

Cleaning up road transport in London



The next steps to improve the capital's air quality

By Simon Moore

Summary of a roundtable discussion on 21st November 2013

Summary



Air pollution is Britain's forgotten environmental and public health crisis. Long-term exposure to fine particulate air pollution in London is attributable for the deaths of thousands of people each year. Policy Exchange held a roundtable which discussed ways to improve the emissions performance of London's road transport, and how local and national government policy can develop to reduce pollution and improve public health. The following key points were made at the roundtable (which do not necessarily reflect the views of Policy Exchange):

- Finance is not seen as an obstacle to further action on air quality as much as the absence of viable policy options. The biggest challenge facing policymakers is the disconnect between the scientific understanding of the issue, modelled results of interventions and what they actually achieve. This makes things difficult politically. There is a perception of air quality policy advocates as being like the boy who cried wolf – we know the last three times didn't work as we expected, but this time it will. This is particularly relevant to Euro vehicle standards, where a great deal of money and effort were spent to strengthen regulations, only for it to make very little difference in the real world, and in some instances make things worse. Politicians no longer believe in technological solutions that they keep being told will work and keep coming up short.

- With expansion over the coming decade, London needs to accommodate as many extra people as live in a city the size of Birmingham. This means transport provision needs to increase at the same time as air quality improvements need to occur.
- Some argued that current and upcoming improvements in vehicle emissions performance would radically improve matters as they filter into the vehicle fleet. Others expressed doubt that performance had improved as much as is claimed, and a growing scepticism about the gains from future (Euro VI and beyond) vehicle regulations.
- Meeting air quality limit values is likely to require more than technological improvements. Policymakers should look at a wide range of things that affect air quality, including home working and other technological change. They should also think more about whether it makes sense for everyone to be making their commutes at the same times of day.
- Seemingly minor regulations can have a big effect. For example, the requirement for London taxis to have a maximum turning circle has had the effect of excluding much cleaner taxis from London's streets.
- There are tradeoffs in promoting air quality as a public transport priority. Safety is TfL's number one priority, and its second priority is to keep the city moving with its aging Victorian infrastructure. Environmental concerns are moving rapidly up the list of other concerns (as is access) but unlikely to dislodge the first two. Campaigners need to be prepared to explain what they want not to have if they are to redirect money to improved air quality performance.
- There is a need to educate the public about the hazards of poor air quality. People need to be thinking about it. Currently the issue is where smoking was in the 1950s and 60s - experts are aware it is dangerous but the risk is not in public's minds. This cycle of public awareness will take time to change.

In conclusion, the growth of London poses an extraordinary challenge for policymakers already struggling to achieve existing pollution limit values. Advancing medical science suggests these targets should be tougher, while measures to tackle pollution continue to perform disappointingly. Public awareness of the problem is very low. The benefits of improved air quality are difficult to quantify in the cost-benefit analyses used to assess policy measures that might improve air quality. Many other priorities compete for spending from government and for the attention of transport planners.

In order to have an informed debate about what (if any) action should be taken to try to reduce air pollution further, it is important to know what actions are likely to have what results. Reaching low levels of pollution may require a fundamental rethink in the way we use and get around our cities.

The consequences of this would be wide-reaching, and careful thought will need to be given to decide whether or not they are appropriate.

Introduction



Air pollution is Britain's forgotten environmental and public health crisis. Long-term exposure to fine particulate air pollution in London is attributable for the deaths of thousands of people each year. London authorities have made improving air quality one of the environmental components of the legacy of the Olympic Games. However, policy options to improve air quality are not straightforward.

One area needing particular attention is road transport, which accounts for around 80% of particulate emissions and about half of NO_x in London. Both compounds have been associated with serious effects on public health. Reducing emissions from transport will play a significant role in improving London's air. This will require innovation, both in the technologies used in road transport and in how cars, buses, taxis and other forms of road transport are used.

