in pollution hot-spots such as London action is needed to tackle emissions from all sources. Local authorities must calculate the additional impact on air quality of all new development; planning permissions for new shipping facilities must require appropriate mitigation measures from developers. This should include, where practicable, a requirement to provide infrastructure to supply electricity to ships at berth. (Paragraph 67)

### Tackling agricultural emissions

23. The agricultural sector must step up action to reduce its contribution to national air pollution. At a time of financial pressure, support for farmers to adopt improved farming methods will be more effective than additional regulation. Decreased emissions are a win-win for the environment and for farmers, who can cut their bills by minimising nitrogen losses. (Paragraph 77)
24. We recommend that Defra surveys by the end of 2016, and in partnership with the National Farmers' Union, the extent to which the most effective air pollution approaches are being used on English farms. The Department should publish the data and report to this Committee on how it will use the information to better target, and if necessary increase, best practice support for farmers. This research

will also facilitate constructive dialogue between the NFU and Defra on the technical feasibility of the current EU National Emissions Ceiling Directive targets for ammonia reduction. (Paragraph 78)

25. Relatively low-cost interventions can reduce emissions. With finances tight, farmers are more likely to take action if Defra can provide incentives for action. The Department must publish plans by September 2016 for using CAP funds more effectively to achieve air pollution objectives. In developing this plan, Defra should identify any EU constraints on directing funds in the optimum way and, where necessary, argue in Brussels for the removal of such barriers under the next CAP reforms. (Paragraph 80)

### Greenhouse gas emissions

26. The farming sector must step up action to cut methane emissions. The livestock sector in particular must do more if it wishes to resist arguments that reducing meat consumption is necessary to protect the environment. Whether through improved feed to cut methane emitted by cows or better manure spreading techniques, all farmers need to minimise their impact on climate change. Defra, learning from successful international approaches, should roll out by the end of 2016 a programme to support the spread of best practice to all farmers. (Paragraph 84)

## Annex: Key air pollutants

- **Ammonia (NH<sub>3</sub>):** a byproduct of agriculture, particularly livestock manure, slurry management, and fertilizers. Smaller amounts can be derived from transport and waste disposal. It is not harmful to humans or mammals but is damaging to terrestrial and aquatic ecosystems. It is a precursor to secondary particulate dispersion.
- **Nitrogen oxides (NO<sub>x</sub>):** combustion processes (e.g. inside motor vehicles) emit a mixture of nitrogen oxides (NO<sub>x</sub>), primarily nitric oxide (NO) which is quickly oxidised in the atmosphere to form nitrogen dioxide (NO<sub>2</sub>). NO<sub>2</sub> has health impacts from penetration of the lungs and physiological systems.
- **Ozone (O<sub>3</sub>):** not emitted directly from any sources. It is a secondary pollutant formed through the reaction of volatile organic compounds with NO<sub>x</sub> and hydrocarbons in the presence of sunlight. Whereas nitrogen dioxide acts as a source of ozone, nitric oxide (NO) destroys ozone and acts as a local sink (NO<sub>x</sub>-titration). For this reason, O<sub>3</sub> concentrations are not as high in urban areas (where high levels of NO are emitted from vehicles) as in rural areas. Ambient concentrations are usually highest in rural areas, particularly in hot, still and sunny weather conditions which give rise to summer 'smogs'.

**Particulate matter (PM)** includes:

- primary particles: those directly emitted from a source, including combustion and mechanical sources, such as traffic emission;
- secondary particles: those formed in the atmosphere as a result of chemical reactions between gases such as ammonia, nitrogen oxides or sulphur dioxide.

PM is conventionally defined and measured by size:

- Coarse particles (PM<sub>10</sub>–PM<sub>2.5</sub>): particles smaller than 10 µm (10 thousandths of a millimetre or a micron) in diameter but greater than 2.5 µm diameter. Coarser particles arise from re-suspended road dust, brake and tyre wear, sea salt, quarries and soil;
- Fine particles (PM<sub>2.5</sub>–PM<sub>0.1</sub>): particles less than 2.5 µm diameter, which include most combustion particles such as those emitted from diesel engine exhaust, waste burning, bonfires, and domestic biomass burning; and secondary particles of ammonium sulphate or nitrate;
- Ultrafine particles (PM<sub><0.1</sub>): particles less than 100nm diameter (100 millionths of millimetre or nanometre) which are emitted in large numbers from diesel engine exhaust.

PM has health impacts with smaller particles considered particularly harmful.

- **Sulphur dioxide (SO<sub>2</sub>):** produced by industrial process such as combustion of fossil fuels for energy production. Exposure causes constriction of the lung's airways, particularly concerning for those suffering from asthma and/or chronic lung disease. As SO<sub>2</sub> is typically a precursor to secondary PM exposure, it contributes to the negative health effects of PM. Environmental SO<sub>2</sub> exposure harms plants by degrading



chlorophyll, reducing photosynthesis, increasing respiration rates and changing protein metabolism. Deposition of SO<sub>2</sub> pollution can acidify soil and water resulting in a loss of biodiversity often in places distant from the source of the emissions.

## Formal Minutes

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**Wednesday 20 April 2016**

Members present:

Neil Parish, in the Chair

Jim Fitzpatrick

David Simpson

Rebecca Pow

Angela Smith

Ms Margaret Ritchie

Valerie Vaz

Draft Report (*Air quality*), proposed by the Chair, brought up and read.

*Ordered*, That the Draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 86 agreed to.

Annex agreed to.

Summary agreed to.

*Resolved*, That the Report be the Fourth Report of the Committee to the House.

*Ordered*, That the Chair make the Report to the House.

*Ordered*, That embargoed copies of the Report be made available, in accordance with the provisions of Standing Order No. 134.

[Adjourned till Wednesday 27 April at 2.00pm.]

# Witnesses

The following witnesses gave evidence. Transcripts can be viewed on the [inquiry publications page](#) of the Committee's website.

## Wednesday 9 December 2015

*Question number*

**Professor Martin Williams**, London School of Hygiene and Tropical Medicine, **Professor Paul Wilkinson**, King's College London, and **Professor Mark Sutton**, Centre for Ecology and Hydrology, Edinburgh

[Q1–44](#)

**Simon Birkett**, Clean Air in London, and **Alan Andrews**, Lawyer, Health and Environment, and Clean Air Project Leader, ClientEarth

[Q45–88](#)

## Wednesday 13 January 2016

**Andy Eastlake**, Managing Director, Low Carbon Vehicle Partnership, **Mike Hawes**, Chief Executive Officer, Society of Motor Manufacturers and Traders, and **Paul Willis**, Managing Director, Volkswagen Group UK

[Q89–198](#)

## Wednesday 20 January 2016

**Matthew Pencharz**, Deputy Mayor for Environment and Energy to the Mayor of London, **Councillor Tony Newman**, Local Government Association Board Member and London Borough of Croydon, and **Councillor Nick McDonald**, Nottingham City Council

[Q199–264](#)

**Andrew Bauer**, Deputy Director of Policy, National Farmers' Union Scotland, and **Dr Diane Mitchell**, Chief Environment Adviser, National Farmers' Union

[Q265–285](#)

## Wednesday 3 February 2016

**Rory Stewart MP**, Parliamentary Under Secretary of State for Environment and Rural Affairs, and **Mr Oliver Letwin MP**, Chancellor of the Duchy of Lancaster, Cabinet Office

[Q286–384](#)

## Published written evidence

The following written evidence was received and can be viewed on the [inquiry publications page](#) of the Committee's website.

AQU numbers are generated by the evidence processing system and so may not be complete.

- 1 Air Quality Group ([AQU0043](#))
- 2 British Heart Foundation ([AQU0007](#))
- 3 British Vehicle Rental And Leasing Association ([AQU0026](#))
- 4 Building Engineering Services Association ([AQU0022](#))
- 5 Calor Gas ([AQU0060](#))
- 6 Calor Gas Ltd ([AQU0008](#))
- 7 Campaign for Air Pollution Public Inquiry ([AQU0004](#))
- 8 Campaign for Air Pollution Public Inquiry ([AQU0006](#))
- 9 Campaign for Better Transport ([AQU0044](#))
- 10 City of London Corporation ([AQU0032](#))
- 11 CIWEM ([AQU0016](#))
- 12 Clean Air in London ([AQU0030](#))
- 13 CPL Industries ([AQU0024](#))
- 14 Department for Environment, Food and Rural Affairs ([AQU0010](#))
- 15 Department for Environment, Food and Rural Affairs ([AQU0062](#))
- 16 Dr Richard Lofthouse ([AQU0002](#))
- 17 Environmental Industries Commission ([AQU0051](#))
- 18 Environmental Protection UK ([AQU0038](#))
- 19 Freight Transport Association ([AQU0017](#))
- 20 Friends of the Earth ([AQU0050](#))
- 21 Gatwick Airport Ltd ([AQU0013](#))
- 22 Gatwick Airport Ltd ([AQU0055](#))
- 23 Greater London Authority ([AQU0045](#))
- 24 Green Alliance ([AQU0021](#))
- 25 Heathrow Airport ([AQU0048](#))
- 26 Institute of Air Quality Management ([AQU0014](#))
- 27 Jim Harkins ([AQU0054](#))
- 28 Joint Nature Conservation Committee ([AQU0012](#))
- 29 King's College London ([AQU0028](#))
- 30 Local Government Association ([AQU0027](#))
- 31 Local Government Association ([AQU0061](#))
- 32 London Councils ([AQU0033](#))
- 33 London Forum of Amenity and Civic Societies ([AQU0029](#))

- 34 Low Carbon Vehicle Partnership ([AQU0056](#))
- 35 Mineral Products Association ([AQU0015](#))
- 36 Mr Howard Wynne ([AQU0036](#))
- 37 Mr Ralph Hardwick ([AQU0031](#))
- 38 Mr Simon Francis ([AQU0040](#))
- 39 National Farmers' Union ([AQU0057](#))
- 40 National Farmers' Union ([AQU0049](#))
- 41 National Physical Laboratory ([AQU0023](#))
- 42 Nottingham City Council ([AQU0053](#))
- 43 Plantlife ([AQU0042](#))
- 44 Professor Mark Sutton ([AQU0019](#))
- 45 Professor Paul Wilkinson ([AQU0034](#))
- 46 Renewable Energy Association ([AQU0035](#))
- 47 Roland Gilmore ([AQU0052](#))
- 48 Royal College of Physicians ([AQU0009](#))
- 49 Society of Motor Manufacturers and Traders (SMMT) ([AQU0058](#))
- 50 Society of Motor Manufacturers and Traders (SMMT) ([AQU0018](#))
- 51 Sustainable Aviation ([AQU0011](#))
- 52 UK Hydrogen and Fuel Cell Association ([AQU0025](#))
- 53 UKLPG ([AQU0041](#))
- 54 Ulster Farmers' Union ([AQU0047](#))
- 55 Volkswagen Group UK Ltd ([AQU0046](#))
- 56 Volkswagen Group UK Ltd ([AQU0059](#))

## List of Reports from the Committee during the current Parliament

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All publications from the Committee are available on the [publications page](#) of the Committee's website.

The reference number of the Government's response to each Report is printed in brackets after the HC printing number.

### Session 2015–16

First Report	Defra performance in 2014–15	HC 443
Second Report	Greyhound welfare	HC 478
Third Report	Farmgate prices	HC 474
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House of Commons  
Environment, Food and Rural  
Affairs Committee

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**Air quality: Government  
response to the  
Committee's Fourth  
Report of Session  
2015–16**

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**Third Special Report of Session  
2016–17**

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**HC 665**

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## The Environment, Food and Rural Affairs Committee

The Environment, Food and Rural Affairs Committee is appointed by the House of Commons to examine the expenditure, administration, and policy of the Department of Environment, Food and Rural Affairs and associated public bodies.

### Current membership

[Neil Parish MP](#) (*Conservative, Tiverton and Honiton*) (Chair)

[Chris Davies MP](#) (*Conservative, Brecon and Radnorshire*)

[Jim Fitzpatrick MP](#) (*Labour, Poplar and Limehouse*)

[Simon Hart MP](#) (*Conservative, Carmarthen West and South Pembrokeshire*)

[Dr Paul Monaghan MP](#) (*Scottish National Party, Caithness, Sutherland and Easter Ross*)

[Rebecca Pow MP](#) (*Conservative, Taunton Deane*)

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[David Simpson MP](#) (*Democratic Unionist Party, Upper Bann*)

[Angela Smith MP](#) (*Labour, Penistone and Stocksbridge*)

[Rishi Sunak MP](#) (*Conservative, Richmond, (Yorks)*)

[Valerie Vaz MP](#) (*Labour, Walsall South*)

### Powers

The Committee is one of the departmental select committees, the powers of which are set out in House of Commons Standing Orders, principally in SO No 152. These are available on the internet via [www.parliament.uk](http://www.parliament.uk).

### Publication

Committee reports are published on the Committee's website at [www.parliament.uk/efracom](http://www.parliament.uk/efracom) and in print by Order of the House.

Evidence relating to this report is published on the [inquiry publications page](#) of the Committee's website.

### Committee staff

The current staff of the Committee are David Weir (Clerk), Danielle Nash (Second Clerk), Sarah Coe (Senior Committee Specialist), Anwen Rees (Committee Specialist), Ellen Bloss (Senior Committee Assistant), Henry Ayi-Hyde, (Committee Assistant) and Nick Davies (Media Officer).

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## Third Special Report

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The Environment, Food and Rural Affairs Committee reported to the House on Air quality in its Fourth Report of Session 2015–16, published on 27 April 2016, as HC 479.

The Government's response to the Report was received by the Committee on 7 September 2016, and is appended below.

The Recommendations contained in the Committee's original report are numbered and highlighted in bold. The plain text is the Government's response on each point.

## Appendix: Government response

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### Introduction

Improving air quality is a priority for this Government. The Government's ambition is for the UK to have the best natural environment anywhere and improving air quality is an essential part of that. We have made considerable progress on reducing emissions of key air pollutants. For example, between 2010 and 2014 emissions of nitrogen oxides (NOx) fell by 17 per cent in the UK.

In December last year, the Government published the National Air Quality Plan for nitrogen dioxide<sup>1</sup> which will ensure we fulfil our environmental responsibilities and make our cities better places to live and work. This is an ambitious plan combining national and local measures. It is focused on targeted interventions that form part of a wider approach exploiting new, cleaner technologies, such as electric and ultra-low emission vehicles.

The Government has committed over £2 billion since 2011 to help bus operators upgrade their fleets, reduce pollution from a range of vehicles and promote the development of clean alternative fuels. We have also been at the forefront of action at EU level to introduce real-world driving emissions testing in 2017, so that diesel vehicles deliver the expected emission reductions on the road as well as in the laboratory.

The Government welcomes the Environment Food and Rural Affairs Committee's interest in Air Quality. Clean air is vital for people's health and the environment, essential for making sure UK cities are welcoming places for people to live and work now and in the future. This requires concerted action across a number of government departments to tackle pollutants emitted from many sectors including transport, industry and the energy and agricultural sectors.

We welcome the Committee's acceptance of the Clean Air Zones model as an appropriate approach to addressing air pollution in cities. We will consult on a proposed framework for Clean Air Zones later this year.

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<sup>1</sup> Improving air quality in the UK: Tackling nitrogen dioxide in our towns and cities [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/48036/eq-plan-2015-overview-document.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48036/eq-plan-2015-overview-document.pdf)

### *Joining up government action*

**1. Despite mounting evidence of the costly health and environmental impacts of air pollution, we see little evidence of a cohesive cross-government plan to tackle emissions. The Cabinet Office must establish clearly with all government departments their duty to consider air quality in developing policies. Furthermore, Ministers must tell the public more clearly how it is co-ordinating action since the work of the inter-ministerial Clean Growth Group is opaque; we recommend that the Cabinet Office report to Parliament before 21 July 2016 on the actions it plans over the coming year to join up effective action across government. (Paragraph 9)**

We recognise that improving air quality is a government-wide issue and that while Defra is the lead Department for air quality policy, ownership of many of the measures that can deliver improvements in air quality primarily rests with other Departments. That is why there has been engagement at all levels across Whitehall, from officials to Ministers, on both evidence and policy, including through the development of the National Air Quality Plan and the 2015 Spending Review. For example, officials in Defra and DECC sit on the Office of Low Emission Vehicles programme board, helping incorporate air quality evidence and policy direction into broader policy areas.

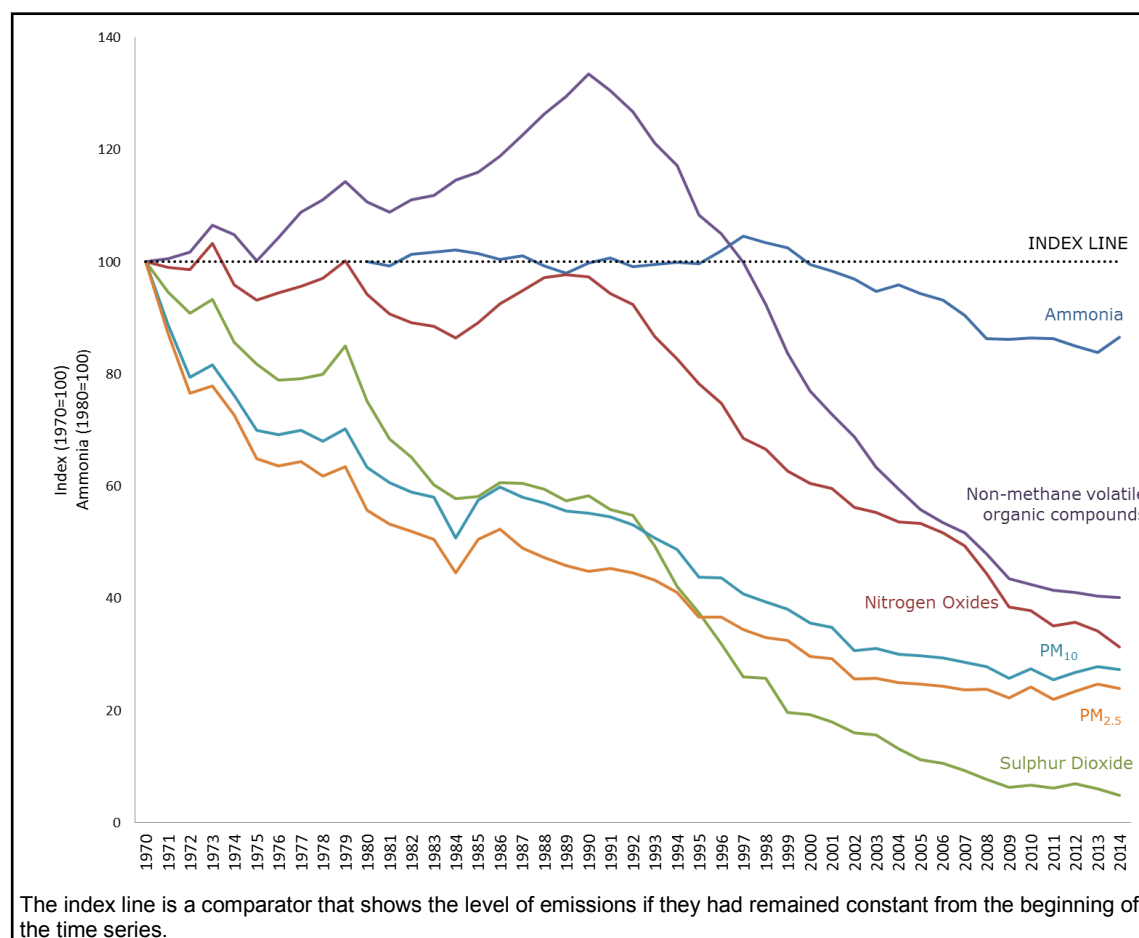
Recognising the importance of effective cross-government work on Air Quality, Defra and DfT officials have recently been brought together to form a new Joint Air Quality Unit (JAQU) to lead the implementation of the National Air Quality Plan. The Unit will ensure a coordinated approach across Whitehall, reporting to a board comprising representatives from the key departments.

The Clean Growth IMG has met regularly and helped to coordinate and drive forward government policy, including on air quality. The membership and timing of these meetings has been deliberately kept flexible to allow the group to quickly respond to changing priorities and circumstances, and to ensure that the right Ministers and officials have been able to attend each meeting. Specific actions have been developed over the course of these meetings, in conjunction with Departmental priorities. Close joint working will continue across government in future.

### *Defra's air quality strategy*

**2. Defra's plans focus too narrowly on nitrogen dioxide pollution, principally from traffic. If the full health and environmental benefits of cleaner air are to be achieved, Defra must set out plans to cut emissions of all air pollutants and from all sources, including from the transport, industry, energy and farming sectors. Plans must aim to clean up indoor as well as outdoor air. (Paragraph 13)**

**Figure 1: Trends in UK sulphur dioxide, nitrogen oxides, non-methane volatile organic compounds, ammonia and particulate matter (PM<sub>10</sub>–PM<sub>2.5</sub>) emissions 1970–2014**



Defra National Statistics Release: Emissions of air pollutants in the UK, 1970 to 2014

Air quality is key to a high quality rural and urban environment. We are committed to improving air quality across England. We published our national air quality plan for nitrogen dioxide last December which sets out a comprehensive approach to meet the EU 40mg nitrogen dioxide limit by 2020 through a new programme of Clean Air Zones. These Zones will tackle the most polluting vehicles—old diesel buses and lorries—in the cities where we have the greatest air quality problems (Birmingham, Leeds, Southampton, Nottingham and Derby).

Alongside this, the previous Mayor of London set out a plan to tackle air pollution in London including the introduction of the Ultra Low Emission Zone (ULEZ) by 2020, retro-fitting of buses and licensing new taxis only if they are zero emission capable from 2018. The new Mayor has recently announced a number of further proposals to improve air quality in the capital. The proposals include extending the ULEZ to beyond the congestion zone to the North and South Circular roads, bringing forward its introduction earlier than 2020 and introducing an extra “T” charge on the most polluting vehicles entering central London.

Our national air quality plan for nitrogen dioxide will deliver multiple benefits for air quality, reducing nitrogen dioxide and helping reduce other pollutants. For example,

encouraging the use of cleaner vehicles within the Clean Air Zones will also help reduce levels of particulate matter (PM) as the later Euro standards have tighter PM emission standards.

Air pollution does not stop at national boundaries and coordinated action is therefore needed to reduce air pollution effectively. It is estimated that at times up to 50% of UK concentrations of fine PM are due to emissions from other European countries. The UK supported the agreement on the revised National Emission Ceilings Directive (NECD) which will set emission limits across the EU for key air pollutants including NO<sub>x</sub>, fine PM and ammonia in 2020 and 2030. The European Parliament is expected to officially approve the Directive in the autumn.

**3. We recommend that the Department publish by the end of 2016 a comprehensive strategy for improving air quality and report annually to Parliament on progress in delivering its objectives. (Paragraph 14)**

The national air quality plan for nitrogen dioxide already sets out a comprehensive plan for reducing nitrogen dioxide levels across the UK. The plan sets out how the Government will legislate to require the implementation of Clean Air Zones in Birmingham, Leeds, Southampton, Nottingham and Derby. This forms part of a wider approach exploiting new, cleaner technologies, such as electric and ultra-low emission vehicles.

Additionally we will be consulting on a Framework for Clean Air Zones later this year which will include the important principles that need to be consistent from city to city to help ensure Clean Air Zones are implemented in the same way by local authorities across England.

There are many drivers of poor air quality and these vary according to local circumstances and pressures. We want to stay responsive to local communities and will do this by moving to a more integrated approach where we operate to clear shared goals. Defra is already taking steps to work towards better integration at the local level. From July 2016, the Environment Agency and Natural England will be transitioning to using 14 Area boundaries with a view to harnessing strong local leadership to drive effective and efficient place-based decision making which has local communities at its heart. We want to design an effective approach to driving environmental improvement, tailored to the needs of our country that has a powerful and permanent impact—making England a cleaner, greener and healthier place to live and work; not just today, but for the generations to come. To help shape our long term approach to the environment, we will run four pilot projects known as Pioneers which will trial and test new ways of working for local environmental benefits in four local areas. This will include a rural landscape, urban setting, catchment planning, and a marine focussed setting.

Access to data and information is essential to enabling informed choices to be made on the best approaches to tackling the sources of, and reducing exposure to, pollution. Air quality monitoring data and Met Office air quality forecasts are already routinely reported to the public in near real time, alongside appropriate health advice. The Government will work towards opening up our data further so that people, businesses and the public sector are able to use it to develop new tools for taking better decisions. This will empower and help the public to understand what this information means, both in terms of the effects of air pollution on their health; and actions which they may take to mitigate those effects.

### **Cost benefit analysis**

**4. Defra's policies aim to cut air pollution to achieve legal limits yet threats to health and the environment remain even at lower levels. Defra must calculate whether cost-effective means can be developed for meeting tougher targets. This calculation must be based on robust evidence about the benefits of cleaner air against the costs of policies needed to achieve it, such as constraints on new development. (Paragraph 17)**

Defra's Strategy<sup>2</sup> makes a clear commitment to improving air quality. The Government's national air quality plan for nitrogen dioxide, published in December 2015, sets out a comprehensive approach for meeting air quality challenges on nitrogen dioxide concentrations. The Plan combines targeted local and national measures to ensure that UK air will be cleaner than ever before, forming part of a wider approach that exploits new and clean technologies such as electric and ultra-low emission vehicles.

Defra routinely carries out cost-benefit analysis when developing and implementing policies and the national air quality plan for nitrogen dioxide was developed through an extensive process of evidence gathering, option analysis and consultation with stakeholders, both in central and local government and beyond. This process identified that in general policy terms the most cost effective and efficient way to improve air quality and protect public health was to control the emissions from the oldest vehicles in areas of high population density. A number of potential policy measures were considered in detail during the evidence gathering process, and Clean Air Zones were established as the most appropriate means of reducing the health impacts of nitrogen dioxide and meeting our legal obligations. The Plan requires the implementation of Clean Air Zones to deliver improvements in the most polluted areas and help achieve compliance with the Ambient Air Quality Directive in the shortest possible time. These geographically defined Zones allow a range of actions and resources to be targeted to deliver the greatest health benefits. They will also deliver a range of wider societal benefits including improved traffic flow and reductions in greenhouse gas emissions.

In addition to the above measures, we will introduce new, tougher targets which will drive down air pollution from all sources, reducing transboundary pollution and significantly reducing the number of premature deaths across the EU caused by poor air quality. Defra is looking carefully at cost-effective measures that could be taken to meet these targets once agreed, and will publish an impact assessment in due course.

**5. Better information is needed; we welcome the Natural Capital Committee's work to identify and place a value on the contribution of clean air to society. Defra must develop, as soon as possible after the Natural Capital Committee produces its findings, practical tools for policy-makers to use in evaluating the costs and benefits of air quality proposals and ensure that the reasoning base for these tools is made publicly available. (Paragraph 18)**

<sup>2</sup> Creating a great place for living: Defra's strategy to 2020 <https://www.gov.uk/government/publications/defras-strategy-to-2020-creating-a-great-place-for-living>

We agree with the Committee's recommendation that practical tools are needed for policy makers to assess costs and benefits. Tools are already available, both through Defra guidance<sup>3</sup> and in the HM Treasury Green Book.<sup>4</sup>

The new Environment Analysis Unit in Defra has been established in part to drive this agenda forwards. However, practical tools shouldn't be limited to policy makers or just to air quality needs.

**6. Defra's policies must provide incentives for voluntary action as a first option before additional regulation is considered. Voluntary approaches can lower pollution in the most cost-effective ways since industry can focus its efforts on actions that work best for specific activities rather than on demonstrating compliance with rules. (Paragraph 20)**

Voluntary approaches are always considered as part of developing new policies on air quality, and the national air quality plan for nitrogen dioxide sets out a number of such approaches and incentives being taken by government, local authorities and industry, e.g. the funding provided by the Office of Low Emission Vehicles and the Local Sustainable Transport Fund.

As part of the preparation of the national air quality plan for nitrogen dioxide we considered incentivising voluntary action within our consultation, in particular for the introduction of Clean Air Zones. However, following further analysis it was concluded that a regulatory approach provides greater certainty to measures being implemented to meet the legal limit values in the shortest possible time. This approach is also supported by responses to the consultation where many asked for central government to provide stronger direction. The Government believes the published plan sets out appropriate action across a range of voluntary, fiscal and regulatory measures that will help us to deliver our air quality ambitions as well as meeting our legal and environmental obligations.

### ***Reinvigorating government policy***

**7. The Government must accord poor air quality a priority commensurate with the toll on the nation's health and environment. Emission reduction targets must be based on scientific evidence and strategies for pollution reduction based on effective cost-benefit analyses. Ministers must set out with absolute clarity the actions required across government if the public is to be reassured that the Government is committed to improving air quality quickly and substantially. (Paragraph 21)**

Public health and improving air quality are cross-government responsibilities and Defra's role is to work across departments and with the devolved governments to drive action to ensure air quality outcomes are mainstreamed across policy, from transport to energy to public health.

We are committed to improving the UK's air quality, reducing health impacts, and fulfilling our legal obligations. The national air quality plan for nitrogen dioxide sets out a comprehensive approach for meeting these goals for nitrogen dioxide, and alongside this we continue to take steps to address other pollutants.

<sup>3</sup> <https://www.gov.uk/guidance/air-quality-economic-analysis>

<sup>4</sup> <https://www.gov.uk/government/publications/green-book-supplementary-guidance-air-quality>



The Government is making a significant investment in a number of initiatives, which will help reduce pollution emissions from transport, including an ambitious programme for increasing the uptake of ultra-low emission vehicles. £2 billion has been committed since 2011 to increase the uptake of ultra-low emission vehicles, support green transport initiatives and support local authorities to take action. These measures will address both particulate matter and nitrogen dioxide, but there is more we can do.

Responding to the urgency of this matter Defra and DfT officials have recently been brought together to form the Joint Air Quality Unit (JAQU). The JAQU will work with local government to deliver an ambitious programme of bespoke measures across cities as set out in the national air quality plan for nitrogen dioxide. It will also ensure a coordinated approach across Whitehall in delivering the plans reporting to a board containing representatives of key departments. The JAQU is supported by a comprehensive range of scientific, economic, commercial, and procurement expertise from both departments.

### **Defra's nitrogen dioxide plans**

**8. Defra's plans for Clean Air Zones will impose a 'one size fits all' model on cities from Southampton to Leeds. The Department must give local authorities greater flexibility in order that they can tailor measures to best meet their local circumstances. For example, cities may find it more effective to limit vehicle access at certain times of day or to target specific bus routes rather than adopt blanket access proposals. (Paragraph 33)**

There will be no 'one size fits all' approach and local authorities will lead on the implementation of Clean Air Zones as they understand their area and are best placed to develop solutions.

The proposals for Clean Air Zones in the five cities where we are requiring their introduction will allow measures to be tailored according to local circumstances. The class and extent of the zones ultimately required will depend upon the outcome of a more detailed local assessment. The combination of measures required, along with details of individual Zones, is being determined through feasibility studies led by local authorities funded by central Government. We are working closely with the local authorities on these studies.

However, it is important Clean Air Zones are co-ordinated from a national perspective. Industry and local authorities have made clear to us that different approaches in different cities can make it difficult for businesses and individuals that travel across a number of cities to make straightforward, economic and operational decisions about the vehicles they buy. Therefore some degree of consistency in approach as to how a Zone is adopted and operates is crucial to their success. We will consult on a Framework for Clean Air Zones later this year which will include the important principles that need to be consistent from city to city to help ensure that Clean Air Zones are implemented in the same way by local authorities across England.

**9. Charging powers are planned for only the five cities with the worst pollution yet dozens of areas breach EU limits: we recommend that Defra extends these powers to other councils in its Clean Air Zone legislation so that communities which wish to do so can tackle pollution hot-spots in this way. (Paragraph 34)**

Cities already have the required powers to introduce and charge for entry into a Clean Air Zone,<sup>5</sup> as well as other air quality schemes. Local authorities can take action as and when necessary to improve air quality and we encourage them to do so.

Under our plan we are requiring Clean Air Zones in five cities, which will focus on air quality hotspots where pollution is most serious and will target the most polluting vehicles like old buses, taxis, coaches and lorries.

**10. We further recommend that Defra consults interested parties including local authorities and publishes revised proposals by 21 July 2016 which address concerns raised in this report. Alongside these, the Government must publish proposals to make it easier for local authorities to use powers over traffic movement and new development to tackle air pollution as and when the need arises, whether inside or outside Clean Air Zones. (Paragraph 35)**

The national air quality plan for nitrogen dioxide sets out a comprehensive approach to reducing nitrogen dioxide levels. Our focus is now on implementing this plan, alongside the steps we are taking to address other pollutants. We are working closely with the five local authorities where we will be requiring Clean Air Zones, and with the Mayor of London and the Greater London Authority to help ensure nitrogen dioxide levels are reduced in the shortest possible time.

As set out above, other local authorities can adopt Clean Air Zones as a way to focus their action to improve air quality using existing powers, and we are engaging with local authorities who are interested in doing this on a voluntary basis. We will be consulting on a framework for Clean Air Zones later this year.

Although we will continue to work with local authorities to consider what further powers they might need, local authorities already have a range of powers they can use to improve air quality, including those set out in the local air quality management system; planning; smoke control areas; transport and traffic powers.

### ***Funding for local action***

**11. Since Defra's plans rely on local action to cut pollution, councils must be given support to implement programmes to encourage people to drive less and use public transport and cycle and walk more. Defra must ensure that councils are recompensed for any costs of implementing new Clean Air Zones which they are not able to recoup from reasonable charges on drivers. Defra and the Department for Communities and Local Government must also preserve funding for wider programmes, such as those supported by the Local Sustainable Transport Fund, which can demonstrate they deliver benefits in a cost-effective manner. (Paragraph 40)**

The UK is investing heavily in transport measures to reduce emissions. £2 billion has been committed since 2011 to increase the uptake of ultra-low emission vehicles, support green transport initiatives and support local authorities to take action. These measures will address both particulate matter and nitrogen dioxide. Examples include:

- Over £1,000 million committed between 2010–2020 to put the UK at the global forefront of ultra-low emission vehicle development, manufacture and use,



including £600 million announced in the 2015 autumn statement, to support the early market for ultra-low emission vehicles between 2015 and 2020. In 2015 more ULEVs were registered in the UK than in the previous four years combined, keeping us well on track for almost every car and van to be zero emission by 2050.

- £600 million invested during 2011–15 to deliver 96 projects across 77 local authorities through the Local Sustainable Transport Fund. With match funding this amounted to over £1bn of investment.
- £374m invested by the Government in cycling (including £151m through the Local Sustainable Transport Fund).
- A further £580 million has been committed for a new 'Access' fund for sustainable travel over 2015 to 2020, building on the legacy of the Local Sustainable Transport Fund and supporting growth in cycling and walking.

As set out in the national air quality plan for nitrogen dioxide, the Government has allocated funding to help local authorities in Birmingham, Leeds, Nottingham, Derby and Southampton implement Clean Air Zones and meet new burdens associated with implementing the Zones. The scoping studies supported by Government funding will assess the optimum balance of additional measures. Where additional measures are required Government will keep the delivery of such measures under review, and will take further action if progress is insufficient.

Measures in London are supported by the 2015 Spending Review Settlement for Transport for London.

In addition, Defra's Air Quality Grant Scheme supports local authority action on air pollution, with £11 million being allocated since 2010. This includes supporting 15 schemes investigating the feasibility of Low Emission Zones. The Government has also streamlined the Local Air Quality Management framework to enable local authorities to take action more quickly by focusing resources to take local action to tackle local air quality hotspots.

### **EU emissions tests**

**12. Although it has taken far too long to agree, we welcome the adoption of a new EU real-world vehicle testing regime since current laboratory tests have routinely and significantly under-estimated emission levels. However, the new limits allow a generous leeway for measurement error and are set above current levels. (Paragraph 45)**

**13. The UK Government must in future negotiations argue robustly for lower EU limits which will deliver reductions on the road equal to, or better than, current laboratory limits. Tougher limits are needed to drive urgent action by the automotive industry to both improve monitoring and to reduce emissions as fast as technically possible. (Paragraph 46)**

The Government has been at the forefront of action at EU level to introduce real driving emissions testing from 2017, driving improvements in real-world emissions. This is essential for improving air quality in our towns and cities.

The recent agreement to introduce real driving emissions testing will reduce emissions to just over twice the limit for new vehicles from 2017 and bring them into full compliance from 2020, with an additional margin for measurement uncertainties.

The Step 2 conformity factor is set to 1.5 (the Euro 6 limit plus 0.5 margin for measurement uncertainty). However the Commission Regulation includes a requirement for the Commission to review this annually and the clear aim is for this margin to be reduced in light of technological progress. The Commission has expressed its intention to make use of this revision clause to move towards a conformity factor of 1.

Some manufacturers have announced that they intend to make changes to vehicles already in use to improve emissions, and will offer this to customers on a voluntary basis. We welcome this and encourage action from other manufacturers ahead of the implementation dates across the EU for RDE testing.

### ***Impact of EU test inaccuracies on Defra plans***

**14. We note that Defra models are based on cautious assumptions about the extent to which the new EU vehicle testing regime would deliver NO<sub>2</sub> reductions on the road. However, a history of failure to translate theoretical standards into cleaner air in practice means that Defra must keep its assumptions under review. (Paragraph 48)**

**15. We recommend that Defra publishes: first, by the end of 2016 an analysis of the impact on UK air quality of Euro 6 vehicle emissions standards; and secondly, by the end of 2018, an analysis of the impact of new real-world driving emissions tests being introduced from 2017. Should either of these reports show that EU standards are in practice failing to have the impact assumed under current plans, Defra must issue revised plans including stronger measures to tackle vehicle emissions. (Paragraph 49)**

The Government's comprehensive national air quality plan for nitrogen dioxide published in December last year is based on the best available evidence and uses the latest COPERT (Computer Programme to Calculate Emissions from Road Transport) (4v11) factors to calculate emissions from diesel cars.

In May the Government presented the results of its vehicle testing programme to European Research for Mobile Emission Sources (ERMES), the international expert body responsible for collating the vehicle emission data which underpins COPERT. We expect updated COPERT emission factors to be released later this year and will work with ERMES to ensure that EU-wide emission factors more accurately reflect the difference between real world driving and laboratory test conditions.

If COPERT factors are significantly revised, we will update our modelling and, if necessary, our national air quality plan for nitrogen dioxide.

RDE will apply to new type approvals from September 2017, and existing models from 2019. As such we expect the biggest step change improvement from RDE to occur in 2019, and it would therefore be more appropriate to assess the impact of RDE on UK air quality in 2020.

