LONDONASSEMBLY

Environment Committee

Driving away from diesel

Reducing air pollution from diesel vehicles

Environment Committee Members

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Foreword

It's no secret that London has an air pollution problem: one only has to step outside on a 'bad air day' to observe first-hand the haze that occurs when dust, particles and other gases combine above the city's streets in dry weather.

What's less well known is the role that diesel engines – and their increasing use in modern vehicles – have played in exacerbating the problem.

Where once it was a deadly mixture of soot and smoke from coal-fired power stations and factories that was largely responsible for London's air pollution, today it is the combustion of diesel that is to blame for much of the problem – with diesel powered vehicles alone responsible for around 40 per cent of London's nitrogen oxides (NOx) emissions.

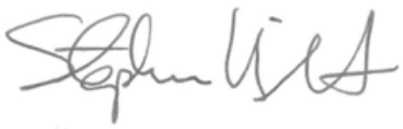
The failure of modern European Union engine standards to deliver the emission reductions expected from diesel vehicles, combined with government policies aimed at encouraging more efficient vehicles, which have indirectly incentivised the uptake of diesel, has left a generation of dirty vehicles on our roads.

The dieselisation of our fleet shows no obvious signs of stopping either: 50 per cent of all new cars sold in the UK last year were diesel, compared to only around 30 per cent a decade ago.

Yet the drive to diesel cannot be allowed to continue, with the government having recently been ordered by the Supreme Court to prepare a new air quality strategy that will bring the UK into line with legally binding limits on levels of harmful air pollution as soon as possible.

The challenge for policy makers then is to phase out high polluting diesel vehicles while at the same time providing the infrastructure and incentives required to support the uptake of cleaner, low emission alternatives.

In examining the different ways to reduce diesel pollution in London, our investigation has rightly focused on those steps which the Mayor could take to further reduce emissions from vehicles directly under his control such as buses, taxis and minicabs. However in order to tackle emissions from private diesel vehicles – such as cars, van and lorries – it is clear that further action will be needed at national level too. Accordingly our recommendations are directed towards both the Mayor of London and central government.



Stephen Knight AM
Chair of the Environment Committee at the time of this investigation

Executive summary

London has a major air pollution problem, and diesel exhaust is a major contributor. Therefore we have looked at London's efforts to reduce pollution from diesel cars, lorries, buses and taxis.

London, like most large cities, has high levels of pollutants. These include tiny airborne toxic particles (PM) and the toxic gas nitrogen dioxide (NO_2), both emitted in vehicle exhaust, especially diesel. Though air quality has improved over the decades, it has not improved enough and in recent years NO_2 and PM levels have remained largely static. In places, London's air quality is among the worst in Europe.

There is a major public health impact. Official scientific estimates are that there are thousands more deaths each year in London as a result: more than obesity or alcohol and second only to smoking. In financial terms this equates to billions of pounds.

London's pollution levels are illegal. The UK breaches limits for NO_2 (set in its own and EU law) by large margins, especially in parts of London. The UK Supreme Court has ordered the government to improve its air quality plan to remedy this as soon as possible, and the EU has begun enforcement action which could ultimately lead to fines of hundreds of millions of euros.

The Mayor has already proposed measures that go beyond the UK's existing air quality plan, and move in the direction of other cities such as Berlin. He has ordered an Ultra Low Emission Zone (ULEZ) in central London from 2020, and has called on the government to supplement it with measures such as a diesel scrappage scheme and widespread road pricing to replace other motoring taxation such as fuel duty and vehicle excise duty. The 2014 Transport Emissions Road Map sets out how these measures could potentially achieve compliance with the pollution limits by 2025.

However, we want to see how compliance can be achieved by 2020. The Mayor says that the government must deliver this acceleration by agreeing to his proposals immediately. We agree that the government should do this, but also call on the Mayor to improve his own plans, including a faster, wider and stronger ULEZ. In this report we set out measures relating to different vehicle types.

Diesel cars, vans and lorries are subject to European standards for vehicle emissions, aimed at reducing emissions across the whole fleet. The different levels of these standards are also used as a basis for specific measures such as

the ULEZ. However, the Euro standards have so far have failed to reduce nitrogen dioxide from diesel vehicles in urban driving, and in some cases have made emissions worse.

The ULEZ therefore will rightly penalise diesel vehicles older than the new Euro 6 standard entering central London. But even with the newest standard, the testing is inadequate and some certified Euro 6 diesel cars emit several times more pollution than the standard allows in real urban driving. The Mayor should press for effective new tests to be brought in soon. The Mayor should also consider further tightening the ULEZ standard as circumstances allow. With a government scrappage scheme, the Mayor should consider removing all diesel cars from ULEZ exemption – other European cities are considering diesel bans. And, supported by effective charging infrastructure, the Mayor should bring forward from 2025 the date by which he proposes to restrict the exemption to zero-tailpipe-emission cars.

The Mayor should also continue to work to promote cleaner technologies for HGVs, such as hybrid, electric and fuel cell drives, and smarter freight management to reduce the distance driven.