This roundtable discussed ways to improve the emissions performance of London's road transport, and how local and national government policy can develop to reduce pollution and improve public health. It looked at key questions, including:

- What further measures should policymakers be taking to tackle London's air quality?
- How can we protect the poorest and most vulnerable from the effects of air quality?
- What role do the London authorities and national government have in improving London's air quality through cleaner transportation?
- How can policymakers balance the need for economic growth and protecting public health?
- What role can new road transport technologies play, and how should they be encouraged?
- Which international examples can London learn from?
- How can it reconcile conflicting environmental goals such as lower carbon and air quality?
- What role will there be for public transport and cycling?

The aim of the roundtable was not to come to firm conclusions, but to explore these issues. It also acted as a scoping exercise for whether Policy Exchange would look to do any further research in this area.

This note summarises, in the words of the author, some of the key points made at the roundtable (at which discussion was held under the Chatham House Rule). **Points outlined in this summary do not**

necessarily reflect the views of Policy Exchange, nor of particular attendees at the roundtable.

Opening remarks were made by Elliot Treharne, who is Air Quality Manager at the Greater London Authority, and by Dr Martin Strobel, director of diesel systems development at Robert Bosch GmbH.

Key points from Elliot Treharne's opening remarks



- Air pollution is a major issue in London. There is rising interest in the area with more and more stakeholders, as well as ordinary people wanting to improve their way of life, become aware of the problem.
- The biggest challenge facing policymakers is the disconnect between the scientific understanding of the issue, modelled results of interventions and what they actually achieve. This makes things difficult politically. There is a perception of air quality policy advocates as being like the boy who cried wolf – we know the last three times didn't work as we expected, but this time it will. This is particularly relevant to Euro vehicle standards, where a great deal of money and effort were spent to strengthen regulations, only for it to make very little difference in the real world, and in some instances make things worse. Politicians no longer believe in technological solutions that they keep being told will work and keep coming up short.
- London is not meeting its required air quality concentration values, and as a result expects EU infraction proceedings to begin in 2014. But this is not what is motivating politicians to act in this area. The reason for tackling poor air quality is the impact on people's health.
- 1.7 million Londoners live in places exceeding limit values for NO₂. This imposes a cost of roughly £2.5bn a year.
- The major source of pollution is transport – 63% of NO_x is from transport.
- The Mayor's Air Quality Strategy (2010) puts in place a number of policies to tackle air pollution. These include:
 - 15 year age limit for taxis
 - 1700 hybrid buses
 - 900 Euro III-standard buses to be phased out, another 900 to be retrofitted with selective catalytic reduction (SCR) equipment to raise them to Euro VI-standard.
 - Air quality fund launched to tackle local hotspots.
 - Electric taxis from 2020, or possibly sooner.
- The problem is not money. If there was a solution available getting funding for it wouldn't be

difficulty. The difficulty is finding technologies that will help.

- Diesellisation was a big error. There are now 45 million diesel cars in Europe. We thought they would be beneficial for climate change, but the claimed CO₂ benefit did not materialise, and when combined with black carbon effects, they may have made greenhouse gas emissions worse. They have also been seriously damaging to air quality targets.
- The GLA is now working on
 - Technology development and retrofitting existing fleets
 - Accelerating Euro VI deployment – if it works. Current indications are hugely encouraging but it is not clear yet whether it will be the answer.
 - Incentives. The Ultra Low Emissions Zone will be consulted on next year. Bringing it in is likely to impact on small businesses, shift workers, and the less wealthy who are less able to replace the vehicles they own.
 - The Office for Low Emissions Vehicles (OLEV) has a £500 million fund to spend, but on what?
 - Individual action will also be important. Studying possibilities on behaviour change. Can people's routes and journey timings be changed to reduce exposure? This is not an ideal solution but may help get a quick improvement. Effort will be particularly focused on highly-sensitive areas such as schools near to busy roads.
- However, not all decisions are ones that London has the ability to decide for itself. The European Commission chose to promote diesellisation and is now penalising London for the consequences of that decision.
- The GLA is very conscious of the need to balance growth, jobs, the environment and inequalities. While damage from poor air quality exacerbates inequality, there is a risk that bad policy could make inequalities even worse if they target certain activities (e.g. banning vans) which would affect poorer residents disproportionately.

