# H&F Air Quality Commission

# Submissions of Written Evidence

# Volume 2

## Responses:

**Centre for Environmental Policy**

**Faculty of Life Sciences**

**South Kensington Campus**

**Imperial College London**

**London SW7 2AZ**

**Tel 0207 594 9292**
**Email** h.apsimon@imperial.ac.uk

**To Rosemary Pettit,**

**Hammersmith and Fulham Air Quality Commission**

I appreciate your concerns about air pollution in your Borough, and your invitation to submit evidence. You will have the detailed knowledge to introduce local measures where possible. However a large contribution comes from traffic where my interest is in improving emissions from vehicles. In particular with a PhD student we have been investigating real world measurements of Euro 6 diesel vehicles, made with PEMS by Emissions Analytics. These illustrate the very wide variability in emissions between different manufacturers and technologies: in the case of Euro 6 diesel NOx emissions, ranging from conformity with Euro 6 standards to 15 times the standards, as well as high proportions of primary $NO_2$. In view of the prolonged process to develop more robust testing and stricter limits by the EC I am hoping that by making available results of independent testing of real world emissions using PEMS, this will help the public to make cleaner choices in the vehicles they purchase and use, Accordingly I am participating in development of an accreditation scheme being established by Emissions Analytics to rank different models of petrol and diesel cars from a wide range of manufacturers. I hope the first data sets will be available shortly, to be expanded over time as more vehicles are tested. I attach a copy of the press release about this scheme for your information, and hope this is helpful.

Yours sincerely

Helen ApSimon

(Professor of Air Pollution)

EMBARGOED: 00:01 SUNDAY 29 NOVEMBER 2015

EMBARGOED: New vehicle $NO_x$ rating scheme to clear air quality confusion

A new initiative has been announced by Emissions Analytics to help consumers, policy makers and vehicle manufacturers better understand the real-world emissions of nitrogen oxides ($NO_x$) from new cars. It will launch in early 2016, after fully considering input from its advisory board.

The $NO_x$ accreditation initiative will help buyers clearly identify the cars emitting the lowest quantities of harmful pollutants, allow manufacturers to demonstrate their vehicles' clean credentials, and provide data to policymakers on progress in the drive to improve air quality. Working across the European Union, the scheme will measure the $NO_x$ performance of passenger cars in real-world driving conditions.

The accreditation scheme is intended to complement the forthcoming Real Driving Emissions regulations for new vehicle certification. It will help ensure that vehicles remain compliant when driven normally on roads, and thereby contribute towards real air quality improvements. Furthermore, it will give consumers a rating that allows the comparison of the relative performance of different cars.

Building on its emissions testing of more than 1000 vehicles over the last four years, Emissions Analytics is ideally positioned to launch the rating scheme. It comes at a time when there is increasing focus on emissions and air quality, following vehicle certification irregularities and legal actions against European countries for air quality violations in cities. The importance of these issues is borne out in the recent consultation by the Department for Environment Food & Rural Affairs (DEFRA) and the plans for local clean air zones in the UK.

To ensure the most effective and robust system, Emissions Analytics has brought together a group of experts to provide advice and guidance, review the test and rating methodology, monitor the regulatory context, and provide input into the wider development of the scheme. This group of leading academic and industry figures includes:

Professor Helen ApSimon – Air Pollution Studies, Imperial College London, UK

Dr Adam Boeis – Department of Engineering, Cambridge University, UK

John German – Senior Fellow, International Council on Clean Transportation, USA

Dr Marc Stettler – Centre for Transport Studies, Imperial College London, UK

Professor Martin Williams – Air Quality Scientist, King's College London, UK

The ratings will be published and publically available for all, including manufacturers, consumers, local and national governments, and fleet operators.

Emissions Analytics sees this rating scheme as a positive contribution to the industry, shaken by recent scandals, and looks forward to working with a wide range of organisations as it launches.

Notes to Editors

## About the $NO_x$ accreditation initiative

Emissions Analytics' $NO_x$ accreditation initiative for the European Union is designed to evaluate the performance of individual passenger cars in terms of tailpipe nitrogen oxide ($NO_x$) emissions under real-world driving conditions. The scheme will assess cars using objective performance criteria, recognising the best performers in emission levels through the ratings awarded.

The rating scheme will be separate from and independent of vehicle manufacturers' certification tests. The results will be publicly available, with the aim of influencing policy development and implementation, allowing consumers to make informed purchase decisions and demonstrating the improvements that vehicle manufacturers are making to bring about improvements in air quality.

It is owned, funded and operated by Emissions Analytics, which will retain all rights associated with the results and ratings.

The rating scheme will formally launch in early 2016, with the publication of the first test results, covering vehicles launched in the previous year. Details of how the scheme will rate vehicles, and the wider process, will be published concurrently.

## About Emissions Analytics

Emissions Analytics is a specialist in real-world, on-road vehicle emissions measurement and analysis, covering the European Union and the United States. It offers subscription access to its database of test results, as well as bespoke services for product development and evaluation. Its capabilities cover the measurement of regulated pollutants, including CO, $CO_2$, NO, $NO_2$, $NO_x$, total hydrocarbons and particulate matter, using officially certified Portable Emissions Measurement Systems (PEMS).

Operating since 2011, it has carried out PEMS tests on more than 1000 model variants of passenger cars in addition to testing heavy goods vehicles, tractors, taxis, vans and buses. It pioneered the process of showing real-world emissions performance across a wide cross-section of vehicles, to demonstrate differences between laboratory certification tests and typical in-use performance.

Emissions Analytics has launched fuel economy services in the UK with *What Car?* (True MPG) and in the USA with *Motor Trend* (Real MPG) to provide consumers with an easy and reliable way to compare real-world fuel economy between cars.

Emissions Analytics works with a wide range of commercial, academic and research organisations to assist in product development, evaluating policy and transport planning.

For more information please contact:

Matt Sanger (Torque): 020 7952 1079, msanger@torqueagencygroup.com.

Alex Michaelides (Torque): 020 7952 1078, amichaelides@torqueagencygroup.com

---

Hi Peter,

I noticed the appeal for cases on air pollution.

Last summer I ditched the car and started cycling to work and walking to my daughters school with her in the morning, her school is near Parsons Green.

The route is along the North End Road and takes in the junction with Lillie Road and those two odd mini roundabouts they have there.

Since December I've noticed the pollution so much more at that particular spot, and also along the whole of the North End Road towards Fulham broadway.

My fear is my daughter breathing in all of this pollution – This in my view definitely needs to be monitored. It will only get worse with the number of tipper lorries travelling between the Earls Court development once the next phase of works knocking down the West Ken estate commences.

Are they're air monitors along this route at present? Would be interesting to know what levels are actually like there.

I' m not normally the type to respond to matters like this but the noticeable poor air quality makes me think of all the other kids and parents breathing in all this pollutant.

Hope this helps.

Regards,

Adrian Talbot.

**Autogas Ltd submission to Hammersmith and Fulham Air Quality Commission's consultation**
February 2015

As the UK's leading provider of the transport fuel LPG autogas, Autogas Ltd, a joint venture between Calor and Shell, welcomes the opportunity to submit evidence to the Hammersmith and Fulham Air Quality Commission.

We have been working with central, devolved and local governments in London and across the UK to increase the uptake of LPG autogas and to take some of the worst polluting vehicles off our roads such as diesel taxis. We very much hope that we can work with the Commission to do this in Hammersmith and Fulham.

**Why LPG?**

We believe that there is no 'one-size-fits-all' solution to reducing harmful transport emissions. Rather there are different technologies that can best meet consumers' needs across different road transport sectors and across the short, medium and long term.

As a readily available low emission alternative to traditional road fuels such as petrol and diesel, there is huge potential for LPG to play a key role as part of the fuel mix for consumers, taxi drivers, and public and private sector fleet operators.

Indeed, in its recently published UK air quality plan, the Department for Environment, Food and Rural Affairs noted the value of LPG for local authorities looking to cost-effectively and expeditiously improve air quality.

An independent report carried out by Element Energy (consultants used by the Department for Transport) has found that in a high-uptake of vehicles run on LPG scenario (i.e. LPG sales reaching 29,000 vehicles by 2020):
- Up to 219,000 tonnes of CO2 could be displaced annually
- An annual reduction of 2.258 tonnes of NOx could be achieved
- Over 256 tonnes of PM10 could be displaced per year by 2029

LPG is readily available from an established refuelling infrastructure network that can be easily and rapidly expanded at no cost to the taxpayer. Furthermore, the industry is looking forward to welcoming the launch of renewable biopropane as an extension of the range of LPG fuel products commercially available, which will launch in Q4 2016. This can be deployed via the existing supply infrastructure, meaning the fuel can be dropped into LPG refuelling courts and LPG-ready cars can use the fuel without any modification to their engines.

At present, no OEMs manufacture LPG-ready vehicles for the UK market. However, drivers can easily and cost-effectively convert their vehicles to run on LPG at

numerous UKLPG approved converters across the country. (UKLPG is the trade association for the LPG industry in the UK. UKLPG Approved Installers must meet required safety standards and must sign up to a Consumer Code of Conduct.) The average cost of a high standard petrol to LPG conversion is £1,500 whilst the cost of converting a taxi from a diesel engine to run on LPG autogas is currently around £8,000 plus VAT.

Once bought, consumers of LPG vehicles can expect to experience savings of up 40 per cent on their fuel bills whilst taxi drivers experience around savings of around 20 per cent – therefore quickly recouping the cost of conversion.