We also call on the Mayor to reduce emissions where he has greatest control – in the public transport fleets of buses, taxis and minicabs.

Older buses, like older HGVs, are heavy polluters. We support the Mayor's policy that, by 2020, double-deckers operating in central London should be Euro VI hybrids and that single-decker buses should be zero-emissions. TfL does not propose to retrofit its first 300 New Routemaster buses to make them Euro VI compliant, but instead to allow them to operate in the ULEZ without meeting the standards of other diesel vehicles. We are concerned that this undermines the credibility of the ULEZ, and sends out the wrong signal.

Reducing emissions from taxis and minicabs will require support and investment from the Mayor and Government. There is currently a shortage of zero-emission-capable taxi models on the market. On top of this, London doesn't have enough rapid charging points – a problem that affects taxis, minicabs and other vehicles. However, 2033 is too late a date for all taxis and minicabs to be zero-emission capable.

The legal obligation is to consider all possible measures to bring air pollution within legal limits as soon as possible. We call on both the Mayor and the national government to do just this, beginning with the measures recommended in this report.

1. Introduction

1.1 London has a major air pollution problem, and diesel exhaust is a major contributor. Public debate on air pollution in recent years has focused closely on diesel emissions; there have been some calls to ban diesel vehicles from cities and ultimately phase them out altogether.

London's air pollution

1.2 London has high levels of air pollution. The pollutants of most concern include tiny particles (particulate matter or PM) and the gas nitrogen dioxide (NO_2). Both are emitted by diesel vehicles among other sources. Most large cities have high levels of pollution; some parts of London are among the most polluted in Europe.[1]

> Pollutant terminology
>
> Particulate matter is often designated by particle size, for example $PM_{2.5}$ or PM_{10}. $PM_{2.5}$ is more harmful as the smaller particles travel further into the lungs, and can pass into the bloodstream.
>
> Diesel exhaust and other combustion sources contain NO_2. They also contain nitrogen oxide (NO), a chemically related gas which can convert to NO_2 in the air. NO and NO_2 are collectively known as NO_X, and all NO_X is of concern when measuring emissions, because of the conversion of NO to NO_2. The NO_2 component of emissions is referred to as primary NO_2 and has the greatest impact on peaks of NO_2 in the air at the roadside, where the NO component has not yet converted to NO_2.

1.3 Air pollution is a major public health hazard, increasing deaths and ill-health.[2] Possible consequences of air pollution include low birth weight[3], stroke[4], heart and lung diseases[5], brain ageing[6] and cancer[7]. Children, older people and those with long-term illness are particularly vulnerable. In 2010, over 3,000 extra deaths were attributed to man-made toxic particles in the air across London – seven per cent of all adult deaths.[8] NO_2 is not included in current mortality estimates, but recent evidence suggests that NO_2 may cause about as many deaths again. Therefore the overall death toll due to air pollution may be considerably higher than previous figures showed.[9] In economic terms, the death and illness caused by air pollution cost London billions of pounds - the World Health Organization estimates the cost of particulate pollution at more than £50 billion across the UK.[10]

Legal limits

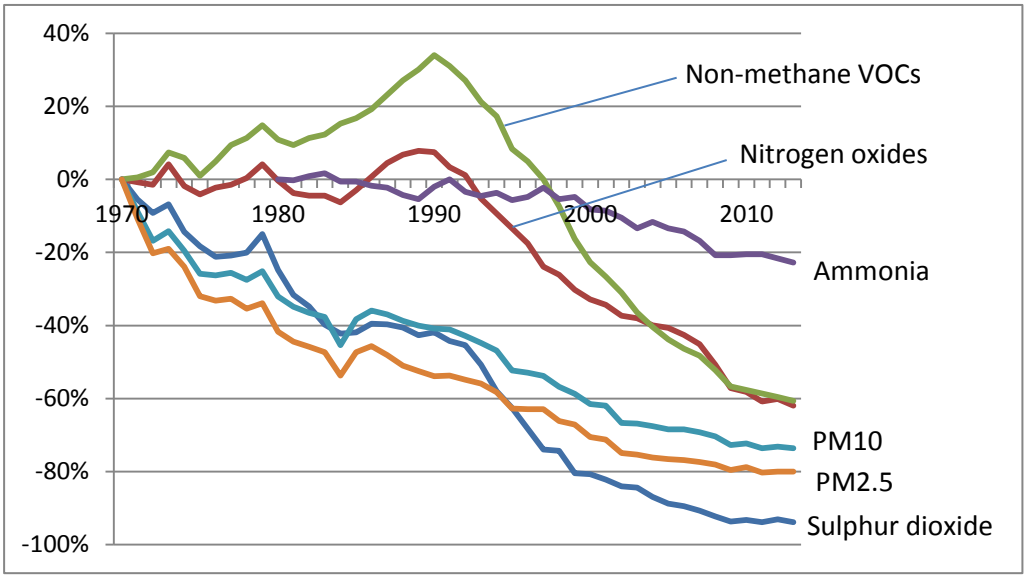
1.4 UK and EU law sets limits on the allowable concentrations of these pollutants in the air. Efforts to come within the limit values for PM_{10} have largely been successful in recent years, but since the NO_2 limits came into force in 2010, they have been breached in much of central London and the Heathrow area, and around main roads throughout Greater London. In the worst hotspots, such as adjacent to the busiest roads, the breaches are by very wide margins. Based on 2014 policies, breaches of these limits were projected to continue in London until after 2030.[11]