### ***Dieselgate: Volkswagen 'defeat devices'***

16. Volkswagen's use of illegal devices has rightly caused consumers to be sceptical about its claims on vehicle performance. The company's different treatment of UK and US customers is also unlikely to be seen as fair. Volkswagen's evidence did not persuade us that the company had fully learnt lessons about the need to be completely transparent if it is to regain customers' trust in its products. (Paragraph 52)

17. The Government must assess whether systems are sufficiently rigorous to give customers confidence that a claim about a vehicle's performance is true. Where proven to have misled customers, the company should pay appropriate compensation. The Government must act on the findings of the EU's review of emissions testing and the outcome of Volkswagen's review of its use of defeat devices to remedy any deficiencies in consumer protection regulation. The Government must also seek at a European level a review of the penalties applicable if deliberately cheating the emissions testing system, and work to ensure that these penalties are robust enough to provide a meaningful deterrent for manufacturers. (Paragraph 53)

The Government takes the unacceptable actions of Volkswagen extremely seriously. Following the revelations that Volkswagen had been using software in their cars which caused the engines to behave differently during emissions tests, we established an Emissions Testing Programme to investigate whether other manufacturers were using equivalent prohibited devices and more broadly to better understand why emissions results in the real world were significantly different from those tested under laboratory conditions. The tests did not detect evidence of test cycle manipulation strategies, as used by the Volkswagen Group, from other manufacturers. However, our tests found higher levels of NO<sub>x</sub> emissions in test track and real world driving conditions than in the laboratory for all vehicles, with results varying significantly between different makes and models. We are pleased that a range of other countries have also responded decisively and retested vehicles to check for prohibited software and measure real world emissions. We engaged with the European Commission and other Member States during our testing programme to ensure a consistent approach in the testing and to maximise the value for the respective activities.

For air quality emissions, the introduction of Real Driving Emissions testing from next year will mean consumers across the EU can be confident that a new vehicle will comply with emissions limits within a specified 'conformity factor' during typical normal use. The introduction of the new Worldwide harmonized Light vehicles Test Procedure (WLTP), expected in 2017, will ensure consumers can compare vehicle CO<sub>2</sub> emissions and fuel consumption using figures that will be more representative of those achieved under normal driving than those measured using the current New EU Driving Cycle (NEDC) test procedure.

The Competition and Markets Authority has recently acquired the power to seek civil redress for consumers. However this only exists in relation to conduct that occurred after 1 October 2015 so is not applicable to the Volkswagen case. Regarding compensation for Volkswagen customers, where there is a clear case that drivers in the UK have suffered a detriment, we would expect Volkswagen to provide compensation.

Pursuant to Regulation 33(4) of the Road Vehicles (Approval) Regulations 2009 it is an offence for a person to knowingly or recklessly make a false statement for the purpose of obtaining vehicle type approval. The penalty on conviction is an unlimited fine.

In February this year the European Commission published a proposal to update the current vehicle type approval framework and this contains a number of measures to strengthen the system across member states. These include a new power for the Commission to impose a penalty of €30,000 per non-compliant vehicle, where a national approval authority has not taken action. The Government shares the overall objectives of the proposal, but is still considering the policy implications of the individual measures contained within it.

### ***New road transport technologies***

**18. At the current rate of change it will be many years before ultra-low emissions vehicles replace all the types of vehicles currently causing pollution. Faster progress could be made if further measures were introduced to encourage people to buy newer, unfamiliar, and in many cases more costly, technologies. (Paragraph 59)**

**19. We recommend that the Government launches a diesel scrappage scheme giving grants to cut the cost of a low-emission vehicle for an owner scrapping their diesel car or van. We think it sensible to target vehicles more than 10 years old because of their high pollution levels but HM Treasury should undertake in the next six months a study to establish the details of the scheme. The study must establish in time for measures to be brought forward in the next Budget: first, the emissions levels of vehicles eligible to be bought or scrapped so the scheme achieves sufficient air quality improvements, and secondly, the level of grant necessary to incentivise sufficient take-up at the lowest cost to the public purse. (Paragraph 60)**

The move to ultra low emissions vehicles is under way. The Government has set an ambitious goal that all new cars and vans should be zero emission by 2040, which is ahead of international commitments such as the International Zero Emission Vehicle Alliance's 2050 commitment, agreed at the COP21 climate change conference in Paris.

The Government established the Office for Low Emission Vehicles (OLEV) in 2009 to drive the uptake of ultra low emission vehicles. OLEV secured over £600 million at the 2015 Spending Review and will continue to offer one of the most comprehensive packages of measures in the world to help overcome consumer barriers, accelerate uptake and support UK industry. This includes at least £400 million for the Plug-in Car Grant, which reduces the price to motorists of eligible ULEVs, support for recharging and hydrogen refuelling infrastructure, and a joint industry-government communications campaign to raise awareness of ULEVs, promote their many benefits, and challenge negative pre-conceptions.

The motoring tax regime includes strong incentives for cleaner vehicles, such as Company Car Tax and Vehicle Excise Duty. Schemes are also underway to assist local authorities in moving to lower emission and zero emission buses and taxis, which can be some of the worst contributors to air pollution in urban areas.

This package of measures and clear long term signals that it sends have established the UK as a global leader in ultra low emission vehicles. We are one of the largest and fastest growing markets in Europe and last year around one in five battery electric cars sold in the UK was built in the UK.

We have considered the use of scrappage schemes both linked to the purchase of ultra low emission vehicles and more generally and have concluded that this may not be an appropriate and proportionate response to the challenges we face, as air quality exceedances are often localised and can be managed in other ways.

The benefits of introducing a scrappage scheme in terms of improved air quality would need to be weighed against its effectiveness, the additional Exchequer cost and wider economic impacts, to ensure value for money for the taxpayer. A high-level cost estimate was carried out, looking at offering grants for scrappage of the dirtiest vehicles and this determined that there is no proportionate way to appropriately target such a measure to the areas where it would be most needed; and as such, it would not be an effective use of significant resources. The use of Clean Air Zones is a more targeted and proportionate approach to tackle the emissions.

**20. We endorse the Government's support for a wide range of technologies, including the provision of fiscal incentives such as lower fuel duty rates for a variety of cleaner fuels. Different technologies, such as gas-powered or hybrid vehicles on the one hand or fully electric vehicles on the other, will offer the optimum solution for different transport needs. However, the Government should not allow the need to maintain technologically neutral approaches to inhibit policy support for the research, development and implementation of low-emission technologies, particularly where there is a strong scientific case for such support. (Paragraph 62)**

The Government recognises that the need to resolve the challenge of poor air quality will not be met by any one solution and will instead require a portfolio of solutions, which can be selected and adjusted according to differing needs and situations. The Government therefore encourages innovation and does not seek to 'pick winners' from amongst emerging technologies. Instead we will support activities that are informed by evidence and backed by industry consensus, allowing the market to determine ultimately which technologies win through. We therefore expect that a portfolio of solutions will be required to decarbonise road transport.

For cars and vans it is increasingly clear that full electrification—through batteries and/or fuel cells—is achievable and desirable. For other road vehicles, with differing requirements, other low emission solutions may work best. When developing policies we ensure that the guidelines include appropriately technology neutral performance criteria, to avoid excluding emerging technologies.

**21. Defra's policies must support technological developments to reduce particulates generated by the wear of vehicle brakes and tyres; the Government must commission by 21 July 2016 an assessment of any policy or research gaps on the level of emissions from these causes and methods for reducing them. The Department must ensure that EU and UK regulations reflect emerging scientific evidence on pollution from wear and tear of vehicle operation. (Paragraph 64)**

Defra is aware of the importance of brake and tyre wear as a source of particulate emissions having commissioned our own independent research on PM<sub>2.5</sub>, which was published in 2012 and 2015 by the Air Quality Expert Group (AQEG).<sup>6 7 8</sup>

The relative contribution of a range of sources, including non-exhaust particulates, is estimated annually through the National Emissions Inventory<sup>9</sup> (NAEI). The NAEI is reviewed and updated annually and is alive to changes in methods and understanding of brake and tyre wear, which are incorporated into the updated emission factors developed under this program. The latest Informative Inventory Report explains, in section 3.3.3.7 (p.146), how non-exhaust emissions of particulates from tyres, brake linings and the road surface are estimated when producing the UK emission inventory.<sup>10</sup>

The NAEI was cited in a comprehensive review by the Joint Research Committee (JRC) in 2014<sup>11</sup> on brake and tyre wear, which showed that the estimated emissions published in the NAEI were in agreement with the latest scientific research and other EU emissions inventories.

The JRC review showed that non exhaust PM accounts for approximately half of transport derived PM (the other half being from the exhaust) and that this proportion has been stable for many years. However, it also highlighted the likely changes that may emerge as exhaust emissions are cut due to abatement technologies. This may lead to brake and tyre wear becoming a more dominant source of particulates than tail pipe emissions.

Defra is working closely with both the Natural Environment Research Council (NERC) and DfT to shape potential funding streams for practically relevant research and technological enhancements where they are the commissioning bodies. An example of this close and active communication was the recent Defra/National Centre for Atmospheric Science<sup>12</sup> (NCAS) workshop, which brought together the NERC air quality research community and Defra data analysts and policy leads. This event, at which the increasing importance of non-exhaust emissions was discussed, enabled Defra to take account of the very latest published and emerging research.

Defra continues to maintain a live interest on this and many other developing areas through its interactions with AQEG and the Committee on the Medical Effects of Air Pollution<sup>13</sup> (COMEAP). These groups provide Defra with evidence from experts within both the air quality and health fields and ensure that we maintain oversight on emerging issues.

6 <https://uk-air.defra.gov.uk/library/aqeg/>

7 [https://uk-air.defra.gov.uk/assets/documents/reports/cat11/1508060903\\_DEF-PB14161\\_Mitigation\\_of\\_UK\\_PM25.pdf](https://uk-air.defra.gov.uk/assets/documents/reports/cat11/1508060903_DEF-PB14161_Mitigation_of_UK_PM25.pdf)

8 [https://uk-air.defra.gov.uk/assets/documents/reports/cat11/1212141150\\_AQEG\\_Fine\\_Partuculate\\_Matter\\_in\\_the\\_UK.pdf](https://uk-air.defra.gov.uk/assets/documents/reports/cat11/1212141150_AQEG_Fine_Partuculate_Matter_in_the_UK.pdf)

9 <http://naei.defra.gov.uk/>

10 [https://uk-air.defra.gov.uk/assets/documents/reports/cat07/1603150959\\_GB\\_IIR\\_2016\\_Final.pdf](https://uk-air.defra.gov.uk/assets/documents/reports/cat07/1603150959_GB_IIR_2016_Final.pdf)

11 <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/non-exhaust-traffic-related-emissions-brake-and-tyre-wear-pm>

12 <https://www.ncas.ac.uk/index.php/en/>

13 <https://www.gov.uk/government/groups/comeap>



### *Shipping emissions*

**22. Shipping is responsible for producing only a small proportion of emissions, but in pollution hot-spots such as London action is needed to tackle emissions from all sources. Local authorities must calculate the additional impact on air quality of all new development; planning permissions for new shipping facilities must require appropriate mitigation measures from developers. This should include, where practicable, a requirement to provide infrastructure to supply electricity to ships at berth. (Paragraph 67)**

The Government recognises, through the National Policy Statement (NPS) for Ports, that local air pollution may be abated through the provision of shore-side fixed electrical power to replace ships' generators while in port. The NPS encourages developers including ports and shipping companies to examine the opportunities available for shore-side electricity connection, particularly in areas identified as having poor air quality.

All proposals should either include reasonable advance provisions to allow the possibility of future provision of appropriate infrastructure, or give reasons as to why it would not be economically and environmentally worthwhile to make such provision.

The Government has implemented the international and EU requirements which control emissions from ships. These require that ships in an emission control area (the North Sea, including the English Channel) must either use fuel with a sulphur content which does not exceed 0.1% or use an equally effective alternative compliance method. Ships that are berthed in an EU port for at least two hours are not allowed to use fuel with a sulphur content which exceeds 0.1%.

The Government has also been helping industry comply with these limits. In 2014, we successfully secured over €29 million of EU grants to help UK ports and ferry companies to install new technology. This included projects to help install exhaust gas cleaning systems on some ferries and to develop bunkering facilities in ports, to enable them to provide alternative fuels such as liquefied natural gas.

### *Tackling agricultural emissions*

**23. The agricultural sector must step up action to reduce its contribution to national air pollution. At a time of financial pressure, support for farmers to adopt improved farming methods will be more effective than additional regulation. Decreased emissions are a win-win for the environment and for farmers, who can cut their bills by minimising nitrogen losses. (Paragraph 77)**

UK farmers have made good progress in reducing their emissions. In recent years trends in the uptake of good practice, such as slurry injection techniques and improvements in nitrogen use efficiency, have been going in the right direction, leading to decreased ammonia and methane emissions.

The Government will continue to support research and development, use of data and the take-up of new technologies and farming methods which improve on-farm efficiency and reduce ammonia, nitrous oxide and methane emissions. We are investing £160m through the UK Agri-Tech Strategy to help take our world class agricultural research onto the farm—helping farmers to enhance efficiency and reduce emissions and costs.

The Agricultural Engineering Precision Innovation Centre is a new £17.7 million government investment in precision agriculture to help develop advanced technologies that will increase productivity and sustainability in UK agriculture; for example, through improved slurry application techniques and more precise use of fertilisers.

**24. We recommend that Defra surveys by the end of 2016, and in partnership with the National Farmers' Union, the extent to which the most effective air pollution approaches are being used on English farms. The Department should publish the data and report to this Committee on how it will use the information to better target, and if necessary increase, best practice support for farmers. This research will also facilitate constructive dialogue between the NFU and Defra on the technical feasibility of the current EU National Emissions Ceiling Directive targets for ammonia reduction. (Paragraph 78)**

Defra has been monitoring air quality for many years and has over 300 million records for a whole range of pollutants measured across the UK. This data has been openly available for a number of years. In November 2015 we published our Air Quality Open Data Roadmap which explains how end users—the general public, farmers and app makers—can access our data. We have recently introduced the ability to perform a bulk download for all locations and all pollutants between 1973 and 2014.

We also publish monitored daily air pollution levels alongside forecasts from the Met Office to enable the public to take appropriate action during air pollution episodes.

The value of our monitoring and modelling data was recently reviewed by the Air Quality Expert Group. In addition to underpinning policy assessment, air quality data supports a diverse range of research, with hundreds of quantifiable outputs as papers, and supports business and growth through consulting and planning processes. Although not specifically acknowledged, we have seen examples of third party apps which appear to have used our GIS background maps to provide information on air pollution where you live. As part of our future work to consider development of an air quality data hub, we will consider including a Defra kite mark to identify where our data is being utilised.

We supported the agreement on the revised NECD which will set emission limits for key pollutants, including ammonia. We will continue to work closely with the National Farmers Union (NFU) and other farming industry stakeholders to reduce ammonia emissions and will consider the need for a specific survey on the use of effective air pollution approaches on-farm as part of this work.

**25. Relatively low-cost interventions can reduce emissions. With finances tight, farmers are more likely to take action if Defra can provide incentives for action. The Department must publish plans by September 2016 for using CAP funds more effectively to achieve air pollution objectives. In developing this plan, Defra should identify any EU constraints on directing funds in the optimum way and, where necessary, argue in Brussels for the removal of such barriers under the next CAP reforms. (Paragraph 80)**

The Government has used the Common Agricultural Policy to help achieve our air quality objectives. For example, the Countryside Productivity Scheme includes measures to tackle ammonia emissions and improve resource efficiency, providing grants for equipment and the development of new skills.



We now have an unparalleled opportunity to make sure all of our policies are delivering for Britain and to grow our world-leading food and farming industry. The Secretary of State is clear that the Government will look carefully at future agricultural policy options to develop new proposals that support our agricultural industry as we leave the EU.

As set out above, we will consider carefully what further steps may be necessary to deliver the revised 2030 emissions ceilings under the revised NECD.

### **Greenhouse gas emissions**

**26. The farming sector must step up action to cut methane emissions. The livestock sector in particular must do more if it wishes to resist arguments that reducing meat consumption is necessary to protect the environment. Whether through improved feed to cut methane emitted by cows or better manure spreading techniques, all farmers need to minimise their impact on climate change. Defra, learning from successful international approaches, should roll out by the end of 2016 a programme to support the spread of best practice to all farmers. (Paragraph 84)**

The Government is committed to meeting its target of reducing greenhouse gas emissions by at least 80% by 2050. Since 1990, total emissions have fallen by 30% and emissions from agriculture have fallen by approximately 20%.

Progress to reduce emissions from agriculture is already being made through industry initiatives and voluntary schemes, such as the Greenhouse Gas Action Plan and the UK Dairy Roadmap. The Greenhouse Gas Action Plan encourages the adoption of on-farm mitigation methods to reduce agricultural emissions of greenhouse gases by 3 megatonnes of CO<sub>2</sub> equivalent (3Mt CO<sub>2</sub>e) by 2022. The UK Dairy Roadmap is an industry-led initiative which includes a target for 2025 that “90% of dairy farmers implement technologies/practices to reduce emissions from agriculture”.

# Environment, Food and Rural Affairs Committee

## Oral evidence: Air Quality, HC 897

Tuesday 13 December 2016

Ordered by the House of Commons to be published on 14 December 2016.

[Watch the meeting](#)

Members present: Neil Parish (Chair); Chris Davies; Jim Fitzpatrick; Kerry McCarthy; Dr Paul Monaghan; Rebecca Pow; David Simpson; Angela Smith.

Questions 1 - 168

### Witnesses

[I](#): Alan Andrews, Clean Air Project Lead, Client Earth; Shirley Rodrigues, Deputy Mayor of London, Energy and Environment.

[II](#): Dr Thérèse Coffey MP, Parliamentary Under-Secretary of State, Defra; Rt Hon Mr Hayes MP, Minister of State, Department for Transport.

## Examination of witnesses

Witnesses: Alan Andrews and Shirley Rodrigues.

Q1 **Chair:** Good afternoon. Thank you very much for coming to our air quality panel. It is really good to have you here this afternoon. We have our debate on our air quality report on Thursday, so it is really an opportune moment to take very up-to-date evidence from you both. Shirley, could you first introduce yourself, please? Then I will ask Alan, and we will get on with the questions.

**Shirley Rodrigues:** My name is Shirley Rodrigues, deputy mayor for environment and energy in London.

**Alan Andrews:** My name is Alan Andrews. I am a lawyer and head of the air quality programme at ClientEarth.

Q2 **Chair:** Thank you very much. Alan, the first question is targeted particularly towards you. The High Court's judgment on 2 November was the second time the courts have ruled against the Government's plans for tackling air pollution. How confident are you that the Government will now develop legally compliant plans?

**Alan Andrews:** Reasonably confident. We have heard some moderately reassuring statements from the Government. We heard Theresa May say that more needed to be done in Prime Minister's Questions. They have not appealed the judgment and they have accepted the court's findings, which is a good sign, but we remain rather sceptical. We are concerned that they will continue to try to delay taking action and obfuscate in an effort to delay things until we leave the EU, at which point they might try to weaken the underlying legislation. That said, we are really hopeful that the Government have now had a change of heart and that we will finally put this five-year legal case behind us and start looking at the solutions.

Q3 **Chair:** We have Ministers coming in after you, so feel free to say what you want to say. This is your opportunity to get it on record, because the other part of the question that I have is: what will your input be to the development of new plans? Are you being asked for any input? How is it working?

**Alan Andrews:** We will engage with the process like any other stakeholder. We will provide responses to the consultation on the draft modified plans next year. We have lots of ideas on policy solutions and we will be happy to share and discuss those with Government.

Q4 **Chair:** You said in the answer to my first question that you are reasonably confident that the Government are taking action. Where do you feel the actions they are taking are not strong enough?

**Alan Andrews:** The most obvious area is on the clean air zones. That is their flagship policy. One of our criticisms of the old air quality plans was

the weakness of their vision of clean air zones. They were only being mandated for five cities. None of them were to restrict access for diesel cars, despite that being one of the main sources of pollution in most zones. Of course, the Government will now have to go back and revise all their modelling, based on realistic assumptions of emissions from diesel vehicles. We believe that will show that far more zones will be in noncompliance in 2020. In fact, they will have to model intervening years, so we think there will be even more zones in noncompliance in 2018. By the Government's own logic, they will have to introduce mandatory clean air zones, which charge vehicles if they do not meet minimum standards for air-pollution emissions. We think that will make a big difference and go a long way, but we want to see a range of complementary measures aimed at reducing emissions.

**Q5 Chair:** Those charges for cars that do not comply—in particular the older diesel engines and what have you—to the Clean Air Act will have to be fairly substantial. Otherwise, they will not necessarily stop people driving in.

**Alan Andrews:** Yes. Unfortunately, Defra has not given us much detail yet on what the level of the charge would be. All we know is, based on the clean air zone framework, which they have just finished a consultation on, that the charge will be set at a level designed to ensure that the limit values are achieved. We take from that that it will be at a high level, designed to discourage entry to the zone, rather than being more of a charge-based model.

**Q6 Chair:** Shirley, I take it, as far as the mayor is concerned, you very much support what ClientEarth are doing. What is the relationship, to be clear for the record?

**Shirley Rodrigues:** The mayor joined the ClientEarth case as an interested party in order to enable the case for London to be heard and for the impacts on London to be understood and presented in court to the judge, so that he was able to take that into account, along with the other input that Alan presented.

**Q7 Chair:** Alan, you made the point about the clean air zones in the central cities. I have a map in front of me here for the week of 29 November leading into December. Of course, there were really high levels of pollution because of the air conditions at that time, so it just shows how essential it is for more effort to be made particularly in those hotspots of the inner city.

**Alan Andrews:** Quite.

**Q8 David Simpson:** The High Court ruling requires the Government to put in place plans that meet the EU requirements in the shortest possible time. In your opinion and in your view, what is the shortest possible time?

**Alan Andrews:** I would take the same view that the court has taken, which is not to pluck a date out of thin air, but rather to ask the

Government what the shortest time possible is. That is not a flippant response at all.

**David Simpson:** No, I know, and I appreciate that.

**Alan Andrews:** What I mean by that is that the onus is very much on the Government to come forward with a plan setting out a full range of technically feasible measures that will be effective in reducing pollution and bringing forward the date for compliance.

Q9 **David Simpson:** In other words, the timescale is important but not that important. The important issue is to get it right.

**Alan Andrews:** Exactly. The important point is to get a range of measures in place that are effective and not to fixate on a date for compliance. One of the criticisms that the court levelled at the Government was for fixing on this compliance date of 2020 and then working back from there. That is the wrong approach. Instead, you start now, where we have widespread compliance across the UK, and then say: what measures can we introduce as soon as possible in order to bring forward the compliance date?

Q10 **David Simpson:** If the Government decide that it could be two years before they do so, that surely would not be acceptable to you.

**Alan Andrews:** They have to do a minimum amount of analysis. They have to rerun their models. They will have to undertake consultation with local authorities and stakeholders, particularly around clean air zones. We recognise that there needs to be a little bit of a lead-in time, but we think clean air zones in noncompliant cities by 2018 should be what they are aiming for, and that certainly seems to be the court's view as well.

Q11 **David Simpson:** What must the Government's plans include to satisfy you that the EU limits will be achieved within the timescale? What needs to be in that to please and satisfy your requirements?

**Alan Andrews:** First, we need the draft plans to provide all the necessary technical information. Fortunately, the court has required that; it has written that into the court order, so we should see all their workings out. That will allow us to really assess the plans are adequate and whether they are genuinely achieving compliance as soon as possible.

Q12 **David Simpson:** With the court's response on that, are you happy with everything the court has said or are there issues that they have missed out on?

**Alan Andrews:** By and large, this is everything we hoped for from the court judgment. It has given us clarity. It is the first time a court has ruled on this question of "as short as possible". We now have a much better legal understanding and much better legal certainty around the obligations that flow from that provision of the legislation, so we are very happy.

**David Simpson:** The court has given you an early Christmas box.

**Alan Andrews:** It has indeed. One other point I should mention is that the court has given us a provision called "liberty to apply". This means that, if there is any dispute over the content of the draft plans, we can go straight back to court and ask for further relief from the court.

- Q13 **Chris Davies:** Again to ClientEarth, how literally will you expect Ministers to interpret the court ruling that the Government should not have any regard to the costs in fixing the date for compliance or the route to achieving compliance?

**Alan Andrews:** The court judgment is relatively clear that it must be a pretty literal approach. The court has basically said there are three elements to the "as short as possible" requirement. The first is that you must adopt scientifically feasible measures. That makes sense. The court is not asking the Government to do the impossible but, if there are scientifically feasible measures that will be effective in reducing pollution, they have to take them.

- Q14 **Chris Davies:** What do you see those as? Can you give some examples of those scientific measures?

**Alan Andrews:** For example, electric buses are scientifically feasible. They work and there are sufficient numbers of them to be deployed in significant numbers to reduce pollution. That is one example. On the other hand, you could say that hydrogen cars, for example, are not scientifically feasible. There might be some prototypes out there, but they are not ready and proven to be effective in sufficient numbers to run. That is the line that I would draw.

If I can come back to two more issues around the "as soon as possible" requirement, the court was very clear on the proper role of cost in determining what measures should go into a plan. The primary objective must be achieving the limit values. Any questions of cost must be secondary to that primary aim, so that gives the Government a very useful steer on the approach they should take.

Finally, the court said that the measures must be proportionate. That does not mean that that is a question of cost and that you can take into account whether they are cost-beneficial or not; it is about making sure that the measures are no more than is needed and that they are targeted rather than being very extreme measures. The court gave the example of banning all vehicles from city centres immediately. That might be disproportionate, if you could achieve compliance with the limit values through a less restrictive means, for example clean air zones.

- Q15 **Chris Davies:** What about being selective? What about banning all diesel cars from central areas? Would you agree with that?

**Alan Andrews:** We would have to see what the evidence suggests. If they can achieve compliance through less restrictive means than banning diesel, then by all means they can do it. The difficulty is that, especially when it comes to diesel cars, the Euro 6 standard is not delivering

real-world emissions as it should. The Government needs to come forward with proposals in their plan for how they are going to address that problem. We need a range of measures to ensure that diesel cars are delivering those reductions on the road, not just in laboratory tests. We want to see a consumer label, so that car buyers know what they are buying, and a range of other measures such as fiscal policy and a targeted scrappage scheme, all aimed at ensuring that we get rid of the dirtier diesel vehicles and drivers.

Q16 **Chair:** Do you mean Euro 5 engines and before? Although Euro 6 diesels are not hitting their targets, they are still cleaner than the previous ones.

**Alan Andrews:** Yes. One of the big problems is that we have a large number of Euro 5 cars on the roads, which are exceeding the limit value by a huge margin when driving on the roads. The solution cannot be just to ignore that; we need to come up with a solution to make sure that those cars are not polluting our city centres. It is for the Government to come up with proposals, but we would certainly like to see, within the clean air zone framework and within other national measures, a drive to keep those most polluting diesel cars out of our towns and city centres.

Q17 **Chair:** Is that scrappage? What is it?

**Alan Andrews:** Certainly, scrappage needs to be one option that is given serious consideration. We would like to see a scrappage scheme that is targeted at people who have to drive into the clean air zone and means-tested, so that people on lower incomes receive higher subsidies for either switching to a cleaner vehicle or getting rid of their cars completely and subsidising public transport, car-club membership or even the purchase of a bicycle. California has implemented a similar scheme, where it gives grants of up to \$12,000 to lower-income families to switch to an electric car.

**Chair:** I was going to come in and make an interesting point on means testing, because one of the troubles with scrappage schemes in the past is that it is mainly those who can afford to scrap their cars who scrap them, and others are not able to. Carry on, Chris, because I tell you off.

Q18 **Chris Davies:** You are asking very good questions on my behalf. I must say I was expecting you to be a little stronger on this particular point, because I understand that several places on the continent—Paris being one of them—are looking to scrap diesel cars going into the city centres by 2025. My understanding is that your organisation thinks that is too long into the future, but you seem to be quite—forgive me for using the phrase—airy-fairy and relaxed towards it all, as long as it works.

**Alan Andrews:** I am sorry if I appeared airy-fairy in my answer. That was not my intention at all—quite the opposite. The law requires all scientifically feasible measures, so that requires a really serious improvement in the measures that are being considered. The reason that we as an organisation do not tend to go in for things like calling for a diesel ban by 2025 is that it is just a little too simplistic. With these things, the devil is always in the detail, so we tend to take a more

nuanced approach, which looks at the legal test and looks at the scientific evidence.

The legal test requires compliance as soon as possible and the deployment of effective measures; the scientific evidence is mixed. It shows that some diesel vehicles can deliver compliance on the road. The vast majority of diesel cars currently do not. That tells us that we need to look seriously at whether diesel bans might work and might deliver compliance, but also at whether there are less drastic measures that could achieve the same aim, and I have listed those already.

- Q19 **Chris Davies:** I can understand what you are saying but is it realistic? Your aims are your aims but are they realistic? Are they achievable? 2025 is not a long time off but, yet again, you are saying that that is too far off. I am somebody who went out a couple of months ago and bought a new diesel car. I am hoping to run that diesel car for several years yet and certainly not scrap it. The garage was trying to sell me diesel cars. We have had a culture over quite a period of time of going towards diesel. Are you being realistic in your aims?

**Alan Andrews:** Yes, I think we are being realistic because, when you look at the health impact of air pollution and at what the law requires, there is no alternative but to start taking action, particularly in relation to diesel cars but across all ranges of vehicle classes. In relation to your point about having recently bought a diesel car, that emphasises how important it is that Government come forward very quickly with a range of measures that send an immediate signal to the market that people should not be buying diesel cars unless they know that they are as clean as the manufacturers claim when driving on Britain's roads, not just in the laboratory tests.

- Q20 **Chair:** In this Budget, there was some positive action on electric cars, but there were no disincentives at all, as far as I could see, for diesel. I take Chris's point because many of us in this room, I suspect, drive diesel cars, but if the Government are going to be serious about changing people's philosophies, they have to give a carrot for people to move to electric or hybrids and, coupled with that, surely they have to start rowing down on some penalties for diesel, but we saw no sign of it. Were you disappointed by that or am I leading the witness?

**Alan Andrews:** No, I am not sure I could have put it better myself. We were disappointed not to see those sorts of measures introduced in the Budget. We have been calling for it for several years.

- Q21 **Chair:** Should you not be banging the table a little louder?

**Alan Andrews:** I am not sure we could bang any harder, to be honest. Taking the Government to the High Court is about as hard as you can bang.

- Q22 **Chair:** I suppose your argument was, naturally, you take the Government to the High Court because of the breaches of the Air Quality Act, and then it is for the Government to then come forward with those



proposals to sort it out. That is what you are really saying, is it not?

**Alan Andrews:** Ultimately, it is the Government's decision what measures to include in their plan. They can choose the route but not the destination, if you like. We have ideas on what those solutions should be. I have referred to some of them. We are continuing to work with lots of stakeholders—other NGOs, local authorities and industry—in developing workable policy solutions that we would be happy to share with Government.

- Q23 **Rebecca Pow:** I went to the Suzuki garage in my constituency at the weekend and, interestingly, as Mr Chairman has referred to, there was a tax incentive to encourage you to buy hybrid cars, so they are going to be no-tax shortly, but all the price rises because of Brexit have completely wiped out those gains. I just wondered if you have any comments about that, because it means, in trying to get the message across that we need to switch cars, we are up against even more. No matter what the Chancellor has done, they are still going to be more expensive, and this is because Brexit is coming into play, because Suzuki's cars are made in Europe and all the costs are going up. When we have that to fight as well, do you have any comments on it?

**Alan Andrews:** Brexit potentially makes the whole thing much more difficult for so many different reasons. In relation to the specific point about the price, all I would say is that it is really important that we make doing the right thing by air quality the easiest and cheapest thing to do. We need to make sure that there are clean alternatives to driving your dirty diesel car into the town centre. We need a major investment in clean public transport, as well as all these additional sticks and carrots that we have discussed.

- Q24 **Angela Smith:** Can I ask you to elaborate a little on that statement that you just made: that Brexit makes the whole thing a lot more difficult? Why?

**Alan Andrews:** I should caveat that. It potentially makes it a lot more difficult. At the moment, we do not know exactly what Brexit means and what form it will take.

**Chair:** I think we will leave it there. I do not want to wind up our other members here, because we have a long way to go on Brexit. We do not have enough time this afternoon to deal with it all.

- Q25 **Rebecca Pow:** Following on from my colleague, I specifically want to talk about London, so, Shirley Rodrigues, you might answer these questions. Does the High Court judgment mean that the mayor needs to change his air quality plans for London? I know he has already put more money in but does he need to look at them again, particularly, for example, accelerating the plans to pedestrianise Oxford Street, which at times, I believe, is the most polluted street on the globe?

**Shirley Rodrigues:** As Alan has pointed out, the onus is on the Government now to remodel and come forward with new air quality plans, so that means that, while we have published the TfL business plan,

we are in the midst of developing a new environment strategy for London, which will include what we are going to be doing on air quality. We cannot finalise that, really, or develop policies or a detailed strategy until we have that information, so we need that modelling to take that into account. Generally, the approach that we are taking in the TfL business plan, which is largely around encouraging modal shift—people using their cars less frequently, moving on to public transport and using active transportation such as walking and cycling, and cleaning up our bus fleets and our taxis—is still likely to be valid.

**Q26 Rebecca Pow:** That is voluntary. You are hoping that people will just decide that that is a good thing to do and do it. The things that are you suggesting—encouraging people to walk, cycle and not use their cars—are voluntary, are they not? The mayor is not doing anything to encourage them to do that.

**Shirley Rodrigues:** The mayor is funding a series of infrastructure and approaches to encourage people to do that, coupled with his proposals to implement the emissions surcharge and the proposals for expanding and accelerating the introduction of the ultra-low emission zone. It is a combination of charges and incentives and making the alternatives available that we hope will help deal with the air quality and congestion problems in London.

**Q27 Rebecca Pow:** The ultra-low emission zones are going to be brought forward to 2019. Is that still not a bit slow, given that we have all these startling statistics about deaths from air pollution and that London has some of the highest polluting areas in the world? It is going to be left for another three years.

**Shirley Rodrigues:** In recognition of that, as soon as he came into office, the mayor promoted the consultations that we have on the emissions surcharge and the ultra-low emission zone, saying that he wanted to bring it forward to 2019. That was before the ClientEarth court case, so we now have to wait to see what the government plans are, as Alan has pointed out. The onus is on the Government to set this out, and the mayor can then do what he can do. At the moment, he is leading by example where he can, but, as to what we can fully do, we have to wait for the information. We will take that and model it as part of a strategy.

**Q28 Chair:** Have we not been waiting a rather a long time for all these things to happen? I know Government blame local government, and then local government blames Government, but in the end, when people walk out in the streets of London, they want something done about it. What are you doing about Oxford Street? It is absolutely packed full of cars. Why do you not get them out of there?

**Shirley Rodrigues:** The mayor is consulting on what to do on Oxford Street. He has already started looking at moving out the dirty buses on Oxford Street. He has to work within the powers that are available to him and he has to operate within the legal framework, which requires, for example, statutory consultations and taking into account people's views, whether they are ordinary Londoners or businesses. He is properly

taking those into account and, as soon as he has that information—the consultation ends in mid-December—we will be using it to develop our proposals for implementation going forward.

- Q29 **Chair:** Taking Oxford Street, as far as I am aware, you are not really supposed to go in there with a private car but, because there are various one-way entrances to Oxford Street, you sometimes go straight into Oxford Street, irrespective of whether you wanted to or not. These things have been going on for ages, under the previous mayor and now under you. I am not necessarily blaming you, but when is something going to happen?

**Shirley Rodrigues:** As I said before, something is happening already. We are working with the business improvement district there and Westminster City Council to determine what can be done to accelerate the clean-up of Oxford Street.

- Q30 **Rebecca Pow:** In the same vein, why has the mayor not proposed to ban diesel vehicles from the city centre? As far as I know, he has not done, yet they have already proposed that in Athens, Paris and Madrid.

**Shirley Rodrigues:** Because he believes that a combination of charges and incentives will get us as soon as possible, which is what we are trying to do.

- Q31 **Rebecca Pow:** We have already had charges, have we not?

**Shirley Rodrigues:** These are charges that are going to affect and take out the dirtiest and most polluting vehicles. The ultra-low emission zone is going to capture the dirtiest diesel vehicles and accelerate the turnover of the fleet, essentially. At the same time as also cleaning up, he has already announced that no more dirty diesel buses will be procured from 2018. He is looking to ensure that no more dirty diesel taxis are used from 2018. He is funding a scrappage scheme himself to take out the oldest taxis that are running around London at the moment. He is doing what he can do within his powers.

- Q32 **Rebecca Pow:** How does the scrappage scheme work for taxis?

**Shirley Rodrigues:** They will be given an amount of money—I think it is about £3,500—to decommission the taxi and no longer use it in London.

- Q33 **Rebecca Pow:** Would you not extend that to cars?

**Shirley Rodrigues:** We have asked for a national diesel scrappage scheme, because we believe that, while the Government's plans identified six clean air zones—the six cities that were the most affected—the ClientEarth case will bring many more cities into play, which essentially means that this is a nationwide problem. A diesel scrappage scheme, which we have been calling for, is all the more needed, now that this is recognised as a nationwide problem.

That might be coupled with a change to vehicle excise duty. We were just talking about the incentives to purchase diesel. Many people have been incentivised to buy diesel. We need to disincentivise those and

incentivise the take-up of clean vehicles. This is what we have been asking the Government to do.

- Q34 **Rebecca Pow:** The GLA is investing £1 billion in new cycling facilities, which is very commendable, but that is only worth it if you can get people out of all these polluting cars; otherwise, people will be on their bikes, being polluted by the pollution that the vehicles are still spewing out.

**Shirley Rodrigues:** That is why we are implementing an accelerated and broader ultra-low emission zone, to clean up the fleet and clean up our buses, so that, as people are moving around London, they are not exposed to that air pollution.

- Q35 **Chair:** The low emission zone on its own will be enough and you will not have to ban vehicles, like they have done in the major cities of Paris, Athens and Madrid. Is that what you are considering?

**Shirley Rodrigues:** We are waiting to see what the government remodelling is, in order to understand what the implications are for London. We can then assess whether the package of measures that the mayor announced last week is sufficient to get us to compliance in London.

**Rebecca Pow:** As far as I understand, the plan is coming out in July, so it is all going to take a long time. By the time the plans come out and you have looked at it and done a consultation, we are years away.

- Q36 **Chair:** We have the Ministers here in a minute, so we can ask them about the remodelling. We rather fear that Government and local government may be playing each other off a little on this one. Would that be unfair?

**Shirley Rodrigues:** The Government have, in their statements, asked local authorities to tackle air quality issues. I cannot really speak for other local authorities, but the Mayor of London has said that he will do as much as he has the powers and the funding to do. He is doing what he can do at the moment. For example, on local air quality management measures, nationwide the Government have made £3 million available. That is clearly insufficient for the scale of the problem that we have, and it is not sufficient for what would be needed to tackle local air quality problems in London alone.