Alternatively, OEMs tell us that orders for right hand drive off-the-shelf models could be manufactured here in the UK with as few orders as 200 passenger cars.
Taking this all into account, there are five transport sectors within which there is significant scope for the increased uptake of LPG which would result in a dramatic decrease in the NOx and particulate matter emitted by these sectors.

| | PETROL | DIESEL | LPG |
|---|---|---|---|
| Average cost correct as of 28/01/16 | 102.01p | 101.05p | 55.43p |

## 1. Taxis

London's Black Cabs account for almost 35 percent of central London's PM10 emissions and around 15 percent of NOx emissions.

We recently converted a TX4 diesel (a typical diesel taxi) to run on LPG so that it could be independently tested at Millbrook. The original TX4 diesel vehicle, when tested under 'real world' conditions, failed to reach Euro 2 emission standards. But, after being converted to run on LPG, the TX4 met Euro 6 petrol passenger car emission standards as well as Euro 6 commercial vehicle standards, and emitted:

**99%** less particulate matter **80%** less NOx **7%** less CO2

Transport for London's Ultra Low Emission Zones will require all taxis from January 2018 to be Zero Emission Capable (ZEC). However, the cost of buying a new electric ULEZ taxi (c.£45,000) is a significant barrier for many taxi fleets. Alternatively, diesel taxis can be easily and economically converted to run on LPG, enabling taxi drivers to extend the life of their taxis and run cleaner vehicles which still meet their operational needs now and in the future.

LPG industry representatives are currently working hard with Transport for London to establish a way forward which would fully support the move to electric taxis whilst at the same time drastically reduce the air quality emissions from the taxis currently in operation.

**CASE STUDY:** We are working with **Birmingham City Council** who, with support from the Department for Transport, are converting 80 black cabs to LPG as part of its 'NOx Champions' project.

## 2. Vans

A dramatic improvement in London's air quality can be achieved by reducing the large number of diesel vans that operate in the city.

At present, no OEMs market LPG-ready Light Commercial Vehicles for the UK. However a full range up to 3.5 tonnes are available in Europe and we are advised could be made available in the UK subject to sufficient demand.

Until these become available, there are a variety of small vans are available in petrol and ready for conversion to run on LPG. Drivers can easily and cost-effectively convert their vehicles to run on LPG at numerous UKLPG Approved Autogas Installers throughout the UK. Furthermore, Mercury Fuel Systems Ltd. offer an LPG/diesel dual fuel system for vans.

Increasing the uptake of LPG vans in Hammersmith and Fulham, could easily be encouraged by the London Borough of Hammersmith and Fulham through incentives such as parking exemptions for LPG vehicles.

## 3. Public sector fleets

We have been working with local authorities and public sector organisations across the country who are under pressure to meet air quality targets but who are unable to afford expensive ZEC fleet vehicles or are concerned about the practical running problems of ZEC vehicles such as access to infrastructure.

LPG offers a practical low emission alternative for fleet operators. Fleets can benefit from the already established infrastructure, and, if needed, a local refuelling tank can be installed with the costs usually covered by the supplier.

**CASE STUDY:** According to **Anglesey Council**'s Fleet Manager Noel Roberts, the Council has experienced "phenomenal savings" since converting 73 of its 142 road vehicles to run on LPG – so much so that it was made council policy to buy vehicles converted to run on LPG. The fleet is served by a refuelling tank that was installed at the Council's premises with the costs borne by the industry.

Autogas Ltd would very much welcome the opportunity to work with the London Borough of Hammersmith and Fulham and other public sector organisations operating in the area to convert fleet vehicles to LPG.

## 4. Private sector fleets

In addition to helping to reduce harmful transport emissions, private sector fleet operators and company vehicle drivers that use LPG-ready cars and light commercial vehicles also experience similar benefits to the public sector such as cost savings and availability of infrastructure.

**CASE STUDY:** Outdoor advertising firm **Clear Channel** estimated that they were saving £200,000 a year based on fuel savings and wider exemptions (including a 100% exemption from the London congestion charge, a discount that was scrapped by the current Mayor of London).

Autogas Ltd would welcome encouragement from the Commission and the London of Borough of Hammersmith and Fulham for the private sector to use LPG vehicles.

## 5. Individual consumers

LPG also presents an opportunity for private users to affordably reduce the harmful transport emissions emitted by their vehicles in a way that also meets their driving needs. Uptake in this sector can be encouraged by the London Borough of Hammersmith and Fulham through initiatives such as parking exemptions.

**How do we increase uptake?**
The LPG industry has been in close correspondence with government at all levels and, as such, we have seen a positive shift in support for LPG as a low emission transitional fuel to a zero emission road network. However, we are keen to ensure that this momentum is not lost and that government at all levels works with the industry and introduces the right support mechanisms to encourage uptake.

| | Taxis | Public sector | Private sector | Vans | Private users |
|---|---|---|---|---|---|
| **What can the London Borough of Hammersmith and Fulham do?** | | | | | |
| Introduce parking exemptions for LPG vehicles | | | X | X | X |
| Consider alterenative fuel infrastructure in local development plans | X | X | X | X | X |
| Use vehicles converted to run on LPG | | X | | | |
| Encourage other fleet operators to convert to LPG or buy LPG-ready vehicles | | X | X | | |
| **What can TfL/GLA do?** | | | | | |
| Introduce ULEZ provision to allow taxi drivers to extend the life of their diesel taxis by 5 years | X | | | | |
| **What can central Government do?** | | | | | |
| Introduce incentives for UK-based OEMs to manufacture LPG-ready vehicles for UK market | | X | X | X | X |
| Introduce financial incentives or soft grants for drivers and fleet operators to convert to LPG | X | X | X | X | X |
| Consider all gaseous fuels as a level playing field by reducing the 1p annual duty differential reduction for LPG | X | X | X | X | X |

We are keen to help the Commission tackle air quality, and would be more than happy to arrange a demonstration in Hammersmith and Fulham of one of our vehicles. In the meantime, should you need further clarification or information on the above please contact Linda Gomersall by email at lgomersall@autogaslimited.co.uk or by phone on 01527 895164.

2 February 2016

Peter Smith
Room 139
Hammersmith and Fulham Council
Hammersmith Town Hall
King Street
London W6 9JU

Dear Peter,

**Hammersmith and Fulham Air Quality Commission – Call for Evidence**

I am writing in response to a letter from Rosemary Pettit, Chair of the Air Quality Commission at Hammersmith and Fulham Council, dated 6 January 2016, in relation to your call for evidence. SMMT recognises the challenge of air pollution and the efforts by government and local authorities to improve air quality in the UK. The automotive industry in the UK and across Europe has invested billions of pounds in technology to reduce both carbon emissions and other pollutants. Air quality is a critical issue across industry sectors and for society at large.

SMMT has outlined its position in relation to national air quality policy in a response to the Department for the Environment Food and Rural Affairs consultation in November 2015 on draft plans to improve air quality in the UK (please see this response enclosed). Overall SMMT welcomes government's plans which should provide increased certainty and clarity of approach to the industry, consumers, wider stakeholders, and local authorities.

Air pollution must be addressed by reducing emissions from across industrial and economic sectors. This includes the transport sector as well as other industry sectors, stationary sources of emissions such as large combustion plants, or agriculture. SMMT recognises the challenge of air pollution and improving the sector's environmental impact is a strategic priority. While air quality has undoubtedly improved over time, more needs to be done to reduce emissions further. Industry accepts that road transport is one of the most significant contributors to urban air quality but it is not the only one. A coordinated and integrated approach across sectors is needed, one that addresses not just air quality concerns but climate change and the needs of society and business to function effectively.

The automotive industry has made significant investment to develop a portfolio of technologies that will address the challenges of reducing carbon and pollutant emissions from vehicles. Average new car CO2 emissions for 2014 were 124.6 g/km and have fallen 31% since 2000. Vehicles being produced today feature filters that capture over 99% of particulate emissions, making them the cleanest ever produced. Compared to 2000, nitrogen oxides (NOx) are down 64%, particulates (PM10) are

down 90% and carbon monoxide (CO) levels are down 22%. The introduction of Euro 6 sees an 84% drop in NOx emissions in diesel cars since 2000. Evidence from bus testing on the London-specific test cycle demonstrates that there has been up to a 95% reduction in NOx emissions from Euro V to Euro VI.

Investment in diesel technology has been key in driving down CO2 emissions from passenger cars in view of the EU 2021 target of 95g of CO2 per kilometre, with diesel cars emitting between 15-20% less CO2 than petrol vehicles. Consumers value the efficiency, performance and low CO2 emissions of diesel vehicles have benefitted through fuel savings for new car buyers of £315 million per year. One in three motorists drive a diesel, covering 60% more miles than petrol drivers. Efforts to reduce CO2 emissions have been made on a technology-neutral basis; targets have been set and the industry challenged to develop technologies that meet them. This has resulted in a flourish of technological innovations; hybrid vehicles, plug-in hybrid vehicles, electric vehicles and, most recently, fuel cell vehicles. A technology neutral approach to air quality policy and coherence with efforts to reduce CO2 is equally essential.

The latest Euro 6 emissions standard and new test requirements on real driving emissions will require new technology to be deployed within cars. For diesel cars this will include a complete re-design of the exhaust after treatment system and most likely the eventual introduction across the fleet of Selective Catalytic Reduction (SCR) technology. Many diesel models will also require the use of Lean NOx Traps (LNT). SCR technology can achieve NOx reductions up to 90%. There are of course cost and engineering challenges in introducing this technology into passenger vehicles, particularly small diesel cars. With some new technology additional infrastructure to enable consumers to refill their vehicles with after-treatment solutions such as AdBlue (a urea based additive used in conjunction with SCR technology) will be needed. SMMT has highlighted to government that additional support for AdBlue infrastructure at fuel refilling stations would help reduce costs and inconvenience for consumers.