Key points from Dr. Martin Strobel's opening remarks



- Many different regulations govern different elements of vehicle emissions, including CO₂, nitrogen oxides (NO_x) and particulate matter (PM) emissions, and the nature of the vehicle testing cycle used to assess emissions performance.
- Diesel has been very helpful in meeting CO₂ emissions targets, with some sub-compact and compact class diesel vehicles already on the market being ahead of proposed 2020 emissions

targets.

- Two pollutants associated with diesel engines have an impact on air quality. Emissions of particulate matter of less than 2.5 μm ($\text{PM}_{2.5}$) have been successfully addressed with the introduction of Euro V standards. In some urban areas exhaust emissions contain less $\text{PM}_{2.5}$ than the surrounding ambient air, because of the effects of diesel particulate filters (DPFs). NO_x remains a problem at present, but Euro VI regulations will solve it with increasing use of selective catalytic reduction (SCR) and active exhaust treatment technologies.
- Targeting NO_2 emissions will be insufficient for addressing the NO_2 concentrations in ambient air. Because NO changes in air in presence of ozone into NO_2 , emissions of all NO_x compounds must be tackled.
- Particulate filters with new SCR coating compounds reduce NO_x emissions between vehicle engines and exhausts by 70-85%, including filtering roughly 95% of NO_2 emissions.
- Improvements in electric vehicles, and battery costs, and an increasing supply of renewable electricity will be important for cleaning up transport emissions in the long term. But before all these are ready, steps will need to be taken to continue to improve the internal combustion engine. Diesel, especially at Euro V and VI standards, will be a crucial part of meeting air quality targets.

Key points from discussion



A range of points was made in discussion, including those summarised below. Relevant policy questions follow in **bold**:

The scale of the problem



- Current (EU) limit values are completely useless for understanding the public health impact of air pollution. The EU standard for $\text{PM}_{2.5}$ is 25 $\mu\text{g}/\text{m}^3$ averaged over a 1 year period. The US standard is an average of 15 $\mu\text{g}/\text{m}^3$ per year, California's standard is 10 $\mu\text{g}/\text{m}^3$ per year, the World Health Organisation's recommendation is 10 $\mu\text{g}/\text{m}^3$ per year. Even below 10 $\mu\text{g}/\text{m}^3$ per year an appreciable number of premature deaths can be detected.
- The GLA's estimate of 4300 deaths per year as a result of air pollution suggests about 9% of deaths in central London are a result of air pollution, and 4-5% of deaths in the outer boroughs. Air pollution is now the 4th biggest reducer of life expectancy.
- Medical science is moving on. Standards should be even tighter if we want to tackle the public health consequences of air pollution. The Departments for Transport and Health need to work

more closely together.

- With expansion over the coming decade, London needs to accommodate as many extra people as live in a city the size of Birmingham. This means transport provision needs to increase at the same time as air quality improvements need to occur. Crossrail and Crossrail 2 will be a start, but more will be needed if this is to go smoothly.
- Tackling air pollution is not going to require lots of little thoughts so much as a few big thoughts.

Are EU limit values sufficiently tight to reflect current understanding of air quality?

Can London realistically achieve future limit values in the face of coming expansion? What actions would it need to take in order to achieve them?