1.5 Both UK campaigners and the European Commission have separately brought legal pressure to bear to accelerate action to eliminate these breaches. In April 2015, following a case brought by the environmental organisation ClientEarth, the UK Supreme Court ordered the government to produce a revised air quality plan by the end of the year, demonstrating that compliance with the limit values will be achieved as soon as possible. This plan must be submitted to the European Commission by the end of 2015.[12] Separately, the Commission has begun a European Court enforcement process, which could result in a very large fine, reportedly up to hundreds of millions of euros.[13] Under the Localism Act 2011, such fines may be passed on to responsible local authorities, including the GLA.[14] The GLA's view is that Mayoral action has gone beyond government action, and so the GLA should not be liable for any part of the fine. Given this position and the uncertain size and timescale of any eventual fine, the GLA has not recognised the matter in its latest annual accounts.

Trends

1.6 Air pollution was much worse still in past decades, and has fallen considerably. As Chart 1 shows, emissions of a range of major pollutants have fallen in recent decades, with emissions of nitrogen oxides down by over half since about 1990.

Chart 1: Most UK pollutant emissions have fallen in recent decades

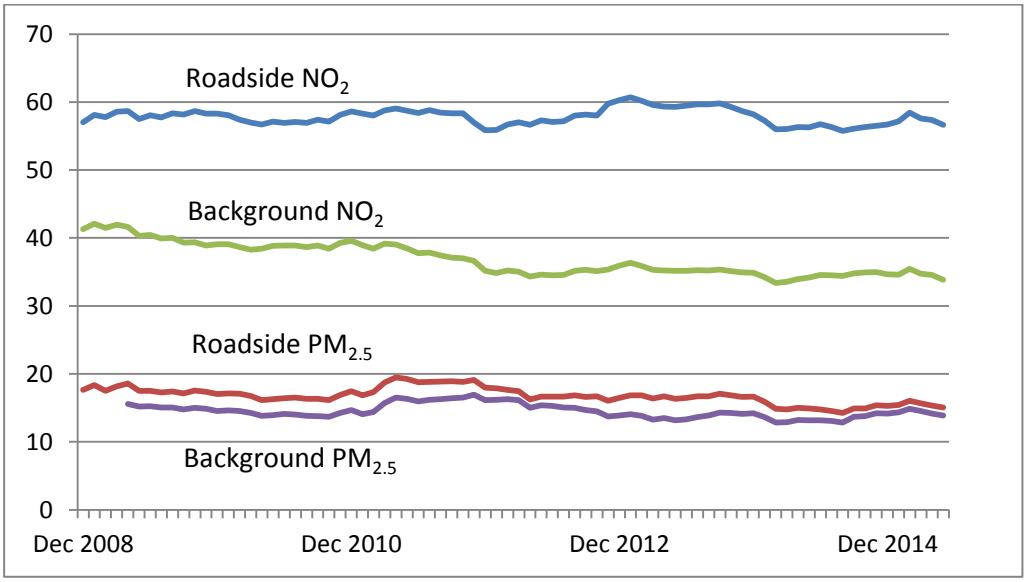


Source: Defra National Statistics Release: Emissions of air pollutants in the UK, 1970 to 2013[15]

1.7 However, the picture for concentrations of NO_2 in London is different, at least in recent years. Background NO_2 has been broadly stable since 2011, and roadside NO_2 since at least 2008. Particulate concentrations have fallen slowly overall, though not consistently.

Chart 2: London roadside NO_2 has been broadly stable in recent years

Average concentrations for the 12 months to the given date, micrograms per cubic metre