Ultra-low emission vehicles (ULEVs) also offer a number of environmental benefits with reduced CO2 and air pollutant emissions. The transition to low emission vehicles has the potential to support industrialisation of these technologies in the UK through increased research, design, development and manufacture of vehicles and components. The market for ULEVs is still small therefore government's package of measures at a national level with consumer incentives, infrastructure funding and R&D support is essential in ensuring that the environmental benefits from the transition to low emission technologies are realised as quickly as possible.
Yours sincerely,

**Mike Hawes**
**Chief Executive, SMMT**

INVESTOR IN PEOPLE

THE SOCIETY OF MOTOR MANUFACTURERS AND TRADERS LIMITED
SMMT, 71 Great Peter Street, London SW1P 2BN
T +44 (0)20 7235 7000 F +44 (0)20 7235 7112 Textphone +44 (0)20 7235 8278 www.smmt.co.uk

**SMMT RESPONSE TO DEFRA CONSULTATION ON DRAFT PLANS TO IMPROVE AIR QUALITY**
**6 NOVEMBER 2015**

## Introduction

1. The Society of Motor Manufacturers and Traders (SMMT) is one of the largest trade associations in the UK, supporting the interests of the UK automotive industry at home and abroad. The automotive industry is a vital part of the UK economy accounting for more than £69.5 billion turnover and £15.5 billion value added. With some 160,000 people employed directly in manufacturing and in excess of 799,000 across the wider automotive industry, it accounts for 11.8% of total UK export of goods and invests £2.4 billion each year in automotive R&D. More than 30 manufacturers build in excess of 70 models of vehicle in the UK supported by around 2,500 component providers and some of the world's most skilled engineers.

2. SMMT recognises the challenge of air pollution and the efforts by government and local authorities to improve air quality in the UK. The automotive industry in the UK and across Europe has invested billions of pounds in technology to reduce both carbon emissions and other pollutants. Air quality is a critical issue for the sector and for society at large. While air quality has undoubtedly improved over time, more needs to be done to reduce emissions further. A coordinated and integrated approach across sectors is needed, one that addresses not just air quality concerns but climate change and the needs of society and business to function effectively. Consistent and coordinated actions on air quality are crucial in ensuring that the automotive sector and consumers have certainty in policy direction.

3. SMMT welcomes the opportunity to respond to this consultation which outlines important draft plans to improve air quality in the UK. SMMT and our members are keen to continue the open dialogue with government on issues related to air quality and provide further detail as government's draft plans are finalised and the full framework for Clean Air Zones is set out later next year.

4. In summary, SMMT:

 Highlights the significant investment the UK automotive industry has made to reduce both pollutant and CO2 emissions from vehicles. Improving the sector's environmental impact is a strategic priority and the important breakthrough in real world testing will deliver further air quality improvements.
 Welcomes government's draft plans which provide increased certainty and clarity of approach to the industry, consumers, wider stakeholders and local authorities. A national approach that enables local authorities to implement solutions suitable for local needs should be a key priority.

 Welcomes the proposal for a Clean Air Zone framework which promotes a consistent approach to emissions standards across the UK. As part of these proposals, government should ensure that the whole Euro 6/VI standard is reflected in requirements for both petrol and diesel vehicles.
 Calls on government to consider additional actions such as establishing a forum on air quality for stakeholders and local authorities as well as assessing whether additional funding is needed to enable a consistent approach to policy across the UK.

**Background**

5. The automotive industry has invested significantly to develop a portfolio of technologies that will address the challenges of reducing carbon and pollutant emissions from vehicles. Average new car CO2 emissions for 2014 were 124.6 g/km and have fallen 31% since 2000. Vehicles being produced today feature filters that capture over 99% of particulate emissions, making them the cleanest ever produced. Compared to 2000, nitrogen oxides (NOx) are down 64%, particulates (PM10) are down 90% and carbon monoxide (CO) levels are down 22%. The introduction of Euro 6 sees an 84% drop in NOx emissions in diesel cars since 2000. Evidence from bus testing on the London-specific test cycle demonstrates that there has been up to a 95% reduction in NOx emissions from Euro V to Euro VI.

6. A technology neutral approach to air quality policy is essential to supporting investments being made across the automotive industry in various technologies that will achieve emission reductions. A consensus technology roadmap developed by government and industry through the Automotive Council has outlined the portfolio of technologies on the path to ultra low and low emission vehicles. It is important to note that increased uptake of hybrid vehicles, plug-in hybrid vehicles, electric vehicles and fuel cell vehicles is critical to achieve objectives on CO2 and air quality; however the internal combustion engine (both petrol and diesel) will continue to be the most widely available technology in the near term.

7. The impact of regulated emission limits in real world conditions has led to a change in approach with more robust Euro standard development underway. Emissions test limit values and changes to the way tests are conducted under the Euro standard regime have seen and will continue to see significant reductions with the introduction of Euro 6 (light duty, 2014/15)/VI (heavy duty 2013/14). The European Commission's clean air policy package, published in December 2013, highlighted that developments through Euro 6/VI, including additional elements around real driving emissions (RDE), would deliver key air quality objectives by 2020.

8. The introduction of Real Driving Emissions (RDE) testing in 2017 represents an important breakthrough for improving air quality in the UK and EU during the critical period to 2020/2025 in achieving compliance with EU NO2 limits. The implementation of RDE is a key focus and deliverable for the industry which has invested significantly in the introduction of Euro 6 vehicles and associated technologies such as Selective Catalytic Reduction (SCR), Lean NOx Traps (LNT) and Diesel Particulate Filters (DPFs). RDE will be a step change in how emissions are regulated and SMMT supports removing as much of the discrepancy between

laboratory testing and real world driving as possible to help reassure customers. On-road conformity limits imposed are extremely tough. There is a danger that not all currently planned diesel models may make it to market, which will present a significant challenge for manufacturers striving to meet stringent 2021 targets for CO2. It is imperative that legislation considers both air quality and carbon emissions to give certainty to both manufacturers and consumers. To deliver significant and timely improvements in air quality it is important that new vehicles can come onto the road as quickly as possible to replace older ones.

**Government's draft plans to improve air quality**

9. SMMT welcomes the publication of government's draft plans to improve air quality, which outlines policy and actions to reduce air pollution across all sectors. SMMT further welcomes government's approach in outlining plans to meet European NO2 limits, which will provide certainty and clarity to sectors and industries, stakeholders and local authorities. SMMT recognises that the strategy has cross-government scope, which is important in ensuring consistency across departments, aligning CO2 and air quality policy and reflecting economic and business impacts.

10. Appropriate action is required at individual, local, national and international levels, as outlined in the consultation. Government, local authorities and other public bodies have a variety of responsibilities and competencies in implementing policies and measures to effectively improve air quality. SMMT agrees with government that local authorities have a central role and are best placed to assess local circumstances to enable effective and targeted implementation of measures to improve air quality.

11. Reducing congestion and increasing traffic flow are critical aspects in ensuring effective reductions in air pollution at a local level. Investment in roads and improvements to road design is a key policy lever to increase capacity and improve traffic flow. There are significant demands on where road funding should be prioritised at both national and local levels, and the previously committed £100 million through the Roads Investment Strategy outlined air quality as a strategic area for investment in the road network. SMMT believes that this funding should be prioritised to relieve congestion, particularly on motorways and major roads through urban areas. Intelligent road design and traffic management should also be considered to reduce stop-start nature of traffic in congested areas.

12. Critical to local delivery of measures is ensuring local authorities have access to appropriate assessment and evaluation resources in order to make informed and effective decisions on which local measures to implement. SMMT supports the continuation of national funding for air quality assessment through Defra's Air Quality Grant Programme. Local source apportionment assessment together with evaluation of the impact of measures on local air quality should provide local authorities with valuable evidence to guide policy development.

13. While action and assessment at a local level is crucially important in addressing air quality issues, UK government has an important role to play in bringing together stakeholders to coordinate and provide guidance on key aspects of air quality policy. SMMT has previously called on government to provide national guidance on vehicle

standards for measures such as low emission zones to ensure consistency of approach across local authorities to avoid a patchwork of different standards across the UK. Such guidance would enable local impacts of air quality to be appropriately managed while maintaining consistency nationally under key criteria.

14. Accelerated uptake of the latest low emission vehicle technologies has a key role in reducing emissions as faster replacement of older vehicles will have an immediate positive impact on air quality. The role of public sector procurement to encourage uptake of low emission technology as well as in the private fleet sector will be important. A technology neutral policy framework that encourages greater uptake of new vehicles across all vehicle categories, and accelerates the introduction of Euro 6/VI and ultra-low emission vehicles in the UK is important to achieve a greater pace of emission reductions. This approach also strengthens the opportunities to take advantage of additional technological developments, such as on safety, as well as investment in lower CO2 innovations in the UK that will deliver industrial benefits.

**Ultra-Low Emission Vehicles (ULEVs)**

15. SMMT welcomes that measures on Ultra Low Emission Vehicles are strongly embedded in government's draft plans on air quality. Continued support for Ultra Low Emission Vehicles (ULEVs) is a vital element of government's plans to reduce emissions and stimulate industrial growth in low carbon technology. The UK is leading its European and international counterparts in promoting the uptake, development and manufacture of ultra-low emission vehicles (ULEVs). The £500 million package of measures from 2015 to 2020 provides a comprehensive framework to secure this leadership across priority areas of market development, infrastructure deployment and R&D investment. This funding is critical for the future of the UK industry as the global shift to low and ultra low emission vehicles provides strategic opportunities for growth and jobs across the whole automotive value chain.