- Q37 **Jim Fitzpatrick:** Ms Rodrigues, Mr Andrews, good afternoon. Apologies for having to pop out; I had to go and speak at another select committee briefly. I want to raise the particular question of the Thames, which, Shirley, will not be a surprise, because we have corresponded and, indeed, we have had one private conversation about the issue. You will not be surprised to hear that I want to raise the particular issue of the Enderby cruise terminal on the Thames, but generally the issue of emissions from the Thames. As the Chair said, we have the Minister for Shipping and the Minister for Air Quality coming in next, and I am very keen to hear if you have a view on emissions from shipping.

My question to the Ministers will be: who is in charge? At the risk of using a metaphor, it is a black hole. It does not seem to be shipping or air quality, and it does not seem to be the mayor or the GLA, yet there are emissions from vessels that, most times, are less than they would be. For example, the commercial haulage down the Thames is better than having more HGVs running on London's streets. We all want to see more commuters on the Thames and we love tourists bringing their money to London. In terms of the Enderby cruise terminal, you will know that I and other colleagues, including Matthew Pennycook from Greenwich, have been raising this wherever we can for quite some considerable time. How do the Thames and Enderby fit in to the latest legal developments and the discussions that you are having with Government about who has responsibility? For those of us looking from the outside, it looks as though nobody has the power to make any decisions in respect of this.

**Shirley Rodrigues:** You are right. The mayor does not have any power over the Thames or dealing with shipping or freight emissions. He has asked for those powers. In London, at the moment half of the emissions are from non-transport sources, such as shipping and construction machinery. That is a very significant amount. While the focus has been on transportation, the mayor has been asking for a 21st century Clean Air Act to give him the powers to enable him to regulate and enforce emissions around construction machinery and the Thames.

Q38 **Jim Fitzpatrick:** Has there been any response from Government yet?

**Shirley Rodrigues:** The conversation that we had with the Air Quality Minister was that they were not envisaging any primary legislation, which was a disappointment.

Q39 **Jim Fitzpatrick:** Mr Andrews, do you have a view on emissions from shipping? Is that featured in any of the modelling you have done or submissions that you have read?

**Alan Andrews:** No. The ClientEarth case was focused on the road transport question. It is really important that the revised plan looks at all the significant sources of pollution in each city. It certainly seemed to us that Defra took a far too crude approach, which basically said, "It is road transport, so we are not going to look at any of these other sources". From what Shirley has said and what we have seen from cities like Southampton, which has major emissions from shipping, there are other sources that need to be tackled. The whole idea of clean air zones needs to look at all those solutions, not just road transport.

Q40 **Angela Smith:** The High Court ruling made clear its view that the Government had erred in law by adopting too optimistic a model when it comes to measuring emissions, given the evidence from the European Union's laboratory tests that the real-world test was not being met. On that basis, what amendments need to be made to the models in order to address that criticism? This is to Mr Andrews.

**Alan Andrews:** Fortunately, about a week before the hearing, the emissions figures, which are known as the COPERT emission factors, were

revised, so we now have the official figures that they need to base their model on. Those show that early Euro 6 diesel cars were emitting something like six times the emission limit on the road. It started at five and then went to about six, and it is projecting a significant drop-off but not until about 2020. When they plug those figures into their model, it will show what we have been saying all along: that far more cities will be noncompliant by 2020. The idea really needs to be a national network of clean air zones in anything from 15 to 30 cities, depending on what the model shows.

**Q41 Angela Smith:** You are saying that the way of dealing with this, as far as Defra is concerned—I am talking about the modelling now, rather than the broader solutions—is merely a matter of feeding in the latest results and making sure that the models more accurately reflect them.

**Alan Andrews:** That is the first and most obvious step, but that alone does not correct all the deficiencies in the Defra model. The Defra model is what is called a PCM model, and it is quite a crude tool. It does not give you the granularity where you can really drill down to the local level and see what pollution is like on a detailed road-by-road basis. Defra needs to use its model, but it needs to look very closely at other sources of information and at local monitoring and modelling, and make sure that its modelling tallies with what is going on at the local level.

**Q42 Angela Smith:** Your opening remarks were really interesting, because we are very sceptical, if I may say so, in terms of your confidence in the Government's commitment to tackle this. If we leave the European Union in two years' time, how much harder do you think that will make it to ensure that the Government act on all of this? We are taking away one of the big sticks, are we not?

**Alan Andrews:** There are so many unknowns at this stage. The answer to that will really depend on whether it is a hard Brexit or a soft Brexit. If we join EFTA and become like Norway, we will still be bound by the Ambient Air Quality Directive. Norway, just last year, was found guilty by the EFTA court for breaching the directive. There is no doubt that, post Brexit, it will be harder to enforce some of these legal obligations, which is why we are very keen that, through the great repeal Bill, all existing legal architecture—

**Q43 Chair:** Sorry to interrupt you, but surely, if we do the great repeal Bill and that brings European legislation into British law, you will still pursue the case under the same laws that were there under European law.

**Alan Andrews:** Certainly, and that was my point, but we need to be really that we get the wholesale transfer of the legal framework, not just bits of it. There is no point in having the standards—

**Q44 Chair:** You think it will be tampered with on the way through, do you?

**Alan Andrews:** With the slip of a draftsman's pen, we might see some of the legal protections we currently enjoy disappear.

**Chair:** How cynical you are.

**Angela Smith:** The lawyers are already indicating this.

**Alan Andrews:** The point is that we might have the limits and the standards might transfer across, but, if we are denied the procedural mechanisms by which we can go to court and enforce them, they are of no use to anyone. That is why it is so critical that the current EU law framework transfers across in full, including all the case law of the European Court and all these procedural avenues by which we can take action before our national courts.

Q45 **Angela Smith:** This is really interesting. The so-called repeal Bill is going to be a critical staging post, in effect, to ensuring that we retain the ability to hold the Government to account on all this and the progress they make.

**Alan Andrews:** Absolutely, and we will be keeping a very close eye on that process. In the shorter term, we are focused on implementation of the new air quality plans. They have most of the policy levers that they need to deliver compliance; what they need to do is get on and deliver. The court judgment makes very clear that they need to take very swift action, so we want to see measures implemented in 2018. We want to see a national network of clean air zones by that date, so they will take effect and we will see the benefits of those measures before leaving the EU.

Q46 **Angela Smith:** Shirley, what verification process do you have to ensure the accuracy of the models the mayor uses in developing his plans on air quality in London?

**Shirley Rodrigues:** The mayor has a bespoke model called the London Atmospheric Emissions Inventory, which takes a lot of inputs on air quality sources from around London. We model that using previous emission factors but taking a much more conservative approach. We then verify some of that information—for example, around transportation—against real-world drive cycles for buses, say, in London, so that modelling mimics how a bus would operate in London: having to stop at bus stops, in traffic and so on. That combination of issues has meant that we have a granular and more detailed appreciation of what air quality is like in London and where the main roads that have hotspots are. We can certainly write to you with a bit more detail. I do not know the exact detail, but we can certainly write to you to follow up.

Q47 **Angela Smith:** The mayor has called for Volkswagen to pay back £2.5 million worth of congestion charges, because drivers of VW models have paid the lower charge for lesser-polluting vehicles. Of course, in practice, we now know that many of these vehicles will have emitted far larger quantities of pollutants than we originally thought. What has been the response of Volkswagen to Mayor Khan's call on that?

**Shirley Rodrigues:** The mayor has asked VW to recompense TfL for lost income, because those cars did not pay the congestion charge. The response has been that we are seeking a meeting, so we are seeking to meet, but there has been no indication that VW would recompense TfL for

that lost charging income. The mayor has also suggested that VW might like to contribute something towards the air quality provision in London—for example, helping our Healthy Routes to Schools programme—in recognition of the impact on health that those cars have had by driving around London and exposing people to air pollution.

Q48 **Angela Smith:** If the mayor is going to demand that from Volkswagen—or rather enter into negotiation or dialogue with Volkswagen along those lines—surely the same would have to be applied to other vehicle manufacturers whose vehicles have breached the limits.

**Shirley Rodrigues:** There are other manufacturers that used defeat devices and did the same, but the focus is on VW because it has admitted this and we had that very specific focus on the congestion charge.

Q49 **Angela Smith:** Why should Volkswagen play ball when other manufacturers have done exactly the same thing?

**Shirley Rodrigues:** Because it has admitted using those defeat devices. As you know, the European Commission is taking the UK Government to court for not exercising its powers as a type-approval authority. We are hoping that that would encourage VW to come forward with some action.

**Angela Smith:** Good luck on that one.

Q50 **Chair:** The Americans have sued Volkswagen for millions and millions of dollars, and we have seemed to do very little, really. You have all these other manufacturers that say that they can do 60 miles to the gallon, and then you have the true figures of 45 miles to the gallon. If all these manufacturers, including Volkswagen, are getting away with it, why are we not doing more? It is good of the mayor to invite Volkswagen for a cosy chat, but would it not be better if he said, “Right, Volkswagen, this is the figure we want. Cough up”? That is what America has done, rightly or wrongly.

**Shirley Rodrigues:** The Government are the type-approval authority and they have the powers to take forward investigations.

Q51 **Chair:** Do not worry; we will not be letting the Minister off the hook. I particularly want to ask what you are doing in the mayoral office about the congestion charge. What are you doing about all these things that, basically, Volkswagen have been let off the hook over?

**Shirley Rodrigues:** We do not want Volkswagen to be let off the hook, which is exactly why we are pursuing them for the lost income.

Q52 **Chair:** You invite them in for a chat. If they say, “No, we are not going to pay”, what will you do then?

**Shirley Rodrigues:** We will ask the Minister to take forward action, because they are the ones that have the power. The Government have the powers. The mayor does not have powers to mandate Volkswagen—

Q53 **Chair:** Not even on the unpaid congestion charge?



**Shirley Rodrigues:** No, as I understand it, but I would have to write to you. My understanding is no.

**Chair:** We will check that out with the Ministers in a minute.

- Q54 **Alan Andrews:** I would emphasise that it is really important for the Government to conduct a more thorough investigation into the Dieselgate scandal. The report we saw in April this year bore all the hallmarks of brushing the issue under the carpet. It concluded that other manufacturers were not using the same defeat device as VW, but we need to know whether the techniques and technologies they were using were legal. It is disturbing that one of the grounds for the Commission infringement action was that the Government had not disclosed to the Commission all the technical information that they had unearthed in their investigation. That raises some difficult questions for the Ministers: what do they know about how far the Dieselgate scandal goes and what are they going to do about it?

**Chair:** Thank you. It is duly noted. We have them here in a minute.

- Q55 **Dr Paul Monaghan:** Alan, as you know, the High Court has criticised the UK Government for giving insufficient consideration to the use of different classes of clean air zones. In your view, what type of clean air zones should the UK Government consider mandating?

**Alan Andrews:** I would just clarify one point: what the Court said, in terms of the classes of clean air zones, was that it would really depend on the modelling exercise. The Government must go away, redo their models and then assess what class of clean-air zone will deliver compliance as soon as possible. We think the starting position should be to assume that we will need a class D clean air zone in noncompliant zones, so that covers all vehicle classes, including cars. They should be assessing a range and doing a full impact assessment of all the different classes of clean-air zone to see when they will deliver compliance and the relative costs and benefits of each class of zone.

The critical point is that they need to address cars. It was clear from the 2015 plan and the information we saw that had led to the preparation of the plan that, right from the outset, the inclusion of cars within clean air zones was ruled out. That cannot be a correct legal approach. They must analyse and assess all the options that are there, including class D CAZs. It is not going to be popular. Charging people to drive their diesel car into towns will not be popular. That is why we need a range of complementary measures, so it is a balancing of the stick and the carrot.

- Q56 **Dr Paul Monaghan:** What are those complementary measures?

**Alan Andrews:** I have listed some: the targeted scrappage scheme; the reconfiguration of vehicle excise duty and company car tax; and action at the European level, so that the new Euro 6 real-driving emission requirements are stricter and do not give too much leeway to manufacturers. More funding for local authorities is critical. It is going to cost money to implement these clean air zones. It is essential that overstretched, underfunded local authorities are given a bit of help along

the way. At the moment, it still seems like central Government are trying to pass this problem down to the local-authority level.

Q57 **Dr Paul Monaghan:** Are there alternatives to mandating class D clean air zones everywhere?

**Alan Andrews:** Yes, there probably are alternatives, and we need a thorough and proper analysis of what those alternatives are and whether they will deliver compliance earlier than a class D CAZ.

Q58 **Dr Paul Monaghan:** What is ClientEarth's view?

**Alan Andrews:** Our view is that the starting assumption should be class D CAZs, but there should be a full and proper assessment by central Government, working with local authorities, analysing all the appropriate measures. Unfortunately, we do not have the analytical capacity to do that kind of work; it really requires significant expertise of the kind that the mayor and Transport for London have and an organisation like us does not.

Q59 **Dr Paul Monaghan:** Given that you do not have the expertise or the ability to conduct some of those scientific evaluations, is it appropriate to call for a blanket mandating of class D clean air zones?

**Alan Andrews:** What I said was that the Government need to analyse that and start their analysis on that basis, but they are, of course, open to look at alternatives. If there is a less restrictive, less draconian way of doing it, then they are free to do so.

Q60 **Dr Paul Monaghan:** Would you be accepting of that?

**Alan Andrews:** We would be accepting of any measure, provided it achieved compliance in the shortest time possible. To do that, they need to address all significant sources of pollution, including cars.

Q61 **Dr Paul Monaghan:** Indeed. I suppose what you are really saying, then, is that you are looking for an evidence-led approach to the improvement of the environment through the control of emissions.

**Alan Andrews:** Absolutely. At the moment, that is what we have not had so far. This was the court's key criticism of the 2015 plan: by taking the approach they had and fixing on this distant date of 2020, by not modelling the intervening years and by relying on outdated and unreliable projections of diesel emissions, the Government had denied themselves the evidence base on which to make proper decisions about what measures to include in the plan. We are hopeful that the new plan will contain the full evidence base, which we can then analyse to assess whether the measures achieve compliance as soon as possible.

Q62 **Dr Paul Monaghan:** From your perspective, what would an appropriate timescale be for that change in approach and re-evaluation of the data?

**Alan Andrews:** The court has laid down a very firm timetable. They must publish a draft plan by 24 April, which must be accompanied by all the technical information that allows us to make a proper assessment.

They must finalise that plan by the end of July, so they are on a pretty tight timetable and they have the court looking over their shoulder.

- Q63 **Dr Paul Monaghan:** Does ClientEarth feel that that is achievable? Should it be undertaken faster, or is it going to end up with half a job and will we be back at this again in a little while?

**Alan Andrews:** We have arrived at probably the right balance. The court, after the first judgment, invited both parties to agree on the exact terms of the order and the exact timetable, so we had a bit of toing and froing with Defra. We asked for a short timetable; they asked for longer. In the end, we have arrived at something that we think gives them adequate time, but not too much time, to do the proper analysis.

**Chair:** Sorry to interrupt, but can we speed the operation up? I have about 10 minutes more. We are going to be overrunning by 10 minutes, but we have two or three more questions, so if you do not mind we will keep going.

- Q64 **Dr Paul Monaghan:** You are optimistic then.

**Alan Andrews:** The other thing to say is that they have done a lot of the background work already. They have done a lot of the analysis. They have the clean air zone framework. They know what they have to do; they just need to get on and do it.

- Q65 **Dr Paul Monaghan:** It is achievable, then. Good. Thank you, Alan. Shirley, what action is the Mayor of London taking to address the High Court's criticism that plans to rely on a London ultra-low emission zone to meet pollution limits were flawed?

**Shirley Rodrigues:** My understanding was that the High Court judgment did not refer to the ultra-low emission zone, so I am not really clear. Alan, do you have any clarification on that? As I pointed out, it is a matter for the Government to work out the remodelling and then come forward with measures and actions that would deliver compliance in a timeframe as soon as possible.

- Q66 **Dr Paul Monaghan:** I accept that, but it is not just about the UK Government; it is also about the mayor's office. The mayor has placed an emphasis on the ultra-low emission zone. It has been criticised, so what is the mayor's office doing to address some of those criticisms that the High Court has levelled?

**Shirley Rodrigues:** As I said, I do not understand where that criticism has come from. Our reading is that the High Court judgment did not mention the ultra-low emission zone as an issue. It was focused solely on Government's approach to air quality modelling, their proposals for their air quality strategy and how to take that approach.

- Q67 **Dr Paul Monaghan:** Do you feel that the mayor's office emphasis on that ultra-low emission zone is appropriate and objective and will be taken forward without further criticism?

**Shirley Rodrigues:** The ultra-low emission zone is out for consultation at the moment. It is a non-statutory consultation following the election of the mayor, seeking Londoners' views on the proposals that we put out to bring the implementation forward to 2019 and to expand its reach. Depending on the consultation responses, the mayor will consider that and will proceed to a statutory consultation in due course. As I have said, we have not understood that there were any criticisms at the High Court of the ultra-low emission zone.

**Alan Andrews:** I think that is right. There were not any explicit criticisms of the mayor's plans within the judgment, but it is also true that the judgment puts pressure on the mayor. He needs to have another look at his plans and assess whether they achieve compliance in the shortest time possible. He cannot do the impossible and he cannot do things where he does not have powers, but those powers that he does have he needs to exercise to the fullest extent possible. He needs to have another look at the T-charge—this toxicity charge—and see if he can push further on that, and he needs to look at the ULEZ again.

One of the main criticisms of it—and this is not the mayor's fault—is that it is based on the Euro 6 standard. If the Euro 6 standard does not deliver, then the ULEZ will not deliver, so the mayor needs to work with national Government on ensuring that it does, by both pushing at the EU level and introducing measures at the local and national level.

Q68 **Dr Paul Monaghan:** Indeed. You have highlighted that you will be undertaking at least two consultations. What is your timescale for completion of those consultations?

**Shirley Rodrigues:** The consultation period ends in mid-December, and then we will assimilate those results. We are proposing to come out with the mayor's transport strategy and environment strategy drafts in 2017.

Q69 **Dr Paul Monaghan:** Will you be consulting on them?

**Shirley Rodrigues:** Yes, they are both drafts for consultation.

Q70 **Dr Paul Monaghan:** When will that process of consultation end?

**Shirley Rodrigues:** Towards the end of the year.

**Chair:** Towards the end of 2017?

**Shirley Rodrigues:** Yes.

Q71 **Dr Paul Monaghan:** When would you hope to start implementing the findings of all these consultations you will be undertaking?

**Shirley Rodrigues:** That depends on the consultation responses, because we need to take into account a number of factors. I cannot give you a date for when that is formally going to be implemented, but we have said that we would bring forward the implementation of the ultra-low emission zone to 2019—assuming all goes well with the consultations, that is what we are aiming for—and the emissions surcharge in 2017.

**Chair:** If we talk enough hot air, we will be able to solve this, but that is an awful lot of consultation and not much action.

Q72 **Dr Paul Monaghan:** From what you are saying, there is not going to be any action taken, it sounds to me, before 2020.

**Shirley Rodrigues:** No. If the consultation responses are assessed as being—

Q73 **Dr Paul Monaghan:** “If” is the key word there, is it not?

**Shirley Rodrigues:** We are required by statute to go through a series of consultations. The non-statutory consultation is not something the mayor had to do, but he wanted to seek Londoners’ views as to his approach in order to give him a firm basis for formally consulting on the scheme that would be implemented, both for the emissions surcharge and for the ultra-low emission zone. These are legal requirements that the mayor has to meet, so we are not trying to delay beyond those legal requirements.

We are absolutely clear. The mayor recognises this is a health emergency for London and wants to implement his package of measures as soon as possible. Where he can move as fast as possible, he is doing, as with the bus retrofit scheme and so on.

**Chair:** Thankfully, we have that down on record.

Q74 **Chris Davies:** We have already heard that there was great disappointment in the Autumn Statement, but how much impact are the Government’s schemes having on the numbers of people switching from diesel and petrol to less polluting electronic and hybrid vehicles?

**Alan Andrews:** I am afraid I do not have the information at my fingertips but I would like to see the modified plan, when it comes forward in April, clearly show how these sorts of policies and incentives are being targeted at the NO2-compliance problem. We would like to see all these incentives increased but also being more targeted at the air-quality problem.

Q75 **Chris Davies:** As far as provision is concerned, how much of the targeting should be coming from the London Assembly? If the London Assembly pays for charging points for hybrid vehicles or electric charging points, the Westminster Government can bring in stronger ideas, surely.

**Alan Andrews:** Certainly. The clean air zone framework that the Government are developing should have minimum standards for electric vehicle charging points to help incentivise the uptake of electric vehicles. Who pays for it is not really for me to say. Local authorities are certainly very overstretched, and we would like to see more assistance from central Government. Ultimately, the court does not care who pays for it, as long as it gets done.

Q76 **Chris Davies:** To you, Deputy Mayor, should you be responsible for paying for that?

**Shirley Rodrigues:** We would expect Government to make the powers and funding available for implementation. As I have already pointed out, for local air quality management UK-wide, £3 million is completely insufficient. We have, as the mayor, funded or announced a TfL business plan—the package of measures that we have talked about, such as low emissions zones, the T-charge and retrofitting buses—and over £875 million has been made available over the next five years in the business plan to help fund that. Further funding is needed, and we have been asking Government, for example, to fund a diesel scrappage scheme, which would help accelerate the movement away from dirty diesel to cleaner vehicles.

Q77 **Chris Davies:** The previous mayor had a legacy: the Boris bike. Are we looking here at a Sadiq station, which is a charging station? What we have heard from you, forgive me, has been more about consultation than charging and progression so far. Is this going to be one of his legacies: that you will electrify the whole of London and make it a much cleaner place?

**Shirley Rodrigues:** That is part of the business plan already, so we are working with local authorities, because we do not control all the roads in London, to roll out charging stations and super-charging or ultrafast charging stations. We are working, for example, with our own functional bodies—TfL, the police and so on—to site some of those charging stations and to make them more available. If we are going to move people out of diesels and into cleaner vehicles and electric vehicles, we need many more charging stations, we need incentives to get people into using cleaner vehicles, and we need disincentives, taking away the incentives for diesel and incentivising the take-up of cleaner vehicles.

Q78 **Chris Davies:** Do you recognise that you do not need to go to consultation on that?

**Shirley Rodrigues:** Yes, we are already doing that.

**Kerry McCarthy:** It is fair to point out that the previous mayors had eight years, whereas the current regime has had not even eight months, and the deputy mayor has not been in place that whole time.

**Chair:** We will give him time.

Q79 **Kerry McCarthy:** You have been talking about shifting from more polluting vehicles to less polluting vehicles, but what about a modal shift away from vehicles altogether—cycling and walking? What is being done on that front? In particular, if I could ask Shirley, some of that would be down at borough level, so what is being done to work with councils, and are there good examples in London of councils that are doing this?

**Shirley Rodrigues:** It is absolutely critical, in order to manage the traffic in London and to deal with health impacts, that we look to get people to use their cars less and only really for essential journeys, and move them into public transportation, cycling and walking. The mayor, again as part of the TfL business plan, has announced, in addition to the £875 million on air quality, a £770 million package of measures for improving cycling

in London. That is doubling what was being spent by the previous administration. It is going into a whole series of measures, which are both London-wide on strategic roads—some of the cycle superhighways—but also local measures at local authority level. The Mayor and Transport for London are working very closely with local authorities on these issues.

**Q80 Kerry McCarthy:** Do you think that concern about air quality is a deterrent to people wanting to cycle? Has that come up or is it mostly that people are scared of doing it or think it is inconvenient?

**Shirley Rodrigues:** My understanding is that it is more about making sure that people feel comfortable on the routes, which is partly the reason for the institution of cycle superhighways or even the routes behind, so that people who are less confident can find an alternative route to work or home. Air quality is a major consideration for anybody out in London, so we are working with Deputy Mayor Val Shawcross on a TfL programme called Healthy Streets, which looks at how you redesign the streetscape to make routes to schools, for example, conducive to people walking and cycling and enjoying the streetscape, essentially.

**Q81 Chair:** Thank you both very much for giving some very good evidence. We have the Ministers in now, straight after you, so we will be able to put some of the ideas and points that you have made directly to them. Thank you. It will make part of our evidence, so thank you very much for coming this afternoon to give us evidence, both to Alan and Shirley. Thank you very much.

## Examination of witnesses

Witnesses: Dr Thérèse Coffey MP and Rt Hon Mr John Hayes MP.

**Q82 Chair:** Good afternoon, Ministers. I am very sorry to keep you waiting but we were taking some very good evidence from ClientEarth and from the Mayor of London's office. Of course, some of the points that they have made we may well be putting to both of you, so it is a great pleasure to have you both here. We are doing this session on air quality because, of course, the Government lost their second judgment in the High Court on 2 November, which ruled against the plans for tackling air pollution.

First of all, a very open question to both of you: how can you reassure the public that the Government take the threat of air pollution seriously? Who wants to start?

**Mr Hayes:** Ladies first.

**Chair:** You will be coming later, Mr Hayes. Do not worry.

**Dr Coffey:** Thank you, Mr Chairman. It is a pleasure to be here. As Defra is the lead Government Department on air quality, I think I can speak for all of Government in saying that, of course, we take this issue

very seriously. We have always been clear that we would update our plans with the best available evidence and we are expecting particular updates in regard to the transport elements, which are being processed right now. I would say that we have a good record of seeing improvements in air quality in time, but recognise the judgment of the High Court, so civil servants are beavering away and working through potential new options for us to consider, on which we will consult next year, in order to have an updated plan by July, as set out in the court judgment.

**Q83 Chair:** Why were the Government back in court for the second time, having not complied, considering that all these things were so much in place, Minister?

**Dr Coffey:** The Government, as you will be aware, prepared the plan, which they gave to the Commission by the end of 2015. As a consequence, we believed that, on the best available evidence, would make us compliant in a decent timeframe. As is the law of the land, people can challenge whether or not our interpretation was accurate or fully compliant, and the judge endorsed our proposals about clean air zones but wanted to see if we could not only update the plans in light of new evidence but also potentially do them more quickly.

**Q84 Chair:** Before bringing Mr Hayes in, is it not one of the problems that Defra has the brief on air quality and it can deal a little with agricultural pollution that may be coming off the land with nitrogen and suchlike, but most of the transport and planning issues, and all the issues that deal with the hotspots in the centres of our major cities, are not Defra? Can you reassure us in this Committee that Government are working seamlessly across Departments, because it does not really look like that from where we are sitting?

**Dr Coffey:** Earlier in the year, the Department for Transport and Defra set up the Joint Air Quality Unit. Defra set up its own Environment Analysis Unit in the last 12 months. We had our first inter-ministerial group recently, which was chaired by the Secretary of State for Business at BEIS, which included representatives from a number of Departments. John and I are standing members of that. Our Secretary of State, Andrea Leadsom, was there as well. It also includes people from Health and from Local Government, and it mattered to me that we brought these people together to make sure that we can make steady progress.

The joint letter that I did with Nicola Blackwood to the director for public health in every council is also a sign of us wanting to work together, recognising that national Government can do certain elements but we also need to work with our local government, as well as individuals, in coming forward with plans that are going to be effective at improving and continuing to improve air quality.

**Q85 Chair:** That is one of the problems also, if I could be so bold, because, naturally, we have local government in here who say they can do so much, but of course it needs to be led by central Government. That is



one of the problems, is it not? Are we not, instead of getting policies that are joined up, getting policies that are just not working? I should not really show this because you cannot really see it from here, but that was at the end of the November. That was during the weather where we had huge a massive area of pollution over London, which went on for nearly a week. We just cannot go on saying that it is a fault of somebody else. Is it the fault of Government or is it the fault of local government? What measures are you going to put in place to make it better, so that people can walk around the streets of London and not be breathing in very toxic fumes?

**Dr Coffey:** I think you will be aware that a significant amount of how pollutants are cleared is through wind. That was possibly the week when we had very still weather.

Q86 **Chair:** Yes, that is right. It was the week where we had strong frosts and low movement of air.

**Dr Coffey:** The Government signed up, through the 2020 Gothenburg Protocol, to our commitments for 2020. Through working with Europe, we have finally, after great work by Julie Girling from the European Parliament—one of your Conservative MEPs in the south west, who was the rapporteur—concluded the new directive, which I would point out that the UK signed up to. It was the first directive we signed up to after the referendum was taken, and that is a good indication of how we continue to be ambitious and work towards these plans.

Q87 **Chair:** It is very laudable that we are signing up to all these agreements but it is not quite so laudable that we are not meeting our targets and that we are in court because we are not. Perhaps I can bring Mr Hayes in now really to see what we are doing about transport and what we are doing about diesel engines. What on earth is going on here?

**Mr Hayes:** You have raised several things already, Chairman, and rightly so. CS Lewis said, "Failures, repeated failures, are finger posts on the road to achievement", so we should see the court case as a wake-up call.

Q88 **Chair:** Was the first court case not a wake-up call? Does it take two court cases to wake up?

**Mr Hayes:** No, but all Governments should start from the perspective that you can always do more and you can always do better. Governments, when they become arrogant and think they have done all that can be done, usually are not on the road to achievement but on the road to failure. Of course, you can do more, and you asked specifically about two things. You asked about working together. I am working with both *Dr Coffey*: and the Minister of State at BEIS, as the acronym is now pronounced, on a regular basis to compare how we can work together and collaborate to achieve our objectives. We have created this Joint Air Quality Unit, which is a Defra/DfT unit. We have worked through the Inter-Ministerial Group on Clean Growth that we described earlier.

We have made extra resources available to local authorities to deliver on the objectives that we have set, with £26 million committed since 2011.

I have the details here. We have established, of course, the clean air zone framework, as you know, and we have particularly focused on a series of cities, where we know there are profound issues of the kind you have described.

I am mindful of the fourth report of the 2015/16 session, where you argue for exactly that: more intergovernmental co-operation and collaboration; a structural means to deliver that, which we now have; more support for local authorities; and, as you amplified a moment ago, Chairman, a greater degree of direction from Government to local government about what it can do and how it should do it, and we have addressed that. We have responded in both those areas to your recommendations and we take them very seriously. Indeed, we take this whole issue very seriously.

Q89 **Chair:** I am very glad you have read the report, Mr Hayes; that is excellent. On local government, £3 million has been put forward for the clean air zones. Of course, you are talking about five cities. We could do with lots more. Do you really think that that is anywhere near enough funds? We are finding that, as you come in to tell us, "We are putting forward these funds", local government comes in and says, "It is nowhere near enough". In the meantime, there is still the problem with air quality.

**Dr Coffey:** What matters is that the fund is there. Over 100 councils have made a bid for that, and the cumulative amount is more than the £3 million figure that you cite. If we can come up with compelling cases, it is for us to go back to Treasury to say why we think that would be a good use of funding in order to make further local interventions. It is not a case of inaction.

Q90 **Chair:** You have had 100 councils applying and you have £3 million. That is £300,000 per council. I don't think it is going to go very far.

**Dr Coffey:** I do not think it is £300,000.

**Chair:** £30,000 in fact.

**Dr Coffey:** I am not saying that every council will be successful. Those applications are being evaluated and we have to do what we think is targeted and appropriate with taxpayers' money in order to address specific air quality challenges.

Q91 **Chair:** I still think, in national terms, it is a very small amount of money and it is a very big problem. We have been twice in the courts. In a minute we are going to start paying massive fines. It will be ridiculous if we get to the situation where we have not put enough resource in place to sort it and we land up paying fines to Europe, because that could happen even at this late stage of where we are.

**Mr Hayes:** That to some extent is why in the Autumn Statement we committed the extra £150 million for cleaner buses and taxis, which of course will have a profound effect on the localities that you are describing. There is £80 million to improve the electric vehicle charging

infrastructure, which is a real barrier to people committing to electric vehicles, certainly in my area, and I imagine your area is much the same. I have literally had someone come to my surgery saying, "I would buy an electric car but I cannot charge it anywhere except Peterborough, which is 25 miles away, unless I charge it at home, of course".

There is £20 million for the advanced renewable fuels demonstration competition, where we are looking at how we can stimulate and catalyse still more fresh thinking about how to address the issues you have described. There was a reflection in the Autumn Statement of the concern you have expressed, that there is a need for greater resource, but it is not as if we are not taking action. We are taking action. You asked at the very outset whether Government can do more, and I was very frank with you that Government can always do more.

**Jim Fitzpatrick:** Ministers, good afternoon. It is nice to see you both. I should point out that we have let the Chairman know that we remember he was your PPS, Minister, so he is not playing favourites this afternoon because we are watching him.

**Mr Hayes:** He has not shown any favouritism so far.

Q92 **Jim Fitzpatrick:** Can I explore this new joint committee? I have written to both of you, and probably spoken to you in the lobbies, about the Enderby cruise terminal in Greenwich. We raised this with the Deputy Mayor of London, Shirley Rodrigues, in the last evidence session and have corresponded and spoken to her as well. Shipping does not feature anywhere on any of the maps. There is nobody who has responsibility for it and the Enderby terminal, as you know, has been the subject of quite a bit of controversy. The vast majority of people support increased use of the river, if at all possible, whether it be for tourism, commerce, commuting or the cruise terminal, and that is pretty much a given. However, when it comes to the new cruise terminal, there is the prospect of cruise vessels being berthed there for 155 days of the year and having to use their diesel engines to power the ship because there is no requirement to provide a shore-to-ship power supply. Notwithstanding that the Government's port statement gave a clear indication that that was what you would like to see happen, there is no power to require the developers to include a shore-to-ship source.

Given that it is not a matter for the Department for Transport, Defra, the GLA or the PLA, this is an area of transport policy that escapes all the scrutiny and all the regulatory requirements of local government and central Government. Will it feature in this new joined-up committee? Will you be looking to bring forward new regulations to require Enderby and future cruise terminals, wherever they are found—because it is not just London; there is a big campaign in Southampton and it is becoming an issue in Liverpool—to provide a shore-to-ship power supply? At the moment, nobody has the power to require the developer to introduce it.

**Mr Hayes:** As you know, Greenwich Council looked at shore-to-ship power in exactly the way you describe and it was ruled out on the grounds that it was impractical, but you make a profound point.

Obviously I am familiar with this case and you had an adjournment debate on it as well in September, Jim. With your knowledge as the former Shipping Minister, as well as the chairman of the all-party group, you will take a keen interest in all these matters.

In a sense, this is a reflection of a bigger problem with ports: that sometimes we see ports and shipping too much in isolation and not as a holistic part of strategy. I want to do more about that. I want to make sure that, in all areas of transport, we are looking at the interconnectivity of what we do. The straightforward answer to your question is, yes, I am more than happy to bring that to the inter-ministerial group at its next meeting. This is an area that can easily fall between the cracks and there is a case for changing the assumptions that currently underpin what happens in respect of port development.

One of the things that Mr Fitzpatrick will know very well is that ports are extraordinarily dynamic. Immense movements take place at ports because they have to respond to very rapidly changing market conditions. Because of that, the goalposts can be moved very rapidly too in terms of some of the issues that you are considering today. We need a mechanism that is just as dynamic and fit for purpose as we would apply in other areas of transport and infrastructure development. It is not there now but we need to do it, and I am more than happy to take it to that group.

**Q93 Jim Fitzpatrick:** I am reassured by the Minister's comments that he is going to take it to the group. As to the Greenwich decision, in my understanding, the advice Greenwich got was that there was no locus for it to insist upon it and, in that instance, it could not require it, but the vast majority of cruise ships can be connected. This is the subject of some controversy, which is why we need somebody to get to grips with it. From what you have just said, can we look forward to this being an element of the report that you are looking to bring forward in conforming to the court's verdict for July this year?

**Mr Hayes:** We have both said publicly that we are going to bring a further report, because we have to, given the decision of the court that the Chairman mentioned at the outset, and I would be surprised if there was not an expectation that we addressed this issue. It would be very odd if we left this issue out. I will certainly take away what you have said and we will discuss it in the inter-ministerial group. I would certainly want to address this before the date you suggest.

**Dr Coffey:** If you remember, though, there was an environmental impact assessment done at the time and that was fairly clear in its outcome. Quite a lot of detailed work has already happened on that specific issue. At the end of the day, Greenwich Borough Council gave permission, having looked at that environmental impact assessment and considered it, and the mayor at the time chose not to call it in. It is not that it has not been considered in great depth.

**Q94 Jim Fitzpatrick:** With respect, Minister, a lot of water—excuse the pun—

has flowed under the bridge since the five-four decision of Greenwich, which was taken under some duress. It is quite clear that the Mayor of London did not have the power to call it in. Given the fact that the Government do not have the power to require Greenwich to review its decision and there is no way for it to be retrieved unless Government take some regulatory or legislative action to enforce that which it has as its port policy guidance—that there should be shore-to-ship power supply—it is really down to Government to rectify this situation.

**Dr Coffey:** Yet the borough council voted for it.

**Jim Fitzpatrick:** I am very grateful that the Minister of State for Shipping has said that he will bring it to the joint committee and discuss it.

Q95 **Chair:** Minister, you are being slightly disingenuous.

**Dr Coffey:** Why am I being disingenuous? The borough council voted for it.

**Chair:** I think you have been through local government—I certainly have—and, if a planning officer sits in front of you and says, “If you hold up that application because you insist upon having electric supply to all the cruise ships that come in, you could be taken to court, taken for costs and you cannot do it”, then it is a no-brainer. You have all these cruise ships coming into London and they have to keep their engines running in order to get power. Is this logical in the 21st century? It is not.

In a way, you have played exactly into our hands from my opening statement because you said quite clearly that you are not playing one against the other. This is a case where, if we all worked together, we could deliver the electric supply.

**Dr Coffey:** I am not playing into your hands. I am trying to say that the evidence was assessed during the environmental impact assessment. The councillors will have taken that into account in their decision. That is what I am trying to get back to: evidence and assessment. I would suggest that that is what we need to keep focus on.

Q96 **Chair:** If you drill down on the way that the decision was made, you will find that it was not made on the environmental situation. It was on other economic considerations.

Q97 **Jim Fitzpatrick:** The equally important point is that this ought not to be Greenwich’s decision. This is not a decision that just affects Greenwich. It affects Tower Hamlets, which is my side of the river; it affects all the surrounding boroughs. It affects the whole of London. This is a London-wide issue. There is no London power. Therefore, there is a gap in the legislation to protect London, because the mayor cannot call it in and cannot deal with it. To say, with the greatest respect, Minister, that Greenwich has made the decision is an abdication of your responsibility as a Minister for the air quality of the UK, where tens of thousands of people are dying prematurely because of poor air quality. To sit there and say, “Greenwich has made its decision” is an insult to the people of

London, if you will allow me.

**Dr Coffey:** It is not an insult to the people of London; it is stating a fact. It is stating a fact that the environmental impact assessment was looked at and considered. I am just trying to say that we have to keep focused on evidence, research and the scientific elements of that. That is why, going forward, we have to make sure that air quality plans are produced on the basis of them being effective.

Q98 **Chair:** Minister, we have been in court twice now and we have very poor air quality. Bringing all these cruise ships into London and allowing their engines to run rather than have an electric supply is going to improve the air quality in London, is it?