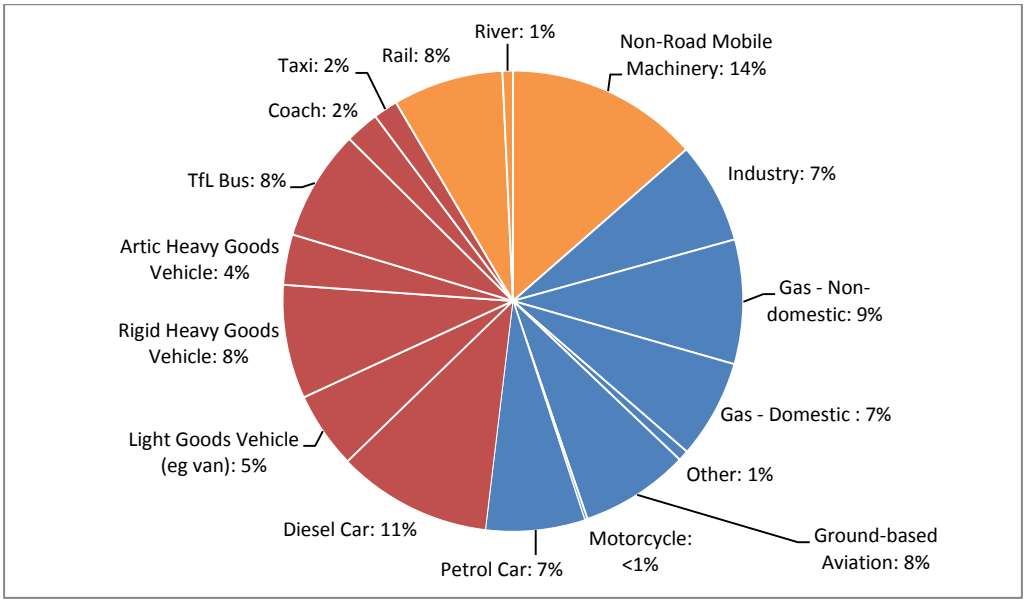


London Average Air Quality Levels, GLA based on Kings College London data, June 2015[16]

The role of diesel emissions in air pollution

1.8 Diesel road traffic is responsible for about 40 per cent of London's NO_X emissions (and a broadly similar proportion of PM_{10}). The proportion has risen in recent years, for two reasons. Government policies to reduce carbon emissions have indirectly promoted and incentivised the use of diesel over petrol, leading to an increase in the number of diesel cars on the road. However, European vehicle emissions standards, designed to reduce the emissions from diesel vehicles have (at least until very recently) had only limited success.

Chart 3: Diesel road traffic is responsible for about 40 per cent of London's NO_X emissions[17]



London Atmospheric Emissions Inventory and Transport Emissions Road Map

Road diesel emissions are in red, other diesel in orange, and other or mixed fuels in blue

1.9 Gram for gram, particulate emissions from diesel vehicles can be more harmful than other particulate emissions (which come from similar sources to NO_X, plus wear on vehicle tyres and brakes, industrial and construction sources, and natural dust). For example, $PM_{2.5}$ emissions from diesel exhaust contain high levels of black carbon, which has been found to be four to nine times more deadly than other types of $PM_{2.5}$.[18]

Mayoral policies

Air Quality Strategy

1.10 The Mayor's Air Quality Strategy (MAQS) was published in 2010. It set out transport and other measures aimed at complying with PM_{10} and NO_2 limits

by the EU's extended deadlines of 2012 and 2015 respectively. Attempts to cut PM_{10} levels have had some success, but the NO_2 reduction has not been achieved, in large measure because of the problems identified in this report. Even taking into account the steps set out in the MAQS, recent analysis indicates that limits will still be breached until after 2030. It has therefore become very clear that further measures are needed.

Air Quality Manifesto and Ultra Low Emission Zone

1.11 In 2014, the Mayor published an 'Air Quality Manifesto', including a plan for an Ultra Low Emission Zone (ULEZ) in central London, to be in place by 2020. Early publicity suggested that only zero or low emission vehicles would be allowed into central London by 2020, with the suggestion that new technologies such as electric vehicles would be required.[19] After further development, the ULEZ scheme as ordered by the Mayor in 2015 sets less stringent standards, which typical petrol and fairly up-to-date diesel vehicles will meet. Non-compliant vehicles will in any case be able to enter by paying a charge.[20]

The ULEZ will cover central London from September 2020

Source: TfL

1.12 We believe that the ULEZ should be stronger. Alongside organisations including London boroughs, the London Health Commission, and the Faculty of Public Health of the Royal Colleges of Physicians, we have previously called for the ULEZ to be strengthened with earlier implementation, wider coverage, stricter standards and/or stronger incentives.[21]

Transport Emissions Road Map

1.13 The Transport Emissions Road Map (TERM), published by the Mayor and TfL in 2014, sets out how the ULEZ, other Mayoral policies and hoped-for national and European action could reduce air pollution, achieving compliance with limit values by 2025 rather than after 2030.[22]

1.14 The ULEZ is expected to achieve the largest share of the reduction, especially in the short term to 2020. To eliminate pollutant breaches by 2025, the TERM also proposes a further phase, with the initial ULEZ standards applied London-wide, and cars without near-zero emissions charged to enter the central zone. The road map also relies on smarter traffic management, including road pricing, and a successful programme of incentives and infrastructure for low-emission vehicles such as electric cars.