Technology performance



- Technology has overpromised for years. Performance has failed to match the claims made of it. Policymakers no longer believe the assurances that ‘this time will be different’. They are suffering from “Euro standards fatigue”.
- Euro V regulations have not ‘solved’ any issues. SCRs and DPFs have serious problems with real world operation. They require the right temperatures to perform to optimal levels. They only perform in tests; real world performance often rarely matches expectations claimed from lab testing. People have taken to removing DPFs from vehicles due to a perception that they lower engine performance. Switzerland has made DPFs mandatory.
- Any test cycle can be beaten. The only way to avoid ‘learning for the test’ is not to have a test cycle but to assess real world performance. This should reduce the discrepancy between claimed performance and actual performance.
- Manufacturers are having to optimise for an ever-greater number of things, including greenhouse gases, various air pollutants, improved safety, customer expectations about speed and acceleration, as well as factors like cost. Many vehicles on the roads are “ludicrously overspecified” as urban vehicles. Eventually tradeoffs may need to occur, though at present technology is improving in all areas. Can we continue to expect one vehicle to be able to answer all the questions, and for policymakers to continue to supply more questions for them to have to answer?
- There are quarter of a million NO_x generators throughout the city in the form of speed bumps. When a vehicle has to decelerate and accelerate constantly, its emissions will be worse than if driven at a steady speed.

- DPFs and SCRs (especially for petrol) will be part of the solution in less built-up areas, but not the whole part. Contributions from electric vehicles will be needed, as will reappraisal of travel modes.
- Private vehicles are unlikely to be retrofit with newer technology, meaning many Euro IV and V vehicles will still be on the roads in 15 years' time. Similarly, current plans for London buses mean Euro V buses will still be running in 2027.

Will Euro VI succeed where Euro IV and V failed?

Should the UK make DPFs mandatory and prosecute people who remove them?

Are we regulating vehicles too stringently on other features that lead to detrimental performance on emissions?

Should the EU adopt a new testing method that looks at vehicle performance in the real world, driven by randomly selected members of the public, rather than in tightly controlled test environments where performance can be manipulated more easily?

Changes to lifestyle and attitudes to travel



- As cities develop they go through a phase of motorisation and then a phase of demotorisation. London is still in the 'motorising' phase.
- According to the latest London Atmospheric Emissions Inventory, exhaust emissions are now only 20% of vehicle PM emissions. To remove pollution from tyre and brake wear, vehicles need to be away from where there are people. This would require removing vehicles from city centres.
- To improve air quality a shift will be needed towards 'active travel' – cycling and walking.
- People's commuting behaviour will change if commutes become worse – more delays or more overcrowding. Alongside developments in home working and other technological change, we should think more about whether it makes sense for everyone to be making their commutes at the same times of day. If everyone worked from home one day a week you could take roughly 20% of the journeys at peak times out of the system. Change on that scale is possible – the smoking ban is an example of similar societal change.
- Currently there is no incentive to work from home. Travelcards only offer a good deal if one travels five days a week. There should be an equivalent discount offered on flexible travelcards that offer, for example, three days' travel a week.
- During the Olympics similar changes to road use behaviour were successfully promoted. TfL is

trying to make those changes permanent.

- Moving NHS service provision into boroughs will help. So will focusing more on economic growth in outer London.

Can the rush hour commuting pattern be eliminated? Can government incentivise alternative working/commuting patterns? How?

Taxis

- Taxis are the dirtiest vehicles left on London's roads. They are making the most journeys and they have the worst emissions performance.
- Allowing 15 year old taxis on the road is disgraceful.
- The monopoly licensing for taxis should be changed. TfL have effectively created a monopoly to the detriment of cleaner air. Current taxis come at a high cost to the driver, who has also little incentive to be cleaner. In particular, requirements for a very tight turning circle act as a significant barrier to entry for other taxi makers and should be removed as it is keeping cleaner taxis off the roads.
- The 25,000 taxis in London will not all be electrified tomorrow. New Euro VI standard taxis which are available now will not be allowed in London because of licensing requirements.
- More news is expected in 2014 on potential revisions to future London taxi regulations, including conditions of fitness and bringing forward the 2020 electrification timetable.