**Dr Coffey:** I would say that the council looked at that assessment.

Q99 **Chair:** Unless we all work together, from local government through to everything that happens in the transport system, we are all going to be sitting here in two or three years' time still with the air quality very poor and still with people having premature death because of it, and I just do not feel that we are pulling together on it. It is no good to quote local decisions in order to opt out of responsibility.

**Dr Coffey:** I would be surprised that you would want to accuse a council of opting out of local responsibility when it makes difficult decisions.

**Chair:** I am not accusing the council, with respect.

**Dr Coffey:** I would suggest, Mr Chairman, that the whole point is, yes, we have national and international commitments, but we have to do this on the basis of local solutions. Something that may or may not be appropriate for Greenwich may be appropriate elsewhere. It is about targeted interventions devised by local communities. That is how you will get long-lasting change.

Q100 **Chair:** If you are going to tackle air quality in this country, you have to tackle it from every direction possible; otherwise you are not going to get to these standards. That is why we miss an opportunity here. I hope, from the conversation that we have had with Mr Hayes, that he will take that up and see what can be done, even at this stage.

**Mr Hayes:** I am reluctant to go up a tributary, Chairman—I emphasise the wit there—but you will remember that the claim made by the residents in the case that has been brought to our attention was that the ships, when they came in and moored, were leaving their engines running and that this was likely to cause, particularly, nitrogen dioxide emissions. Now, I took a look at this, because I thought you might raise it. I was mindful of the adjournment debate, the case in Greenwich and all the rest of it. Local air quality management guidance in relation to ships is that the relevant pollutant is considered to be sulphur dioxide. There is no requirement to consider nitrogen dioxide pollution from ships unless more than 5,000 ship movements take place annually.

That is something that I want to draw to the attention of this inter-ministerial group, at the very least, but the bigger point that you are making in this Committee relates to the one I made about looking at this thing in the round, taking into account all the things that happen at ports and with shipping and seeing them in a similar way that we would see buses, taxis, cars or other vehicles. At the moment, we see shipping as quite separate.

I do not want to go down a tributary off a tributary, whatever that is called, but the point I made to Mr Fitzpatrick was that, too often, we do not see ports policy and shipping policy in that holistic way. I want to do it more. This is a really good example of how we can do that.

**Chair:** As far as I can see, the problem with the science of air quality is that, if you take an average of what these ships would come in with and the atmospheric conditions over a year, they would probably say that they do not add a great deal of pollution to the overall air quality. However, if these ships come in on a week, like there was at the end of November, when there is very little wind and pollution is not rising up into the atmosphere, then they have undue influence on the quality of air. That is why we really need to drill down on all of it.

Q101 **Angela Smith:** I had better behave myself, I suppose. Can I ask both of you how you are re-assessing your plans to cut the NO<sub>x</sub> and NO<sub>2</sub> emissions in light of the judge's comments that the Government should not have any regard to cost when fixing the compliant date or determining the route for achieving compliance?

**Mr Hayes:** Any Government that took no account of cost or cost-effectiveness would not only be called to order by committees like this one, but would be challenged robustly on the Floor of the House and soon become extremely unpopular with the people they represented. Of course Government must take account of cost and cost-effectiveness, whatever the judge may have said. No Government would ever commit to an open chequebook regarding any area of policy, as you well know, Angela.

I will say this: nothing is off the table. Where we can, and must, take a lead from what the judge has said is to say that we have to start thinking about things that we had not previously considered. We need to go to places that we had not previously considered going. The conversation that I am having across Government is that what we have been doing up until now has not been sufficient to persuade the court, which means that we need to do more.

Q102 **Angela Smith:** Can I test you on that, Minister? Let us take examples of things you may like to think about doing that you have not thought about doing before, such as banning diesel cars from city centres or introducing a diesel scrappage scheme.

**Mr Hayes:** There are two ways of promoting low-emission vehicles, including electric vehicles. One is to make high-emission vehicles

unattractive, and the other is to make low-emissions vehicles more attractive. The two things are not mutually exclusive, by the way.

**Angela Smith:** The two examples I gave were examples of both of those ways forward.

**Mr Hayes:** They were. You are right that, in order to encourage people to make choices that will lead to where we want to be in respect of the destination on emissions, we need to make electric vehicles, for example, much more attractive. That is partly about cost, which is why some of the figures I read out earlier matter. It is partly about infrastructure, which is why the charging points point I made matters. It is partly about battery technology and battery life, which is why that matters.

Simultaneously, given the concerns about nitrous oxide, we could make diesel vehicles in particular less attractive. Nothing is off the table and we are considering all those things.

Q103 **Angela Smith:** So a diesel scrappage scheme is not off the table.

**Mr Hayes:** The problem with the scrappage scheme is that it is, as you know, notwithstanding your first remark, extremely costly.

**Dr Coffey:** It is not particularly targeted either.

**Mr Hayes:** I would add two things, if I may. You may think that this is provocative, Chairman, but we are not here to pat each other on the back, are we? In an area like the one that the Chairman represents or that I represent, the ability to access a private vehicle, in parishes where only half have bus services, is critically important to quality of life and access to opportunity. I am not going to be a Minister who penalises working people who want to run a car because, if they did not run a car, their lives would be altogether poorer, since cars would then become what they once were: the luxury of those few who could afford to buy and run them.

Secondly, in respect of diesel and what we do about it, you will know that successive Governments took the view, not very long ago, that diesel was rather a good thing and petrol was rather a bad thing. We put into place all kinds of fiscal mechanisms to encourage people to buy diesel cars. Are we really going to say to those same people, "We told you that you were doing the right thing but now we are really going to penalise you"? We have to be very careful how we proceed with this, because it could be inequitable and unreasonable.

Q104 **Chair:** Thérèse Coffey raised the issue that we have to take our evidence on a scientific basis. The problem we have with diesels is that the scientific basis of what we have been judging was carbon before and now it is nitrous oxide, and we have to deal with diesels, however unpalatable it may be. This shows no desire of Government to do it. You should be changing the taxation away from diesels towards hybrids and petrols.

**Mr Hayes:** You are right, of course, that the prevailing view of the relative damage done by petrol and diesel has changed because our



understanding of the science has changed. Angela is making a point about the existing diesel fleet. You are certainly right that we want to discourage people from investing in diesel. New cars need to be as clean as they can be.

Q105 **Chair:** There is no sign of that in the taxation.

**Mr Hayes:** A scrappage system would be immensely costly because, to encourage people to scrap their existing cars, the scheme would have to be extremely generous. I am not sure that it is a place that we can go yet. Nothing is ruled out, and I am not ruling it out, but I do not want to give you a blithe, easy answer that we will get rid of all the diesels, they are all going to go, we will have a national scheme and all the rest of it when I do not necessarily think we will.

Q106 **Angela Smith:** The impression I get, Minister, is that there is no conclusion drawn in terms of this equation or this balance between economic benefit and cost in terms of compliance. Everything is on the table, but you are very alert to the possibility that you could penalise drivers unwittingly in a way that is unfair. I get that, but Departments must have already done some work on identifying the potential additional cost that could accrue if we were to move to compliance in the shortest possible time. Can you tell us what the indication is? What is the potential cost?

**Mr Hayes:** I can give you a categoric answer: yes, work of that kind is underway; yes, we appreciate that we have to respond to what the court said; yes, we will deal with that when we publish our response in the summer.

Q107 **Angela Smith:** What is the indication so far? Work is being done and everything is on the table. I do not get the impression, Minister, that things are moving very quickly, considering the court said that this had to be done in the shortest possible time.

**Mr Hayes:** You have set out the dilemma. How do you marry the three objectives? You have to do something that is cost-effective. You will notice that, when I talked earlier about Governments per se, I talked about cost and cost-effectiveness. How do you do something cost-effective that delivers the objectives on emissions that you want to deliver and does not unfairly penalise individuals and their families? Those are the three things that we are juggling.

Q108 **Angela Smith:** Does cost-effectiveness also include the possibility of significant fines being levied against the Government if this is not handled quickly enough?

**Mr Hayes:** Yes, that is part of our cost calculation. That is why we are going to do it in the summer.

Q109 **Angela Smith:** You are mindful of that.

**Mr Hayes:** Very.

Q110 **Angela Smith:** The Government will avoid those fines being levied.

**Mr Hayes:** That is our objective. That is our aim.

Q111 **Angela Smith:** Finally, I will come to the point about the big stick here, which is the legislation that we have on the table from the European Union. We heard from previous witnesses that the repeal Bill will be really important in all of this and that it will be really important not only to have all the European Union directives and regulations translated onto the UK statute book, but to have case law relating to those regulations and directives transferred into UK law. Is the intention of the Government to do that and to show, in that sense, a real commitment to continuing on this road towards compliance?

**Mr Hayes:** It would not be appropriate for me to debate what the Government are going to do post the great repeal Bill.

Q112 **Angela Smith:** No, I am talking about the lead-up to the repeal Bill. Is it the intention of the Government to ensure that all the commitments that we currently have in relation to this really important issue are going to remain on our own statute book, so that the Government remain committed to dealing with the problem?

**Mr Hayes:** I was going to add a suffix, which is: it is inconceivable that we would not want to continue down the road that we have already gone down in terms of policies in this area. You are right to say that, even were we not a member of the European Union now, and when we are no longer a member of the European Union, the idea that we would take our foot off the pedal in respect of the environment, emissions and the regulatory framework around them would be fanciful. We are certainly not going to do that.

Q113 **Angela Smith:** Dr Coffey, the assumption is that all those regulations, directives and case law will go on to the statute book.

**Dr Coffey:** I am not aware of the elements concerning case law. I am clear that the great repeal Bill is about operability and the Prime Minister has been clear that we will bring into domestic UK law, or into whichever appropriate legal jurisdiction, whatever we have currently there. We expect to transpose the National Emission Ceilings Directive into UK law in due course as well. It was only agreed last month, finally, at the European Parliament. That process will happen.

**Mr Hayes:** The goals that we set out to leave the environment in a better place than we found it and in terms of how we would deal with air and water were not about the European Union. They were about our Houses of Parliament and our Government being very clear about their agenda; and that agenda will not change.

**Dr Coffey:** One of the reasons to try to regulate across the European Union is because a lot of pollution is cross-boundary. That is why we have gone further and supported the EU's targets for 2030. That still stands.

Q114 **Chair:** Would both of you Ministers accept that the fact that so many people are affected by bad air quality, especially in our city centres,

irrespective of where the legislation is coming from, means that Government and local authority can be expected to do much more?

**Dr Coffey:** That is why we three stood on a manifesto about investing in clearer air and water, very specifically.

**Mr Hayes:** I totally agree; you have put it in a nutshell. This is about the health and wellbeing of our people and our children. I do not want my children breathing in particulate material that is injurious to their health. We were looking at these figures in the inter-ministerial group. We know that those who live in certain parts of our country where air quality is the worst have a measurably diminished quality of health. You can measure it in terms of life expectancy or in terms of deaths per year. I am not suggesting that you can go to a hospital and find people on whose death certificates is written, "This person died because of air quality". However, if you have respiratory problems anyway, this is a major contributory factor.

Q115 **Angela Smith:** It is certainly a contributory factor. I absolutely felt the impact of the weather the other week here in London. From what both Ministers have said, and particularly from what John has just said, I can take it that you will be putting your shoulders to the wheel and working as hard as possible to come up with, as soon as possible, a firm plan for delivering compliance in the shortest possible time. How quickly can we expect this to happen? If it is as important as the Minister has just suggested, and people's health depends on it to some extent, then surely there is an urgency here in terms of coming up with not just some platitudes that we are looking at everything, everything is on the table and we are looking at cost-effectiveness, but rather some concrete proposals for dealing with the problem.

**Dr Thérèse Coffey:** Clean air zones were endorsed by the judge and, indeed, by your Committee as a way forward. The framework consultation closed just very recently. That is being considered. Now there are responses to that and we intend to propose in the new year, as we have already laid out, at least our five cities that we will require to have clean air zones. I have already been to visit Derby in that regard. I have had conversations elsewhere. I also met Steve Rotherham and Deputy Mayor Ann O'Byrne in Liverpool on 2 December in order to discuss some of the things that they are doing. This is about trying to work with councils to think about how we can improve air quality.

Q116 **Angela Smith:** The question was: when are you going to come forward with concrete proposals as a result of the work you are doing in the joint committee? This is about the Government's response. I accept that you have to work with local government but, in the end, it is central Government that will have to respond.

**Dr Coffey:** That is right, and the timetable has been laid out. We are required to start our consultation and to have that ready by 24 April, and to have the plan in place by 2017. It will require local action as well, in order to deliver the outcomes for the citizens that we all represent.

Q117 **Chair:** You accept that Government will need to lead.

**Dr Coffey:** Yes. This will require multiple leaders. It will require an element of bravery, perhaps. I am not going to name them, but one or two councils have been less reluctant to get on with their consultation being developed for the clean air zones. It is about coaxing and encouraging. Councils already have the power to do this if they wish.

**Mr Hayes:** You have been very specific in your questions and I am trying to be very specific in my answer. We are going to develop a new air quality plan, as you know, and we are going to put a draft in place in spring and finalise that during the summer. The question you are really asking is: will that contain broad statements of intent or specific measures? The commitment I give you is that it will contain specific additional measures.

Q118 **Chair:** I want to go on to vehicle emissions modelling with the next question. Why did the Government use models that they knew were based on underestimates of vehicle emissions when they devised their air pollution plans? In the judgment, the judge noted that not only had officials been aware of the emerging evidence, but it had reached as far as Cabinet. He said that a Cabinet briefing document on air quality, apparently dated October 2015, noted that significantly higher Euro 6 emissions would suggest that 23 UK zones would not be compliant with EU NO2 rules. This is for diesel cars. Why were these models not brought up to date?

**Dr Coffey:** I am reliably informed that we update our models with the best evidence that we have at the time. We had been pressing for updated factors. Those eventually came through and we started the process of updating our model.

Q119 **Chair:** The judge had this evidence. He is saying that it had reached as far as the Cabinet level in 2015, and yet we did not alter the air quality rules. Why was that? I know it is before your time, but we have to drill down on why more action was not taken, why we are going back to court all the time and why we are losing.

**Dr Coffey:** I do not know about that specific briefing, but I know that the Government came forward with a plan by the end of December 2015. As I say, we were waiting and pressing for additional factors, which would then have updated that. We now have that information and we are churning the handle. I am genuinely not sure I can add any more information to that.

Q120 **Chair:** We appear to be playing catch up all the time and we just do not seem to be tackling the air quality as it is happening. I want to bring in Mr Hayes now, on Volkswagen and the fact that their vehicles were emitting more pollution than they were stating and they had altered the software in order to make sure that the wrong figure came out. There has been huge criticism of the Department for Transport's "ambivalence towards assessing the legality of Volkswagen's use of defeat device software despite its condemnation of Volkswagen's actions to us and in

the media. The Department for Transport was too slow to assess the use of its powers under the Road Vehicles (Approval) Regulations 2009 to prosecute Volkswagen for its deception”.

Now, to cap it all, it looks like the EU Commission might take a case against us, the Government of this country, because we have not taken enough action against Volkswagen. You could not make this up even if you tried.

**Mr Hayes:** Several things have happened since the emissions scandal broke in September 2015 in respect of Volkswagen. First, we assessed the scale of the issue, investigated what went wrong and pressed Volkswagen to put in place a technical solution for all the existing car owners. The important thing was to get all the people who bought Volkswagen cars in a place where there was a technical fix. I meet Volkswagen regularly to press them to make sure that technical fix is being rolled out. It is being rolled out and, as far as the consumers are concerned, I do not want to put anybody in a position where they are driving a car that they thought was within the regulations and turns out not to be.

Secondly, we had to do a serious piece of work to test a range of other vehicles, not just Volkswagen vehicles, and see what they were doing in respect of emissions. We completed that work, as you will know, Chairman, but my strong view is that Volkswagen should pay for it. I have told them that.

Q121 **Chair:** What are we doing about making them pay for it?

**Mr Hayes:** I have issued an invoice to them and I expect them to pay it promptly. I ideally want it before Christmas. I shall certainly have it by January.

Q122 **Chair:** This is interesting, Mr Hayes. What does the invoice include? What are you charging them for?

**Mr Hayes:** Essentially, after the VW emissions fix—I say “fix”, but I really mean “fiddle” because they really do fiddle with the tests—it became clear was that we would need to do a piece of work to test a whole range of other vehicles, to make sure that other manufacturers had not been engaged in the same thing, so to retest, as it were, vehicles across the piece. That was a very extensive and elaborate enterprise. Why should the taxpayer fund that? VW should fund that. I made that clear to them. They have not, frankly, put up much of a defence against my claim and, as a result, I have issued them with an invoice for those costs.

Q123 **Chair:** Why is the EU taking action against the UK Government? They obviously do not believe that you—not you personally, but the Government—have not done enough.

**Mr Hayes:** There are some other issues here, aren’t there? There is an issue of getting the technical solution right for existing car drivers, and I pushed Volkswagen hard on that. There is the issue of the real cost to Government of dealing with this, and I have been very clear about that

and sent them an invoice, as I said, which I expect to be paid. There is an issue going forward about whether people who have now had this fix and who buy Volkswagen cars should be issued with a different kind of warranty. I have argued very strongly that that should be part of the package too. I am still in negotiation with Volkswagen on that, but I am an extremely fierce negotiator, as I told them when I met them. I am determined to do the best by British citizens who were buying Volkswagens under false pretences. That is what it boils down to. It is completely unacceptable. Volkswagen know they have behaved very badly. They are not denying that they were in the wrong. They have said that publicly and to me privately, and it is now up to them to make up for what they have done. That is why I have been so tough on them.

As far as the EU is concerned, we continue to discuss this with our continental friends. We used to call them "partners" when we were in the EU, but I prefer to call them "continental friends" now. We are still in it and I know we are still in it. We will not be for long, thank goodness. They have similar issues, of course, because the Germans are very anxious and concerned about this. VW is a big business for them. I have not ruled out taking legal action, by the way. I have not ruled it out. I am still considering that. It is not straightforward, for all kinds of reasons that you will understand, Chairman. If Volkswagen do not satisfy me, I have told them that I have not ruled out taking further action. We may investigate it ourselves and we may take further action.

Q124 **Chair:** If you have been sold a new diesel vehicle that did not meet the pollution levels that it was said to produce and then you drive into a low emission zone, you are basically being charged less than you should be for that vehicle. Of course, the previous witnesses here from the GLA said that Volkswagen also owe them a great deal of money for the extra pollution charges that should have been paid by those cars, because they were emitting higher levels of pollution than the manufacturers were saying. Are you also pursuing that?

**Mr Hayes:** That is an interesting suggestion. I would have to test whether that would stand up as a legal argument, and I do not know the answer to that question, frankly. I am prepared to go away and seek further advice on it.

Can I just deal with the fundamental result of this? We really have to move very quickly to real driving tests, because of course you will remember that there is a significant difference between a test that is done based on laboratory conditions and a real driving test. We have secured a tough new real driving emission test in the EU legislation. From next year, vehicles will have to meet emission limits in real driving conditions, across a wide range of operating conditions. We want to ensure, further to your question, that those tests deliver real, measurable outcomes, not a paper exercise that could be subject to the kind of trickery that we have seen previously.

Q125 **Chair:** If you buy *What Car?* or any other car magazine, you will often see that it says, "This car will do 68 miles to the gallon—manufacturer's

recommendation; the true government figure is 45", so what on earth is happening? Why are these manufacturers—not just Volkswagen; they are all doing it—able to state that their vehicle will do 68 or 70 miles to the gallon when the true figure is only 45? Surely, even under trade description, they are acting illegally. Why is the Government Department for Transport not doing more there?

**Mr Hayes:** When I met my wife, I promised her a life of endless bliss.

**Chair:** Has she not had endless bliss?

**Mr Hayes:** While I am happily married and we have a lovely time, I cannot say that every single moment has been blissful.

Q126 **Chair:** Minister, if I have a beef animal, and I say it is 600 kilos but it turns out to be only 450 kilos—it is the same principle—I could not sell that animal as a 600 kilo animal. Why on earth should a manufacturer supply a car that does 70 miles to the gallon when, in true figures, it does 45 miles to the gallon? It is not right.

**Mr Hayes:** I would not have the temerity to challenge you on any matter concerning livestock, given your knowledge and experience.

Q127 **Chair:** The principle is the same.

**Mr Hayes:** I will say this: we work very regularly with the Society of Motor Manufacturers and Traders. I was with them yesterday. The point of principle that you made is absolutely right: people should not be buying things on one basis and finding that, when they get them, they are operating on an entirely different basis. That is true in general terms about cars, as you have suggested, and it is particularly salient in respect of emissions, which is why we have to get empirical information based on real tests in robust conditions that will stand up and that people can trust.

Q128 **Chair:** When are we going to be at that stage, then?

**Mr Hayes:** As you know, next year we move to the real driving test that I have described, and that will change the circumstances that you have set out.

Q129 **Chair:** When you say "next year", do you mean the beginning of the year, the end of the year, sometime, never?

**Mr Hayes:** Well before the end and sometime after the beginning.

**Chair:** That is the best phrase to date, I think.

Q130 **David Simpson:** It is good sometimes to have a bit of humour; it breaks the monotony. Ministers, the court criticised the Government for relying on clear air zones to meet the EU limits and for giving insufficient consideration to using different classes of zones. What changes will you make to your clean air zone plans to address the criticism?

**Dr Coffey:** I was under the impression—perhaps I was overoptimistic—that the judge thought that clean air zones were rather good but,

recognising, as I hope, that we will have a menu of options, councils can think together about their local communities and what will work well to see which areas are going to be particularly affected. Our indicative early modelling indicates that there will be more towns and cities requiring further intervention in a specific way. It is not about thinking solely about clean air zones but other options that may be available.

Q131 **David Simpson:** You spoke about the figures coming up and identifying certain areas. Would it be your intention to require cities to charge cars that do not meet the emission standards to drive in the most polluted areas?

**Dr Coffey:** As was said earlier, nothing is off the table. Options are being worked up, as are the likely impacts of those different options. I cannot give you a definitive answer to that now.

Q132 **David Simpson:** If cities were identified, do you think it would be the policy? Obviously it will be evidence-based, but surely the way to go would be to charge cities or councils if that was the case, in order to eradicate the problem.

**Dr Coffey:** Genuinely, stuff is still being worked up. I cannot give you a definite answer, apart from to say that there are a series of things being looked at. I cannot remember the extent of the charging regime, but those kinds of things are being worked up. It has to be said that businesses have asked us to try to have a level of consistency where we can between cities, and that is part of what we have consulted on, but ultimately we are going to need targeted interventions that will improve the situation in each particular urban centre.

**Mr Hayes:** Thérèse went to Derby to discuss this with Derby Council. We have had a couple of workshops on clean air zones. We are looking at how we can improve the communication of the opportunities for clean air zones with local authorities. Along the lines that the Chairman spoke about earlier, we need to make sure that local authorities are geared up to make the best of this opportunity. In essence, the real question is: do we have more zones and do we do more in them? That is the challenge that we will have to meet when we develop our new strategy. I think that both are possible. We want more zones, as Thérèse said earlier, and we probably want to do more in them.

There are three objectives: promoting economic activity and growth in a sustainable way in the town; taking immediate action to affect air quality; and creating a more sustainable view strategically about pollution and air quality within an area. All those three can be married, but it is about getting local authorities into a place where it is attractive to them and they see it as good for their citizens, and where Government are very clear about what they can do with local authorities to make it happen. We are probably looking at more zones and doing more in those zones, in order to meet the objectives that have been established as a result of this court case.



**Dr Coffey:** I had a request, for example, when I visited Liverpool, to have red routes. I have asked for that to be looked at, in order to see what we can do. Do we need to do more secondary legislation? Of course we have red routes in London, and I think there are some in Birmingham as well. I have spoken to the LGA lead councillor on this as well. They have made some requests. All these different things are being looked at, in addition to the work being done centrally.

Q133 **David Simpson:** John made the point in relation to getting councils to recognise the difficulties that there are with pollution. How can you steer councils in a certain direction? Do you penalise them? How do you do it?

**Mr Hayes:** We did a consultation on the draft Clear Air Zone Framework and the regulation mandating the implementation of clean air zones, because we want local government to see this as an opportunity to improve the quality of life within the locality. Many in local government see it that way, but I am not sure that it could be said across the whole country. Getting local authorities enthusiastic about this as a positive vision for the future that they can offer to their local citizens and making sure that that marries with the Government's objectives for emissions is really important. This is partly about making sure that we get a joined-up approach.

It is also about tying together various strands of work. Local authorities will have a view about buses; they will have a view about trams in some places. My old city of Nottingham now has an extensive tram system, which has been a great success and is being extended. What is the cycling strategy like? Where can cars go and where can they not go? I made it very clear earlier that I do not have a prejudice against private motorists and I would never have that; I take the opposite view. All those things have to be co-ordinated.

Government can help by identifying and exporting best practice, and doing so on the basis of what we ask for, what we offer, what we recommend and what we advise.

**Dr Coffey:** Manchester is not one of the five cities that we are mandating to have clean air zones, but they are looking at this. It is about local solutions. Liverpool were explaining to me that they got rid of some of their bus lanes, or are making them very time-limited. They are experimenting in order to work out the best outcome. Ultimately we need free-flowing traffic. I cannot, as a central Government Minister, write every plan. Every time I walk from Defra, there are five zebra crossings from the corner of Horseferry Road. I can give my views as a person on whether that is the best route, having stop-start traffic all the time, or whether a pelican crossing would be better, but ultimately it will be down to Westminster and, in particular, the Mayor of London. I am not going to impose those solutions on them.

Q134 **David Simpson:** To finish very quickly, in relation to the buses, cars and vehicles, does the same legislation cover heavy goods vehicles, delivery vans and all that? Does the same legislation cover those as well?

**Dr Coffey:** The current proposals are focused on commercial vehicles: HGVs, taxis and things like that. That is the focus that we have laid out so far.

Q135 **Chair:** Of course, delivery vans would not be heavy goods vehicles, would they?

**Dr Coffey:** Commercial vehicles.

**Mr Hayes:** To pick up a point you made, David, the purpose of the framework that we published in October is to ensure a consistent approach to clear air zones. The thing that we need to square is making sure that, while the approach is consistent and delivers the outcomes we want, it takes account of particularities. The whole point of local government is that it should not be vanilla-flavoured; it has to be responsive to the needs of its locality and its community, and to take its community with it. My argument for the advocacy of this, on the basis of the difference that it could make to wellbeing, is so that those local authorities can feel an ownership of it in a way that allows them to do things they are proud of and that make their citizens very proud of it too. That is what we are trying to achieve here. It applies, as Thérèse said, to commercial vehicles of all kinds.

I am sure you will ask the question if I do not mention it, Chairman, so I will just say this: of course, in respect of the way people purchase things, we are seeing a change in how goods are obtained and delivered. This is having a big effect in all kinds of areas.

Q136 **Chair:** Shopping online and having it delivered by vehicles, yes?

**Mr Hayes:** Precisely. It is causing a big change in terms of the number of delivery vehicles, the number of smaller vans and the number of warehouses. There are a lot of ramifications to this. May I make another case on behalf of private motorists? I do not want to see our towns and city centres any more hollowed out than they are in some places now. I want to see them vibrant and successful. We have to think about local economies here as well. We might be doing something very important and significant in respect of emissions, while doing something quite unhelpful in terms of local employment and vitality.

Q137 **Kerry McCarthy:** Can I ask about the bigger picture? It is coming through in some of what you were saying about air quality mattering everywhere, but I am not really getting it, to be honest, from the Defra Minister. Air pollution is a nationwide problem. There are very few parts of the country that would not benefit from seeing a reduction in air pollution levels. This focus on five clean air zones might technically get you within targets, but is it really what we want to see for the country? I am not getting a sense of urgency that this is something we should be trying to move further on across the board. It is all about nudging and encouraging and it not really being your problem.

**Dr Coffey:** I can assure you, Kerry, that this is my top priority and the top priority of the Secretary of State. I have weekly meetings on air

quality with people from the joint unit. There is detailed work happening in order to develop this new plan. We have been working to get these clean air zones. The Government are taking national leadership by requiring councils to address the issue—that is the legislation that will be coming forward—but I cannot change every single traffic light around the country in order to get traffic flowing more readily.

There are other issues to do with agriculture and ammonia. Our air quality expert group has asked us to focus on ammonia because of the interaction it has at an environmental level, so on 1 December we opened up a new fund for farmers and we have had several expressions of interest in projects to take that forward. We are working on particulate matter. Air quality is improving, but I recognise that we want to keep it improving more quickly. It just so happens that the majority of the issues with nitrous oxides are related to transport and, in particular, urban centres. That is why there is so much focus on that particular policy.

**Q138 Kerry McCarthy:** We will go on to agriculture in a moment and someone else will ask about that. You mentioned the word “consistency” earlier. The problem with the five zones is that there is not consistency then between cities. Leeds, for example, were concerned that it could displace business to Bradford. They are obviously in competition. If vans have to pay to enter Leeds, why not relocate? That would be a concern for the core cities. I represent Bristol, which is one of the core cities. What are you doing to try to ensure consistency? I accept that there need to be local solutions in a city; Bristol may have particular geographical problems that you would not have in a city like Sheffield. At the same time, they are in competition with each other and they would expect a level playing field.

**Dr Coffey:** I am not sure why you would want to put conditions on a place that does not particularly have air quality issues and is already in compliance.

**Q139 Kerry McCarthy:** Are you saying that Bristol does not have air quality issues?

**Dr Coffey:** I am not saying that Bristol does not. Perhaps I am misunderstanding your question. I interpreted it as: why not just make the entire country an air quality zone, to have that consistency?

**Q140 Kerry McCarthy:** I started by saying that you would be hard pushed to find an urban area in the country that did not have an issue with air pollution.

**Dr Coffey:** Yes, and councils already establish air quality management areas. They will vary. It so happens in my constituency that there are two left, and action is being taken by the local council to address that. I had written to over 250 councils asking them about the issues, because we genuinely want to see what we can do to try to help in this. In one particular case, moving a traffic light by 10 yards is one thing that they

believe will make a difference so that the air quality issue will in effect no longer be an issue.

I understand what Leeds are saying. If their air quality is so poor that they have to take extra measures, which may involve charging vans to go in and out, they may lose business to Bradford, but why impose costs on Bradford when they do not have this air quality issue?

**Kerry McCarthy:** They do.

**Dr Coffey:** They may do.

**Kerry McCarthy:** They might not technically be within the same parameters.

**Angela Smith:** We can talk about traffic lights all we like, but Bradford has a problem. Sheffield has a big problem at junction 34. Some of the schools in that area have been declared as hotspots. There is a problem in every urban centre. What we are driving at is that we do not get a sense of responsibility from Defra for this issue, in terms of putting together the strategy, the legislative framework and the regulatory approach that we need to see to ensure that every single urban centre in the end does deliver. I accept there is a need for local leadership, but the leadership fundamentally needs to come first and foremost from Government, from Defra and from DfT in terms of ensuring that we get on the right path as quickly as possible. Do you accept your role in providing that leadership and strategic oversight of where we need to get to?

**Dr Coffey:** That is the role of Government and that is why, as I say, I have a weekly meeting on air quality and people are on this. People are working away on options. We are putting forward clean air zones as a tool, but other options will be worked up for councils to take leadership on. We are requiring five cities now. That number may significantly increase as a result of the new data that is still being churned through the model. We have indications from the light-touch model, as it were, that significantly more areas might need to bring in measures, as will be required in Leeds, Birmingham, Derby, Southampton and, of course, Nottingham. That might be a longer list, but I cannot give you the names of those councils now. I have an indicative list, but we have not finished that work and it would not be polite to do so if we have not actually spoken to the councils involved.

Q141 **Angela Smith:** I am just asking for some leadership. We do not want to see you passing the buck. We just want to see leadership.

**Dr Coffey:** I am not passing the buck to anyone. This is a shared problem. We have national strategies to achieve it, but you will need local action to deliver it.

Q142 **Chair:** Even though your old models were not right, you are confident that your new models will be right and that you will not be back in court, having it ruled against you and paying European fines. Is that what you think, Minister?

**Dr Coffey:** The models will be updated with the best information that we have. I am not sure that it would be sensible for Government to make up factors.

Q143 **Chair:** The Government have not covered themselves in roses in this. They have been twice to court twice, they have lost twice and they are not getting to grips with air quality. In fairness, Minister, you cannot come here and tell us at this Select Committee that the Government have been doing a marvellous job because they have not. You would be far better off holding your hands up and saying that, rather than giving us information that "we have the model". You had the model and that model was proved to be wrong. We have systems of paying farmers; sometimes they work and sometimes they do not. We want to know that you have a system in place now to make sure that the air quality in the inner cities meets the requirements, because it does not at the moment and we are not really confident that we are moving there fast enough.

**Dr Coffey:** As I say, we will develop options to help councils come up with local solutions that will mean air quality improves.

Q144 **Chair:** Please answer me. Do you believe the model that Defra is using is fit for purpose?

**Dr Coffey:** It is a very big and clunky model. It is not particularly agile, but part of that is the level of detail it goes into in making different assumptions. That is why it takes a long time, once the handle is turned, for the output to come out at the end. I will not pretend that it is my favourite model, but it produces the level of detail that we believe is appropriate in order to then have legal consequences of it in requiring actions to take place.

Q145 **Chair:** That description should fill us full of confidence, should it?

**Dr Coffey:** What I mean is that the detailed outcome is based on factors, and the factors were the ones that we were able to use because that was the best evidence that we had. We now have new factors. If those new factors are incorrect, then the outcome will be incorrect.

Q146 **Chair:** All the time that these factors are incorrect or not, people are suffering with poor air quality and in the meantime the Government are likely to get fined.

**Dr Coffey:** I recognise entirely that there are parts of our country where air quality is a real problem. That is why I say it is a top priority for me and for the Secretary of State. That is why I am pushing on what we can do along these lines.

**Mr Hayes:** To be very blunt and clear, the court judgment obliges us to revise our plans. There is no use saying that the plan was adequate because the court has found that it is inadequate. We have to revise our plans and, in essence, that means that we have to do more and we have to increase pace. We will do both.

Q147 **Chair:** You have to be back to ClientEarth by April and you have to be

back to the European Commission by July, so there is not a lot of time for the Government.

**Dr Coffey:** We are not presenting the plan to ClientEarth. The plan is to be presented to the public.

**Chair:** Right, then on to the European Commission.

**Dr Coffey:** We draft the plan, go to consultation and then have our final plan.

**Chair:** We look forward to that.

Q148 **Chris Davies:** You will be delighted to hear, Ministers, that we do not have a problem with air quality in Hay-on-Wye in the Brecon Beacons National Park, so we will not be requiring a clean air emissions zone. I fully agree with the fact that you are having target zones. I think that is the way forward, but not everybody agrees.

Government support is focused on incentivising the use of low carbon vehicles, moving from diesel and petrol into electric and hybrid vehicles. How much of an impact do you think the government schemes are having?

**Mr Hayes:** I have asked for exactly those facts and figures, because I knew you would ask me. So far, in terms of electric and low-emission vehicles, we are talking relatively small numbers. We are talking about 75,000 or so. In terms of vans, we are talking about somewhere between 2,500 and 3,000. I think that will accelerate quite rapidly, for the reasons I have given already, because we can get battery technology in a better place; we can reassure people about charging points; we can overcome the doubts that people therefore have about longer journeys. People are not quite sure, once they have charged their battery, how long it will take before they run out and they need to recharge. We need to continue looking at price, because there is a barrier to entry around price.

To pick up the points made earlier, there is also the point about relative attractiveness, isn't there? If electric and low-emission vehicles generally become more attractive at the same time as other kinds of vehicles become less attractive, the choices that individuals make will reflect that. I am confident that we can do more. At the moment, it is relatively modest but I am very confident that we are heading in the right direction. That is the frank answer to your question.

Q149 **Chris Davies:** Can I push you on London, for example? In the previous panel, the Deputy Mayor of London was sitting where the Minister for Defra is sitting. She basically said that the Westminster Government have to fund more for electricity points. London is the focus for most of us at the moment. How can we get more electric points around London? Do we need government intervention or, as *Dr Coffey*: quite rightly said, do local authorities need to get involved?

**Mr Hayes:** We do need to involve local authorities. We can look at Paris as a parallel. I had a meeting about this quite recently. The rollout of charging points in Paris is extremely impressive. I would not say that

they have one on every street corner, but they certainly have a very extensive number of charging points throughout the city. It is patchier in London. I want to take powers to do more. I want to incentivise people to do more. The Modern Transport Bill will specifically address this issue, by the way. I want to encourage some of the more reticent local authorities, which at the moment are not taking up the opportunity to put charging points in place, to do so.

This is partly about spreading the message and encouragement, but it may also be about creating a statutory framework to deliver the consistent provision of charging points of the kind that they have in the French capital.

**Q150 Chris Davies:** Would you be looking at a separate city plan? I have just bought a diesel car, as I made quite clear in the last session, and that was only a couple of months ago, so I have not been persuaded with the electric model. I travel 185 miles to get up to London and I do not feel confident that a battery car would get me all the way here. We really need to start with the cities, and we do not seem to be a long way down the line at the moment.

**Mr Hayes:** You underestimate the level of work that is going on technologically. Battery technology is moving ahead quite rapidly. A business recently came to brief me on the development of batteries that both have a longer life and are less affected by recharging. I am sure you know more about this than I do, but one of the problems that people have is that, every time you charge a battery, you have an effect on its longevity. If you can address that and create a longer-life battery—and both of those things are happening; a lot of work is being done on both of those things—you will change a lot of the assumptions that people make about the disadvantages of investing in electric vehicles.

You are right, in that there will be differences between London and an area like the one that I live in and represent, because people typically travel much longer distances in rural areas to access public services, for example, and to go about their daily lives. We will need to look closely at rural areas, and that is one of the reasons I want to take powers. It might be that we end up with a very patchy provision of charging points and some areas are disadvantaged by the very fact that they are remote or rural, and we cannot allow that to happen. That is a point where Government would need to get involved directly.

**Q151 Chris Davies:** For the short term in particular, with diesel for example, what is your assessment of the potential for cleaner diesel as a substitution for traditional diesel?

**Mr Hayes:** We are doing a lot of work on that as well. I have always been quite interested in this from the days when I was the Minister for Energy. There is a lot of work happening in the area of cleaner diesel. It is a rapidly changing field of work, because we are getting better and better at making it more cost-effective. Part of the problem here is scale. You need enough of a demand to create scale that will drive down price. That

is true both in cleaner diesel and in electric vehicles. Until you get to a take-off point, you will not drive the price down to make it economic. I am extremely confident about that.

I will tell you what I would rather like to do on this, Chairman, because it is quite a technical area. With your permission, I would like to write to the Committee following this meeting, setting out the things I have just described: the work that is going on in terms of battery technology and with cleaner diesel.

Q152 **Chair:** Yes. There is a cleaner diesel fuel available out there.

**Mr Hayes:** There is a cleaner fuel available, but the point I was really making is that getting it to a point where it is commercially viable through a change of affordability requires scale. I want to write to you with the detail about that.