16. The increased uptake of ULEVs will have direct local air quality benefits alongside reductions in CO2 emissions. The ULEV market is in an early stage of development and should be continued to be supported through incentivisation. An immediate priority for the industry is maintaining the Plug-In Car Grant, which is critical in supporting market development. The continuation of the grant at a level which provides an attractive upfront incentive to consumers is crucial in achieving market self-sufficiency over time.

17. Industry invests heavily in the development and uptake of ULEVs via initiatives such as the Go Ultra Low communications campaign and other brand and market specific measures. Go Ultra Low is a unique campaign that brings together seven vehicle manufacturers, government and SMMT to demonstrate the benefits of ULEVs, overcoming barriers and help increase purchase consideration. Strong commitment to this campaign is resulting in high impact recognition and proliferation of key messages on ULEVs However, given the embryonic, developing state of the market it is critical to maintain the funding package to ensure that there are adequate long-term fiscal and policy incentives in place to support emerging technologies coming to market.

## Clean Air Zones

18. As outlined previously, SMMT supports a consistent and coordinated approach to local policies such as low emission zones or Clean Air Zones. Different approaches risks creating a patchwork of zones across the UK which will ultimately lead to confusion for consumers. As such, SMMT supports government's proposed Clean Air Zone framework which puts forward a national approach in supporting those local authorities who are considering or have already implemented Clean Air Zones. Government should ensure that the Clean Air Zone framework is effective in aligning emission standards or criteria to enable consumers, businesses and other vehicle users planning certainty.

19. SMMT and the industry look forward to working with government as it sets out the full framework for Clean Air Zones in early 2016. It is important that industry and consumers are given the maximum time possible to adapt and plan for the introduction of Clean Air Zones.

20. SMMT supports the tiered approach as outlined in the consultation document of four classes of vehicle categories. It is right that local authorities should be able to decide which classes of vehicles are subject to control. An approach that takes into account the local circumstances and pressures on air quality in particular hotspots should be the basis on which local authorities decide which vehicle class is applicable for their local area.

21. SMMT welcomes that the standards set under the framework are based on Euro 6 (light duty)/VI (heavy duty). SMMT supports the use of Euro 6 for both petrol and diesel cars. Defra should ensure that vehicle criteria used in Clean Air Zones apply the whole Euro standard rather than only NOx emission limits.
This would ensure a level playing field and include key aspects of Euro 6/VI legislation on other pollutant emissions and increased in service conformity and robustness.

22. In the draft plans, the table outlining emission standards under paragraph 151 refers to an emissions limit "at first registration or retrofit". It is important that government clarifies the specific circumstances when retrofit is considered an appropriate solution as part of its approach to bringing forward compliance. SMMT does not think retrofit is a suitable or viable solution in the case of cars and some vans due to the significant cost and extent of required changes. Government should reflect this as it develops the framework further. It is important that the durability of emissions control of both original equipment and retrofit products are maintained and robust, both as new and during their lifetime. Applying whole Euro standard requirements deliver the durability and certainty of emission control. Some SMMT members have suggested that government should explore an approval or accreditation framework for retrofit systems to ensure consistency across local authorities implementing Clean Air Zones.

23. SMMT strongly supports the promotion and uptake of ULEVs through Clean Air Zones coupled with other measures which local authorities could adopt, such as free parking and priority lane access to increase the desirability of ULEV use.

24. SMMT recognises the localism agenda and supports local authorities in assessing whether Clean Air Zones are appropriate for their localities. In order to achieve widespread compliance and consistency within the framework structure, SMMT proposes that Defra takes steps to incentivise and encourage local authorities to ensure the highest levels of uniformity across the UK, particularly in relation to emission standards.

25. The funding already in place through Defra's Air Quality Grant Scheme is supported by SMMT, as previously highlighted. SMMT would support further consideration and assessment by government for additional funding requirements to enable the proposals outlined in government's draft plans. The ability of local authorities to fund the infrastructure requirements of implementing a Clean Air Zone will be varied across the UK and the costs of doing so are often high. Government should consider whether a funding scheme to overcome some of the practical and logistical barriers to implementing a coherent framework of Clean Air Zones would increase the consistency of such zones.

26. It is important that local authorities have access to the data needed for efficient and effective functioning of Clean Air Zones. This information would include data on Euro standards to implement vehicle emission criteria. SMMT seeks dialogue with Defra and the Department for Transport to explore how this can best be provided and assess whether there needs to be further work by the DVLA to ensure Euro standard information is effectively captured in government's vehicle registration data.

**Additional considerations**

27. It is clear that there is a responsibility to improve air quality at a national, international, local and regional level. Defra recognises that there may be practical and political challenges associated with the measures set out in its draft plans, SMMT would support national government taking a lead in overcoming some of these challenges whether through funding arrangements or bringing local authorities and wider stakeholders together.

28. UK government has set out a positive framework under which local authorities can implement local solutions, however it is recognised that the framework is not binding on local authorities. To ensure a consistent approach, SMMT proposes that government establishes a forum to bring together stakeholders, local authorities and devolved administrations which would facilitate a dialogue on challenges local authorities are facing and provide the opportunity for discussion on how these challenges can be overcome. The ability for government to use its convening power in establishing such a dialogue would enable a focal point for how air quality issues can be addressed across the UK at a national, local and devolved level.

29. The UK is a leader in the introduction of low emission buses with government funding simulating uptake of hybrid, electric and hydrogen buses. Funding for buses and other vehicle types should be stepped up to encourage growth in all low emission sectors of the industry. SMMT has long called for incentivisation of low carbon heavy commercial vehicles and funding allocations should reflect the considerable need for increased decarbonisation in this sector. Furthermore there are significant technological opportunities in the bus sector to deploy innovative

solutions (such as geo-fencing) that would enable buses to operate in low emission modes in specific air quality hot spots. SMMT calls on government to explore what more it can do to encourage greater deployment of these technologies through trials, demonstration projects and wider use.

30. The integrity of emission control and after-treatment systems is important in ensuring continued delivery of emission reductions. Government should consider what additional steps can be made to discourage and prevent the removal of systems such as Diesel Particulate Filters (DPF) and other tampering which results in hardware failures or software being recalibrated ("chipping") to switch off emission controls.

31. The introduction of real driving emissions (RDE) regulation as outlined previously is a step change in vehicle testing, with significant real world air quality benefits. To meet the rigorous testing requirements and deliver further emission reductions industry is investing in a range of technologies which will require additional infrastructure to enable consumers to refill their vehicles with after-treatment solutions such as AdBlue. Additional support for AdBlue infrastructure at fuel refilling stations would reduce costs and inconvenience for consumers.

32. Motoring taxation and Vehicle Excise Duty (VED) have been important mechanisms in driving down CO2 emissions. SMMT recognises the challenge that the improved CO2 performance and fuel efficiency of vehicles will have on tax receipts through VED and other motoring taxation. Where air quality concerns are a localised issue, motoring tax is a national policy and applied to all vehicles. Changes to VED or motoring taxation to address air quality is a blunt instrument that would not guarantee a specific and effective remedy to air pollution.

**Contact details:**
Jonathan Hawkings
Senior Policy Manager
jhawkings@smmt.co.uk
020 7344 9217

Dear Peter,

I have lived in Block B Aspen Gardens W6 9JE since 1994 with my 4 children. Jack my youngest child was just over 1 year old when we moved in here and within 3 weeks of moving here he developed Asthma. The doctor prescribed a blue and brown pump and said the important one was the brow pum which needed a nebuliser to administer to Jack but he said if he took the daily does for 9 months the asthma shouldn't develop.  He now has very mild asthma that is affected by the weather and where he is.

I am very consious that we live right beside the flyover and have made an effort to get us all out regularly into the countryside where I hope the air is cleaner.

If I walk around Hammersmith I get quite breathless sometimes yet when I get out into less congested areas I have no problem breathing.

My neighbours are developing respiritory ailments and I am sure that having all of our living and bed rooms facing the main road we are more vulnerable than if these rooms were on the other side of the building.

There seems to be a lack of air quality monitors on this road and i believe that this may be because the readings would be too scary.

I'm not really sure what to say really except that this would not be my choice of address purely because of the road noise and air pollution. I'm pretty certain it is having  detrimental effect on our brain function and general health.

I am happy to take part in any further investigations into the noise and air pollution in this area.

Yours sincerely

Paula Merrony,

Dear Mr Smith

I just read an Article re Air Pollution on the Get West Website

I have to say I find the pollution in Hammersmith and Fulham horrendous.

We try to be healthy for our daughter by walking her to school but the journey to her school involves walking through North End Road and then navigating Fulham Broadway. Where the traffic is always business

It really has an affect as we don't want to use the bus or drive but sometimes it feels better for her health.