1.15 Recent statements by the Mayor and his environment adviser have indicated that compliance could be achieved by 2020, if there is sufficient support from national government. The measures the Mayor is asking for include a national scrappage scheme for older diesels and the reform of Vehicle Excise Duty to reflect emissions of local pollutants as well as CO_2.[23]

International examples

1.16 A number of other world cities have policies to restrict vehicle movements. The most relevant comparisons are with other large European cities that also discourage or exclude the oldest and/or most polluting vehicle types, such as Paris and Berlin. None has a complete ban on diesel vehicles yet, but reports suggest some may move in this direction.[24]

The committee's work

1.17 In the course of this investigation, we took evidence from a range of experts on the effects of diesel pollution and potential ways to reduce it. We also built on our past work on air pollution, including a response in February to the consultation on the ULEZ order.[25]

The structure of this report

1.18 In chapter 2 of this report we look at the current plans to meet air quality standards in London by 2025, and argue that the Mayor should take action so they are met sooner. In chapter 3 we examine plans to tackle emissions from private diesel vehicles such as cars, vans and lorries. In chapter 4 we examine how the Mayor, through TfL, can reduce emissions from buses, taxis and minicabs – vehicles that TfL either directly controls or licenses.

2. Compliance with legal limits: strengthening the ULEZ

2.1 Compliance with the legal limits for NO_2 should be achieved as soon as possible and the Mayor needs to show how this can be done. Under the current TERM plans (including the ULEZ), compliance is set to be achieved by 2025 – 15 years after the limits were put in place. But compliance will not be achieved by the ULEZ alone. Other measures will be needed, including a shift to travel by bus, train, walking and cycling. Any increase in traffic will increase the challenge.

2.2 The Mayor has recently envisaged compliance by 2020 if the government immediately adopts road pricing, motoring duty reform and a scrappage scheme. However, details of these and their pollution impacts are lacking, and we have seen no figures showing compliance by 2020.

2.3 Following the Supreme Court judgment, all measures should be considered to achieve NO_2 compliance as soon as possible.

2.4 It would be fairer on Londoners for any additional or stronger measures to be brought forward as soon as possible, enabling responses such as mode or vehicle changes to be planned with due notice.

Recommendation 1

The Mayor, working closely with the boroughs and national government, should show how the whole of London could achieve full compliance with air pollution limits by 2020.

The Mayor should consider again our recommendations on the ULEZ:

• implementation should be brought forward from 2020;

• the non-compliance charge should increase over the zone's first years and consideration should be given to increasing the charge for heavily polluting vehicles to a more punitive level, to enhance the zone's impact and reflect the generous time to change vehicles or routes to avoid the charge; and

• discussions with boroughs on the costs, benefits and practicalities of a wider ULEZ should be progressed rapidly, and with a view to widening the ULEZ beyond the Congestion Charge Zone as soon as is practically possible, following further public consultation.

3. Cars, vans and lorries

Diesel cars, vans and lorries contribute nearly a third of London's NO_X emissions. The main tool to reduce their emissions is to discourage the most polluting vehicles in favour of cleaner vehicles. These efforts rely on the Euro standards for vehicle emissions. However these have so far have failed to reduce NO_2 from diesel vehicles in urban driving.

The ULEZ therefore rightly will penalise diesel vehicles older than the new Euro 6 standard entering central London. It exempts petrol vehicles as old as Euro 4 – these have emissions of toxic pollutants as low as the most modern diesels. However, they are likely to emit more CO_2, and the Mayor should check the possible impact on his carbon reduction targets.

There are still problems with Euro 6 diesel cars. Because of inadequate testing, some certified Euro 6 models emit several times more pollution than the standard permits in real urban driving. The Mayor should press for effective new tests to be brought in soon. The Mayor should also consider further tightening the ULEZ standard as circumstances allow. The Government should bring in a scrappage scheme for replacing a polluting vehicle with a cleaner one. With such a scheme, the Mayor should consider removing all diesel cars from ULEZ exemption. And, supported by effective charging infrastructure, the Mayor should restrict the exemption to zero-tailpipe-emission cars sooner than the proposed 2025.

Euro VI heavy goods vehicles (HGVs) do have much lower emissions than older models, and cleaner alternatives to diesel are not widely used. Therefore it is right for the ULEZ standard to be Euro VI for diesel HGVs. But there are still significant emissions from these large diesel engines, and the Mayor should continue work to promote cleaner technologies. London also needs smarter freight management to reduce the distance driven by HGVs.

3.1 Diesel cars, goods vehicles and private coaches contribute about 30 per cent of all NO_X emissions in London (and about 26 per cent of PM_{10}). It is therefore essential to reduce emissions from these sources.

'Dieselisation' and fiscal incentives

3.2 Diesel has become more prevalent in the vehicle fleet, especially for cars where it was once rare in comparison to petrol. Diesels now account for a majority of UK new car sales. Diesels have had a reputation for being cheaper and more environmentally-friendly. Government policy has also favoured

diesels, for example by basing Vehicle Excise duty on headline carbon emissions figures.

3.3 However, it is now increasingly understood that these perceptions and policies need to change. Diesels' advantage in $C0_2$ emissions is in practice smaller than the headline fuel consumption figures suggest, especially in stop-start urban driving. For this and other reasons the overall economy comparison does not necessarily favour diesel cars, again, especially in urban driving.[26] We also heard that the black carbon particles in diesel exhaust are a highly potent greenhouse agent.[27]

3.4 But the major reason for the policy shift away from diesel is the role of diesel emissions in air pollution. As this report will show, diesel cars can be much bigger emitters of local toxic pollutants like NO_X and PM. Vehicle duty could be reformed to reflect these as well as carbon emissions – the recent Government changes to vehicle duty remain linked to CO_2 only.[28] A more comprehensive fiscal reform, involving fuel duty and road pricing, should also be pursued, but would take considerably more development.