Q153 **Chair:** Can I carry on with one point here? It is grand to have all these charging points for cars but, if you only have about 1% of the fleet of the cars in the country—because that is all it is at the moment; it might be moving to 2%—it is still not going to solve your problem if you are not getting people fast enough off your diesel and petrol cars and onto the electric cars. I know you need the charging points, but do you not want an incentive to buy the electric car and a disincentive to buy diesel and petrol? I know this for the Treasury, but it is also for Transport. Do you not want to start altering the taxation on both diesel and petrol cars? I know you do not want to go there, but do you need to do both? Like I said, you can have as many charging points as you like but, if you do not have electric cars to charge, you are not going to solve the problems with pollution.

**Mr Hayes:** This Committee is full of members with rich experience, a keen eye and a sharp ear, and they will have heard what I said about the relative attractiveness of different kinds of vehicles. There are all kinds of ways that you can affect the relative attractiveness, but far be it from me to stray into the areas that are outside my purview.

Q154 **Chair:** Sorry, Minister. Successive Governments have used a system to encourage people to buy diesel cars, and now I am afraid they will have to start rowing away from giving them an incentive, to neutralising that, to a disincentive. It may take a little while to do, but you do not seem to be showing any signs of even considering it.

**Mr Hayes:** Do not forget that we effectively subsidise the electric car market through the plug-in grant. We have put a substantial amount of resource in to remove one of the barriers to entry, which is cost, but, to the point about charging points and suchlike, there are other barriers to entry. If you make electric vehicles more attractive through a variety of mechanisms, more people will go for them. A lot of this depends on the manufacturers. I am talking to the manufacturers about this on a regular basis and one of the things I have argued is that, when people go into a car showroom or when they buy a used car, if the car they are looking at is electric and it does all that a petrol or diesel car will do and more, so



there is no reason not to buy it, this will take off extremely rapidly. At the moment—

**Chair:** It may not be attractive enough to everybody.

**Mr Hayes:** Well, it is probably perceived as marginal and we have to make it mainstream.

Q155 **Chris Davies:** I have a last question. I would like to have reassurance from both Ministers, if I may, for the rural community. I mentioned the diesel vehicles, but we also have many day-to-day Range Rovers, Land Rovers, tractors and agricultural machinery that rely on diesel, whether it is good, bad, clean or traditional. There is no plan in the near future for a scrappage or barring from use of those particular vehicles. Can I have a reassurance that the Government are not planning to effect those in the near future?

**Mr Hayes:** I have mentioned cleaner diesel and I am going to write to you about it. Cleaner diesel is applicable to some of the vehicles that you have described, as the Chairman suggested. Getting those vehicles to a place where they are making a less injurious contribution to the environment, and enabling the owners of them to do so in an affordable way, is part of what I want to do. I represent a rural area too and I am very familiar with the kinds of vehicles that you are describing. Over time, I am confident that we can get there. We certainly will not ignore those in the plans that we put together.

**Dr Coffey:** I am not aware that just banning a diesel car anywhere in the country tomorrow would be targeted, in trying to achieve what we need to do.

**Chair:** The new tractors, a little like cars, are much less polluting. They have AdBlue and all sorts, as do the lorries.

Q156 **Kerry McCarthy:** We have heard about the plan to bring forward a strategy to tackle NOx next year. Is it not time for a strategy that deals with all pollutants? The last time that the Government published one was in 2007 and, when the Committee suggested it in its recent report, the Government did not seem very keen on that idea.

**Dr Coffey:** My recollection is that we have seen a decline in the other pollutants and we are compliant on that, as far as I am aware. On the ammonia, we recognise that there is still more to do. We opened up something for farmers where there has been an expression of interest. A straightforward one would be covers for slurries.

Q157 **Kerry McCarthy:** Would it not be more consistent, if we are looking at the issue of air pollution overall, rather than just focusing on one pollutant that causes the problem, to look at everything in the mix so that we have an overarching strategy?

**Dr Coffey:** We have been doing that over time with sulphur dioxide, which has come down significantly. A lot of focus has been on industry

and regulation of that. I would have thought that signing up to the National Emission Ceilings Directive is exactly part of that.

- Q158 **Kerry McCarthy:** Under the 1995 Environment Act, the Government were required to produce a national air quality strategy. That is now nearly 10 years out of date. Would it not be a good idea to bring it up to date? Quite a lot has changed in that period.

**Mr Hayes:** I think you are right. We should publish a plan to meet our 2020 and 2030 ceilings. I can go away and talk about that.

- Q159 **Chair:** One of the big problems is that, from 1995 to 2005 and onwards, it was still focused on carbon and carbon dioxide, and then all of a sudden we have to move to nitric and nitric dioxide. That is the real problem, because we are actually having to change the science and change the vehicles along with it. It is not easy to do that.

Can I bring in Angela now with a couple of agricultural questions?

- Q160 **Angela Smith:** With your agreement, I have one quick question before that, if you do not mind. I promise it will be quick. There is an acknowledgement that we need a strategy on NOx, and that is going to be delivered by the spring. To be honest, there is no disagreement in the concept of having local government as a key partner in delivering a lot of that strategy. Do I have a commitment from the Ministers, though, that central Government, in terms of implementation of the strategy, will fully fund local government to deliver? In other words, you are not going to require local government to, for instance, deliver charging points and then not give it the funds to do so.

**Dr Coffey:** It is a little too early to say at the moment, Angela. Councils will come up with different plans according to what their needs are.

- Q161 **Angela Smith:** I am talking about the strategy. Minister Hayes has acknowledged that we need a central government strategy to deliver the compliance that we are looking for in terms of European Union regulations. Will Government fund the deliverance of that strategy, even when it involves local government?

**Dr Coffey:** Last year we gave out £500,000 in air quality grants.

- Q162 **Angela Smith:** No, I am talking about the strategy that you will come up with next April. Are you going to make sure that it is fully funded and you do not require local government to dip into its pockets for money that it does not have.

**Dr Coffey:** I am not sure I can say that national Government are just going to write a blank cheque. It will be about local targeted interventions, where necessary, but we are already investing, as John has pointed out in a number of different ways, in nitrous oxide emissions in that particular regard.

**Angela Smith:** That is a no, then.

**Dr Coffey:** We are also putting funding out to see what we can do to help with ammonia. If you want to talk about particulate matter, I want to encourage householders to think very carefully about the kind of wood they buy.

**Angela Smith:** This is not relevant to the question. It seems to me that the answer is no.

**Dr Coffey:** I have given you the answer that I do not think the Government are able to write a blank cheque on every single action, because we do not yet have detailed actions to talk to you about.

**Mr Hayes:** I talked about the money in the Autumn Statement. We have to look at how far the changes we need to make can already be funded out of that additional money and the money that we have already committed. If more funds are required, that is something that we will have to address in that plan. It may be that, beyond the £290 million, which was additional money, and beyond the core money that we are spending—I mentioned £2 billion since 2011—more funds are required, and that is something that we would have to look at. I will not be dishonest with you about that. I would rather be straightforward and say that, when we draw up the plan, we will need to think about those ramifications. I want to see the plan and the costings before I can give a definitive answer.

Q163 **Angela Smith:** Just on agriculture, then, this is a question for the Defra Minister obviously. The UK has signed up to the National Emission Ceilings Directive recently, which binds us to a reduction in ammonia levels of somewhere between 8% and 9% by 2030. What is Defra planning to do to deliver on that target?

**Dr Coffey:** As I say, we have started to think about a farming ammonia reduction grant, and I was giving the potential example of covers for slurry stores, which would help reduce ammonia emissions from beef and dairy farms. We should recognise that over half of the ammonia emissions come from the livestock sector, from the dairy and beef sector, which is why we want to focus our activity there.

We are starting to support farmers to take action, but we need to continue to do more research on this element of it. A lot of this will come from agriculture.

Q164 **Angela Smith:** What kind of research is being commissioned? Has Defra invested in scientific research? Is it doing research co-funded with the NFU? What kind of research is being commissioned?

**Dr Coffey:** The greenhouse gas action plan, which we published in 2010, has become like the footprint, and we continue to see ammonia fall. It is about trying new things and getting more farmers to be involved in that. It is those kinds of activities that targeted grants are trying to get more people involved in, to deliver on these measures.

**Angela Smith:** Would it help, Chair, if we had a written note on this? It feels a bit vague.

Q165 **Chair:** Yes, it would. I would like to be reassured that Defra is also saying to farmers, "If you use your slurries in a better way, you will lose less ammonium, less gas will be omitted and you will grow more crop as well". It is a very useful fertiliser. Sometimes we miss an opportunity for farmers to gain financially by using the manures better and still reduce the amount of gas being emitted.

**Dr Coffey:** That is a fair point. Working with farmers to increase the quality of slurry is a start, and then how you apply it, as you indicate, is rather critical, not only in the benefits that it can bring forward for soil health but also in terms of the emissions. Opening up this grant is a good way to signal to the industry that more needs to be done, and we want to be there, helping farmers to achieve it.

Q166 **Chair:** I do not know whether you could supply any written evidence, as you may not be doing this, but I know the New Zealanders have also done quite a lot of work on the types of grasses that they grow so, when the cattle and sheep digest the proteins, they do so more quickly and they give off less methane gas. I do not know whether Defra has done any of this work or not.

**Dr Coffey:** I have a note here that talks about methane emissions arising mainly from enteric fermentation in ruminant livestock. I must admit I do not know what "enteric" means but I shall look that up.

Q167 **Angela Smith:** So methane is not particularly part of Defra's plan for reducing emissions in agriculture.

**Dr Coffey:** That is about reduction of carbon so, yes, there is a wider element as well. I have met Nick Hurd. I am not the Farming Minister, so I will not pretend that I have been involved proactively in farming schemes in that regard. Nick and I sat down with George a few weeks ago to talk through this. I am hoping to see Nick again this weekend. It is on our agenda to think about how we improve the quality of farming and reduce emissions, as well as tackling carbon in that regard.

Q168 **Angela Smith:** You are looking at emissions as a whole and not just one particular emission.

**Dr Coffey:** Yes. As I say, that is part of the greenhouse gas action plan.

**Angela Smith:** A written note, Chair, would be a good idea.

**Chair:** It would be useful.

**Dr Coffey:** I am more than happy to do that.

**Chair:** Thank you, Ministers, very much for your evidence this afternoon. You can tell that the Committee is very keen, as are you, to see our air quality improve across the country. We are expecting action from the Government such that they comply with the legislation on air quality. We look forward to those measures being put in place more quickly than we have necessarily heard this afternoon. That would be really useful.

**Dr Coffey:** Thank you, Mr Chairman.

**Mr Hayes:** Thank you, Chairman. We take this very seriously indeed. We are grateful for the opportunity to explain some of what we are doing. We are more than happy to provide any further evidence you wish and to reassure you, drawing on the metaphor that Angela used earlier, when my shoulder is not to the wheel, my nose is to the grindstone. Very often it is both, which is quite hard to achieve. I can confirm, given what Mr Fitzpatrick said, that you have become much more difficult since you stopped being my PPS.

**Chair:** I am very pleased to hear that. Seriously, we will follow this very closely. I suspect that in a few months' time—six months' time, or it may not be as long as that—we will be doing a little more on this. On Thursday, we have a debate and you, Minister, may well be coming to us.

**Dr Coffey:** I will be replying to that.

**Chair:** You will be replying to that. We have our debate on Thursday on air quality and we will be looking to take more evidence again in the future. Thank you, Ministers, very much. May I wish you both a very happy Christmas? Thank you very much.



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## West Midlands Metropolitan Area Response to DEFRA Consultation

### DRAFT AIR QUALITY ACTION PLANS

### RESPONSE

#### November 2015

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This response represents the view of the West Midlands Integrated Transport Authority (ITA) and was developed by the ITA Policy & Strategy Team. The team works through the West Midlands Strategic Transport Officers Group (STOG) which comprises the ITA, the seven West Midlands Metropolitan Authorities of Birmingham, Coventry, Dudley, Sandwell, Solihull, Walsall and Wolverhampton and Centro. The response was endorsed by the ITA Connected Communities Group.

West Midlands Local Authorities will also be responding to this consultation.

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**Question 1: Do you consider that the proposed plan set out in the overview document strikes the right balance between national and local roles?**

No, we do not regard that the right balance between local and national roles has been set out in proposed plan. For example, local measures and local proposals to tackle NO<sub>2</sub> compliance issues cannot be adequately delivered in the West Midlands without significant Government capital and revenue support or through the Devolution Deal. This is likely to be similar in other major cities and metropolitan areas.

In context, the West Midlands Metropolitan Area is located at the heart of the UK with strong transport connectivity to all of the UK's major cities, airports and sea ports. Indeed, 90% of the UK population and businesses can be accessed from the West Midlands within a 4 hour drive time.

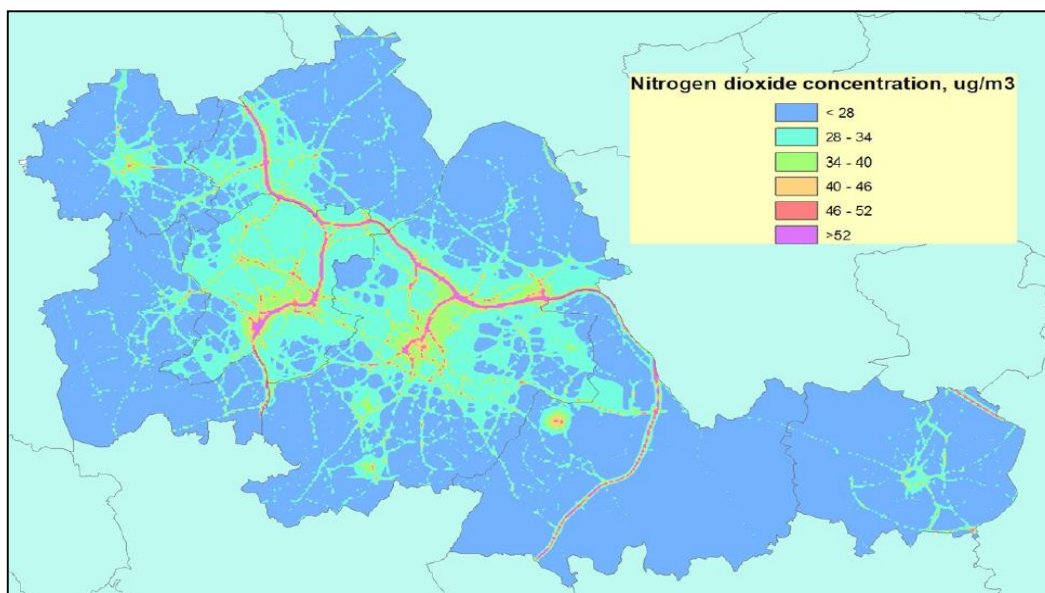
Such strong connectivity is closely linked to the high quality connectivity provided by the UK's motorway and trunk road network for which the West Midlands is located as the centre point. The Metropolitan Area has the M6, one of Europe's busiest motorways running through the heart of the metropolitan area, along with the M5 and M42 motorways whilst the M69, M40 and M1 are all located adjacent to the metropolitan area and have impact on our air quality. The motorways which serve the metropolitan area perform a critical dual functions; both strategic and local.

Strategic Trips

The motorways provide connectivity to, from and through the West Midlands to key national markets, ports, airports and other gateways across the UK.

The M6 motorway in the West Midlands has sections which carry 130,000 vehicles per day of which approximately 40,000 are freight vehicles and 90,000 cars or other road users. Of these the West Midlands estimates that as many as 60% of all these trips are undertaking strategic journeys which either pass through the West Midlands or have a destination origin outside the West Midlands.

The ability of the West Midlands to influence or induce behavioural change to these trips is limited as is the ability to mitigate the air quality emissions. As a consequence, the M6 is one of the major sources of air quality emissions in the West Midlands as shown in the map below.



**Figure 1 - Air Quality across the Metropolitan Area<sup>1</sup>**

Figure 1 clearly shows that the West Midlands motorways are the principal sources of exceedances affecting the metropolitan area with the vast majority of the traffic are undertaking non-local trips. This means that Highways England and the Department for Transport should have a far stronger role and responsibility towards air quality exceedance. Moreover, the Government needs to clarify responsibility for air quality emissions between local and national transport networks. Local Highway Authorities cannot be responsible for motorway sourced air quality emissions which should be the responsibility of Highways England.

As local authorities already have statutory duties and air quality management plans in place, the outline proposals by Government will not likely generate the type of benefits required to meet EU and national targets. The Government needs to provide specific funding and national policies to support local areas such as consideration of old diesel scrappage schemes or consideration of using the tax system (such as VED) to begin a transition away from the use of older diesel cars all of which will generate significant benefits with funds generated being used to potentially cover the cost of any schemes. We are disappointed that the Government have not outlined any national policies in the document to this end.

The West Midlands Metropolitan Area is also of the view that in order to ascertain environmental, air quality and economic benefits, the M6 Toll should be better utilised in order for it to function as part of the Strategic Highway Network.

For example, assessments demonstrated that if the existing 10,000 strategic HGV trips which occur on the M6 daily (defined to be those which start and finish outside the metropolitan area) were removed off the M6 and onto the M6 Toll, then operational benefits of Smart Motorways e.g. more reliable and free flowing conditions could be extended by at least ten years. Such traffic conditions are more suitable to better air quality.

<sup>1</sup>Source: [http://cms.walsall.gov.uk/west\\_midlands\\_letcp\\_low\\_emission\\_zones\\_-\\_technical\\_feasibility\\_study\\_wp1\\_scenario\\_modelling\\_base\\_case.pdf](http://cms.walsall.gov.uk/west_midlands_letcp_low_emission_zones_-_technical_feasibility_study_wp1_scenario_modelling_base_case.pdf)



The air quality and therefore health benefits of this proposal would be significant along with the economic and carbon benefits this would generate. It is the view of the Midlands Metropolitan Area that this can be achieved quickly and with a simple subsidy of HGV tolls by Government, for instance through a shadow toll. The West Midlands would be willing to share any elements of these studies if requested by the Select Committee.

#### Local Trips in the West Midlands

The West Midlands has intrinsic economic structure based on large advanced manufacturing and professional service sectors. With three cities and numerous large and strategic centres along with world class development such as i54 Enterprise Zone, travel patterns are complex with people accessing employment and skills across the metropolitan area regardless of where they live. We know that nearly 40% of all morning am peak journeys involve people crossing at least one local authority boundary.

The West Midlands Metropolitan Area has long argued that the financial resources required to fund large light rail schemes such as Midland Metro, which would have a positive contribution to the local trips on the M6, are not available without significant cost risk being borne and paid for by local areas. Such schemes, if funded and delivered, would encourage the use of low emission travel in the metropolitan area.

We believe such an approach, supported by Devolution Deal resources, would generate significant benefits including building such infrastructure which would benefit air quality, enhance local economies and connect more people to jobs in a manner that reduces economic exclusion and increases productivity.

**Question 2: Are you aware of any other action happening in your area which will improve air quality and should be included in the plan? If yes, please identify as far as you are able: a. What the additional actions are; b. The zone(s) in which they are being taken; and c. What the impact of those actions might be (quantified impacts would be particularly useful)**

The West Midlands Metropolitan Area are undertaking significant amounts of activity with various numbers of local and regional stakeholders to combat air quality issues. These include:

#### **West Midlands Strategic Transport Plan, 'Movement for Growth'**

The West Midlands Strategic Transport Plan, "Movement for Growth", sets out the long term approach that will be taken to guide the necessary improvements to the West Midlands' transport system over the next twenty years.

The plan of improvements, which are scheduled to be made year in, year out over the next twenty years, will be delivered by many organisations through various programmes and packages. The role of the West Midlands ITA is to ensure that delivery is joined up and in keeping with this over-arching long term plan for transport. The plan is currently a public consultation draft and contains the following policies:

#### **'Environment and Public Health'**

- Policy 9 - To significantly improve the quality of the local environment;
- Policy 10 - To help tackle climate change by ensuring a large decrease in greenhouse gases from the West Midlands Metropolitan Area's transport system; and

- Policy 11 - To significantly reduce diabetes, obesity, respiratory and cardio-vascular problems through reduced transport emissions and increased active travel.

### **West Midlands Low Emissions Towns and Cities Programme (LETCP)**

The LETCP is a partnership comprising the seven West Midlands local authorities, (Birmingham City Council, Coventry City Council, Dudley MBC, Sandwell MBC, Solihull MBC, Walsall Council and Wolverhampton City Council) working together to improve air quality and reduce emissions from road transport. The aims of the LETCP are to:

- Improve air quality through the reductions in road transport emissions, and simultaneously reductions in carbon emissions;
- Establish best practice policies and measures for the West Midlands, creating transferable models for other towns and cities;
- Improve health; and
- Maximise opportunities for economic development through the transition to a green economy.

Collectively, the LETCP has helped to inform the respective Local Plans of the Metropolitan Authorities, is helpful in demonstrating Duty to Cooperate, and provides important evidence to demonstrate working towards meeting air quality action plans and statutory obligations. For example, the four Black Country Authorities have developed a collective Air Quality Supplementary Planning Document as the planning process has a significant role to play in ensuring health and wellbeing by encouraging more sustainable development, including measures to secure air quality improvements.

### **Our Innovation Economy**

The West Midlands is home to a critical cluster of the UK's most important and biggest manufacturing businesses and leading centres of advanced engineering research, which presents huge economic and transport opportunities in the future. 70% of all UK low carbon vehicle research and development occurs in the region. The Midlands has been an early adopter region for EVs since the late 2000s and the CABLED project trialled over 100 vehicles in Birmingham and Coventry and included the installation of public charging infrastructure.

### **Local Policy Approaches**

Coventry has been leading the way in becoming a global Research and Development Hub. With these and other national partners it has developed a comprehensive programme of activity for integrated mobility, securing a range of funded projects to support innovation in transport including the world leading UK Autodrive project.

Birmingham Connected Transport Strategy, developed by Birmingham City Council, also promotes the creation of Low Emission Zones, the wider roll out of Electric and Low Emissions Vehicle infrastructure, Green Travel Districts and the role of technology to bring together low emission vehicles and public transport. The City Council published a 'Blueprint for Low Carbon Refuelling Infrastructure', which aims to put into place a framework for delivering infrastructure to support the roll-out of low carbon vehicles.

### **Electric and Alternative Fuelling Infrastructure**

The West Midlands has also been involved in the delivery of Electric Vehicle charging infrastructure at a number of our Park & Ride sites through the Plugged in Places Midlands

Programme. Birmingham City Council and other Metropolitan Authorities are also exploring opportunities to develop and deliver CNG Gas and Hydrogen fuelling stations following the work of the 'Blueprint for Low Carbon Fuel Refuelling Infrastructure'.

### **Local Sustainable Transport Fund**

The West Midlands Local Sustainable Transport Fund – Smart Network, Smarter Choices has helped improve the sustainable transport offer across the West Midlands through infrastructure, technology and behavioural change. This programme continues to support low carbon and improved air quality through the reduction of short distance car trips and promotion of active travel and public transport.

### **Delivery of Low or Zero Emission Buses**

The West Midlands has explored the use of technology in reducing carbon emissions from transport and improving air quality. There are now 49 diesel-electric hybrid buses operating on routes in Birmingham, Wolverhampton, Dudley and Solihull and 3 plug-in electric buses operating in Coventry. These have all been funded through the DfT Green Bus Fund in partnership with operators. The West Midlands ITA through Centro/PTE, are also finalising bids for the OLEV Low Emission Bus Fund and DfT Clean Vehicle Technology Fund.

Also through partnership agreements with National Express we have Euro 6 buses being delivered into the region, with 154 of these being delivered in 2015. Centro/PTE were also successful in applying for the Clean Vehicle Technology Fund with 21 buses operated by Travel De Courcey in Coventry currently being fitted with catalytic filters which virtually eliminate harmful emissions.

### **Bus Policy - ITA Bus Alliance**

The West Midlands ITA have agreed its future bus policy for the West Midlands with objectives to deliver *"Buses on key corridors are to be zero or ultra low emission with every other bus at least EURO VI or equivalent."*

To deliver this bus policy, an ITA Bus Alliance has been developed which will drive bus quality enhancements through greater use of Statutory Quality Partnership powers, which would allow the ITA to specify key quality standards such as vehicle emission levels, branding and in some cases maximum fares and frequencies. A Bus Statutory Quality Partnership Scheme (SQPS) currently operates in Birmingham city centre which has seen quality standards rise on all bus routes into Birmingham city centre and has already specified improved standards up to 2021 which are to be introduced incrementally.

To further support the delivery of the Bus Alliance, National Express West Midlands have committed that all buses they buy between now and 2020 will be at least Euro 6, such that there will be over 650 Euro VI buses on the road by 2020 delivered through commercial investment alone.

To support the ITA Bus Alliance, a 'Low Emission Bus Delivery Plan for the West Midlands' is also in development. The purpose of this is to identify the best ways of reducing emissions from buses by considering various technologies, prioritising these in terms of cost (capital and revenue), and ensuring that they are focussed in locations where they will have the most impact.

Our close working at a local and metropolitan level demonstrates our ambitions to improve air quality and shows that we have plans to deliver ours and national objectives. Government needs to empower local areas through greater capital and revenue resources through Devolution Deals to implement these comprehensive local policies, strategies and delivery plans.

**Question 3: Within the zone plans there are a number of measures where we are unable to quantify the impact. They are included in the tables of measures. Do you have any evidence for the impact of these types of measures?**

The LETCP and Metropolitan Local Authorities have carried out various technical evidence studies on the modelling of low emission zones and impacts of air quality on health and wellbeing.

The West Midlands ITA, through Centro/PTE as its delivery organisation, would also be able to provide technical evidence on the impacts of its Statutory Bus Quality partnership in Birmingham City Centre, the impacts of its successful Clean Vehicle Technology Fund projects and the outcomes of the 'Smart Network, Smarter Choices' LSTF programme.

**Question 4: Do you agree that a consistent framework for Clean Air Zones, outlined in section 4.3.6 of the UK overview document, is necessary? If so, do you think the criteria set out are appropriate?**

We agree with this approach but we request further details on how this would work in practice and what resources from Government would be available to help implement and enforce these Clean Air Zones. Furthermore, we request clarity on who would be responsible for implementing and enforcing these zones in Metropolitan Areas and how they differ from Low Emissions Zones.

Government needs to do much more in terms of regulation and incentives to accelerate the development and uptake of low and zero-emission vehicles. Without this, Clean Air Zones could simply move air quality problems elsewhere and could make city centres (which have been shown to be highly sustainable locations from a carbon perspective) less attractive for development and to businesses. The Government also needs to significantly increase the funding available to local authorities for sustainable transport measures, including its requirements under the Infrastructure Act 2015 to have a committed strategy and investment towards walking and cycling.

The West Midlands ITA and the 7 Metropolitan Authorities request a formal discussion with DEFRA to discuss future Clean Air Zones in further detail.

**Question 5: What do you consider to be the barriers that need to be overcome for local authorities to take up the measures set out in section 4 of the UK overview document? How might these be overcome? Are there alternative measures which avoid these barriers?**

One of the main barriers the West Midlands Metropolitan Area faces is who is responsible for tackling air quality issues and ensuring compliance with EU Directives. Clarity is needed from

Government on who is best placed to tackle air quality issues due their complex and cross boundary nature. For example in the West Midlands Metropolitan Area responsibility for such schemes lies with Highway Authorities, meaning they are subject to local decision making influences. Moreover, Strategic Transport decisions are taken by the Integrated Transport Authority (with the potential for a Combined Authority in the future) as the Local Transport Authority.

A Greater London approach where responsibility to develop and implement Low Emission Zones or Clean Air Zones lies with Transport for London, meaning a strategic view towards them can be developed through the Greater London Assembly and the London Mayors Office, which could be beneficial to areas such as the West Midlands and other Core City areas.

As mentioned, the consultation is weak on the role of Highways England and Network Rail in tackling national air quality problems; due to our central location this has a disproportionate impact on the West Midlands. Government needs to set out a strong framework for reducing emissions on the strategic road and rail networks, with greater incentives for SME's but greater penalties for those users who break these standards. This would be achieved by working with local areas and freight groups etc.

In the West Midlands Metropolitan Area, local authority research demonstrates that emissions from road transport are the principal source of elevated concentrations of NO<sub>2</sub> and airborne particles such as PM<sub>10</sub>. Based on national estimates, vehicle emissions account for up to 630 premature deaths in the West Midlands each year.

As stated under question 1, the West Midlands Metropolitan Area would welcome longer term funding commitments; both capital and revenue, so we can deliver our ambitious programmes to meet compliance directives but also help unlock additional funding opportunities from EU funding programmes. This is the approach that the West Midlands has presented during the West Midlands Combined Authority development and wider devolution discussions with Government and HM Treasury.

In summary, the West Midlands Metropolitan Area further welcomes the Government commitment to invest £500million in Ultra and Low Emission Vehicles, between 2015 and 2020. This investment should be protected and possibly strengthened during the forthcoming Comprehensive Spending Review and Autumn Statement process and announcements.

**Question 6: Are you aware of any additional action on non-transport sources to improve air quality that should be included in the plans?**

We are not aware of any additional actions.

The West Midlands Metropolitan Area is committed to tackling Air Quality but this to be carried out in partnership with Government and the EU to tackle compliance issues.



# The impact of poor air quality on health in Birmingham

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This submission to the Health, Wellbeing & the Environment and Economy, Skills and Transport Overview & Scrutiny Committees from Birmingham Public Health is based on the report and presentation to be tabled at the Health and Wellbeing Board attached as Appendix 1.

This report addresses the key lines of enquiry:

- What are the main types of air pollution that affect people's health, where do they come from, what is that health impact, and who is most likely to suffer the effects?
- Are there any trends which can be identified in relation to air quality and public health in the city?
- For each air pollution related health problem, what is the likely nature and scale of impact on the City's health care system, and what are the likely social and economic costs of this?

Other colleagues are better placed to address the key lines of enquiry:

- What evidence is there about air quality, emission sources, and levels of air pollution in Birmingham or in specific pollution hotspots?
- How do these rates compare to other comparable major cities in the UK and Europe?
- Birmingham has been ordered by the Government to impose charges in 'clean air zones' to cut pollution. What types of vehicle, driving mode, location and fuel system most contribute to the health impacts of road traffic, and what would be the most effective ways of implementing and operating a 'clean air zone' so as to minimise these burdens?
- What are the potential barriers to clean air zones being implemented widely in the city?
- Are there other measures which can be taken such as for example the planting of urban trees to absorb airborne pollutants and improve air quality and are there any plans in relation to these?

## What are the main types of air pollution that affect people's health, where do they come from, what is that health impact, and who is most likely to suffer the effects?

There are a number of air pollutants that may be released as a consequence of human activity. The two which cause most concern in terms of the evidence of their public health impact are:

- Nitrogen oxides, principally NO<sub>2</sub> – basis of the Clean Air Zone
- Particles, including PM<sub>2.5</sub> – linked to mortality in the Public Health Outcomes Framework

There is evidence that both of these pollutants can affect health even below current air quality guidelines.

***There is no safe level of either pollutant that does not harm health.***

Vehicles are the major source of both NO<sub>2</sub> and PM<sub>2.5</sub> and both are linked to a range of health effects. As the sources of these two pollutants (and others such as ozone and benzene) are linked, measures to reduce the concentration of one are likely to reduce both the concentration and adverse effects of the other.

In Europe air pollution is the biggest environmental risk factor for premature death. While other components of air pollution damage health, particularly at high levels of exposure, the strongest evidence for harm caused by lower levels is the effect of long-term population wide exposure to PM<sub>2.5</sub> and NO<sub>2</sub>.

In the UK, PM<sub>2.5</sub> is responsible for 29,000 premature [1] deaths annually and NO<sub>2</sub> is associated with 23,500 deaths [2], based on current outdoor air pollution. There is likely to be some overlap so it is not considered appropriate to add these numbers; current estimates are that PM<sub>2.5</sub> and NO<sub>2</sub> are responsible for 40,000 deaths annually. [3]

A 10 µg/m<sup>3</sup> reduction in PM<sub>2.5</sub> pollution alone would have a larger impact on increasing life expectancy in England and Wales than eliminating road traffic accidents or passive smoking. [4]

The most evidence exists for PM<sub>2.5</sub>, which is why Public Health England currently benchmark on this measure in the Public Health Outcomes Framework.

### PM<sub>2.5</sub>

#### Strong evidence

There is strong evidence for the impact of short and long-term exposure to PM<sub>2.5</sub> on cardiovascular health, lung cancer, reduced life expectancy, reduced lung function and heightened severity of symptoms in individuals with [4] [3]:

- Asthma
- Chronic Lung Disease
- Ischaemic Heart disease
- Stroke



### Emerging evidence

Emerging evidence also suggests an effect of PM<sub>2.5</sub> on children if their mothers were exposed to higher levels during pregnancy, with links to:

- Adverse birth outcomes (low birth weight, preterm birth, infant mortality, neurodevelopmental harm, small for gestational age)
- Airway inflammation
- Increased susceptibility to respiratory infection [3] [4]

Children living in more polluted environments based on measures of PM<sub>2.5</sub> are more likely to experience:

- Asthma symptoms
- Low lung function
- Increased vulnerability to Chronic Obstructive Pulmonary Disorder (COPD; a lung disease) in adulthood [3] [4]

Long term exposure to PM<sub>2.5</sub> throughout life has also been associated with increased risk of obesity, Type 2 diabetes, changes in cognitive function including dementia and social isolation [3].

### NO<sub>2</sub>

NO<sub>2</sub> is a part of the same air pollution that PM<sub>2.5</sub> is found in and has a separate and additional impact on health; high acute levels are associated with respiratory morbidity, hospital admissions and emergency visits for cardiovascular and/or cardiac diagnoses and mortality. Chronic exposure has been associated with reduced lung function in children and adults, respiratory infections in early childhood including bronchitis, cancer and adverse birth outcomes. [5]

The full extent of these impacts across a person's life such as the effect on quality of life, school attendance and absence from the workforce are not yet fully quantified but some studies have attempted to measure these wider impacts. [3] [5]

### Vulnerable groups

There are some groups who are more exposed to outdoor air pollution and some that are more likely to experience adverse health effects when exposed.

#### Increased risk of exposure

Certain occupational groups have an increased exposure, including those who work outside close to traffic pollution. People who spend more time than average in environments with higher levels of air pollution such as road vehicle commuters, taxi, bus and lorry drivers. There is some evidence that taxi and bus drivers are exposed to three times the levels of outdoor air pollution in their vehicles. [3] [6] [7]

#### Increased susceptibility

People living in areas of deprivation may not necessarily have increased exposure to outdoor air pollution compared to the general population, although this is the case in some areas. The major concern is that this population group experience a magnified effect as a result of often living in poor housing conditions with greater exposure to pollutants and also experience higher levels of chronic stress, which reduces the body's resilience to toxicants present in polluted air. [3]

Groups at higher risk of adverse health outcomes due to air pollution include:

- Pregnant women and the unborn child
- Children in high pollution areas are four times more likely to have reduced lung function when they become adults
- For older adults the risk of death from PM<sub>10</sub> exposure is twice that of younger populations
- Adults with pre-existing medical conditions are at increased risk of serious adverse health events such as asthma attack, stroke and heart attack. [3] [8]

## Are there any trends which can be identified in relation to air quality and public health in the city?

No local data on trend in health outcomes and air quality are available at present.

We have recently gained access to prevalence data for key air quality related health conditions at geographical levels. We are exploring how to link these to modelled air pollution levels and hospital admission rates to investigate local trends.

## For each air pollution related health problem, what is the likely nature and scale of impact on the City's health care system, and what are the likely social and economic costs of this?

A UK expert panel investigating the health impact ('COMEAP') has declared there are no safe limits for PM<sub>2.5</sub> and NO<sub>2</sub>:

- Every 10µg/m<sup>3</sup> increase in PM<sub>2.5</sub> is associated with a 6% increase in all-cause mortality [1]
- Every 10µg/m<sup>3</sup> increase in NO<sub>x</sub> is associated with a 2.5% increase in all-cause mortality [2]

It has been estimated that in Birmingham this equates to:

- PM<sub>2.5</sub>: 520 deaths in 2010 [9]
  - 6.4% deaths attributable to this form of anthropogenic air pollution
- NO<sub>2</sub>: 371 deaths in 2011 [10]
  - Range of 2.9% to 8.7% deaths attributable to NO<sub>2</sub> alone (independent of effect with PM<sub>2.5</sub>)

This gives a combined effect 891 deaths per year, ***over half that due to tobacco***

The latest Public Health Outcome Framework values are being revised and may differ slightly from those above.

At present we do not have robust estimates of the wider impact of air pollution on hospital admissions, the wider health and care system, and what the likely social and economic costs are. It is an area we are looking to explore further with colleagues in PHE, NHS and academia.

Addressing outdoor air pollution is not only a matter of risk avoidance; there are health, social and economic benefits in doing so. There is strong evidence that reducing air pollution increases life expectancy, reduces health inequalities and reduces morbidity for people living with respiratory and cardiovascular conditions in particular. [4] [11]

Evidence also suggests benefits that include increased productivity (e.g. workforce productivity), improved school attainment (through reduced school absence, improved concentration, reduced

behavioural disorders), reduced obesity and sedentary behaviour through increases in physical activity (children living with asthma and adults who are obese). [3] [11] [12]

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	<b><u>Agenda Item: 10</u></b>
<b>Report to:</b>	<b>Birmingham Health &amp; Wellbeing Board</b>
<b>Date:</b>	<b>29<sup>th</sup> November 2016</b>
<b>TITLE:</b>	<b>AIR POLLUTION AND HEALTH IN BIRMINGHAM</b>
<b>Organisation</b>	<b>Birmingham Health and Wellbeing Board</b>
<b>Presenting Officer</b>	<b>Adrian Phillips/Wayne Harrison</b>

<b>Report Type:</b>	<b>Decision</b>
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<b>1. Purpose:</b>
1.1. To update the Board of the threat posed by poor air quality due to outdoor air pollution in Birmingham on health as well as to the local economy.