I'm not sure what could be done but it's seem so sad to hav great stalls in North End Road selling fresh produce but it counterbalanced by the fumes that pollute the road plus with all the additional building works going on around Fulham including Earls Court works which also affects us it just seems to be getting worse

Kind regards

Kathy Hunter

West Kensington

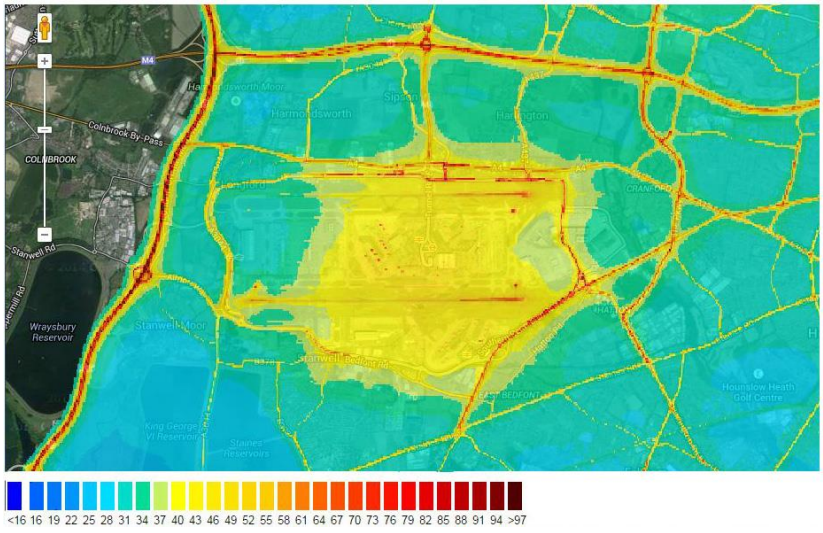
# Heathrow expansion and air pollution

## The problem

Air pollution is the UK's biggest environmental cause of premature death (second only to smoking overall) [i], killing 29,000 people prematurely a year from particulates alone. [ii] However if the effects of the toxic gas NO2 are added, the number of premature deaths is expected to double. [iii]

It is estimated that 9,500 Londoners die every year from air pollution. [iv]

Heathrow is already a massive polluter. The map below shows how EU and UK air pollution standards – set to protect human health – are regularly breached around Heathrow. [v]




It is a matter of the utmost importance that air pollution levels are reduced. Indeed, the courts have ruled that this must be done. [vi]

If a third runway is built at Heathrow, the will be nearly 50% more flights and passengers. It is blindingly obvious that this will lead to an increase in air pollution as compared with two runways. This in turn will lead to further delay in meeting legal limits and will cause more ill health and deaths.

### Airport Commission's response

The Airports Commission (AC) was not able to hide the fact that a new runway would generate more air pollution because the government's air pollution model

[vii] indicates that EU 'Limit Values' could well be breached if Heathrow was expanded.

But it tried **every trick in the book** to try and show this does not matter, so that a third runway could go ahead:

The air pollution estimates are for 2030, when the runway will only be about 5 years old and will only be partly used. The real impact of a new runway – a fully used runway – is not shown.

AC recommended that new capacity at Heathrow should not be released unless doing so would not delay compliance with European law .." This is a confidence trick. The UK will not achieve compliance with European law until all locations in the UK meet limit values. There are a handful of sites in central London that have higher levels even than those at Heathrow. Therefore, as long as air pollution levels around Heathrow remain lower than the worst hotspot in central London, they can claim there is no constraint on Heathrow expansion.

AC just concentrates on meeting EU legal limits. That is, what the UK can get away without legal action. AC ignores the deaths and ill-health as issues in their own right, even though air pollution at well below EU legal limits has health and other impacts.[viii]

AC considers that as long as EU limit values are achieved, the potential health benefit of reduced air pollution from non-airport sources can be appropriated by extra pollution from a third runway.

AC ignores the fact that NO2 levels would breach EU limit for a significant ecosystems near Heathrow,

## Conclusions

**Air pollution is a huge public health issue and Heathrow is already a massive polluter.**

**A third runway would very probably cause EU limits to be breached and it would certainly lead to more ill health and deaths.**

Contact details
Nic Ferriday, West London Friends of the Earth
020 8357 8426 ; 07873 388453 ; wlfoe@btinternet.com

i Healthy Air Campaign - air pollution, the problem: http://healthyair.org.uk/the-problem/
ii Committee on the Medical Effects of Air Pollutants/COMEAP – 29,000 premature deaths attributed to long-term exposure to man-made particulate air pollution per annum: https://www.gov.uk/government/publications/comeap-mortality-effects-of-long-term-exposure-to-particulate-air-pollution-in-the-uk
iii Effects of NO2 are expected to double premature deaths figures: http://erj.ersjournals.com/content/early/2014/02/20/09031936.00114713.abstract and http://www.airqualitynews.com/2014/12/05/uk-nitrogen-dioxide-mortality-figures-due-next-year/
iv http://www.airqualitynews.com/2015/07/15/london-air-pollution-kills-almost-9500-a-year-study-finds/

v The Heathrow area in 2010 breaching the NO2 annual legal limit (all areas yellow to red are breaching legal limits). Source: http://www.londonair.org.uk/london/asp/annualmaps.asp. (2010 is shown "because it is the latest year for which an accurate model is available.")
vi The Supreme Court ruled that that the UK Government must draw up a new action plan by the end of 2015 to tackle air pollution and ensure that the period of failure to comply with the EU limit values for air quality is 'as short as possible'. Press summary of the ruling is available here: https://www.supremecourt.uk/decidedcases/docs/UKSC_2012_0179_PressSummary.pdf.
vii Air pollution model, Defra PCM model, which is used to assess the possibility of preventing UK compliance with EU limit values.
viii Eg http://www.eurekalert.org/pub_releases/2015-08/esoc-apa082815.php

# The Great Heathrow Air Pollution Scandal

## 1. Introduction

The issue of air pollution has come to the forefront in the last couple of years and it has become a political 'hot potato' because of the air pollution impacts that a third runway at Heathrow would have.

This report shows that:

- Air pollution is an issue of the utmost importance in terms of its effect on human life and health.
- A third runway at Heathrow would make air pollution appreciably worse than it would otherwise be.
- The Airports Commission (AC) has systematically played down the air pollution impacts of a third runway at Heathrow.
- The reason why the AC has under-stated impacts is completely explicable when account is taken the social and political context.

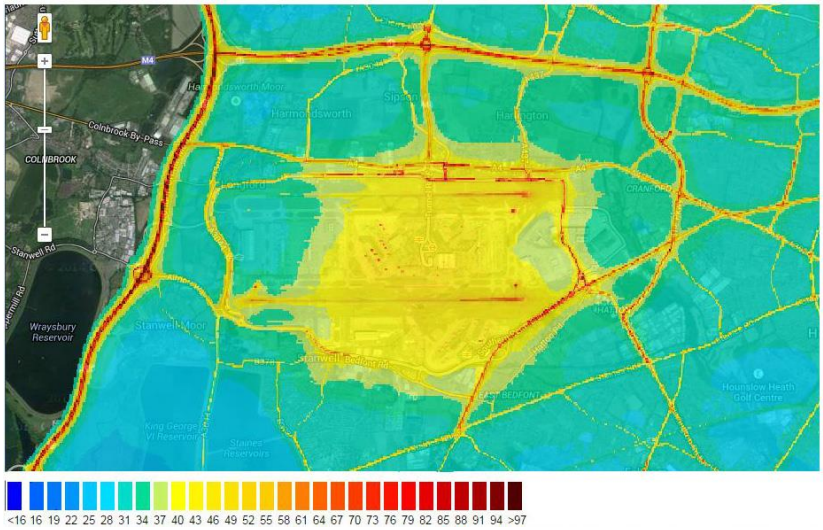
This report is timely and relevant, with a court case involving Plane Stupid just finishing. The defendants argued that their action in invading the runway at Heathrow was justified in order to avert far greater harm, for example climate change and air pollution. They argued that the conventional democratic methods were ineffective. The defendants wanted to have an expert witness on air pollution in order to show how air pollution would be worse with a third runway and to show that the conventional democratic methods were ineffective in preventing harm. The magistrate refused to allow the witness to appear.

## 2. The problem

Air pollution is the UK's biggest environmental cause of premature death (second only to smoking overall) [vii], killing 29,000 people prematurely a year from particulates alone. [vii] However if the effects of the toxic gas NO2 are added, the number of premature deaths is expected to double. [vii]

It is estimated that 9,500 Londoners die every year from air pollution. [vii]

Heathrow is already a massive polluter. The map below shows how EU and UK air pollution standards – set to protect human health – are regularly breached around Heathrow. [vii]




It is a matter of the utmost importance that air pollution levels are reduced. Indeed, the courts have ruled that this must be done. [vii]

If a third runway is built at Heathrow, there will be nearly 50% more flights and passengers. It is blindingly obvious that this will lead to an increase in air pollution as compared with two runways. This in turn will lead to further delay in meeting legal limits and will cause more ill health and deaths.

## 3. History and context

Expansion or otherwise at Heathrow has been a matter of debate and argument for decades. It came to the fore in the Rucatse study of 1993 which identified a third runway as an option but did not make a recommendation.

In 1995 a public inquiry into a fifth terminal (T5) commenced. Air pollution was already an issue and evidence was given by local authorities and Friends of the Earth. BAA claimed that T5 did not imply any need for a third runway. Their argument was not believed by the NGOs or councils opposing T5. However, the inspector, in recommending T5, accepted the argument and said that a third runway should be ruled out. The government accepted the recommendation on T5 but were equivocal about a third runway.

Almost straight after completion of T5, lobbying for a third runway started. More detail is available in 'Heathrow terminal 5 and runway 3: A chronology of worthless promises: 1993-2008' published by Friends of the Earth.

In 2000 the government issued a Green Paper 'The future of aviation'. Following extensive consultations, debate and a Judicial Review, the White Paper was finally issued in 2003 [vii]. Government policy was that a new runway would be needed in the southeast and that Heathrow was the chosen option. Stansted was the preferred fall-back if a third runway at Heathrow proved impracticable and was also the preferred option for the next runway after Heathrow's third.