Should London rethink its approach to licensing taxis? Can it bring forward a cleaner taxi fleet by amending its rules? Can it overcome opposition from drivers to achieve this?

Public transport

- Expansion of public transport provision will be important. The numbers involved in projects already on TfL's books are huge. There is a huge backlog of infrastructure investment that already fills out the timetable for the next 10 years.
- There are tradeoffs in promoting air quality as a public transport priority. Safety is TfL's number one priority, and its second priority is to keep the city moving with its aging Victorian infrastructure. Environmental concerns are moving rapidly up the list of other concerns (as is access) but unlikely to dislodge the first two. Campaigners need to be prepared to explain what they want *not* to have if they are to redirect money to improved air quality performance.

What degree of prioritisation should air quality and environmental impact have in public transport

decision making?

Will London's transport budget be able to cope with growing demands on it in coming years?

Public awareness of air pollution

- There is a need to educate the public about the hazards of poor air quality. People need to be thinking about it. Currently the issue is where smoking was in the 1950s and 60s – experts are aware it is dangerous but the risk is not in public's minds. This cycle of public awareness will take time to change.
- Communication of statistics around deaths and illness needs to be better, more easily understood. Statistics used at the moment are too technical, and hard for public to understand exactly what is being said.
- It is not enough to tell people that there is a problem – they need to know what they can *do* about it. The London authorities will be doing more next year to investigate what role civil society and NGOs can play in building awareness of problem and actions that people can take. DfT is looking at projects with NGOs to raise awareness of the environmental cost of transport.
- Politicians will only prioritise tackling air pollution over other things if they are pressured by their constituents and potential voters. The public needs to know how it can create pressure on politicians to create change.
- There was a perception that Transport for London and the GLA do not want to publicise air quality as a problem, because they do not want to spur change that they will be unable to respond to. Likewise, there was cynicism that austerity, rather than government discomfort, was the reason that advertising and communication around air quality had been cut.

How can public awareness, both of the problem of air pollution, and of actions they can take to improve air quality or limit their exposure to polluted air, be improved?

Policy suggestions

To conclude, participants were invited to propose one policy that could help. Those are listed here:

- Using gas in vehicles (natural gas or LPG) could be a cheaper way of quickly bringing emissions down. In Europe many more LPG options are available than in the UK, where support has been short term. 10 year support for LPG would get lead to many more vehicles being available in the UK.
- Vertical exhausts can reduce the impact of exhaust emissions by up to 20% (by removing them

from ground level where pedestrians are).

- Change the bus operators' grant to subsidise them per mile driven rather than per litre of fuel used.
- Improve data on air pollution using personal air quality monitors supplying open access measurement data and cloud based mapping of results.
- End the turning circle requirement for London taxis.
- Adopt US limit values for pollutants
- London should hire a Deputy Mayor for the environment and air quality
- Improve quantification of benefits of improved air quality, so departments can make a better case for investments that help with more attractive cost-benefit ratios.
- Get businesses on side to support more aggressive actions, such as the Ultra Low Emissions Zone.

Policy Exchange concluding comment



The growth of London poses an extraordinary challenge for policymakers already struggling to achieve existing pollution limit values. Advancing medical science suggests these targets should be tougher, while measures to tackle pollution continue to perform disappointingly. Public awareness of the problem is very low. The benefits of improved air quality are difficult to quantify in the cost-benefit analyses used to assess policy measures that might improve air quality. Many other priorities compete for spending from government and for the attention of transport planners.

In order to have an informed debate about what (if any) action should be taken to try to reduce air pollution further, it is important to know what actions are likely to have what results. Reaching low levels of pollution may require a fundamental rethink in the way we use and get around our cities. The consequences of this would be wide-reaching, and careful thought will need to be given to decide whether or not they are appropriate.

Further work is needed to identify the possibilities of behavioural, technological, and cultural change, so policymakers can achieve the best balance of concerns about growth, wellbeing and the environment.

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