2. Implications:		
BHWB Strategy Priorities	Child Health	Y
	Vulnerable People	Y
	Systems Resilience	Y
Joint Strategic Needs Assessment		Y
Joint Commissioning and Service Integration		Y
Maximising transfer of Public Health functions		Y
Financial		
Patient and Public Involvement		
Early Intervention		Y
Prevention		Y

<b>3. Recommendation</b>
It is recommended that the Board:
3.1 Consider adverse outdoor air quality as a theme in its strategy.
3.2 Supports the improvement of air quality by reducing air pollution as a collective priority
3.3 Receives an update in future meetings

<b>4.</b>	<b>Background</b>
<b>4.1</b>	<b>Outline of the problem</b>
4.1.1	Man-made outdoor air pollution in Birmingham causes just under 900 deaths per year. It is second only to tobacco-smoke as an avoidable cause of early mortality. Most deaths are due to Stroke and Coronary Heart Disease. It has a harm profile remarkably similar to that caused by tobacco smoke.
4.1.2	Unlike the “smogs” of the 1950s, today’s air pollution is mainly unnoticed without special equipment or in extremes. It is caused by two main factors. The first are the very small particles in the air – like smoke but smaller. They are measured in microns and are less than 10 µm (Particulate matter or PM). The two most common measures are PM 10 and PM2.5. The other main pollutant is oxides of Nitrogen, NO <sub>x</sub> , especially NO <sub>2</sub> .
4.1.3	Both these pollutants are mainly created from the internal combustion engine, especially those powered by diesel fuels. Vehicular road traffic causes the greatest effect. Electric cars as well as other vehicle types do not produce such pollutants.
4.1.4	Outdoor air pollution has attracted attention due to increased evidence of its negative health impact. Five areas in the United Kingdom (UK), including Birmingham, exceed European Union (EU) legal limits. The result is a risk of a financial fine, a requirement upon the City Council to declare itself an Air Quality Management Area and implement an action plan to reduce air pollution in a timely manner.
4.1.5	Birmingham City also performs poorly according to its Public Health Outcome Framework. Pollution undoubtedly also affects Respiratory Health, an area which all Birmingham CCGs have as an adverse indicator.
4.1.6	Birmingham City Council is developing an action plan in line with the requirements but the scale, severity and nature of the threat requires a coordinated, multiagency response.
<b>4.2</b>	<b>Defining the threat of air pollution</b>
4.2.1	Birmingham City Council must coordinate a local response to reduce levels of NO <sub>2</sub> to a yearly average of less than 40µm. This target is not consistent across the EU; in Scotland for instance, (including cities) the targets for air pollution are set much lower – less than half the England target for some gases.
4.2.2	The most evidence exists for PM <sub>2.5</sub> , which is why Public Health England currently benchmark on this measure; in the most recent reporting period Birmingham had an average PM <sub>2.5</sub> of 11.4µg/m <sup>3</sup> compared to an England average of 9.9µg/m <sup>3</sup> .
4.2.3	A UK expert panel investigating the health impact (‘COMEAP’) has declared there are no safe limits for PM <sub>2.5</sub> and NO <sub>2</sub> ; every 10µg/m <sup>3</sup> increase in PM <sub>10</sub> is associated with a 6% increase in all-cause mortality and every 10µg/m <sup>3</sup>

increase in NO<sub>x</sub> is associated with a 2.5% increase in all-cause mortality.

- 4.2.4 The EU targets and Air Quality Index advice are not representative of the full impact on health or the cost of not reducing levels below the current thresholds.

### **4.3 Impact on health**

- 4.3.1 In Europe air pollution is the biggest environment risk factor for premature death. While other components of air pollution mentioned above damage health, particularly at high levels of exposure, the strongest evidence for harm caused by lower levels is the effect of long-term population wide exposure to PM<sub>2.5</sub> and NO<sub>2</sub>.

- 4.3.2 In the UK, PM<sub>2.5</sub> is responsible for 29,000 premature deaths annually and NO<sub>2</sub> is associated with 23,500 deaths, based on current outdoor air pollution. A 10 µg/m<sup>3</sup> reduction in PM<sub>2.5</sub> pollution alone would have a larger impact on life expectancy in England and Wales than eliminating road traffic accidents or passive smoking.

- 4.3.3 There is strong evidence for the impact of short and long-term exposure to PM<sub>2.5</sub> on cardiovascular health, reduced lung function and heightened severity of symptoms in individuals with:

- Asthma
- Chronic Lung Disease
- Ischaemic Heart disease
- Stroke

- 4.3.4 Emerging evidence also suggests an effect of PM<sub>2.5</sub> on children if their mothers were exposed to higher levels during pregnancy, with links to adverse birth outcomes (low birth weight, preterm birth, premature, neurodevelopmental harm, small for gestational age), airway inflammation and increased susceptibility to respiratory infection.

- 4.3.5 Children living in more polluted environments based on measures of PM<sub>2.5</sub> are more likely to experience asthma symptoms, have low lung function and are more vulnerable to Chronic Obstructive Pulmonary Disorder (COPD-a lung disease) in adulthood.

- 4.3.6 Long term exposure to PM<sub>2.5</sub> throughout life has also been associated with increased risk of obesity, diabetes, cognitive function including Dementia and social isolation.

NO<sub>2</sub> is a part of the same air pollution that PM<sub>2.5</sub> is found in and has a separate and additional impact on health; high acute levels are associated with respiratory morbidity, hospital admissions and emergency visits for cardiovascular and/or cardiac diagnoses and mortality. Chronic exposure has been associated with reduced lung function in children and adults, respiratory infections in early childhood including bronchitis, cancer and adverse birth outcomes.

- 4.3.7 The full extent of these impacts across a person's life such as the effect on

quality of life, school attendance and absence from the workforce are not yet fully quantified but some studies have attempted to measure these wider impacts.

#### **4.4 Wider impacts of air pollution and potential benefits of addressing it**

4.4.1 Addressing outdoor air pollution is not only a matter of risk avoidance; there is health, social and economic benefits to doing so. There is strong evidence that reducing air pollution increases life expectancy, reduces health inequalities and reduces morbidity for people living with respiratory and cardiovascular conditions in particular.

4.4.2 Evidence also suggests benefits that include increased productivity (e.g. workforce productivity), improved school attainment (through reduced school absence, improved concentration, reduced behavioural disorders), reduced obesity and sedentary behaviour through increases in physical activity (children living with asthma and adults who are obese).

#### **4.5 Vulnerable groups**

4.5.1 There are some groups who are more exposed to outdoor air pollution and some that are more likely to experience ill health effects when exposed. Certain occupational groups have an increased exposure, including those who work outside close to traffic pollution. People who spend more time than average in environments with higher levels of air pollution such as long distance commuters, taxi, bus and lorry drivers. One study showed taxi and bus drivers are exposed to three times the levels of outdoor air pollution in their vehicles.

4.5.2 People living in areas of deprivation may not necessarily have increased exposure to outdoor air pollution compared to the general population, although this is the case in some areas. The major concern is that this population group experience a magnified effect as a result of often living in poor housing conditions with greater exposure to pollutants and also experience higher levels of chronic stress, which reduces the bodies resilience to toxicants.

4.5.3 Groups at higher risk of adverse health outcomes due to air pollution include:

- Pregnant women and the unborn child
- Children in high pollution areas are four times more likely to have reduced lung function when they become adults
- For older adults the risk of death from PM<sub>10</sub> exposure is twice that of younger populations
- Adults with pre-existing medical conditions are at increased risk of serious adverse health events such as asthma attack, stroke and heart attack.

#### **4.6 Options to progress the matter**

4.6.1 There are several different tactics which could be employed in addressing air pollution:



Immediate steps to cut local pollution include reducing internal combustion traffic, especially diesels.

4.6.2 Medium term options include reducing the number of polluting engines

4.6.3 Long term approaches depend on the above as well as rebalancing our society away from a reliance on the car and motorized transport

#### **4.7 Conclusion**

4.7.1 As described in a recent article in the British Medical Journal “The NHS has borne the brunt of costs associated with air pollution and will benefit directly from improved air quality. For that reason alone the health sector should take a more active role in the decision making process that drives change.” BMJ, 29<sup>th</sup> October 2016.

4.7.2 Air pollution is a major determinant of Health and Wellbeing and merits the attention of the Health and Wellbeing Board.

### **5. Compliance Issues**

#### **5.1 Strategy Implications**

##### **Health and Wellbeing Board priorities**

Vulnerable people:

- Improve the wellbeing of vulnerable children – potential impact on school attainment, evidence particularly for children living in poverty, reduce cases of asthma and ill health by those with the condition.
- Older people to remain independent, reducing hospital admissions.

Child Health:

- Reducing childhood obesity: there is some evidence that experiencing asthma reduces participation and enjoyment of physical activity for children with asthma. Reduces activity levels increases the risk of obesity.
- Reducing infant mortality: air pollution has been associated with low birth weight at term, small for gestational age and preterm birth, all of which are risk factors for infant mortality.

System Resilience

- Common NHS and Local Authority approaches: the matter of air pollution has impacts for health, welfare and social care usage as well as potential workforce productivity losses for both agencies and their supply chain through working days lost and attendance to work when feeling unwell. In addition,



both agencies have authorities to take action to reduce road traffic and mitigate the impact such as standards for supply chain, implementation of local policy, public awareness raising, improving local infrastructure such as transport.

## **5.2 Governance & Delivery**

A legal requirement not to exceed statutory levels  
A representative of the CCG to be invited to the local Air Quality Board

## **5.3 Management Responsibility**

Feedback to the HWBB through the DPH and Cabinet members (as a corporate council responsibility)

# **6. Risk Analysis**

Likelihood: 0 = will never happen; 4 = definite outcome  
Impact: 0 = no impact; 4 = death/legal challenge

Identified Risk	Likelihood	Impact	Actions to Manage Risk
Premature mortality	3	4	
Morbidity among people with respiratory and cardiovascular conditions	4	3	
Morbidity among children living in poverty and children with respiratory conditions	3	3	

## **Appendices**

Presentation Slides – Health Effects of Air Pollution in Birmingham

## **Signatures**

**Chair of Health & Wellbeing Board  
(Councillor Hamilton)**

**Date:**

The following people have been involved in the preparation of this board paper:

Rebecca Willans  
Wayne Harrison

Adrian Phillips



## Public Health England submission – Air Quality Evidence

### **The impact of poor air quality on health in Birmingham – Call for Evidence Scrutiny Committee**

**Address:** Public Health England, Centre for Radiation, Chemical and Environmental Hazards (CRCE).

#### **Public Health England**

Alec Dobney Unit Head, Environmental Hazards & Emergencies Department, CRCE.

Karen Exley Senior Environmental Public Health Scientist, Air Pollution & Climate Change unit, Environmental Change Department, CRCE.

***What are the main types of air pollution that affect people's health, where do they come from, what is that health impact, and who is like to suffer the effects?***

#### **Introduction**

Within the UK, air pollution is the largest environmental risk linked to deaths every year (PHE, 2015). The current evidence indicates that air pollution can be associated with cardiovascular disease, lung cancer, respiratory disease, asthma and stroke. Air pollution disproportionately affects the young, older people, those with underlying cardiopulmonary conditions and the most disadvantaged within our communities. This may result in reduced physical activity, increased hospital attendance and premature mortality (WHO, 2013).

Both long and short-term exposure to air pollution are known to adversely affect health. Short-term exposure (over hours or days) to elevated levels of air pollution can cause a range of effects including exacerbation of asthma, effects on lung function, increases in hospital admissions and mortality. Epidemiological studies have shown that long-term exposure (over several years) reduces life-expectancy, mainly due to increased risk of mortality from cardiovascular and respiratory causes and from lung cancer. The most consistent and convincing evidence suggests an important role for fine particulate matter (PM<sub>2.5</sub>) in causing the observed adverse health effects, although other outdoor air pollutants such as nitrogen dioxide (NO<sub>2</sub>) and ground-level ozone are also known to cause adverse health effects.

Air pollution is now associated with much greater public health risk than was understood even a decade ago, and more associated adverse health effects are emerging.

#### **Short-term pollution episodes**

Short-term pollution episodes are also associated with exacerbation of asthma, effects on lung function, increased daily mortality and admissions to hospital (Macintyre et al. 2016).

Air pollution is forecast by the Met Office and presented using the Daily Air Quality Index (DAQI), which defines a scale from 1 (low) to 10 (very high). The DAQI (<http://uk-air.defra.gov.uk/air-pollution/daq>) includes health advice for those more likely to be affected by short-term increases in pollution, in particular those with heart and lung problems.

The current air quality index was developed by COMEAP and is based on health evidence. The 'Low' bands indicate air pollution levels where it is unlikely that anyone will suffer any adverse effects of short-term exposure, including people with lung or heart conditions who may be more susceptible to the effects of air pollution. The 'Moderate' band represents levels of air pollutants at which there are likely to be small effects for susceptible people only. Values for the 'High' bands are associated with significant effects in susceptible people. At 'Very High' levels of air pollution even healthy individuals may experience adverse effects of short-term exposure (COMEAP 2011).

### **Particulate matter (PM)**

Particulate air pollution is a complex mixture of many chemical components which form particles of different sizes (PM<sub>2.5</sub> and PM<sub>10</sub> are the regulated size fractions). Particles are emitted directly from a range of human-made sources, such as road traffic, solid fuel combustion, and natural sources such as desert dust and sea salt, or are formed by chemical reactions in the atmosphere (AQEG, 2005). Epidemiological evidence for PM is supported by toxicological evidence for some health outcomes, thus allowing a causal interpretation of some associations with PM. Although it might be expected that some particle components are more harmful to health than others (e.g. diesel particles), the evidence available from epidemiological studies does not give a consistent view of their relative toxicity. It is estimated that long-term exposure to particulate air pollution (PM<sub>2.5</sub>) has an effect equivalent to around 25,000 deaths a year in England (around 29,000 deaths a year in the UK) (PHE, 2014; COMEAP, 2010a).

### **Nitrogen dioxide (NO<sub>2</sub>)**

On average around 80% of oxide of nitrogen (NO<sub>x</sub>) emissions in areas where the UK is exceeding NO<sub>2</sub> limit values is due to transport, although urban and regional background non-transport sources are still considerable (Defra, 2015). The largest source is emissions from diesel light duty vehicles (cars and vans) where the emissions standards have had least impact and there has been significant growth in vehicle numbers over the last ten years in the UK.

Epidemiological studies have shown associations of NO<sub>2</sub> in outdoor air with adverse effects on health, including reduced life expectancy. It has been unclear whether these effects are caused by NO<sub>2</sub> itself or by other pollutants emitted by the same sources (such as road traffic). Evidence associating NO<sub>2</sub> with health effects has strengthened substantially in recent years and we now think that, on the balance of probability, NO<sub>2</sub> itself is responsible for some of the health impact found to be associated with it in epidemiological studies (COMEAP, 2015).

The Committee on the Medical Effects of Air Pollutants (COMEAP) has been considering how to quantify the mortality associated with long-term average concentrations of NO<sub>2</sub> and its final recommendations will be published on its website. These recommendations will provide further evidence of the benefits to public health of the LA's work to lower exposure to air pollution. NO<sub>2</sub> particularly at high concentrations, is a respiratory irritant that can cause

inflammation of the airways (for example, cough, production of mucous and shortness of breath). Studies have shown associations of NO<sub>2</sub> in outdoor air with reduced lung development (lung function growth) and respiratory infections in early childhood and effects on lung function in adulthood. A number of studies have reported associations with long-term average concentrations of NO<sub>2</sub>. However, attributing health outcomes from exposure to individual constituent pollutants in emissions is not simple. This supports the need to tackle emissions in general and not necessarily to focus on individual pollutants (HPA, 2009) (Gauderman et al. 2015).

### **Sensitive population groups**

During short term High pollution episodes, children, older people, and people with chronic health problems are among the most vulnerable to air pollution (RCP/ RCPCH, 2016). Short-term (e.g. day-to-day) peaks of elevated air pollution are associated with increases in hospital admissions for respiratory and cardiovascular conditions. Individuals with pre-existing cardiovascular and respiratory conditions may experience worsening of symptoms when air quality is poor. There are an estimated 3 million people living with chronic obstructive pulmonary disease (COPD) in England, with around 2 million people undiagnosed. Evidence that air pollution causes COPD is not conclusive, but there is good evidence that air pollution triggers worsening of symptoms in those living with related conditions (COMEAP, 2016).

There is evidence associating exposure to air pollutants with a worsening of asthma symptoms. Traffic-related air pollution may play a role in inducing asthma in some individuals, particularly those who live near busy roads carrying high numbers of heavy goods vehicles (COMEAP, 2010b). A recent long term study of children's health in California reported improvements in lung development in children following a reduction in levels of air pollution (Gauderman et al. 2015). This study highlights that taking action to reduce levels of air pollutants could potentially allow more young people to achieve their maximum lung function growth potential.

Those with lower socioeconomic status and those from ethnic minorities can be disproportionately exposed to environmental hazards, including proximity to industrial facilities, hazardous waste sites, air pollution, noise and occupational exposures (Morello-Frosch et al, 2011). The underlying causes of inequalities are highly complex and date back many decades; however, The Marmot Review suggests a way forward to addressing health inequalities and outlines policy objectives for action. To reduce health inequalities, targeted interventions are required towards the more disadvantaged groups (Marmot 2010). Defra has identified that the most deprived deciles were primarily located in urban areas of England (Greater London, Birmingham, Merseyside, Greater Manchester, South and West Yorkshire, and the North East) and tended to have the highest levels of the standard air pollutants (including fine particulate matter and nitrogen dioxide) (Defra 2006).

### **Health Effects - burden**

Estimates of the 'fraction of all-cause mortality attributable to air pollution' are now included in the Public Health Outcomes Framework (PHOF) as indicator 3.1. The calculations are based on estimates of population exposure to modelled concentrations of PM<sub>2.5</sub>. Long-term exposure to air pollution is associated with increased population mortality. Currently, PM<sub>2.5</sub> is regarded as the best measurement for characterising this effect, with mortality risk

increasing with increasing levels of measured PM<sub>2.5</sub>, and with no obvious lower threshold. PM<sub>2.5</sub> itself appears very likely to be a cause of health effects.

For Birmingham, an estimated 5.7% of all-cause mortality is attributable to air pollution. However, the impact is better understood in terms of lifetime lost to the population, currently estimated at around 6 months on average for each person in the UK. It is not known how this effect is distributed across the population, although much of the impact is linked with cardiovascular deaths, and it is likely that air pollution places an additional burden on many people, being a contributory factor in bringing deaths forward, rather than being the sole cause of death for individuals.

In addition, interventions that improve air quality will benefit other indicators within the PHOF, particularly those related to respiratory and cardiovascular morbidity and mortality (indicators 4.04, 4.05, and 4.07) and active travel can improve physical fitness, thereby benefiting indicators associated with excess weight at various ages (indicators 2.06, 2.12) and the proportion of physically active adults (indicator 2.13).

Values for each of the 30 West Midlands authorities are fairly similar (range 4.1% to 6.0%), and Birmingham has figures similar to other major conurbations, though values for London are slightly higher. Comparison figures for some other towns are shown in the table below:

Fraction of all-cause adult mortality attributable to anthropogenic air pollution (measured as fine particulate matter, PM<sub>2.5</sub>)

Area	Fraction of mortality attributable to PM
*Birmingham	5.7%
Brighton and Hove	4.6%
Bristol	5.1%
*Derby	5.6%
Enfield	6.1%
*Leeds	4.9%
Liverpool	4.5%
Manchester	5.1%
Newcastle-upon-Tyne	4.4%
*Nottingham	5.9%
*Southampton	5.3%
Westminster	7.8%
*Clean Air Zone cities	

Public Health Outcomes Framework indicator 3.1 (**accessed 16/12/16**)

<http://www.phoutcomes.info/public-health-outcomes-framework#gid/1000043/par/E12000004>

## Defra/DFT Plans and NICE Guidelines

The Department for Environment, Food and Rural Affairs (Defra) published the Government's plans to improve air quality in the UK in December 2015. These focus on tackling NO<sub>2</sub> in towns and cities. A High Court [judgment](#) in November 2016 criticised some aspects of the assessments used to develop the plans, and Defra has been ordered to draw up revised plans by July 2017.

The Department of Health in England asked NICE to produce guidance on reducing the ill-effects of outdoor air pollution on health. The draft NICE guideline focuses on the cost-effectiveness of local interventions which aim to reduce exposure to transport related air pollution.

PHE supports consideration of measures to reduce sources of air pollution and people's exposure. As well as targeting defined areas where exceedances of the air quality standard objective for NO<sub>2</sub> have been observed, we would support measures that improve air quality as a whole. Attention to improving air quality over the wider area also acknowledges its transient nature; whereby the negative effects of air pollution may occur at locations other than where the emissions occur. There are no thresholds of effect identified for NO<sub>2</sub> and particulate matter and therefore health benefits can be expected from improving air quality even below concentrations stipulated by EU and UK standards.

### **Mitigation and complementary measures**

Road transport is also a source of atmospheric carbon dioxide (CO<sub>2</sub>), and many of the measures which will improve air quality will also reduce CO<sub>2</sub> emissions, thus reducing long term climate change. Furthermore, interventions aiming to improve air quality by promoting a modal shift from private motor vehicle use to active travel (walking and cycling) and integrated public transport can help improve physical activity levels, which will provide additional public health benefits.

Health communication enables the public to reduce their personal exposure by avoiding areas of higher pollution; this is beneficial for the general population and those with existing health conditions. Examples of successful implementation of health communication include air quality implementation services such as airTEXT, airALERT and 'Know and Respond'. All of these services provide free information to everyone about the quality of outdoor air they breathe. The consideration of measures that foster awareness of the effects of air pollution in the local population can empower people to make informed decisions on how to reduce exposure and if required, to better manage their health conditions (Bradley et al, 2015)(SPHSU2004).

Land use and transport planning can have synergistic effects on air quality including at the local level. Low emission strategies such as reducing congestion can contribute to the aims of other transport policies and strategies for example, encouraging reduction in the use of private vehicles; the adoption of cleaner fuels (for example, provision of low emission infrastructure) and increased modal shift can alleviate the impact of traffic on both the local population and urban environment.

To aid decision making, the EU cooperation project, the Joint Air Quality Initiative (Joaquin) has developed a decision support tool that helps policy makers to choose best fit measures to improve their own local air quality traffic interventions (JOAQUIN 2015).

In summary, interventions that are aimed at reducing air pollution can contribute to increased life expectancy and also help reduce premature deaths from cardiovascular and respiratory disease. We encourage a focus on improving air quality as a whole including interventions that reduce emissions, whilst also embracing measures that can be adopted at an individual level such as promoting active travel and awareness of the effects of air pollution on health.

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# The impact of poor air quality on health in Birmingham

## Response from Environmental Health

**Committees:** Health, Wellbeing & the Environment O&S  
Economy, Skills and Transport O&S

**Key Question:** Is there an evidential link between poor air quality and poor health, what are the main controllable sources of this in Birmingham, and what can be done to improve air quality with a view to improving health outcomes in Birmingham?

This submission to the Health, Wellbeing & the Environment, and Economy, Skills and Transport Overview & Scrutiny Committees from Birmingham Environmental Health addresses the key lines of enquiry:

- What evidence is there about air quality, emission sources, and levels of air pollution in Birmingham or in specific pollution hotspots? (Page 2)
- How do these rates compare to other comparable major cities in the UK and Europe? (Page 22)

Other colleagues are better placed to address the other key lines of enquiry:

- What are the main types of air pollution that affect people's health, where do they come from, what is the health impact, and who is most likely to suffer the effects?
- Are there any trends which can be identified in relation to air quality and public health in the city?
- For each air pollution related health problem, what is the likely nature and scale of impact on the City's health care system, and what are the likely social and economic costs of this?
- Birmingham has been ordered by the Government to impose charges in 'clean air zones' to cut pollution. What types of vehicle, driving mode, location and fuel system most contribute to the health impacts of road traffic, and what would be the most effective ways of implementing and operating a 'clean air zone' so as to minimise these burdens?
- What are the potential barriers to clean air zones being implemented widely in the city?
- Are there other measures which can be taken such as for example the planting of urban trees to absorb airborne pollutants and improve air quality and are there any plans on relation to these?

## What evidence is there about air quality, emission sources, and levels of air pollution in Birmingham or in specific pollution hotspots?

Environmental Health maintain a network of air quality monitoring stations incorporating real time monitoring stations (RTMS) which sample the air in real time and provide outputs over a short period e.g. five minute averages, and passive stations which sample over a longer period to provide an average concentration e.g. monthly.

The RTMS are mostly established and maintained at the same location for a number of years to give more accurate trends, whereas the passive sites, which mostly monitor for nitrogen dioxide (NO<sub>2</sub>) are more flexibly used, depending on the requirements, although a large number of sites have been retained without relocating to further provide good trend analysis.

### Real time monitoring stations

The location of the real time monitoring stations as of 2016 is shown in the figure below. It should be noted that the station at 'Birmingham Tyburn Roadside' has now been relocated to Watery Lane to monitor pollution on the ring road, this having taken place late 2016.

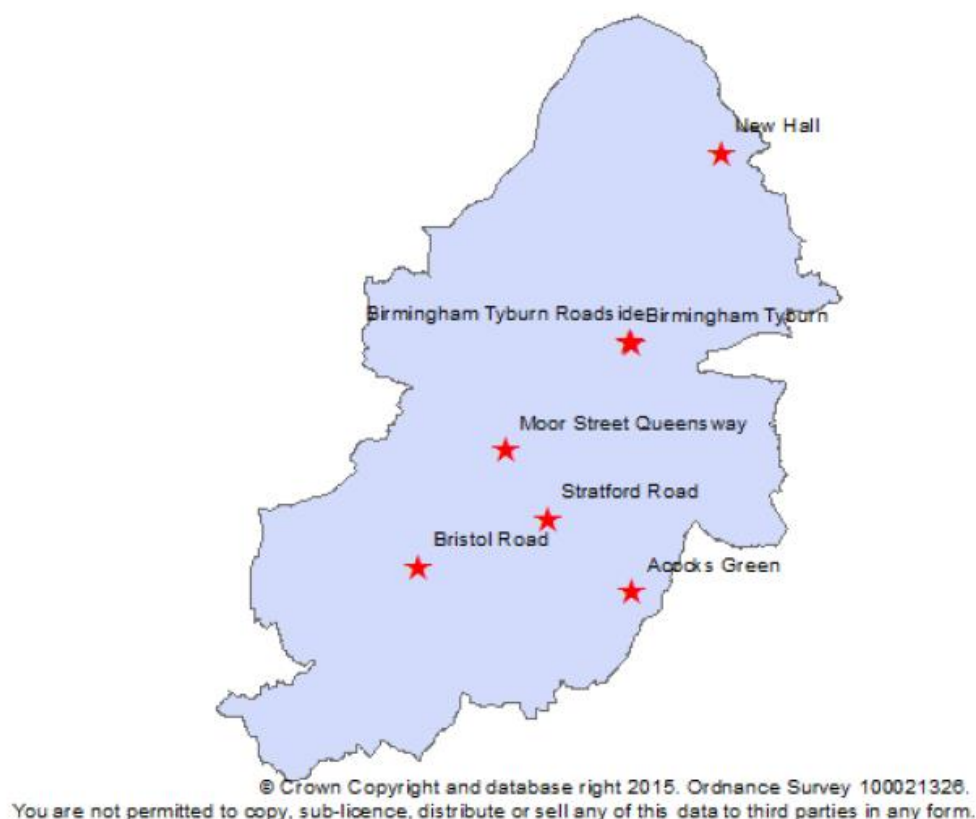


Figure 5. Locations of automatic monitoring sites.

Page 3 shows the details of the automatic monitoring sites, along with the pollutants monitored.

## Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Inlet Height (m)
	Birmingham Tyburn Roadside	Urban Traffic	411577	290491	NO <sub>2</sub> ; PM <sub>10</sub> PM <sub>2.5</sub> , O <sub>3</sub>	Y	Chemiluminescent; FDMS	10	6	2.0
	Birmingham Tyburn	Urban background	411592	290440	NO <sub>2</sub> ; PM <sub>10</sub> PM <sub>2.5</sub> , O <sub>3</sub> , SO <sub>2</sub>	Y	Chemiluminescent; FDMS	27	65	2.0
	New Hall	Urban background	414574	296724	NO <sub>2</sub>	Y	Chemiluminescent	41	20	2.0
	Stratford Road	Urban Traffic	408820	284591	NO <sub>2</sub>	Y	Chemiluminescent	5	5	2.0
	Bristol Road	Urban Traffic	404545	283020	NO <sub>2</sub>	Y	Chemiluminescent	27	9	2.0
	Moor Street Queensway	Urban Traffic	407435	286891	NO <sub>2</sub>	Y	Chemiluminescent	65	6	2.0
	Acocks Green	Urban background	411649	282207	NO <sub>2</sub> , O <sub>3</sub> , PM <sub>2.5</sub>	Y	Chemiluminescent; FDMS	43	65	2.0

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

The charts on the following pages (4 through 7) show the monitoring data for all pollutants at each of the stations over a number of years, this having been reported to Defra on an annual basis.

**Table A.3 – Annual Mean NO<sub>2</sub> Monitoring Results**

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2015 (%) <sup>(2)</sup>	NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> ) <sup>(3)</sup>				
					2011	2012	2013	2014	2015
Birmingham Tyburn Roadside	Urban Traffic	Automatic		97	<b>45</b>	<b>46</b>	<b>42</b>	<b>43</b>	<b>42</b>
Birmingham Tyburn	Urban background	Automatic		96	34	32	29	31	30
New Hall	Urban background	Automatic		99	19	19	17	17	16
Stratford Road	Urban Traffic	Automatic		92	36	35	31	36	33
Bristol Road	Urban Traffic	Automatic		99	33	30	34	34	29
Moor Street Queensway	Urban Traffic	Automatic		99	N/A	N/A	<b>44</b>	<b>43</b>	<b>45</b>
Acocks Green	Urban background	Automatic		98	23	32	29	N/A	18

**Table A.4 – 1-Hour Mean NO<sub>2</sub> Monitoring Results**

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2015 (%) <sup>(2)</sup>	NO <sub>2</sub> 1-Hour Means > 200µg/m <sup>3</sup> <sup>(3)</sup>				
					2011	2012	2013	2014	2015
Birmingham Tyburn Roadside	Urban Traffic	Automatic		98	0	0	0	0	0
Birmingham Tyburn	Urban background	Automatic		96	0	0	0	0	0
Acocks Green	Urban background	Automatic		97	0	0	0	0	0
New Hall	Urban background	Automatic		99	0	0	0	0	0
Stratford Road	Urban Traffic	Automatic		92	0	0	0	0	0
Bristol Road	Urban Traffic	Automatic		99	0	0	0	0	0
Moor Street Queensway	Urban Traffic	Automatic		99	0	0	0	0	0

Notes: Exceedances of the NO<sub>2</sub> 1-hour mean objective (200µg/m<sup>3</sup> not to be exceeded more than 18 times/year) are shown in **bold**.

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 90%, the 99.8<sup>th</sup> percentile of 1-hour means is provided in brackets.

**Table A.5 – Annual Mean PM<sub>10</sub> Monitoring Results**

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2015 (%) <sup>(2)</sup>	PM <sub>10</sub> Annual Mean Concentration (µg/m <sup>3</sup> ) <sup>(3)</sup>				
				2011	2012	2013	2014	2015
Birmingham Tyburn	Urban traffic		61	23	19	18	19	19
Birmingham Tyburn Roadside	Urban background		95	24	22	19	20	17

Notes: Exceedances of the PM<sub>10</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been “annualised” as per Technical Guidance LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

**Table A.6 – 24-Hour Mean PM<sub>10</sub> Monitoring Results**

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2015 (%) <sup>(2)</sup>	PM <sub>10</sub> 24-Hour Means > 50µg/m <sup>3</sup> <sup>(3)</sup>				
				2011	2012	2013	2014	2015
Birmingham Tyburn	Urban traffic		61	18	9	7	6	3
Birmingham Tyburn Roadside	Urban background		95	18	13	9	8	6

Notes: Exceedances of the PM<sub>10</sub> 24-hour mean objective (50µg/m<sup>3</sup> not to be exceeded more than 35 times/year) are shown in **bold**.

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 90%, the 90.4<sup>th</sup> percentile of 24-hour means is provided in brackets.



**Table A.7 – PM<sub>2.5</sub> Monitoring Results**

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2015 (%) <sup>(2)</sup>	PM <sub>2.5</sub> Annual Mean Concentration (µg/m <sup>3</sup> ) <sup>(3)</sup>				
				2011	2012	2013	2014	2015
Birmingham Acocks Green	Urban Background		64	N/A	11	13	12	12
Birmingham Tyburn	Urban traffic		61	16	14	14	13	13
Birmingham Tyburn Roadside	Urban background		96	17	13	16	14	12

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been “annualised” as per Technical Guidance LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

**Table A.8 – SO<sub>2</sub> Monitoring Results**

Site ID	Site Type	Valid Data Capture for monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2014 (%) <sup>(2)</sup>	Number of Exceedances (percentile in bracket) <sup>(3)</sup>		
				15-minute Objective (266 µg/m <sup>3</sup> )	1-hour Objective (350 µg/m <sup>3</sup> )	24-hour Objective (125 µg/m <sup>3</sup> )
Birmingham Tyburn	Urban Background	87	95	0	0	0

Notes: Exceedances of the SO<sub>2</sub> objectives are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed a year)

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%)

(3) If the period of valid data is less than 90%, the relevant percentiles are provided in brackets.

The following summary table shows the concentrations for the main pollutants (NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>) as annual averages for the given years. The data for 2016 is blank as it has not yet been collated into an annual average.

Station	NOX	NO	NO2	PM10	PM2.5	SO2	O3	Benzene	PAH	Black Carbon
Tyburn	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
A4540 Watery Lane	✓	✓	✓	✓	✓		✓	✓		✓
Acocks Green	✓	✓	✓		✓		✓			
New Hall	✓	✓	✓							
Stratford Road	✓	✓	✓							
Selly Oak	✓	✓	✓							
Moor Street										
Queensway	✓	✓	✓							
NO2	2011	2012	2013	2014	2015	2016				
Tyburn	34	32	29	31	30	0				
Tyburn Roadside	45	46	42	43	42	0				
Acocks Green	23	32	29	n/a	18	0				
New Hall	19	19	17	17	16	0				
Stratford Road	36	35	31	36	33	0				
Selly Oak	33	30	34	34	29	0				
Moor Street										
Queensway	n/a	n/a	44	43	45	0				
PM10										
Tyburn	23	19	18	19	19					
Tyburn Roadside	24	22	19	20	17					
PM2.5										
Tyburn	16	14	14	13	13					
Tyburn Roadside	17	13	16	14	12					
Acocks Green	n/a	11	13	12	12					

**Note**  
All data in this summary table is in µgm<sup>-3</sup>

It should be noted that from the monitoring results specified that the only sites where concentrations exceed the limit of 40µgm<sup>-3</sup> are at the Tyburn Roadside and Moor Street Queensway sites, the former being by a busy arterial route, the latter being subject to heavy bus patronage.

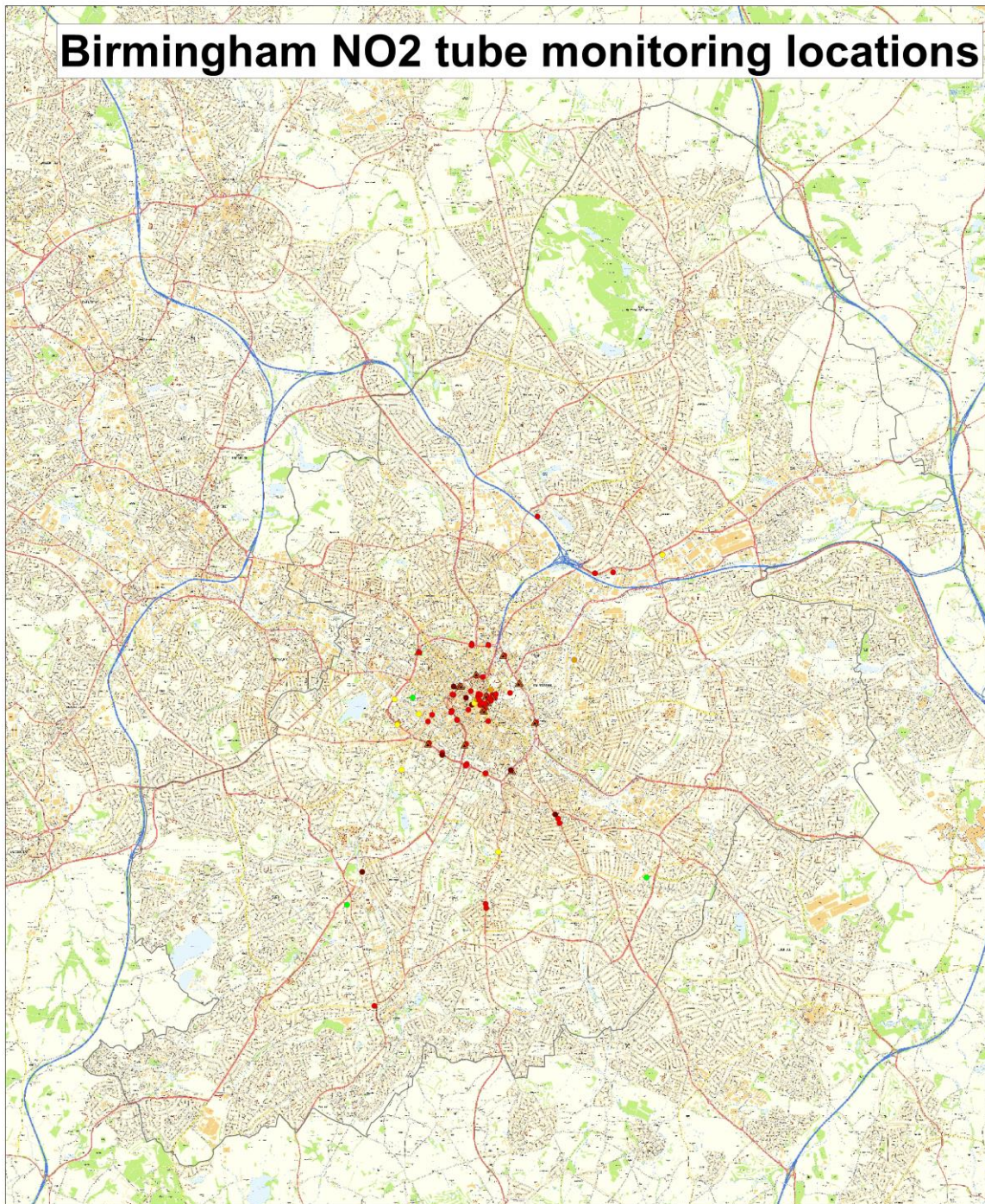
### Passive diffusion tubes

Given that the only pollutant of legislative concern (this not being the same as public health concern) is NO<sub>2</sub>, Environmental Health maintain a network of passive diffusion tubes to monitor this pollutant. These are relatively cheap and easy to deploy and have analysed and provide a reasonably accurate output.

The figures on pages 9 and 10 show the locations of these sites, both city wide and within the city centre and ring road and provide indicative results for 2016 (these having not yet been finalised).



# Birmingham NO2 tube monitoring locations



## Legend

tube\_results\_2

national\_b

- 15 - 25
- 26 - 35
- 36 - 37
- 38 - 40
- 41 - 59
- ▲ 60 - 93

□ CITY



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  - 41 - 59
  - 60 - 93
  - ▲ CITY



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## Legislative Standards

The city Council has a duty to comply with the following Objective Levels (excerpted from Local Air Quality Management Policy Guidance (PG16), Defra, April 2016). This table identifies the pollutants for which local authorities have responsibility to report on under the Local Air Quality Management (LAQM) regime, introduced in The Environment Act 1995.