Following this policy statement, the Labour government started to prepare for a third runway. It recognised that air pollution could be a 'show stopper' because air pollution is regulated by EU and UK law, unlike climate change or aircraft noise.

The government carried out air pollution modelling which showed that a third runway would probably be inconsistent with air pollution limits. The government promptly carried out a new study with more optimistic assumptions and – lo and behold – a third runway would be consistent. This issue was picked up by the Sunday Times which ran a front page feature and by the BCC which devoted an entire Panorama program to the scandal.

In the run-up to the 2010 general election, in October 200, David Cameron famously said: "*No third runway at Heathrow - no ifs, no buts.*" [vii]. In June 2010, soon after the coalition government was formed, transport secretary Philip Hammond said: "*We have been clear in our opposition to additional*

*runways at Heathrow, Gatwick and Stansted, so the challenge we face now is making them better within existing runway capacity constraints*." [vii]

In September 2012 an "Independent Commission" was established with the remit to include, among others, a third runway at Heathrow. Studies on air pollution were commissioned and are discussed in detail in 3 and 4 below. The AC's final report was issued in July 2015. This is discussed in 5, followed by the latest developments and a consideration of the overall context of the air pollution issue.

In March 2013 the government published its 'Aviation policy framework'. [vii] As the title suggests, it was not a prescriptive document and said nothing about options for airport expansion. There was no mention of air pollution in the 10 pages of introduction and executive summary. There is a brief discussion in the section on 'local environmental impacts' [vii] but the statements were bland and gave no real indication of the seriousness of the situation. [vii]

**4. November 2014 report on air pollution**

In Nov 2014 the Airports Commission (AC) issued a report on air pollution which they had commissioned from consultants Jacobs UK Ltd.[vii] It is notable that this work only covered the shortlist of sites (Gatwick, Heathrow Northwest NW and Heathrow Extended Northern) which AC had already decided upon. This is telling because it shows how low the AC had in its priorities air pollution and public health. If those had been high priority, the AC would surely have looked at the air pollution impact of a 'long list' of airports and given those impacts significant weight in producing its shortlist. Instead it leaped to two options in its shortlist which it could not have failed to know would be the very worst in terms of air pollution.

The Jacobs Nov 2014 report covered the present and forecast emissions from Gatwick and the two Heathrow options. Only the Heathrow NW option is considered here. The report used results from the Department of Environment and Rural Affairs (DEFRA) Pollution Climate Mapping Model (PCM) which can be used to estimate/forecast the air pollution levels at particular locations.

The estimates of emissions of NO2, PM10 and PM2.5 are shown in the report. The Executive summary says [vii]:

"*UK emissions of NOx are expected to meet current 2020 Gothenburg Protocol targets in both 2025 and 2030. The baseline NAEI 2030 projections are 82.8% of the 2020 Gothenburg NOx targets with the proportion of national emissions increasing to 83.20% with the third runway. While such contributions are likely to be accommodated in the context of the current Protocol targets; there remains a risk that the Protocol targets themselves may become tighter making any accommodation a greater challenge*.

*UK National emissions are projected to exceed the Gothenburg targets for PM2.5 emissions in 2025 and remain in exceedance in 2030. Although this is only by a small proportion, without mitigation Heathrow NWR could cause exceedance of the Gothenburg targets to increase 0.12% by 2030.*

*Emissions of PM2.5 attributed to associated airport activities in the Heathrow NWR baseline in 2030 represent almost 9% of the projected exceedance of the current 2020 Gothenburg Protocol target without mitigation considered*."

Table 4.3 of the report [vii] shows that at 2030 that with two runways there would be 11.0 thousand tonnes of NOx emitted, of which 93% is aircraft emissions. But crucially, emissions from on-airport and other airport-related traffic are excluded.[vii] In 2040 the total emissions fall to 10.3 thousand tonnes (kt) and in 2050 to 8.7 kt. Even without a third runway there would be a steady rise in average aircraft size and number of passengers between 2030 and 2050, so Jacob must have assumed there would be a substantial fall in aircraft emission per passengers. AEF is not aware of evidence that would support such an assumption and it is surprising that Jacobs (or AC) has not justified in some detail such a key assumption.

With a third runway NO2 emission would be 23% higher in 2030 than without. This relatively small figure is because the third runway would not be fully used by 2030. [vii] When the third runway is full, one might expect the emissions to be about 50% higher than without, on the grounds that flights and passengers are about 50% more. Mysteriously, emissions are only 34% and 38% higher at 2040 and 2050 respectively, according to Jacobs.

Table 4.2 [vii] shows the proportion of total UK annual NOx emissions that would be caused by Heathrow. The figure is 2.3%. However, Heathrow is a tiny part of the country and Heathrow's workforce and its economic activity are also very small in comparison to the UK as a whole. Therefore 2.3% is a very large amount in relative terms. It has been stated that Heathrow is the biggest polluter in western Europe.

On concentrations the report said [vii] "*The PCM modelling indicates there to be a low to likely risk of exceeding annual mean NO2 EULVs within the Heathrow NWR study area in 2030. The likely risk is identified along the A4 at sections of Bath Road Colnbrook-by-pass. Projected local monitoring also indicates there to be a low to high risk of exceeding annual mean NO2 AQOs within the same study area. The high risk locations have been identified along the M4, Hillingdon*."

Table 4.6 shows two sites outside the airport which are forecast to exceed UK/EU NO2 limits. Two other sites are well under the limit as are 4 out of 5 sites in Table 4.7. However, given that these are roadside sites, the caveat from Jacobs is important: "*Currently published PCM projections have been undertaken with the Emission Factor Toolkit (EFT) V5.2c, which was superseded in June 2014 by EFT V6.01. The latest EFT revises overly optimistic uptake rates of Euro VI vehicles in the future fleet mix, which is likely to increase projected emissions and predict higher pollution concentrations. This has been accounted for in Jacobs' Risk Evaluation for the local assessment. This has been accounted for in Jacobs' classification of Risk by including NO2 concentrations between 30-36µg/m3 within the low risk category*." In short, their figures are likely to be under-estimates.

App C give an extensive list of sites, very few of which are near the UK/EU limits. But interestingly, the increases in pollution that would result from a third runway are not shown. This indicates that Jacobs (and AC) are only interested in staying within legal limits, not in the increases of pollution in the far larger areas where pollution would increase but stay below the legal limits.

Although air pollution levels may remain below legal limits this absolutely does not mean there are not health, habitat and economic impacts from the

increases caused by third runway. It appears that Jacobs and AC are only interested in what the government can 'get away with' in terms of meeting limit values, not in human health and environmental impacts per se.

It can be seen from the above that there are a few locations where limit values are very likely to be breached with a third runway and many more where Jacobs says there is a considerable risk. Furthermore, there are unanswered questions about certain results which make the achievement of limit values even less certain.

The conclusion that one must reach from the study is that there is little confidence that all the air pollution limits can be met.

It was stated by Jacob that this report was not definitive because the DEFRA PCM model used to assess concentrations is a "static" model. Jacob consider that a 'pollutant dispersion modelling' is needed: "*The second stage of assessment to be undertaken, following the publication of this report, will consider pollutant dispersion modelling including the effects of potential government and scheme promoter mitigation measures, and will report on an assessment of receptor impacts and risks to limits and targets*."

We do not dispute that there are in inadequacies in the static model and a dispersion model could be better. But an important question is whether the decision to carry out another set of modelling was decided on purely technical/professional grounds. Or was it because the static model did not give the answers the AC wanted to hear?

Rejecting a Heathrow option on the grounds of air pollution would have been a huge embarrassment to AC and would have infuriated the government. There would, therefore, have been huge pressure and great incentives to AC and Jacobs to do further work which would show that air pollution is not after all an impediment.

In case this view might be considered to be 'paranoid' or a 'conspiracy theory', it should pointed out that this has happened before. In about 2007 the then Labour government decided there should be a third runway at Heathrow. It carried out air modelling which showed that a third runway would probably be

inconsistent with air pollution limits. The government promptly carried out a new study with more optimistic assumptions and – lo and behold – a third runway would be consistent. This issue was picked up the Sunday Times [vii] which ran a front page feature and the BCC which devoted an entire Panorama program [vii] to the scandal.

**5. May 2015 report on air pollution**

In May 2015 the Airports Commission (AC) issued a further report on air pollution which they had commissioned from consultants Jacobs UK Ltd. [vii] The timing is most telling. May 2015 was just a few weeks ahead of the AC's final announcement and report. Along with the final report, a series of other documents were published. The Commission had obviously already decided on its Heathrow NW recommendation and was putting together its final report well before the Jacobs report was published. It follows that the AC had no intention of taking serious account of air pollution or of Jacob's latest findings when recommending or not the Heathrow NW runway.

The AC did consult on the Jacobs report and the Aviation Environment Federation (AEF) and West London Friends of the Earth responded rapidly in May 2015. But as the final report was issued at the beginning of July it is patently obvious that AC could not, in its recommendations, have taken account of AEF's, WLFOE's or any other responses except in a cosmetic sense (such as adding some words to clarify statements).