Recommendation 2

The Government should take forward the Mayor's proposals for fiscal reform in motoring, starting with an urgent review of Vehicle Excise Duty to reflect local toxic pollutants such as NO_X and PM as well as CO_2.

Euro emissions standards

3.5 The European Union standards for vehicle emissions (the Euro standards) seek to progressively bring down emissions per vehicle. The standards set maximum emissions levels for different vehicle types such as cars and light vans or heavy goods vehicles. The standards apply to all new vehicles sold in the EU, and have been progressively tightening since their introduction in the 1990s, to bring down average fleet emissions as older and more polluting vehicles are scrapped at the end of their lives. The successive standards are referred to by number, with the latest being Euro 6.

3.6 Several policy measures to incentivise cleaner vehicles use the Euro standards. These include the Low Emission Zone (LEZ), the Ultra-low Emission Discount on the congestion charge, and the forthcoming ULEZ.

Euro emissions standards

The standards for light vehicles have Arabic numerals (such as Euro 4). The corresponding standards for heavy vehicles use Roman numerals (such as Euro IV) The most recent standards are Euro 6 (applying to all new cars and light vans from September 2015), and Euro VI (applying to all new heavy vehicles from the end of 2013).

3.7 Every vehicle, apart from taxis, entering the ULEZ from September 2020 will need to comply with a set of exhaust emission standards (Euro 4 for petrol and Euro 6 for diesel) or pay an additional daily charge (£12.50 for cars and vans, £100 for lorries and buses).

3.8 The Euro standards have been widely criticised as unrealistic. Compliance with the standard is determined by running an engine at a standardised test cycle. But 'real world' NO_X emissions from diesel cars – tested to reflect the slower speeds typical of urban driving – have been shown to be typically three to five times higher than official test results, as detailed in Appendix 2. Diesel light vans are subject to similar standards and testing.

3.9 Pre-Euro 6 diesel cars and vans should be removed from London's most polluted areas as soon as possible. These vehicles (still available in showrooms) emit just as much NO_X as older vehicles, and more NO_2.

Petrol – a cleaner alternative?

3.10 There are competing views of petrol as an alternative to diesel. Generally, petrol cars emit less NO_X and PM than diesel, but somewhat more CO_2.

3.11 The main concern of the ULEZ is emissions of local pollutants, especially NO_X. As Appendix 2 shows, petrol cars at Euro 4 and 5 emit less than a tenth as much NO_X as their diesel equivalents (and at Euro 4 a tiny fraction of the PM). For this reason, the ULEZ standards treat Euro 4 petrol and Euro 6 diesel as equivalent, allowing both into the central zone without charge. To facilitate the removal of older diesels from the road, alternatives will be required in the used car market, and older petrol vehicles provide this alternative.

3.12 However, a secondary aim of the ULEZ is also to reduce CO_2 emissions. Petrol vehicles tend to have higher CO_2 emissions than diesels of equivalent age (although diesel exhaust is high in black carbon, which is a very potent greenhouse agent, as well as very damaging to human health). Therefore, a switch from diesel vehicles to equivalent or perhaps older petrol vehicles might risk raising carbon emissions. For this reason, the Society of Motor

Manufacturers argued that the ULEZ standard should also be Euro 6 for petrol.

Recommendation 3

The Mayor should model the CO_2 impact of the Euro 4 and 5 petrol vehicle exemption, to ensure it will not jeopardise his transport CO_2 reduction targets.

Continuing problems with diesel cars

3.13 Even with the new Euro 6 standard, diesel cars and vans remain a problem. These vehicles (coming in now and compulsory from September) are considerably cleaner than earlier diesel models, but – as Appendix 2 shows – their NO_X emissions, realistically-tested, are still about six times higher than those of Euro 5 or 6 petrols. For this reason, we heard from professors of air pollution and public health at Kings College London that no diesels – even Euro 6 vehicles – should be exempt from the ULEZ charge.

3.14 This problem may be partly solved by improved testing before certifying vehicles. Proposed new tests will hopefully ensure that cars perform to the Euro 6 standard, which (as shown in Appendix 2) is broadly comparable to the petrol Euro 4 standard. But the tests will not be in place before 2017, and possibly later. As a result, for at least two years, cars will enter service that are certified to Euro 6 but, in practice, emit much more NO_X than equivalent petrol vehicles. They will remain on the road for years to come and will qualify for any exemptions based on Euro 6 – including the ULEZ. Moreover, even when effective tests are available, diesel cars will remain dirtier than their petrol counterparts, emitting about 30 per cent more NO_X and releasing black carbon into the air.