## Annex A: Air Quality Objectives Contained in the Air Quality (England) Regulations 2000 (2002 as Amended)

Pollutant	Objective	Averaging Period
Nitrogen Dioxide - NO <sub>2</sub>	200 µg/m <sup>3</sup> not to be exceeded more than 18 times/year	1-hour mean
	40 µg/m <sup>3</sup>	Annual mean
Particles - PM <sub>10</sub>	50 µg/m <sup>3</sup> not to be exceeded more than 35 times/ year	24-hour mean
	40 µg/m <sup>3</sup>	Annual mean
Sulphur Dioxide (SO <sub>2</sub> )	266 µg/m <sup>3</sup> not to be exceeded more than 35 times/year	15 minute mean
	350 µg/m <sup>3</sup> not to be exceeded more than 24 times/year	1 hour mean
	125 µg/m <sup>3</sup> not to be exceeded more than 3 times/year	24 hour mean
Benzene <sup>47</sup>	16.25 µg/m <sup>3</sup>	Running annual mean
	5.00 µg/m <sup>3</sup>	Annual mean
1,3-butadiene	2.25 µg/m <sup>3</sup>	Running annual mean
Carbon Monoxide	10.00 mg/m <sup>3</sup>	Maximum daily running 8-hour mean
Lead	0.5 µg/m <sup>3</sup>	Annual mean
	0.25 µg/m <sup>3</sup>	Annual mean

Note, there is no requirement for the City Council to comply with any emission limit for fine particles (PM<sub>2.5</sub>). it is important to understand however that fine particles have well recognised adverse health impacts and as such the Public Health Outcomes Framework (PHOF) has an indicator specifying the fraction of mortality attributable to particulate air pollution. It is important therefore to seek reductions in such pollution to both promote and safeguard public health.



A Limit Value for PM<sub>2.5</sub> does exist but the duty lies with central Government. This limit value stands as:

	Pollutant	Time period	Standard	To be achieved by
UK	PM <sub>2.5</sub>	annual mean	Objective of 25 µg m <sup>-3</sup>	2020
		three-year running annual mean	15% reduction in average urban background concentrations against a 2010 baseline	2020

Monitoring for PM<sub>2.5</sub> at the two sites in Birmingham shows levels significantly below the limit value, although it should be stressed that there is no safe limit for PM<sub>2.5</sub> exposure and the health response is linear i.e. any increase in levels will give rise to a corresponding increase in adverse health outcomes and, conversely, any decrease in levels will result in a reduction in adverse health outcomes.

#### Compliance with the Air Quality Objectives

The review and assessment process for air quality compliance commenced back in the late 90's, and resulted in Birmingham City Council completing all stages of the review and assessment reporting framework as required by Defra.

The whole city was designated an Air Quality Management Area (AQMA) for Nitrogen Dioxide in January 2003 on the basis of observed and predicted continued exceedence of the annual mean level within the AQO.

A declaration for particles (PM<sub>10</sub>) followed in October 2004 on the advice of Government, although no observed exceedence was noted, nor was any future exceedence predicted by Birmingham.

The declarations necessitated the issuing of an Air Quality Action Plan (AQAP), and this was completed in 2006.

The review and assessment process continued and in 2010 the declaration for particles (PM<sub>10</sub>) was revoked on the basis that there had been no exceedence, and there continued to be no predicted exceedence.

The AQAP was revised in 2011, this being the current version (presently under review).

No other pollutant has been identified, either originally or subsequently, as warranting a declaration.

The only pollutant of concern from a legislative perspective was, and remains, nitrogen dioxide or NO<sub>2</sub>.

### Defra's Air Quality Plan (AQP) for the UK with specific reference to the compliance position for the West Midlands Urban Area (WMUA)

The UK, as an EU Member State, has to comply with the EU Directive on Ambient Air Quality. This identifies a range of pollutants and sets limit values for compliance. Of particular relevance are the limit values for NO<sub>2</sub> which are identical to those contained within the AQO.

The deadline for compliance with the EU limit values was 01/01/2010. This was not met. An application for an extension was made by the UK, and accepted by the EU, permitting an extension up to 2015. This was not met. Accordingly, the UK remains in breach of the EU limit values for NO<sub>2</sub>.

The UK Government was challenged for the original non-compliance by an environmental action group named ClientEarth. The Supreme Court ruled that the UK Government must do more to deliver compliance and an output from this ruling was the creation of an Air Quality Plan (AQP) for the UK.

The AQP created 43 discreet areas within the UK and assessed each for compliance against the EU limit values. Birmingham sits within the West Midlands Urban Area (UK0002). Government predicted that this area would have the second largest amount of non-compliance (based on non-compliant road length), second only to London.

The plan was structured to deliver compliance in the shortest possible time although the predictions were at five yearly intervals commencing 2020, from a baseline of 2013. The predictions are derived from modelling concentrations of NO<sub>2</sub> on major roads only, and compliance is deemed to be met when the model outputs show concentrations below 40µgm<sup>-3</sup><sup>1</sup>.

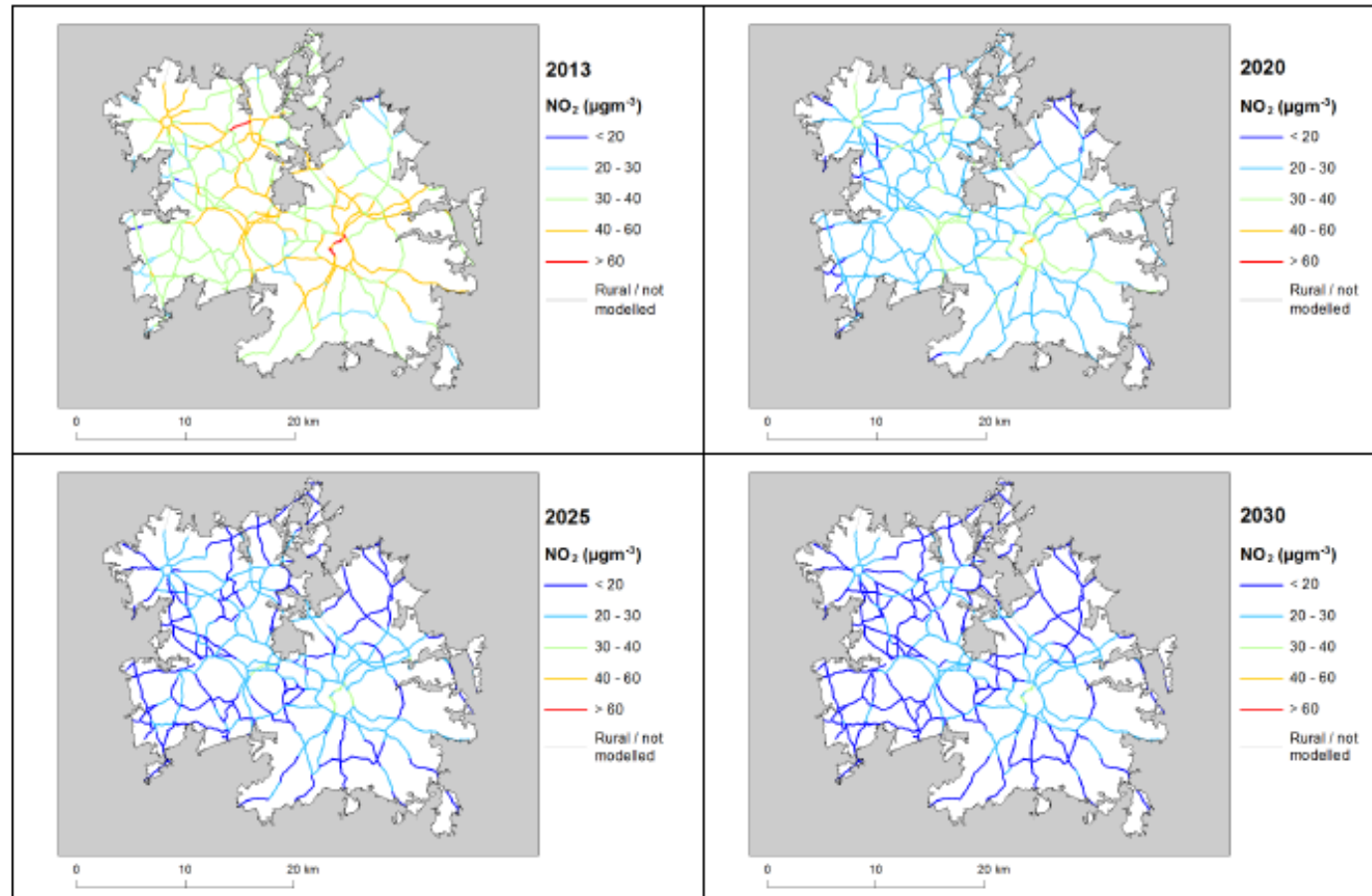
The model outputs (Page 14) showed a compliance position for the WMUA for 2013 (baseline), 2020, 2025 and 2030.

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<sup>1</sup> One µg is a millionth of a gram

Model outputs from Defra's AQP showing the projected compliance position for Birmingham

**Figure 7: Roadside baseline projections of annual mean NO<sub>2</sub> concentrations in 2020, 2025 and 2030. 2013 is also included here for reference. Modelled exceedances of the annual limit value are shown in orange and red.**



**Note**

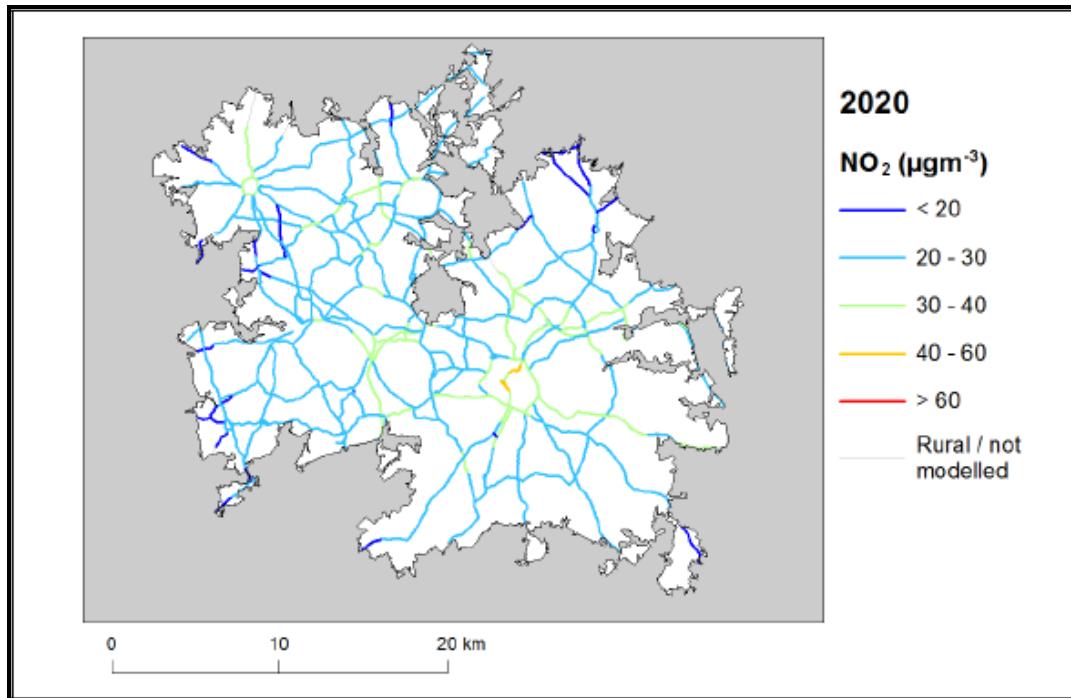
The maps show the compliance position for the WMUA, which includes Birmingham. Compliance is deemed to be met if the roads shown are not red or orange.

It can be seen therefore that 2020 still has non-compliance, whereas come 2025 this has been rectified through natural improvements to the vehicle fleet.

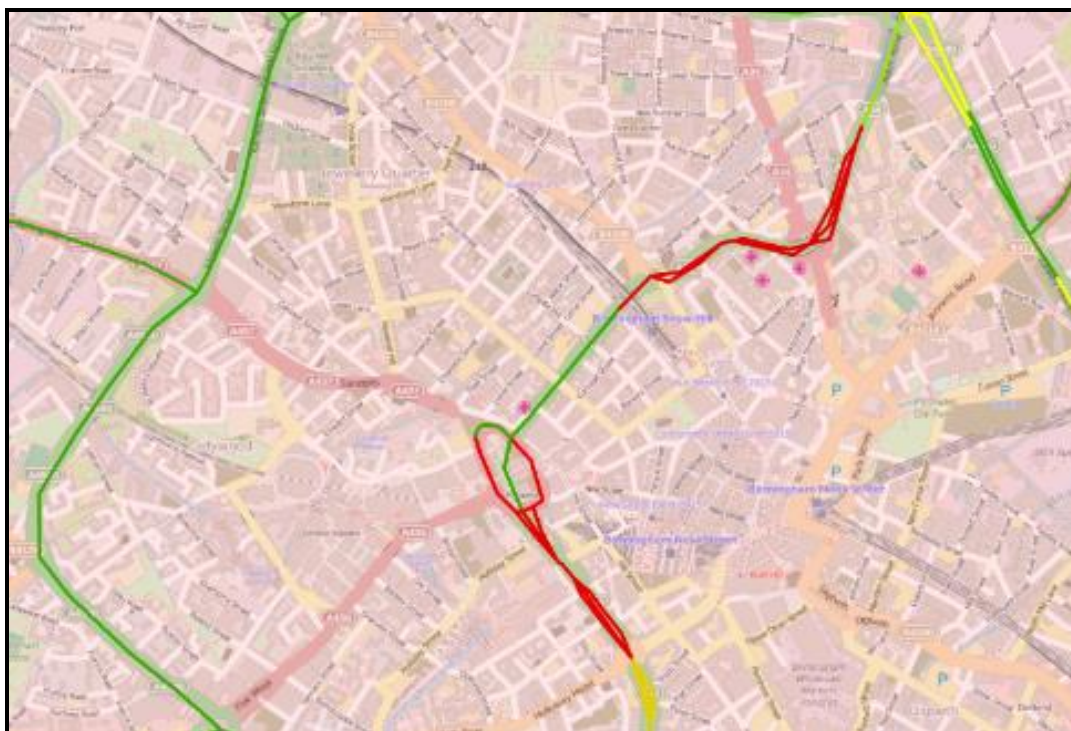
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The Government position was to direct Birmingham to deliver compliance as soon as possible and by 2020 at the latest. This was based on Birmingham having the only non-compliant area within the wider West Midlands Urban Area, come 2020. By 2025, the projection was that Birmingham would be compliant.

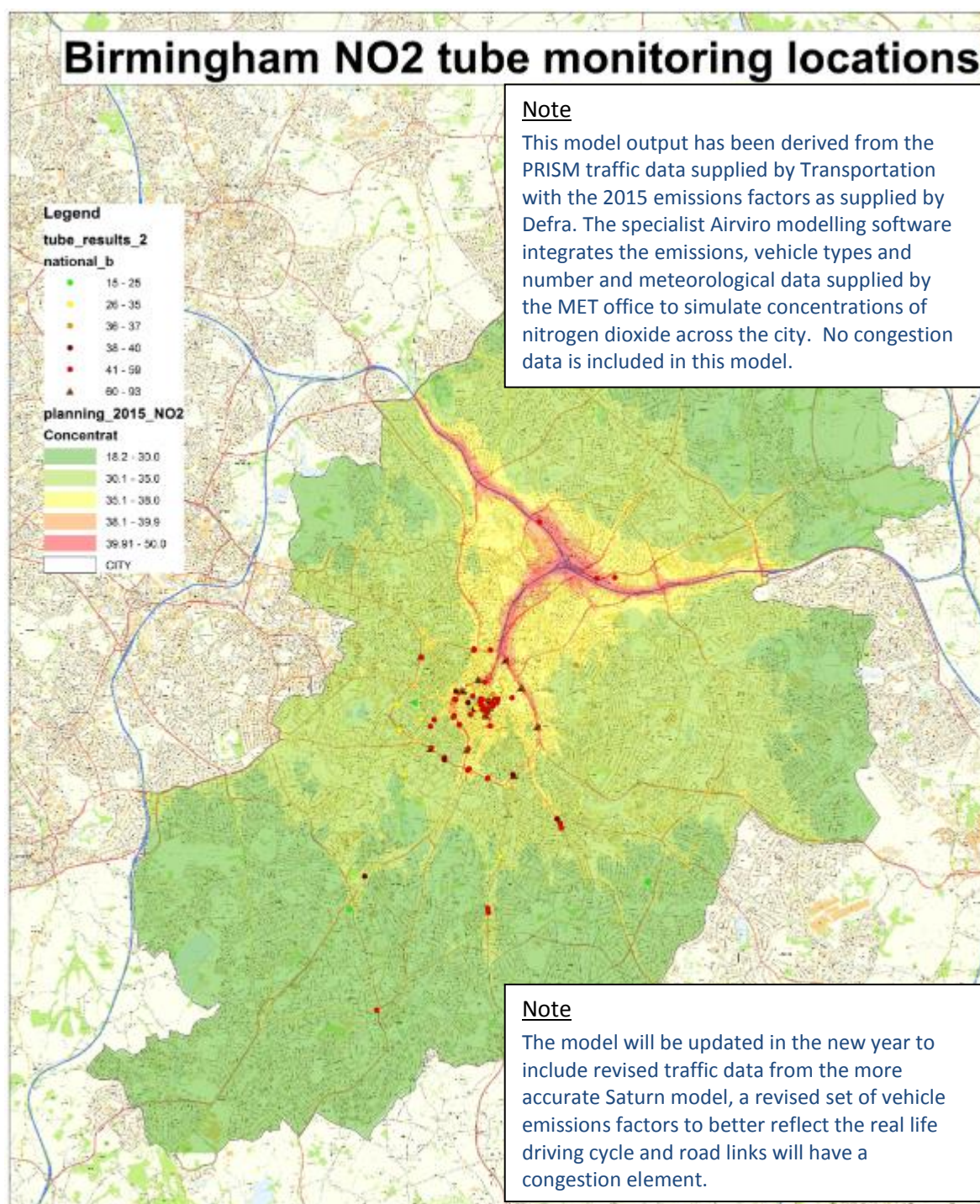


The only stretches of the network predicted to be non-compliant in 2020 are in Birmingham, on the A38 running through the city centre. The areas in question are better shown below.



## Birmingham city Council air quality modelling

The models produced by Defra do not give the full picture however, as Defra's modelling only focusses on roads with higher traffic numbers and as such misses smaller, less well trafficked roads, which can, due to topography or vehicle composition present their own problem. Accordingly, Environmental Health run their own model, outputs from which are shown on the following pages (city-wide and city centre).



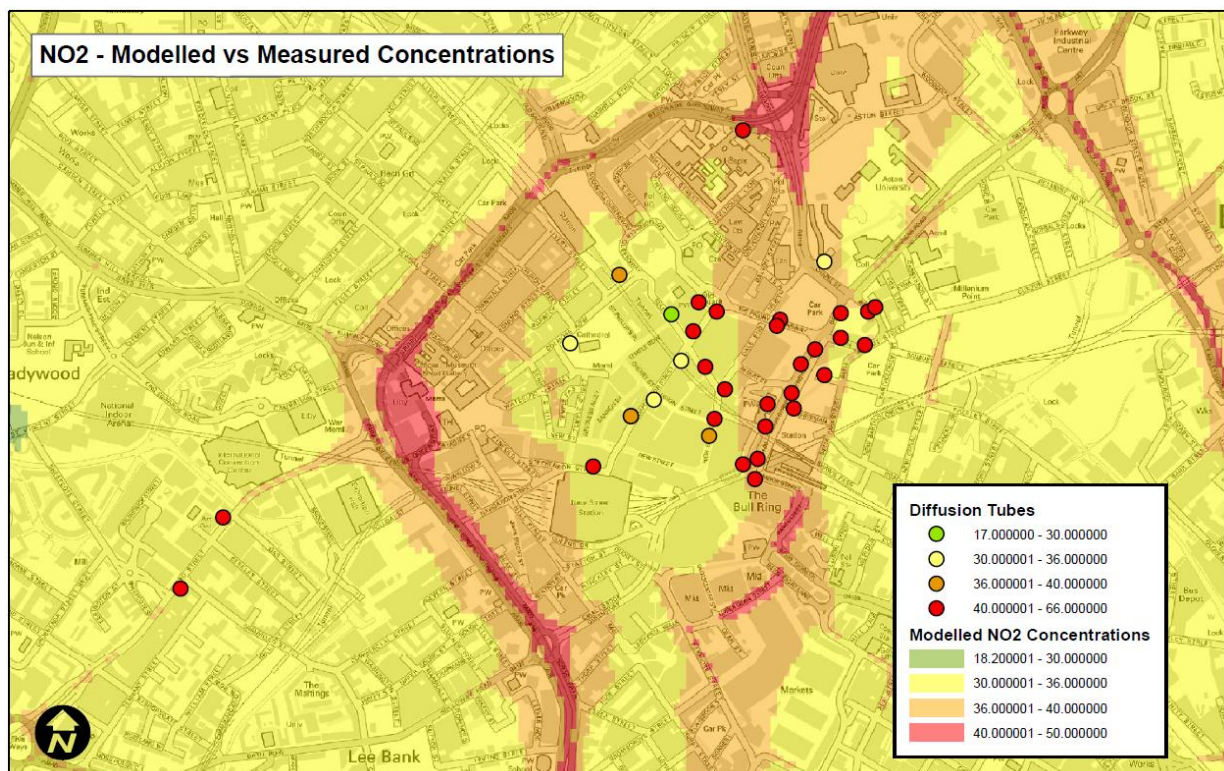


It is important to appreciate that the model shows concentrations of NO<sub>2</sub> at the centre of a 'grid', in the case of this model it is a fifty metre square grid (50m<sup>2</sup>). Accordingly each grid is not necessarily homogenous in concentration, rather there will be some edgree of fluctuation the further or nearer to the source.

It is also important to understand that the model does not represent the actual emissions concentrations, rather it is an approximation. An example of the difference between model outputs and actual concentrations may be seen in the M6 corridor, which according to the model suggests that the area to the immediate north east of the corridor (in the direction of the prevailing winds) is of a similar concentration as that experienced on the M6 itself. This however is not the case due to topography – a large stretch of the M6 is elevated which we know from monitoring on the leeward side that concentratinos are reduced from those shown in the model.

This also explains why the focus of monitoring and interventions has been on the city centre and not along the M6 corridor, which is considered legislatively compliant.

The following model output is focussed on the city centre area and overlays NO<sub>2</sub> diffusion tube data. As can be seen, the model is under-reporting concentrations on Moor Street Queensway, possibly due to the need to reduce the speed of vehicles on that road within the model. This is another example of how modelling is a useful guide but needs to be treated with a degree of caution.



## Causes of air pollution

An aspect of the key lines of enquiry related to the causes of air pollution. There are many pollutants, yet only NO<sub>2</sub> and PM are of relevance within Birmingham. The following excerpt from a Defra document explains the official position with regards to these pollutants.

### **What are the causes of air Pollution**

<b>Pollutant</b>	<b>Description and main UK sources</b>	<b>Potential effects on health/environment</b>
Particulate Matter (PM-PM <sub>10</sub> and PM <sub>2.5</sub> )	Particulate Matter is generally categorised on the basis of the size of the particles (for example PM <sub>2.5</sub> is particles with a diameter of less than 2.5µm). PM is made up of a wide range of materials and arise from a variety of sources. Concentrations of PM comprise primary particles emitted directly into the atmosphere from combustion sources and secondary particles formed by chemical reactions in the air. PM derives from both human-made and natural sources (such as sea spray and Saharan dust). In the UK the biggest human-made sources are stationary fuel combustion and transport. Road transport gives rise to primary particles from engine emissions, tyre and brake wear and other non-exhaust emissions. Other primary sources include quarrying, construction and non-road mobile sources. Secondary PM is formed from emissions of ammonia, sulphur dioxide and oxides of nitrogen as well as from	<p>Both short-term and long-term exposure to ambient levels of PM are consistently associated with respiratory and cardiovascular illness and mortality as well as other ill-health effects. The associations are believed to be causal. It is not currently possible to discern a threshold concentration below which there are no effects on the whole population's health.</p> <p>PM<sub>10</sub> roughly equates to the mass of particles less than 10 micrometres in diameter that are likely to be inhaled into the thoracic region of the respiratory tract. Recent reviews by WHO and Committee on the Medical Effects of Air Pollutants (COMEAP) have suggested exposure to a finer fraction of particles (PM<sub>2.5</sub>, which typically make up around two thirds of PM<sub>10</sub> emissions and concentrations) give a stronger association with the observed ill-health effects, but also warn that there is evidence that the</p>

	emissions of organic compounds from both combustion sources and vegetation.	coarse fraction between (PM <sub>10</sub> – PM <sub>2.5</sub> ) also has some effects on health.
Oxides of nitrogen (NO <sub>x</sub> )	All combustion processes in air produce oxides of nitrogen (NO <sub>x</sub> ). Nitrogen dioxide (NO <sub>2</sub> ) and nitric oxide (NO) are both oxides of nitrogen and together are referred to as NO <sub>x</sub> . Road transport is the main source, followed by the electricity supply industry and other industrial and commercial sectors.	NO <sub>2</sub> is associated with adverse effects on human health. At high levels NO <sub>2</sub> causes inflammation of the airways. Long term exposure may affect lung function and respiratory symptoms. NO <sub>2</sub> also enhances the response to allergens in sensitive individuals. High levels of NO <sub>x</sub> can have an adverse effect on vegetation, including leaf or needle damage and reduced growth. Deposition of pollutants derived from NO <sub>x</sub> emissions contribute to acidification and/or eutrophication of sensitive habitats leading to loss of biodiversity, often at locations far removed from the original emissions. NO <sub>x</sub> also contributes to the formation of secondary particles and ground level ozone, both of which are associated with ill-health effects. Ozone also damages vegetation.

Source: [https://uk-air.defra.gov.uk/assets/documents/What\\_are\\_the\\_causes\\_of\\_Air\\_Pollution.pdf](https://uk-air.defra.gov.uk/assets/documents/What_are_the_causes_of_Air_Pollution.pdf)

#### Local sources of air pollution

Although it is known (see above) that the primary source of NO<sub>2</sub> is from road traffic, how this actually translates into local emissions is known as ‘source apportionment’.

The table on page 20 is taken from the WMUA document showing the source apportionment on the A38 fronting the Mailbox, whilst the tables on page 21 show source apportionment from the Low Emissions Towns & Cities Programme Low Emission Zone Technical Feasibility Study (LETCP LEZ TFS). Both show, clearly, that diesel cars are the primary source of NO<sub>x</sub> emissions.

Source apportionment table from the WMUA document<sup>2</sup>

**Table 3: Modelled annual mean NO<sub>x</sub> source apportionment at the traffic count point with the highest modelled concentration in 2013 in NO<sub>2</sub>\_UK0002\_Annual\_1 ( $\mu\text{gm}^{-3}$ ) (traffic count point 81488 on the A4400; OS grid (m): 406670, 286600).**

Spatial scale	Component	Concentration at highest road link (a)
Regional background sources NO <sub>x</sub> (i.e. contributions from distant sources of > 30 km from the receptor).	Total	10.5
	From within the UK	6.1
	From transboundary sources (includes shipping and other EU member states)	4.3
	Total	56.4
Urban background sources NO <sub>x</sub> (i.e. sources located within 0.3 - 30 km from the receptor).	From road traffic sources	29.0
	From industry (including heat and power generation)	4.4
	From agriculture	NA
	From commercial/residential sources	12.1
	From shipping	0.0
	From off road mobile machinery	3.6
	From natural sources	NA
	From transboundary sources	NA
	From other urban background sources	7.3
	Total	118.4
Local sources NO <sub>x</sub> (i.e. contributions from sources < 0.3 km from the receptor).	From petrol cars	15.1
	From diesel cars	54.0
	From HGV rigid (b)	13.5
	From HGV articulated (b)	3.6
	From buses	10.7
	From petrol LGVs (c)	0.3
	From diesel LGVs (c)	21.1
	From motorcycles	0.1
	From London taxis	0.0
	Total NO <sub>x</sub> (i.e. regional background + urban background + local components)	185.3
Total NO <sub>2</sub> (i.e. regional background + urban background + local components)		70

(a) Components are listed with NO<sub>x</sub> concentration of NA when there is no source from this sector.

(b) HGV = heavy goods vehicle

(c) LGV = light goods vehicle

#### Note

The table shows the modelled NO<sub>x</sub> concentration on the A38 fronting the Mailbox. The largest source of emissions is from local sources (118.4 compared to 66.9 from regional and urban background combined). The largest contributor to the local sources are diesel cars, followed by diesel LGVs.

Power generation for instance would comprise elements of regional background (from within the UK = 6.1) and urban background (industry = 4.4) to give a combined value of around 10.5, maximum).

<sup>2</sup> <https://www.gov.uk/government/publications/air-quality-plan-for-reducing-nitrogen-dioxide-no2-in-west-midlands-urban-area-uk0002>



**Table 29: Annual average daily traffic flows, 2011 DfT manual counts**

Road	Location	Road type	AADT	Percentage of traffic flow						Speed, kph
				Cars	LGV	Rigid	Artic	Bus&Coach	M/C	
A38	Children's Hospital	Urban	86372	86.2	10.9	1.1	0.4	0.7	0.7	50

## 5.4 Emissions

The emissions rates of oxides of nitrogen from road vehicles on each road link for 2011 were estimated using Defra's Emission Factor toolkit (EFT v5.2c). Table 30 shows the calculated emission rate and the proportion of oxides of nitrogen emitted by the main categories of vehicle. Cars and LGVs make substantial contributions to oxides of nitrogen emissions on all the roads. HGVs also make substantial contributions, particularly on the motorway links.

**Table 30: Source apportionment of oxides of nitrogen emissions**

Location	Emission rate, g km <sup>-1</sup> s <sup>-1</sup>	Percentage of emissions							
		Petrol Cars	Diesel Cars	Petrol LGV	Diesel LGV	Rigid HGV	Artic HGV	Bus & Coach	M/C
A38 Childrens Hospital	0.434	19%	39%	1%	18%	10%	5%	9%	0%

**Table 32: Source apportionment of primary nitrogen dioxide emissions**

Location	Emission rate, g km <sup>-1</sup> s <sup>-1</sup>	Percentage of emissions							
		Petrol Cars	Diesel Cars	Petrol LGV	Diesel LGV	Rigid HGV	Artic HGV	Bus & Coach	M/C
A38 Childrens Hospital	0.121	2%	59%	0%	28%	5%	2%	4%	0%

### Note

Table 29 shows the % of annual average daily traffic on the A38 near to the Children's Hospital. The greatest proportion is from cars.

Table 30 shows the % split of NO<sub>x</sub> emissions from the vehicle split identified in Table 29. As can be seen diesel cars and LGV provide the greatest contribution.

A fraction of the NO<sub>x</sub> emitted is as NO<sub>2</sub> (known as primary NO<sub>2</sub>). Table 32 shows which vehicle types produce the most, based on the split from Table 29.

Primary NO<sub>2</sub> is an instantaneous pollutant in that unlike secondary NO<sub>2</sub> it does not require time to be converted through atmospheric chemical reactions.

<sup>3</sup> [http://cms.walsall.gov.uk/index/environment/pollution/air\\_quality/low\\_emissions\\_towns\\_and\\_cities\\_programme.htm](http://cms.walsall.gov.uk/index/environment/pollution/air_quality/low_emissions_towns_and_cities_programme.htm)

## How do these rates compare to other comparable major cities in the UK and Europe?

### UK compliance position on air pollution

The UK, as an EU Member State, has to comply with the EU Directive on Ambient Air Quality. This identifies a range of pollutants and sets limit values for compliance. Of particular relevance are the limit values for NO<sub>2</sub> which are identical to those contained within the AQO.

The deadline for compliance with the EU limit values was 01/01/2010. This was not met. An application for an extension was made by the UK, and accepted by the EU, permitting an extension up to 2015. This was not met. Accordingly, the UK remains in breach of the EU limit values for NO<sub>2</sub>.

The UK Government was challenged for the original non-compliance by an environmental action group named ClientEarth. The Supreme Court ruled that the UK Government must do more to deliver compliance and an output from this ruling was the creation of an Air Quality Plan (AQP) for the UK.

The AQP created 43 discreet areas within the UK and assessed each for compliance against the EU limit values. Birmingham sits within the West Midlands Urban Area (UK0002). Government predicted that this area would have the second largest amount of non-compliance (based on non-compliant road length), second only to London.

The plan was structured to deliver compliance in the shortest possible time although the predictions were at five yearly intervals commencing 2020, from a baseline of 2013. The predictions are derived from modelling concentrations of NO<sub>2</sub> on major roads only, and compliance is deemed to be met when the model outputs show concentrations below 40µgm<sup>-3</sup><sup>4</sup>. Of the 43 areas Government predicted that only six cities are projected to exceed the limit values in 2020 – London, Birmingham, Leeds, Nottingham, Derby and Southampton (see below).

### 3.1. England

54. Our projections show that due to the measures already implemented since our 2011 plans, alongside natural vehicle fleet turnover, we will have much reduced concentrations of NO<sub>2</sub> compared to the 2013 baseline and be at or below the limit values in all but six<sup>20</sup> cities in 2020.
55. The most significant challenge relates to these six cities in England that are projected to exceed the limit values in 2020. In these cities - London, Birmingham, Leeds, Nottingham, Derby and Southampton - additional measures will be required to address the particular issues, and areas, that are causing the exceedance.
56. For the five cities outside London, Government will require the introduction of Clean Air Zones, as set out below in Sections 3.5 and 3.6, along with additional measures in Leeds and Birmingham. In London the Mayor has already agreed to introduce a range of measures including the introduction of the Ultra Low Emission Zone (ULEZ).

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<sup>4</sup> One µg is a millionth of a gram



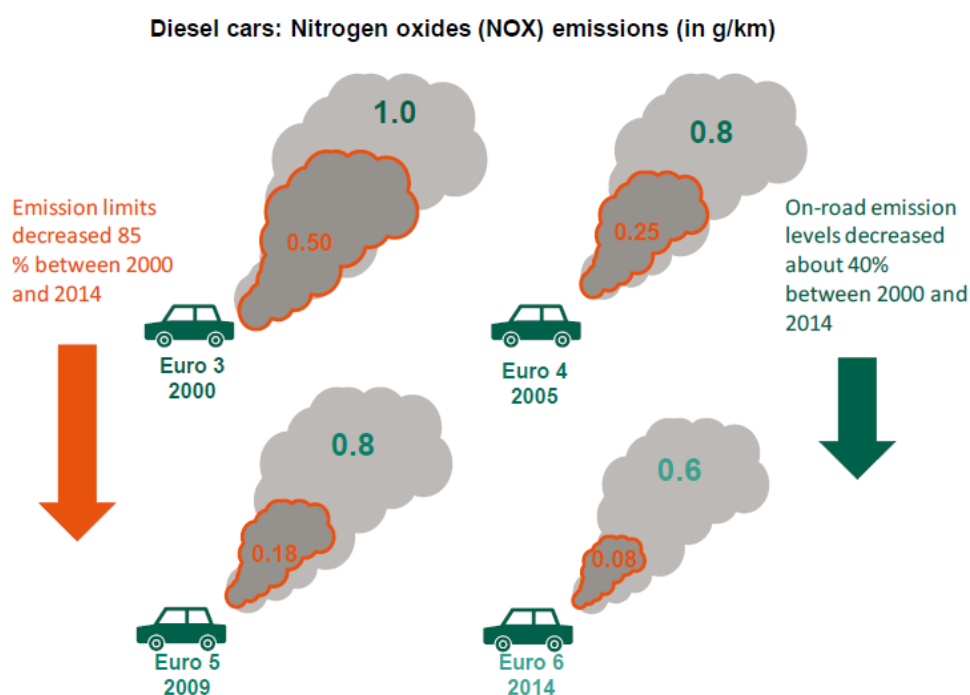
## Emissions from diesel vehicles and their failure to meet Euro limits

Despite Government projections, evidence has arisen about the failure of the latest Euro standards (Euro 5 / V) of the time to deliver emissions reductions in line with expectations. This was evidenced initially through performances of Euro V heavy duty vehicles (HGVs and buses) and came to light spectacularly for cars with the 'Volkswagen scandal'.

This admission prompted the UK Government to commence an investigation into whether this practice was more widespread, and also to understand why real world emissions differed significantly from those under laboratory testing. This became known as the Emissions Testing Programme (ETP)<sup>5</sup>.

The ETP report concludes that it did not detect any defeat device in any vehicle other than those from within the Volkswagen Group.

The ETP report also identified the discrepancy between in-laboratory testing and real world emissions across all vehicles tested, with real world driving giving rise to significantly more emissions than detected in the laboratory. Whilst the Euro standards have been semi-successful in reducing emissions from diesel cars, the reason why this success is limited is because the permitted limit, as evidenced through in-laboratory testing, is not realized by actual emissions arising from real world driving. The following infogram taken from the ETP report displays this differential.



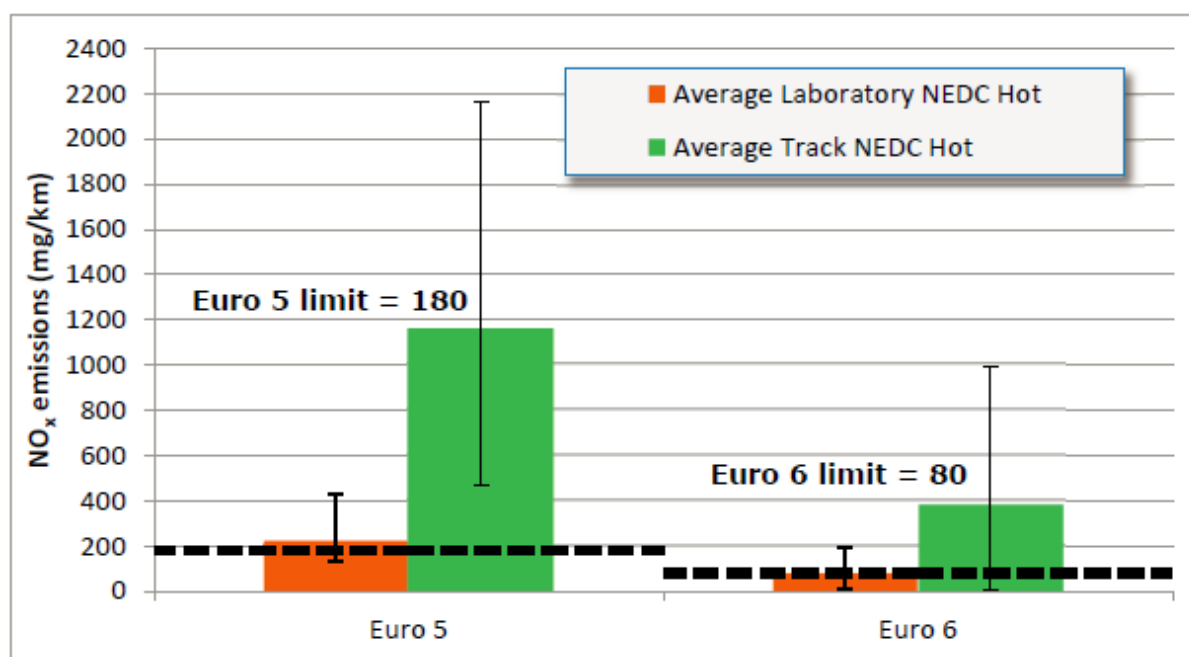
<sup>5</sup> The actual ETP report may be viewed at: <https://www.gov.uk/government/publications/vehicle-emissions-testing-programme-conclusions>

The ETP tested both Euro 5 and Euro 6 vehicles on the New European Drive Cycle (NEDC) in-laboratory cycle under both cold and hot engine conditions. All the Euro 5 vehicles met the legislative standard on the cold conditions, but when the engine was warmed up some vehicles remain compliant but many do not with the highest being 2.4 times above the limit.