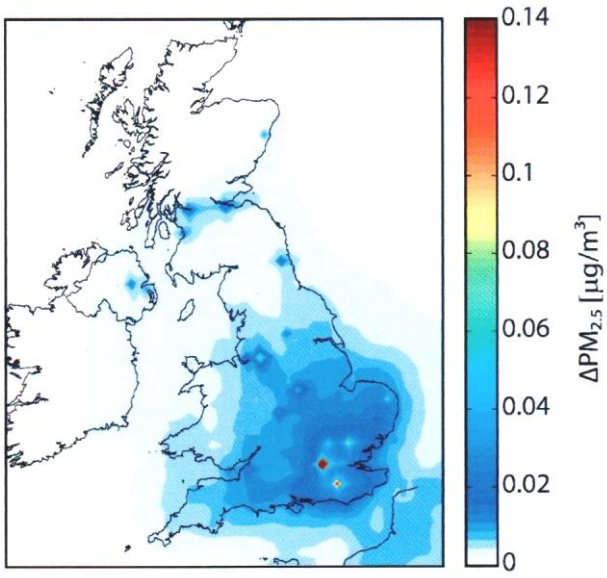
It is extremely difficult for volunteers and NGOs to assess the air pollution modelling which has been undertaken with a large budget by Jacobs. We are nonetheless able readily detect major shortcomings in the process which cast severe doubt on the conclusions. The shortcomings are described briefly below.

We are concerned about the apparent disparity in the results from the Defra PCM model (which is used to assess the possibility of preventing UK compliance with EU limit values) and the local dispersal model (the ADMS-Airport model). While the Nov 2014 air quality report made clear that the Defra PCM model was a static model while the dispersal model is dynamic, beyond this there is a total lack of explanation of the varying results. There is

not even a comparison of results laid out. For example, one would have to look at Table 4.6 and App C of the Nov 2014 report with Table 5.5 and Table H1 of the May 2015 report in an attempt to see the differences. Then one would find most locations cannot be matched up anyway. Not even being able to clearly see the discrepancies does not engender confidence in the results.

The report states in 3.2: "*The contribution of airport emissions to ground-level pollutant concentrations falls off rapidly with increasing distance from the airport boundary, and is very small beyond a distance of a few kilometres. The "Principal Study Area" for each Scheme has been selected to focus on sensitive properties and habitats likely to be substantially affected by the Scheme and encompasses a 2km radius around each Scheme boundary*." This statement may be correct as it stands, but it totally misrepresents the impacts further away from the airport. While pollution concentrations resulting from airport emissions decline progressively as one moves away from the airport, the area and number of people affected progressively increase. [vii] In societal terms, a lot a people suffering a small increase in pollution may well be as significant as a small number of people suffering a large increase. The total impact or societal impact on 8 million Londoners downwind of Heathrow could be greater than the impact on 120,000 people in the study area.

This effect is well illustrated in a report by Barrett et al.[vii],[vii]



3.7 of the report explains that only emissions from aircraft below 915 metres have been modelled. However, aircraft rise rapidly above this height and they spend the vast majority of their time in this country over 915m. The fact that they are over 915m does not mean they do not cause pollution at ground level. What it means is that the pollution is spread over a wider area. The vast majority of pollution emitted by planes that are higher than 915m (but which come from or are going to Heathrow) is probably deposited in areas well away from Heathrow. This pollution, probably affecting millions of people, is ignored Jacobs and AC.

We note that all the values in Table 5.5, H1 etc are just 'spot' values. There is no attempt to provide error limits or confidence limits. Without these it is impossible to validly make statements such as there would be no exceedances. [vii] If for example one had an estimate of 35 ug/m3 for a site and the confidence limit was +-10, there would be a very significant chance of the limit value of 40ug/m3 being exceeded. This is not good enough when human health and the law are concerned.

There is great over-emphasis on exceedance or not of UK/EU limit values. The health impacts of air pollution increase as air pollution levels go up and there are no known thresholds below which there are no impacts. Although air pollution levels may remain below legal limits this absolutely does not mean there are not significant health, habitat and economic impacts from the increases caused by third runway. It appears that Jacobs and AC are mainly interested in what the government can 'get away with' in terms of meeting limit values, not in human health and environmental impacts per se.

While the dispersion modelling suggests there would be no exceedances in 2030, the rules for determining compliance require that 'national' model is used. The national model is DEFRA's PCM model, Jacobs' dispersion model being a local model. Using PCM there is one receptor – at Bath Road – which would exceed the limit.

Possible delay to compliance to the EU limit values is discussed in 5.4.4. Most of the very highest levels or air pollution now and in 2030 are forecast to occur in central London, particularly Marylebone Road. Jacobs' interpretation seems

to be that all one need do is to bring the pollution at Bath Road down to less than Marylebone Road [vii], however high the latter is, and then there is no delay in compliance. Therefore pollution would not be an impediment to a third runway. AEF does not believe that playing off a single site against another in this way to demonstrate compliance is the EU's intent. Neither does the Environment Audit Committee and nor does Campaign for Clean Air in London's legal advisor. [vii]

Associated with the great over-emphasis on exceedances, there is great under-emphasis on changes in air pollution at all the locations which would not exceed limit values. A third runway would increase pollution for nearly everyone in the area. Jacobs estimates populations subject to increases of pollution at 122,000 by NO2 and 121,000 by PM10.[vii] But these populations are only the ones in the 'Principal Study Area' – there will be much larger populations outside that are also impacted. Because there are health and mortality impacts well below limit values, it can be safely assumed there will be adverse health impacts for a very considerable population beyond the 122,000 and 121,000.

The EU directive does by any means regard just exceedances as important. It regards maintaining and improving air quality as important too. [vii] AC's stated objective is "*improve air quality consistent with EU standards and local planning policy requirements*. [vii] The National Policy Framework is even stronger: "*Planning policies should sustain compliance with and contribute towards EU limit values ..* [vii]

Jacobs shows that air pollution levels would go up almost everywhere with a third runway, contradicting UK policy and AC objectives. Jacobs and AC clearly believe, although they do not state it as such, that it is all right to appropriate any reductions in air pollution that would result from other action (such as cleaner cars) and offset them by increases due to a third runway – as long as there are not exceedances.

There is no discussion of the morbidity and mortality due to air pollution from Heathrow and a third runway and no presentation of results. [vii] Since the

major concern about air pollution is human health, this omission is very concerning.

There has been some work on the subject. In 1988, it was estimated that that the death toll arising from Heathrow's air pollution was about 57 pa and that a fifth terminal would be add about 17.[vii] This evidence was not disputed. In 2010 a report was produced [vii] by MIT and Cambridge. It says: "*If a third-runway is built at London Heathrow, early deaths due to emissions from Heathrow increases from 110 to 150*." [vii] It should be noted these only refer to deaths, not ill-health that does not lead to death.

One can only surmise that Jacobs and AC want to confine discussion of air pollution to an abstruse technocratic exercise, not highlight the real human issues that ought to influence the decision.

As well as EU limit values, there are a series of 'guidance values' for pollutants recommended by the World Health Organisation.[vii] The UK may not be obliged by law to meet these values, but it is remarkable they are not even mentioned in the 'legislation and policy context' section of the report. These guideline values would most certainly be breached in some locations with a third runway. One strongly suspects this is why Jacobs and AC have kept quiet about them.

Table 5.9 shows that almost half of all the 'designated habitats' in the vicinity of Heathrow would be subject to breaches of limit values for NO2 with two runways. In almost every case, a third runway would make things worse. Jacobs states that a third runway would only cause one new exceedance [vii] but fails to mention that this is because most of the sites will be over the limit even with two runways.

After Table 5.9 Jacobs says: "*The macroscale siting criteria in the Directive states that sampling points for the protection of vegetation and ecosystems should be sited a) more than 20 km from an agglomeration (about 250,000 people), and b) more than 5 km from Part A industrial sources, motorways and built up areas of more than 5,000 people. The UK Government interprets this to infer that the critical level for NOx does not apply within these areas*." This is a blatant attempt by the UK government to disregard the effects of air

pollution on ecosystems. If applied, it could rule out a large majority of the country's ecosystems on the grounds they are near a small town or a polluting industrial site or a motorway. It is doubtful that this interpretation would be upheld in court and it is most certainly not within the spirit of EU law.

The forecasting of the impact of third runway on air pollution levels and the tables and discussion all relate to 2030. But a third runway would only come on stream at about 2025 and it would by no means be fully used.[vii] The full impact of growth on air pollution would only be seen when the runway is filled up. Showing only 2030 impacts blatantly misrepresents the air pollution impacts of a third runway.

In addition to the annual average of 40ug/m3 for NO2, there is a UK/EU limit values for 1 hour means of 18 occurrences each year [vii] The Jacobs report says of this standard: "*The 1-hour mean Limit Value/objective for NO2 that is cited in Tables 2.1 and 2.2 has not been explicitly considered. It is extremely challenging to predict 1-hour mean concentrations with any certainty, and the annual mean limit value/objective is more stringent. Reliance is thus widely placed on an empirical relationship between the two metrics, whereby if the annual mean NO2 concentration is less than 60 µg/m3, there is little risk of exceeding the 1-hour mean criteria.*"

It may be the case that this assumption of no exceedances is justified but given the importance of the issues – it is one of just two limit values for most problematic pollutant – this explanation is inadequate. The consultees surely deserve more than a single 'throwaway' paragraph that gives no explanation of who places reliance on the assumption and on what basis they do so and does not even provide references.

There can be no doubt that hourly exceedances are a significant issue. One site in London had 1537 breaches in 2015 compared with the limit of 18! [vii] The limit for the whole of 2016 was breached by 8th Jan. Other sites are following closely behind. [vii] The annual average for this site was well over the limit at 123ug/m3 so this statistic does not of itself disprove Jacobs' assumption. But an 85-fold exceedance of the hourly limit when the annual average is only exceeded 3-fold must cast doubt on the assumption.