Recommendation 4

The Mayor should continue to lobby the EU for effective Euro 6 testing to be implemented as soon as possible, and the tests to include as realistic a reflection of urban driving as possible. The Mayor should report the lobbying work and responses to this committee by the end of 2015.

Transport for London should carry out regular testing on London's roads to see if Euro 6 vehicles are reducing the expected level of emissions in the way their model predicts. It should explore the possibility with the European Commission of removing the ULEZ exemption from vehicles registered as Euro 6 which do not meet the required standards in London's urban conditions, and of Transport for London undertaking its own emissions tests if necessary.

3.15 Any reduction in exposure to toxic pollutants will deliver welcome health benefits. The Mayor proposes to tighten the ULEZ standard to zero-tailpipe-emission for cars in a second phase. The sooner this happens, the more Londoners will benefit.

Recommendation 5

The standards for the ULEZ must be kept under review, and should be tightened to drive the uptake of lower-emissions vehicles as they become more widely available. In particular, consideration should be given (in tandem with measures to assist consumers – see recommendation 6) to removing all diesel cars from the exempt category.

The committee supports the Mayor's further proposal to tighten the ULEZ standard to zero-tailpipe-emission for cars in a second phase, and recommends that it be brought in sooner than 2025 (supported by effective provision of charging infrastructure).

3.16 The Mayor has called for national funding for a scrappage scheme. People would be offered grants when scrapping a polluting diesel vehicle and purchasing a low-emission vehicle, such as a plug-in hybrid. A similar scheme in 2009-10 saw 392,000 cars removed from the road.[29] The Mayor's adviser argued that this could be close to fiscally-neutral, if VAT receipts on the new purchase and the stimulus to UK manufacturing were considered.[30] Some older petrol vehicles, not complying with Euro 4, would also need to be replaced. A scrappage scheme or similar support may be particularly important to ease the compliance of the light goods and commercial fleet.

Recommendation 6

The Government should take forward the Mayor's proposal for a scrappage scheme linked to replacing non-compliant vehicles with low-emission vehicles – provided it can be assured that the replacement vehicles achieve low emissions in urban driving.

Heavy goods vehicles: working to different standards

3.17 Older diesel heavy goods vehicles (HGVs) are heavy polluters, and should be deterred from entering central London. Under the ULEZ, HGVs that do not reach the Euro VI standard would be charged £100 per day to enter central London. Yet even the latest Euro VI HGVs still emit significant pollution.

3.18 There are currently few alternatives to diesel-powered HGVs, and we therefore agree that Euro VI heavy vehicles should be exempt from the ULEZ charge until lower emission alternatives are widely available. Over the longer term, lower emissions from HGVs will be possible with new technology (such as hybrid, plug-in electric or hydrogen fuel cell) and better freight management (reducing the use of HGVs by planning deliveries better and making more use of smaller vehicles for smaller deliveries).

Recommendation 7

The Mayor should continue to actively promote very low emission technologies for heavy vehicles, such as plug-in hybrid, plug-in electric, hydrogen fuel cell electric or others.

The Mayor should re-examine whether goods vehicles should also be included in the introduction of the zero-emission standard for ULEZ exemption, proposed for cars from 2025.

The Mayor should also drive forward smarter freight management to minimise the demand for goods transport in and through London.

4. Buses, taxis and minicabs

The Mayor, through TfL, has the ability to exert significant control over the emissions from London's public transport fleet – buses, taxis and minicabs. It is important that the Mayor demonstrates his commitment to reducing emissions by tackling the problems caused by vehicles under TfL's control or regulation.

Older buses, like older HGVs, are heavy polluters. We support the Mayor's policy that, by 2020, double-deckers operating in central London should be Euro VI hybrids and that single-decker buses should be zero-emission. TfL does not propose to retrofit its first 300 New Routemaster buses to make them Euro VI compliant, but instead to allow them to operate in the ULEZ without meeting the standards of other diesel vehicles. We are concerned that this undermines the credibility of the ULEZ, and sends out the wrong signal.

Reducing emissions from taxis and minicabs will require support and investment from the Mayor and Government. There is currently a shortage of zero-emission-capable taxi models on the market. On top of this, London doesn't have enough rapid charging points – a problem that affects taxis, minicabs and other vehicles.

Buses

4.1 There are almost 9,000 buses in TfL's fleet, of which the vast majority are powered by diesel engines.[31] As with HGVs, buses that predate the latest Euro VI standard are heavy polluters. TfL plans to modernise its bus fleet to introduce more hybrid vehicles, which can run on electricity for some distance without using the diesel engine. By 2020, almost all double-decker buses operating in central London will be Euro VI hybrids, and all single-deckers will be zero-emission. We welcome this progress, though it has been painfully slow. Hybrid buses can be operated in zero-emission mode where needed – a technique known as "geofencing" – which, in theory, could cut NO_2 emissions in the worst-polluted parts of central London.

New Routemasters

4.2 The ULEZ makes an exception to the general Euro VI standard for diesel vehicles in the case of the New Routemaster (NRM) hybrid bus, and we are concerned that this may undermine the credibility and pollution benefits of the ULEZ. About 300 of the first NRMs are entering service with Euro V hybrid

engines. These older models have direct NO_2 emissions about 5 times more than Euro VI hybrids.