For Euro 6 vehicles all met the limit from a cold start, but when the engine was warmed up there was once again a spread with the highest being also 2.4 times above the limit.

With regards to the proceeding paragraphs, it is important to understand that the legislative limit for Euro 5 is 180mg/km whilst for Euro 6 is it 80mg/km and as such Euro 6 vehicles are respectively 'cleaner' than their Euro 5 counterparts.

When the vehicles were taken out onto a test track and therefore not under in-laboratory conditions the results were markedly different, with many more vehicles failing the limit and there being a greater spread. This is evidence for the discrepancy between in-laboratory testing and real world driving. The following graph taken from the ETP displays these results:



The ETP also looked at how these vehicles actually perform on the public road. The results for both Euro 5 and Euro 6 are all above the legislative limit – for Euro 5 the average was 1135 mg/km - over six times higher than the 180 mg/km official legislative NEDC laboratory test limit, whilst for Euro 6 the best results are less than twice the NEDC limit of 80mg/km, while the worst are more than 12 times higher. For both sets of results it is not appropriate to make comparisons between individual vehicles as conditions varied from test to test.

### Possible re-run of the PCM model

Government's compliance assessment is based on a model known as the Pollution and Climate Model, or PCM model for short. Outputs from this model have already been presented on page 14 of this document. It is this model which has predicted the non-compliance in Birmingham along the A38.

The PCM is an emissions model, and like any model, the accuracy of the outputs are heavily dependent upon the accuracy of the inputs. One of those inputs is known as 'emissions factors' and these are a measure of the average amount of a specific pollutant or material discharged into the atmosphere by a specific process, fuel, equipment, or source. There are different emission factors for differing vehicle types and Euro classifications.

The problem arises when the real world emissions do not meet the predicted emissions, upon which the emissions factors are based, this now being evidenced as the case. Accordingly, any model dependent upon these emissions factors is therefore subject to uncertainty, this being the case with the PCM.

The question therefore being considered is whether there will be a re-run of the PCM and what emissions factors will be used. Should the model be re-run with updated emissions factors, then this may result in more areas being deemed non-compliant.

It is predicted that new emission factors will be made available around March 2017, and until that time it is not possible to comment further on this subject.

### Compliance position within the Europe Union

The following excerpt from the Government's Air Quality Plan provides some context.

## **2. The challenge**

5. The Government is taking action on air quality in order to improve health and the environment. We are not alone in facing this challenge, 16 other European countries will need to take action to reduce their nitrogen dioxide levels.

Defra have been approached and requested to provide advice on the situation across the European Union and their response directed to the Air Quality Plan (statement above) and suggested that the problem would be within the major cities of the various Member States. No further information was forthcoming.



To Health, Wellbeing and the Environment Overview & Scrutiny Committee  
Economy, Skills and Transport Overview & Scrutiny Committee

## **The impact of air quality on health in Birmingham**

**Submission by Birmingham Friends of the Earth, January 2017**

Birmingham Friends of the Earth (BFOE) is an independent, non-party campaigning organisation which has been sustained by its members for 40 years. BFOE is one of many such groups nationally and internationally, all advocating protection of the Earth, on which depends the well-being of this and future generations.

### **What are the main types of air pollution that affect people's health, where do they come from, what is that health impact, and who is most likely to suffer the effects?**

Birmingham city council has recognised the need to reduce carbon emissions from burning of fossil fuels by 60% by 2026. Combustion produces CO<sub>2</sub>, but at the same time nitrogen oxides and particulates (fine smoke). Nitrogen dioxide has 300 times the greenhouse gas effect of CO<sub>2</sub>, and particulates hold heat, so they add to warming. The same pollutants are directly damaging to people's lungs. Therefore measures for a Clean Air City should be complementary to those already identified in Birmingham's Carbon Roadmap<sup>1</sup>, and the Low Carbon Transport Strategy<sup>2</sup>, having the same aims and requiring the same actions. We urge the city council to do more than the bare minimum needed to comply with legislation on air quality, but rather to take the opportunity to clean up the city's energy, waste and transport systems.

### **Health effects**

Many places in Birmingham regularly exceed EU and WHO safe limits for NO<sub>x</sub> and particulates. The effects of these pollution on human health have recently been set out in NICE guidelines<sup>3</sup>. People suffer every day from asthma, heart disease and lung disease aggravated by air pollution causing breathing difficulties, disability and even premature death. This health burden is very inequitably distributed, since the most vulnerable will be children, elderly people and those in poor health - who are the least likely to drive and pollute. Deprived inner city areas receive the highest levels of air pollution, much of it from cars driven by commuters from outside the city boundaries.

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<sup>1</sup> Carbon Roadmap, Birmingham Green Commission 2013

<sup>2</sup> Birmingham Low Carbon Transport Strategy, 2012

<sup>3</sup> "Air pollution: outdoor air quality and health" NICE guideline 3 December 2016

## **Static plant emissions to air**

Large static combustion plants produce a background level of polluted air in the city. They tend to be concentrated in inner areas. Considered separately, they may not exceed permitted limits, but together they produce an unacceptable level of pollution. The proposed Clean Air Zone should include the larger combustion plants. It would be inequitable to levy a charge on the owners of single vehicles, but to exempt the owners of large combustion plants.

Buildings produce air pollution, especially if biomass is burned for heating. This is claimed to displace fossil fuels, but the smoke particles released from biomass hold heat and warm the air. They also may create a localised problem for human health, which is why the city council adopted a Biomass Policy in 2013 that required emissions to be identified and controlled. These plants should be included in the proposed Clean Air Zone.

Incineration of refuse does not “dispose” of it, rather it becomes air pollution, which we all breathe. The largest incinerator in Birmingham is the plant owned by Veolia plc, to which 100,000s tonnes a year of council collected refuse is delivered for burning. It is not surprisingly the largest source of CO<sub>2</sub> emissions in Birmingham - 323,000 tonnes a year<sup>4</sup>. Its other by-products released to air are in proportion; they include nitrogen oxides and particulates. We have calculated its NO<sub>2</sub> output compared to a car and find that it is equivalent to 1,300 extra cars taking to the streets, whenever it operates<sup>5</sup>. Other emissions reported to the Environment Agency from the plant are particulates, hydrogen chloride and fluoride, also metallic compounds, all substances injurious to human health<sup>6</sup>. We emphasise that rubbish is not a fuel, so its composition and the chemical by products from its combustion are unpredictable. The average figures that Veolia report may conceal spikes when the plant starts up. Even if emissions from the plant are within permitted limits this does not mean that they are healthy, and they are additional to all the other sources of air pollution. This plant is due to become the city council’s property in 2019, so its emissions to air should be looked at critically before committing to its future operation. The new Waste Strategy should take into account the council’s responsibility for air quality and conform to the Clean Air Zone.

## **Traffic emissions to air**

Road traffic in Birmingham adds corridors of polluted air to the background level; the greater the traffic flow, the greater the exceedance of EU limits for NO<sub>2</sub>. The problem in the West Midlands has been comprehensively mapped and described in a recent report to DEFRA<sup>7</sup>. BFOE has itself measured unsafe levels using cheap diffusion tubes

The most polluted roads are those with highest traffic levels and those enclosed by concrete walls, especially the A38 in tunnels under the city centre. Drivers themselves suffer the worst effects, since they are enclosed and draw air at the level of exhaust pipes, so get 21% more exposure than pedestrians or cyclists according to research by Kings College, London<sup>8</sup>. Measures to reduce vehicle

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<sup>4</sup> Freedom of information request by BFOE to Environment Agency, 2013 figures

<sup>5</sup> Tyseley plant NO<sub>x</sub> 312 t/yr 2012/ diesel car E6 NO<sub>x</sub> 0.08 g/km X average car commuting 2900 km pa = 1,345

<sup>6</sup> Environment Agency Air Pollution map <http://apps.environment-agency.gov.uk/wiyby/>

<sup>7</sup> “Air Quality Plan for the achievement of EU air quality limit value for nitrogen dioxide (NO<sub>2</sub>) in West Midlands Urban Area” DEFRA 2015

<sup>8</sup> <http://www.airqualitynews.com/2016/02/16/higher-air-pollution-health-risk-inside-car-study-finds>

pollution in a Clean Air Zone would therefore benefit the occupants of cars, buses and taxis, even more than other city residents.

We suggest learning from the report from Transport for London "Improving the health of Londoners Transport Action Plan"<sup>9</sup>

**Birmingham has been ordered by the Government to impose charges in 'clean air zones' to cut pollution. What types of vehicle, driving mode, location and fuel system most contribute to the health impacts of road traffic?**

Friends of the Earth campaigns to phase out diesel vehicles in the UK, since they produce 5 times the nitrogen oxide of petrol equivalents and cannot be made low emission. A Clean Air Zone in Birmingham must send a clear signal to vehicle owners and manufacturers that diesels are being discouraged and are to be phased out, so everyone can plan forward on this basis.

The internal combustion engine is abused by stop-start patterns of driving. Pollution is at its worst when vehicles are waiting at red lights, so the NICE guidelines recommend reducing delays and idling engines. We note that Coventry has recently taken out most of the red lights in its city centre and traffic is flowing more smoothly, while London is also removing many traffic lights. The new 20mph zones in Birmingham should be reviewed to take out unnecessary light controls.

We draw attention to research for DEFRA showing that most of the particulates do not come from car engines, but from the friction of tyres, brakes and the road<sup>10</sup>. This means that replacing every diesel vehicle with an electric one would not solve the problem, only less traffic overall will achieve clean air.

**And what would be the most effective ways of implementing and operating a 'clean air zone' so as to minimise these burdens?**

The clean air zone should include all polluting vehicles, but also large combustion plants, such as waste incinerators and biomass heating, as proposed above.

The problem of traffic emissions results from Birmingham's exceptional dependence on the private car, as recognised in the "Birmingham Connected" strategy. The council should therefore halt all changes to streets such as road widening and Red Routes that increase traffic flows and make it more convenient to drive. These schemes only encourage more driving, so are counter-productive. There should also be a freeze on parking provision in central Birmingham, with park and ride being provided instead at the city limits.

Birmingham City Council owns or leases a large fleet of vehicles, and we expect to see it show leadership by planning for a rapid phase out of its own diesels. Other public bodies should be asked to explain how they will change their fleets to low emission.

It would be inequitable to charge some vehicles and owners, but not others. The justification for charging would be the pollution caused, therefore any charge should be proportional to the emissions the vehicle produces.

It is essential that any charges on polluting vehicles operate in a way that reduces overall traffic flows and change the city's transport mix away from the private car. It would be counterproductive to levy charges on buses and taxis,

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<sup>9</sup> Improving the health of Londoners Transport action plan, TFL

<sup>10</sup> "Sources of particles in the UK" ,DEFRA <https://uk-air.defra.gov.uk/>

but not private cars, since this is likely to be passed on in higher fares and could make people more likely to drive a car into the city. We do not see any reason to charge buses and taxis, when the council has the power to phase out polluting ones through the licensing system.

Any charges that are collected should be ring fenced and spent only on high profile schemes which offer cost effective alternatives to the private car. We suggest some, as follows.

Reallocating road space from the car is required to allow convenient and attractive journeys by tram, bus, taxi and bicycle. If the council will not charge cars for using road space, then it must be rationed and reallocated. There should be plans to reduce the number of lanes of traffic in the city centre and to widen footways, cycle ways and busways. Coventry city centre is a recent case where this has been done. In Birmingham's 20 mph zones, the traffic should require less road space since vehicles travel closer together, hence roadways can be narrowed to allow for alternatives to the car.

An important part of the solution is the promotion of active travel. Birmingham has a public health crisis from lack of physical activity that results from overuse of the private car for the 25% of car journeys that are under two miles. Better cycling and walking infrastructure would lower pollution and also make the city more attractive to businesses. People's mental health also shows improvement when they interact with nature.

BFOE's Let's Get Moving petition has called for £10 per person per year to be spent on cycling provision. Lines of back streets at 20mph could be made "no through road except cyclists" which would prevent cars from "rat running" through residential areas. Birmingham should have a cycle hire scheme like London, Paris and most other European cities.

We support plans to remodel and reduce traffic through Digbeth, which is no longer an A road but remains a pollution hotspot, especially around the Coach Station.

The A38 tunnels through the city centre are highly polluted, but offer an opportunity to use them for clean public transport, as suggested in the "Birmingham Connected" strategy. The Heartlands Parkway A47 has spare capacity, and could accommodate a busway.

Car clubs in many cities allow 12 or more people to use each car and members have much lower levels of driving, so Birmingham council should allocate free spaces for car club vehicles.

Electric vehicle charging points should be an early priority and locations for them found, if people are expected to run electric cars and vans.

'Birmingham Sprint' bus rapid transit would cost just one tenth per mile compared to Midland Metro for on-street running in Birmingham, we understand. Clean, fast buses seem to be the readiest way to save the city from over-use of the private car.

The existing number of buses could be reduced by an inter-operable smart ticketing system. The City of Oxford's Smartzone has resulted in fewer buses and a growth in bus use, with very substantial savings in emissions<sup>11</sup>. Future

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<sup>11</sup> Oxford Smartzone <https://city.oxfordbus.co.uk/smartzone>



buses should be low emission and the new Mayor for the West Midlands could insist on this.

The South Birmingham rail line through Kings Heath is maintained to passenger standard, but it has no stations. One million car journeys every year take place that would be displaced if stations were reopened along this line, according to the original Centro feasibility study, so it should be a high priority. The level of pollution on Kings Heath High Street is unacceptable.

The level of pollution in New Street station is unhealthy and unacceptable and creates the wrong impression of public transport. The station's policy that drivers should switch off their engines when stationary is not being enforced. Diesel trains such as Cross Country's Voyagers should be charged or banned in future, to push forward the move to low emission alternatives.

**What are the potential barriers to clean air zones being implemented widely in the city?**

There is a danger that a charging zone is confined to the city centre, so causing a diversion of traffic, relocating the problem with informal 'ring roads' developing to bypass the zone. Therefore a city-wide approach to clean air is necessary.

If more drivers try to 'park and ride' at the city boundaries, then parking spaces will have to be provided there.

It could be that only low income households and self-employed people actually pay the charge, since they cannot afford to purchase a new car or van. The timescale should be such that people can actually purchase a low emission vehicle if that is the aim. A carefully-designed scrappage scheme is essential, to encourage people to exchange their old diesels and to ensure they stay off the road.

**Are there other measures which can be taken such as for example the planting of urban trees to absorb airborne pollutants and improve air quality and are there any plans in relation to these?**

Appropriate street trees can absorb air pollution and they should be maintained, replaced and increased. The NICE report says that street trees can prevent winds blowing the pollution away, but in fact there is no "away" and trees actually provide air conditioning. Trees give shade and transpiration that help to prevent the overheating of the city in summer and extreme events such as the 2006 Birmingham tornado which cost millions in damage. With climate warming this will be more important in future. Trees also help to slow rain runoff and so prevent expensive flooding incidents.

We welcome the efforts of Trees for Life in their partnership with the council, but would like their remit extended from parks to any suitable site for trees.

There should be more publicity about tree preservation and the benefits of trees in the city.





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## **The impact of poor air quality on health in Birmingham**

### **1. Introduction**

The particular point in the Scrutiny framework that Birmingham Trees for Life are addressing in this paper is the following:

- Are there other measures which can be taken, such as for example the planting of urban trees, to absorb airborne pollutants and improve air quality, and are there any plans in relation to these?

### **2. Background**

We know that Birmingham is suffering from above average levels of Nitrogen dioxide and other pollutants, and as a result there are areas of the city which have particularly poor air quality. We know that this has a negative impact on public health for both citizens, and unborn children and their development and future health.

There is a considerable wealth of evidence from studies around the world that proves that tree leaves can filter out particulate matter and many other pollutants from the atmosphere. Similarly, other scientific studies show that the shade cast by trees, in addition to the transpiration of water during photosynthesis, can help to reduce air temperatures.

Research has shown that tree planting is a valuable part of the overall strategy to alleviate air pollution in cities – it is a very cost effective and controllable element of the package of measures that can be taken. **Retention of mature trees is also crucial to the ability of the tree canopy to contribute to this. The continuing removal of healthy mature trees and replacement with young trees reduces the ability of the overall tree canopy to trap particulates and absorb NO<sup>2</sup>.**

However, the effects of trees and green infrastructure go far beyond the impact on air pollution, with much wider health and wellbeing benefits. Extensive research has been completed over several decades, around the world, and much of it gathered together by **Dr. Kathleen L. Wolf** of Washington University and summarised in her paper **Green Cities: Good Health** – referenced on the website: <http://depts.washington.edu/hhwb/>

Trees are part of the wider urban nature network, termed by Dr. Wolf 'Metro nature', which includes naturalistic areas, such as urban forests, greenbelts, conserved open spaces, and riparian (river) corridors. 'Metro nature' also includes culturally constructed nature such as parks, streetscapes, community gardens, pocket parks, and recreation paths; it also includes functional spaces that are integrated within built form to provide specific services or functions, such as green roofs, green walls, or other green infrastructure facilities which can be used where tree planting is not practicable. Last, but not least, urban gardens provide a vast network of greenery, including trees and shrubs, which form a vital part of urban green networks in our Cities.

There is also a considerable wealth of evidence for the beneficial effects of nature on general health and well-being referenced here: <http://nhsforest.org/evidence>

**President: The Lord Mayor of Birmingham**

**Vice Presidents: The Bishop of Birmingham, Sir Frederick Crawford DL, Lord Jones of Birmingham, The Rt Hon the Lord Rooker, Bruce**

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### 3. Key Health Benefits of Trees and 'Metro Nature'

Trees and woodland have a measureable impact on air quality, in particular by absorbing pollutants such as sulphur dioxide and ozone, intercepting harmful particulates from smoke, pollen and dust, and releasing oxygen through photosynthesis, thus reducing the incidence of diseases exacerbated by air borne pollutants. The negative effects of air pollutants are proportionately greater in urban areas, where trees are close to sources of pollution and nearer to people who might be affected – yet tree cover in urban areas is under threat.

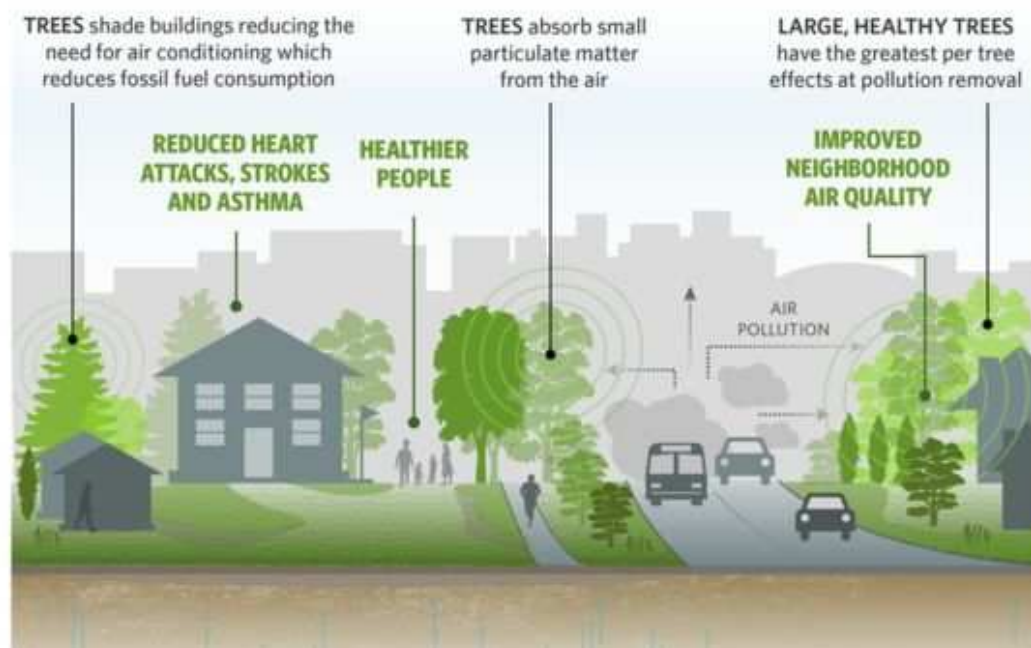
The UK already has one of the world's highest rates of childhood asthma, with about 15 per cent of children affected. The predicted rise in air pollution will increase attributable deaths and hospital admissions, with as many as 1,500 additional deaths and hospital admissions each year (*'Future health - Sustainable places for health and well-being'*, CABA 2009).

**A study by Lancaster University estimated that doubling the tree cover in the West Midlands alone would reduce mortality as a result of poor air quality from particulates by 140 people per year.**

**Other key findings on the connection between 'Metro nature' and health include:**

- Public housing residents with nearby trees and grass were more effective in coping with major life issues compared to those with homes surrounded by concrete.<sup>35</sup>
- Exposure to nearby green space and trees may have a positive effect on infant birth weight,<sup>47</sup> particularly for lower socioeconomic groups.<sup>48</sup>
- Studies in Japan of *Shinrin-yoku*, or forest walking, have found effects of improved immune system response, lowered stress indicators, reduced depression, and lower glucose levels in diabetics.<sup>19,83</sup>
- The character of a neighbourhood has a significant effect on residents' physical activity. People in communities with abundant green space generally enjoy better health.<sup>8</sup>
- People who use parks and open spaces are three times more likely to achieve recommended levels of physical activity than non-users.<sup>12</sup> People prefer nearby, attractive, and larger parks and open spaces for their activity.
- Physical activity has been linked to improvements in mental health and stress; many studies connect urban park use to decreased stress levels and improved moods. More than 100 studies have shown that relaxation and stress reduction are significant benefits associated with spending time in green areas.

(<http://depts.washington.edu/hhwb/>)



#### 4. How trees help to alleviate air pollution

**Planting trees is a cost-effective way to tackle urban air pollution:** A study by US-based The Nature Conservancy (TNC) reported that the average reduction of particulate matter near a tree was between 7% and 24%. (<http://www.bbc.co.uk/news/science-environment-37813709>)

The report concluded that city trees provide a lot of benefits to people living in urban areas. "The average reduction of particulate matter near a tree is between 7-24%, while the cooling effect is up to 2°C (3.6°F)." The study of the use of trees in 245 cities around the world compared the cost-effectiveness of trees with other methods of cooling and cleaning air. "On that front, trees are cost competitive with other options". **However, the TNC report highlighted that most of the cities featured in the study were losing more trees than they were gaining.**

On average, one acre of new forest can sequester about 2.5 tons of carbon annually. Young trees absorb CO<sup>2</sup> at a rate of 13 pounds per tree each year. Trees reach their most productive stage of **carbon storage** at about 10 years at which point they are estimated to absorb 48 pounds of CO<sup>2</sup> per year. At that rate, they release enough oxygen back into the atmosphere to support two human beings. (<http://urbanforestrynetwork.org/benefits/air%20quality.htm>)

Although trees have long been part of urban life, either by design or consumed by expanding urban areas, they had been sidelined in the second half of the 20th Century. In a 2014 report, the London i-Tree Eco Urban Forest Survey, following what was described as the "largest city tree survey of its kind", it was calculated that London's trees provided "**at least £133 million of benefits every year** in terms of air pollution removal, carbon sequestration and reducing the amount of water going into drains". This report quantified the benefits of ecosystem services provided by London's urban forests (including removal of air pollution) at £6 billion, highlighting the economic as well as health and environmental benefits of planting more trees in cities. (<http://www.forestry.gov.uk/pdf/LONDONI-TREEECOSUMMARY160331.pdf/%24FILE/LONDONI-TREEECOSUMMARY160331.pdf>)

Researchers from Lancaster University placed a screen of 30 trees in planters in front of houses and then looked at the effect on the concentrations of fine-particulate air pollutants inside the homes. They reported that, compared to houses without the trees, the screened houses showed only half the indoor concentrations of particulate matter, ranging in size from 1 to 10 micrometers (PM<sub>1</sub>, PM<sub>2.5</sub>, and PM<sub>10</sub>). Analysis of the trees' leaves showed that the surfaces of their leaves were trapping particles similar to those found inside the houses. (<https://www.accessscience.com/content/urban-tree-leaves-remove-fine-particulate-air-pollution/BR0116141>) (<http://pubs.acs.org/doi/abs/10.1021/es404363m>)

It must be noted that there have been findings that indicate that trees can also have an adverse effect on air quality through the emission of volatile organic compounds (VOCs), which can increase ozone. However, because VOC emissions are temperature dependent and trees generally lower air temperatures, increased tree cover can often lower overall VOC emissions and, consequently, ozone levels in urban areas. VOC emission rates vary by species, and careful selection of tree species, coupled with appropriate design of planting schemes, would ameliorate any potential adverse effects on ozone. (<http://laqm.defra.gov.uk/laqm-faqs/faq105.html>)

**With so many benefits to people and the environment, trees are a cost-effective natural resource that should be a key focus of all investment and development opportunities in major cities. While trees should not replace other strategies to make air healthier, they can be used as part of a suite of interventions that aims to control particulate matter pollution, as well as mitigate against rising temperatures in cities. In designing tree planting schemes, some key principles should be incorporated into a city's planting plan, from choosing suitable tree species, to careful selection of the spaces to be planted, and the density and placement of the trees.**

## 5. Summary of the benefits of urban trees

- Trees are the lungs of our planet. They soak up carbon dioxide from the atmosphere, acting as carbon sinks and using photosynthesis to convert the gas into oxygen.
- Certain trees are very adept at absorbing and storing harmful pollutants and degrading them into less harmful forms, relieving the negative effects of global warming.

Other benefits include: (<http://www.civictrees.co.uk/our-top-10-benefits-of-trees/>)

- Trees can act as effective sound barriers, reducing noise pollution.
- Trees also help to prevent flooding and flood damage.
- Trees provide a solution for managing soil erosion.
- Trees provide shade and much-needed cooling in urban environments.
- Trees can increase the value of both residential and commercial property and produce increased spending in retail areas.
- Trees and green spaces can have an impact on behaviour, reducing anti-social behaviour.
- Getting close to nature is considered one of the best ways of improving overall health and wellbeing – both mental and physical.
- Trees, particularly mature specimens, are a vital source of food and shelter for all kinds of wildlife, promoting biodiversity and boosting the local ecosystem.

Dr. Rob MacKenzie of Birmingham University says: *'Asking whether cities should have trees in it is a bit like asking whether a suit should have a person in it. There is every chance that urban trees could provide a "nature-based solution" to several pressing problems with the urban environment, but perhaps not in the way scientists and policy-makers seem currently to be thinking. Rather than providing a technical fix that disguises our obsession with the diminishing returns of the internal combustion engine, increasing urban tree numbers could change our entire perspective on cities, facilitating the creation of liveable cities that value nature as an integral part of social, economic and environmental capital.'*

(<https://theconversation.com/do-trees-really-help-clear-the-air-in-our-cities-48202>)

## 6. So, what about Birmingham?

It has recently been calculated that Birmingham only has 18% tree canopy cover, compared to an average of 25-30% in other European cities. We have felled thousands of mature trees from Birmingham's streets, parks and open spaces, and more trees will continue to be lost to disease and old age. In recent years, the city centre, which, it could be argued, has the greatest need for more trees, has suffered a huge loss of mature trees due to development.

Since 2006, Birmingham Trees for Life (BTFL) has planted almost 60,000 trees in parks and open spaces. However BTFL has no jurisdiction over street trees, which includes almost all of those in the key city centre areas suffering from poor air quality and adverse heat island effects. Outside the PFI contract, there is no dedicated tree planting budget - tree planting is funded through planning agreements, and by BTFL which raises money through outside grants.

## 7. Recommendations:

- The Council needs to create a robust and enforceable planning framework to protect existing trees and ensure adequate, sustainable tree planting becomes "the norm" in all future new developments.
- Transport and Highway infrastructure schemes, which are currently exempt from many environmental and planning regulations, must be made to respect and protect existing mature trees, and pursue design solutions to retain and protect them. Indeed, such schemes offer a unique opportunity to create enhanced green corridors for the future with the right kind of "visionary planning and design".
- The Council needs to establish a "ring fenced" tree planting and maintenance budget for all City Council owned land, with consideration being given to innovative funding sources such as "Tree Bonds" secured through major new developments.
- Adopt the premise that all Birmingham trees are considered part of the '**urban forest**', where the aim is to increase the tree canopy cover to 25% during the life of the current Birmingham Development Plan to 2032.

# **The impact of poor air quality on health in Birmingham**

**Evidence from  
Birmingham Children's Hospital NHS Foundation Trust**



## **1. About Birmingham Children's Hospital**

- 1.01 Birmingham Children's Hospital NHS Foundation Trust is an internationally recognised hospital delivering care to children and young people from Birmingham, the West Midlands and across the UK. It has contact with approximately 1 in 8 of the children resident in Birmingham in any given year. The hospital also provides an integrated 0-25 mental health service in partnership with other organisations across Birmingham. The Trust is also in the process of acquiring Birmingham Women's NHS Foundation Trust to form the NHS's first foundation trust dedicated to integrated family care.
- 1.02 The majority of services are delivered from a major hospital facility on Steelhouse Lane in Birmingham City Centre, built up from an original victorian hospital building. This is a constrained site on the edge of the Colmore Business District, bounded by the A38 and Lawley Middleway
- 1.03 Given its identifiable role as a leading children's hospital, the trust is often named in media reporting as a site affected by adverse air quality. Although these readings are taken away from the entrance to the hospital, they obviously cause concern and distress to visitors.

## **2. The impact of air quality on the health of children in Birmingham**

- 2.01 In addition to the evidence on the health effects of air quality in adults, there is a growing body of literature that indicates there should be concern about the impact of air quality on the health of Birmingham's children.
- 2.02 Given the evidence around adult harm is well summarised, and will be submitted from other sources, this submission focuses on harm in children, and learning from the Trust's recent smokefree zone consultation.

### **Birth outcomes**

- 2.03 Several studies have examined potential ways that air pollutants can have an impact on birth outcomes. One review encompassed forty one studies that used a range of measures such as birth certificates, health records and questionnaires and have also studied different major pollutants. The best evidence was the increased exposures to SO<sub>2</sub> during pregnancy made pre-term births more likely, and that increased exposure to PM<sub>2.5</sub> during pregnancy made low birth weight births more likely.<sup>1</sup>
- 2.04 Children who are low birth weight are more likely to have poorer growth in childhood. The impact of this is a higher incidence of adult diseases, such as type 2 diabetes, hypertension and circulatory disease.

### **Congenital anomalies**

- 2.05 Air pollution may contribute towards congenital anomalies. In particular both NO<sub>2</sub> and SO<sub>2</sub> were related to increased numbers of children born with coarctation of the aorta, and tetralogy of Fallot, both significant defects in the structural arrangement of the newborn heart. The increased risk from NO<sub>2</sub> was the larger of the two influences with an



increase in 10ppb increasing the likelihood by around 20%. Other relationships were found between O<sub>3</sub> exposure and cleft lip, and PM<sub>10</sub> and atrial-septal heart defects.<sup>2</sup>

### Infant mortality

- 2.05 Long term exposure to particulate matter has been linked with overall child mortality. A large study in California found that every 10µg/m<sup>3</sup> increased exposure to PM<sub>10</sub> increased the risk of death by 5% between the first month and first year of life. A larger proportion of the increased risk was due to Sudden Infant Death Syndrome (SIDS) and respiratory causes of death.<sup>3</sup>
- 2.06 The relationship between particulate matter and infant mortality has been confirmed by a number of studies identified in a systematic review. The increased risk was found for post-neonatal infant deaths (between one month and one year of life) and for deaths from SIDS.<sup>4</sup>
- 2.07 Other reviews have indicated that short and long term exposures to CO and NO<sub>2</sub> increases the risk of SIDS.<sup>5</sup>

### Asthma

- 2.08 COMEAP has previously issued two statements on the relationship between air pollution and the exacerbation of asthma symptoms in those, initially in 1995 and updated in 2010. In both statements the Committee agreed that the evidence supported the view that ambient air pollution causes irritation and inflammatory responses of the airways and exacerbates symptoms.<sup>6</sup>
- 2.09 There is some evidence from a systematic review that short term exposure to air pollutants increases the number of visits to emergency departments and admissions to hospital. Whilst this relationship was true amongst patients of all ages the effect was stronger in children.<sup>7</sup>
- 2.10 COMEAP concluded in 2010 that the evidence is consistent with the possibility that outdoor air pollution might play a role in causing asthma amongst susceptible individuals.<sup>6</sup>
- 2.11 COMEAP used a variety of evidence to arrive at that statement, which at times was apparently contradictory or found no association. Taken overall the evidence was of a consistent but modest relationship between air quality and the proportion of children with asthma (prevalence). There was a stronger weight of evidence that asthma was more common children who lived in proximity to roads, especially those carrying heavy goods traffic, and that a characteristic of these traffic emissions may be responsible for a relationship. Another explanation would be that air quality is more likely to cause asthma in individuals already susceptible.<sup>8</sup>
- 2.12 More recent systematic reviews of studies that followed children from birth have restated the relationship between childhood exposure to traffic-related air pollution and subsequent risk of developing asthma. The relationship was particularly strong amongst children with increased exposure to PM<sub>2.5</sub> and black carbon.<sup>9</sup>

- 2.13 A second recent systematic review included a wider range of studies that related childhood asthma to long-term traffic-related air pollution. It included studies that looked at the effects of older children, not just from birth. It identified forty two studies and a large subset of these was able to be included in a pooled estimate to identify the most likely relationship between different pollutants and asthma diagnoses.<sup>10</sup> The most likely risk of developing asthma for traffic related air pollutants are set out in table 1.

Pollutant	Incremental increase	Increased risk of developing asthma
Black Carbon	$0.5 \times 10^{-5} \text{ m}^{-1}$	8%
NO <sub>2</sub>	4µg/m <sup>3</sup>	5%
PM <sub>2.5</sub>	1µg/m <sup>3</sup>	3%
PM <sub>10</sub>	1µg/m <sup>3</sup>	5%

*Table 1. The relationship between air quality and risk of developing asthma.*

## Childhood Leukaemia

- 2.14 Exposure to residential traffic after birth increases the risk of childhood leukaemia. A systematic review encompassed both European and American studies and a range of methods to examine exposure to traffic during childhood, although predominantly based around home address. Studies typically included onset of leukaemia in under-14 year olds. There was no increased leukaemia risk from prenatal exposure.<sup>11</sup>
- 2.15 Benzene is often cited as the most likely traffic pollutant that influences the risk of childhood leukaemia,<sup>11</sup> although more recent studies have also found associations between childhood leukaemia and 1,3-butadiene.<sup>12</sup>

## Middle ear infection

- 2.16 Some studies have identified a link between childhood middle ear infection, diagnosed in outpatient visits, and several markers of traffic related air pollution such as PM<sub>2.5</sub>, NO and SO. Wood smoke was also significantly related to middle ear infection.<sup>13</sup>

### 3. Smoke free zone

- 3.01 In many countries, smoke-free zones are adopted around public buildings.<sup>14</sup> In the UK, voluntary smokefree zones have been used in public spaces and play areas to protect children from smoke.
- 3.02 The Trust routinely receives feedback from the family members of patients about people smoking outside of the hospital. This is a poor patient and family experience for who visit and causes anxiety for parents and children who have to walk past people smoking on their way to hospital appointments and visits.
- 3.03 A way to address the feedback would be to create a smoke-free zone around the hospital boundaries. The zone BCH proposed would encompass the sides of the hospital that patients typically approach from, and would cover all of the entrances from the Emergency Department on Steelhouse Lane to the entrance for the new clinical building
- 3.04 After initial discussions with Birmingham City Council, an eight week on-line consultation was carried out by Birmingham Children's Hospital to understand how strongly people felt about the hospital pursuing establishment of the zone. The consultation ran from the 3<sup>rd</sup> August until the 28<sup>th</sup> September 2016
- 3.05 The consultation questionnaire was well responded to with over 1,100 people completing it.
- 3.06 The majority of people who responded supported action to stop people from smoking outside of the hospital and agreed that a smoke-free zone was the right way to do this. Support was very strong amongst staff, and also family members of patients. Many family members shared experiences of walking past people smoking with their children to illustrate their concerns.
- 3.07 The majority of the respondents who were strongly against the proposal indicated that they did not frequently walk through the proposed zone. Over half of respondents against the zone both did not live in Birmingham and did not walk through the proposed zone.
- 3.08 In order to inform people that they were in a smoke free zone, respondents almost wholly agreed that signs were required.
- 3.09 There is no consistent evidence base around harm from outdoor environmental tobacco smoke inhaled by passing bystanders. The Trust's primary motivation for pursuing the zone is the experience and reaction of children, young people and families. Smoking is perceived as a harmful behaviour, and people expect to be able to arrive at an NHS site without walking through exhaled tobacco smoke.
- 3.10 To support families who already smoke, the Trust requires that Local Authority and NHS commissioners provide effective, responsive and accessible stop smoking services for them to refer people who smoke to.

- 3.11 The consultation demonstrated that people are very willing to be engaged on this topic, pragmatic in their consideration of the issues, and recognise not only harm, but also the experience of the environment as important factors in their decision making.

## Contact Details

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## Glossary

- 5.01 CO – Carbon Monoxide, a poisonous gas often produced through incomplete combustion
- 5.02 COMEAP – Committee on the Medical Effects of Air Pollutants, a government committee advising on health effects
- 5.03 Hypertension – Raised Blood Pressure that can contribute to a range of serious medical conditions including heart attack, and stroke
- 5.04 NO<sub>x</sub> – A group of mono-nitrogen oxide gases, produced during combustion.
- 5.04 PM<sub>2.5/10</sub> – Measures of fine particulate matter in the air
- 5.05 SIDS – Sudden Infant Death Syndrome, a more appropriate and descriptive term that has replaced the colloquialism of 'cot death'
- 5.06 SO<sub>2</sub> – Sulphur Dioxide, a harmful gas that reacts to produce other compounds including sulphuric acid. The majority of SO<sub>2</sub> originates from human sources

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