Because there could be exceedances using the PCM model, Jacobs considered a number of possible mitigation measures (5.7.1 on page 81). The attempt is laudable but a striking feature is that while they were able to suggest measures, they could not estimate the impact of most of them. Those measures that they have quantified make little difference – well under 1ug/m3 for most. Perhaps more significantly, the most important measures are unlikely to be politically deliverable. Congestion charging is anathema to the government (whereas road building is supported.) A charge or tax on NOx is very unlikely for governments that are seeking to reduce tax in the form of Air Passenger Duty, despite aviation already being massively under-taxed compared with other sectors of the economy.

**6. Airports Commission final report**

In July 2015 the AC made its final report. It recommended, as most people expected, a new runway at Heathrow.

The report had an appreciable significant section on air pollution, euphemistically called "air quality". It used the Jacobs reports to promote the view that air pollution should not be an impediment but did not include important qualifications and nuances in Jacobs that would call into question the recommendation. Nor did AC highlight any of major flaws that we have described above.

The major flaws and omissions in the AC final report may be summarised as follows.

AC just concentrates on meeting EU legal limits. That is, what the UK can get away without legal action. It ignores the deaths and ill-health as issues in their own right, even though air pollution at well below EU legal limits has health and other impacts.

AC considers that as long as EU limit values are achieved, the potential health benefit of reduced air pollution from non-airport sources can be appropriated by extra pollution from a third runway.

AC recognises that delay in compliance with European law could be an impediment but interprets this to mean that extra pollution from Heathrow,

however great, would not matter as long as one on other site, probably in central London, remained even worse.

The air pollution estimates are for 2030, when the runway will only be about 5 years old and will only be partly used. The real impact of a new runway – a fully used runway – is not shown.

Almost half of all the 'designated habitats' in the vicinity of Heathrow would be subject to breaches of limit values for NO2 with a third runway. AC meekly accepts the government's view that these should be ignored.

Hourly limit values have legal force along with annual averages. These are not mentioned, apart from a 'throwaway' sentence in a Jacobs report.

Mitigation, ie action to bring air pollution levels down to within legal limits with a third runway, are discussed in the final report. [vii] But they are little more than a set of 'good ideas'. They have not been assessed for financial, social or political deliverability and were not recommended.

**7. Legal challenge to UK government**

On 29/4/15 The UK Supreme Court quashed the Government's "*ineffective plans to cut illegal levels of air pollution in Britain*" and ordered it to deliver new ones by the end of the year. The Supreme Court Justices were unanimous in their decision, saying: "*The new Government, whatever its political complexion, should be left in no doubt as to the need for immediate action to address this issue.*" The ruling was the culmination of a five year legal battle fought by ClientEarth.[vii]

In Dec 2015 the government published a new air quality plan.[vii] ClientEarth considered that the plan was unsatisfactory: "*These plans are an outrageous statement to the Supreme Court essentially stating that the government doesn't intend to comply as soon as possible. It is an arrogant response that is simply not good enough*." ClientEarth concluded that it will have to make a legal challenge to force the Government to take faster action to achieve legal pollution limits.[vii]

The fact that the government has been taken to court is highly relevant. This affair will have been watched closely Jacobs and AC. They could not have failed to conclude the government does not want to be pushed into implementing the EU air quality directive. Nor could not it have failed to occur to them that one of the reasons why the government was resisting on air pollution in London is because of Heathrow expansion. There was a pretty strong message, albeit inferred and most certainly not written, that the government did not want or expect the Commission to reject Heathrow expansion because of air pollution considerations.

**8. Environmental Audit Committee**

In December 2015 the House of Common Environmental Audit Committee published a report on its investigation into the environmental impacts of Heathrow expansion. [vii]

It found, independently of ourselves, the same three major flaws in the AC's work that we had found earlier.

Para 43: *"Many of our witnesses interpreted the Commission's interpretation of the Air Quality Directive as implying that significant increases in NO2 resulting from Heathrow expansion would be allowable because of worse performance elsewhere in London. This would make no sense in terms of protecting public health and wellbeing. The Government should make clear that this is not the position it intends to take when assessing the scheme for compliance with the Directive*."

Para 47: "*Before the Government makes its decision, it will need to demonstrate that its revised air quality strategy can deliver compliance with legal pollution limits within the timescales agreed in the finalised plan to be approved by the European Commission. It will also need to show that this can be maintained even when the expanded airport is operating at full capacity. Heathrow's existing air quality strategy should also be revised to meet the new targets. Failing this, Heathrow should not be allowed to expand*."

Para 50: "*The Commission recommended that the release of capacity at an expanded airport should be conditional on air quality standards being met. The*

*Government should not approve expansion at Heathrow until it has developed a robust framework for delivery and accountability. This should have binding, real-world milestones and balance the need for investor certainty with assurances that a successor Government cannot set the conditions aside if they become inconvenient*."

## 9. Government position (as at January 2016)

Following the AC final report in July 2015, the government indicated that it would respond by the end of the year. The government statement on 10th December said it supports the building of a new runway in the south east, to add capacity by 2030 (earlier airports claimed they could have a runway built by 2025). However, the decision on location is "*subject to further consideration on environmental impacts and the best possible mitigation measures*." All three short listed schemes will continue to be considered.

It is almost certain that air pollution is a major reason for deferring a decision. It is probably the only real 'show stopper'.[vii] It is extremely likely that government experts, including lawyers, have advised that a new runway at Heathrow would be wide open to challenge in the UK courts and from the EU.

## 10. The political context

Air pollution from Heathrow is not a technocratic issue, isolated from everyday life. The issue can only be interpreted by reference to the sider social, economic and political context. A whole book could - and should - be written about the non-technical aspects of air pollution. There follows here the briefest of analysis.

In October 2009 David Cameron said: "*No third runway at Heathrow - no ifs, no buts*." [vii]. In June 2010, soon after the coalition government was formed, transport secretary Philip Hammond said: "*We have been clear in our opposition to additional runways at Heathrow, Gatwick and Stansted, so the challenge we face now is making them better within existing runway capacity constraints*." [vii]

However, these statements did not prevent heavy lobbying from industry and Conservative MPs for airport expansion.

An “Independent Commission” was established in September 2012. The government appointed an ‘establishment’ figure, Sir Howard Davies, as part-time chair and four establishment and virtually silent part-time commissioners. The detailed work was devolved to a secretariat drawn mainly from the DfT (Department for Transport). Those staff returned to their roles at DfT after the Commission’s work finished.

This chronology of events demonstrates that David Cameron was prepared to renege on his Nov 2009 promise. If he had been determined to stick to his promise, he could have still established a commission, but one whose remit excluded a third runway at Heathrow.

As the only airport in the country nearly full to capacity and having by far the highest forecast future demand, Heathrow was always likely to be the airport recommended for expansion. The implicit change in policy – from ruling out to supporting or at least accepting Heathrow expansion - could not have failed to be noticed by those involved, not least Howard Davies, the Commissioners and the consultants employed by AC. This, then, is the context in which all the AC’s work was conducted.

Sir Howard Davies is a conventional economist and his biography shows [vii] that he is greatly favoured by government. In appointing him yet again to a prestigious and high-profile post, this time as head of the AC, David Cameron clearly regarded Davies as a ‘safe pair of hands’. Given the government’s prioritising of economic growth and its lack of interest in environmental issues such as air pollution and climate change, it does not take a political scientist to realise that the government did not want or expect AC to rule out new runways or a new runway at Heathrow on environmental grounds. Davies was just the person to not do so.

If Davies had recommended against a new runway on environmental grounds, the government and sections of the business community would have been furious. It is inconceivable that Davies would have been offered any further government commissions.

The contrast with another prominent economist, Sir Nicholas Stern, could not be more marked. Stern produced a seminal report showing how the economy could be seriously impacted by climate change. Having spelled out this truthful but politically unpalatable message, he was sidelined by government.

If is also apparent that if Davies had come out with the 'wrong answer' he would not have been favoured by the private sector. It is inconceivable that someone with strong and radical messages about air pollution and climate change and who challenged the primacy of economic growth and claims about what really generates growth, would be appointed as chairman of a large bank.

The four commissioners, thought largely silent and un-noticed by the public, will also be seen to be establishment figures, with a history of public or public sector appointments and no history of controversial views. It is notable that not one of them dissented or chose to speak out about any aspect of the AC's findings, despite the extremely suspect conclusions on air pollution, climate change, economics, etc. They too would have lost favour with government had they spoken out.

As noted above, most of the secretariat of AC were seconded from DfT. They are civil servants and are now back again as servants to their DfT seniors and to the Minister of Transport. For them to highlight evidence, let alone argue a case against a third runway, when the political mood was so obviously in favour, would have been a career-limiting move.

The consultants too had strong reasons to not to 'rock the boat'. Air pollution consultants depend to a great extent of work given to them by developers and businesses who employ them to show that air pollution should not be an impediment to their scheme. A consultant who signalled air pollution problems any more strongly than s/he absolutely had to [vii] would rapidly discover work drying up and would be unlikely to get any more government contracts.

This above analysis shows clearly that all the major parties in the inquiry had strong reasons not to promote evidence that would undermine recommendations for a new runway in southeast or a third runway at Heathrow. In no way, therefore, was the AC genuinely "independent".

With no confidence in the AC and a one-sided multi-million pound propaganda campaign by Heathrow, one should not be surprised that NGOs and committed individuals feel they need to represent the concerns and rights of ordinary people in whatever way they can. They have been deprived of any meaningful hearing by AC or government and do not have deep pockets to pay for public relations campaigns. The question that arises is a profound one for them, for public policy and for democracy. Should people who feel they have no

alternative but to resort to non-violent direct action be criminalised for doing so?

Nic Ferriday, for West London Friends of the Earth
January 2016