4.3 Although other, higher-emitting, Euro V hybrids are to be retrofitted to meet the Euro VI standard, TfL does not propose to retrofit the Euro V NRMs, but instead to allow them to operate in the ULEZ as they are. There is a special exemption in the ULEZ order for this purpose. TfL argues that, rather than spending an estimated £15 million on the retrofit, it is more cost-effective to replace older buses on suburban routes with new buses. TfL has not, however, published a cost-benefit analysis to support this argument.

4.4 In addition, the NRMs are likely to be operating on London's streets for far longer than other models; because they are a unique model and there is currently no second-hand market for them, TfL has decided to purchase all 608 vehicles directly with a view to operating them for their entire working life of at least 14 years. By this time, the Euro V NRMs would most likely be the most polluting buses in the fleet.

4.5 The Euro V NRMs, being significantly cleaner than standard Euro V buses, would in the near future be a benefit in the suburbs, where they could replace even older Euro III or IV conventional diesel buses emitting several times the NO_X per bus.

Recommendation 8

TfL should not drive its own non-Euro-VI buses in the zone where others are penalised. All London's Euro V hybrid buses, including New Routemasters, should be retrofitted to meet Euro VI standards by 2020. If cost-benefit considerations preclude this, non-retrofitted Euro V buses should be redeployed away from central and inner London as soon as enough Euro VI buses can be procured to serve the central and inner London routes.

4.6 Work is ongoing to develop and bring to market double-decker buses with zero or near-zero tailpipe emissions[32]; we support this work and would like to see all new buses in London giving zero tailpipe emissions as soon as possible.

Taxis

4.7 Taxis (black cabs) are a significant source of pollution in central London and are rightly subject to regulatory action to reduce this. However, past and current regulation is responsible for the emissions of the current taxi fleet, and it is not feasible to expect the trade to implement radical changes without sufficient support or viable alternatives to diesel engines.

Reducing the age of diesel taxis

4.8 The Mayor had proposed that, from 2020, the age limit on taxis would be reduced from 15 to 10 years. However, this proposal has been withdrawn in the face of opposition from the trade (and questioning by this Committee). Instead, the new proposal is to supplement the existing 15-year limit with a subsidy of up to £5,000 for voluntary decommissioning of taxis over 10 years old.

Introducing zero-emission capable taxis

4.9 From 2018, all newly registered taxis will have to be 'zero-emission capable' (plug-in petrol-electric hybrid, fully electric or similar). While we support this move, we also have concerns about how this will be implemented and the impact on the taxi trade.

4.10 Until there are enough zero-emission capable taxis on the market, and enough rapid charging points in central London, it will be difficult for the taxi trade to switch away from diesel vehicles. Indeed, the two issues are related; the London Taxi Drivers' Association (LTDA) told us that manufacturers are not launching new electric taxis because of the lack of rapid charging points in central London. And Nissan has also cited the zero-emission requirement as a reason for suspending the launch of its planned petrol London taxi, which would have been cleaner than existing commercial models and was to have been the precursor to an all-electric model.[33] TfL is confident that suitable vehicles will be on the market from 2017, on the basis of undisclosed 'working with a number of manufacturers'. It has announced a grant scheme with a £3,000 supplement to the £5,000 available from the government's Office for Low Emission Vehicles to support the purchase of plug-in taxis. This, and the voluntary decommissioning grant, are to be paid for by a fund of £65 million secured by TfL with government support.[34] The Government has also recently confirmed £10 million of additional funding for a rapid-charging network in London.[35]

Timetable

4.11 Under current plans with the 15-year age limit, London's taxi fleet may not be fully zero-emission capable until 2033. Some, heavily polluting, Euro 5 diesel vehicles will not qualify for the voluntary decommissioning grant until 2025 and could still be operating in London until 2030, and Euro 6 diesels (many inadequately tested) for three years after that (whereas it is proposed that by 2025 private cars and minicabs will all be subject to the ULEZ charge unless they are fully zero-emission). The Mayor should therefore encourage the

rapid phasing out of Euro 4 and 5 taxis from 2018 and their replacement with zero-emission capable models.

Minicabs

4.12 Minicabs (private hire vehicles), like other cars, will be subject to the ULEZ, as well as their 10-year age limit. The ULEZ charge will provide a significant incentive to shift away from Euro 4 and 5 diesel models (which would otherwise be prevalent in the industry) to petrol equivalents or newer Euro 6 diesels. This should reduce NO_X and PM emissions.

4.13 There is a limited move towards zero-emission-capable minicabs. From 2018, registered minicabs up to 18 months old will be required to be zero-emission-capable. However, such new vehicles are mainly used by large cab companies. Smaller operators are likely to continue to use mainly older vehicles, which will then be required to meet ULEZ standards of Euro 6 for diesel or 4 for petrol.

4.14 Questions were raised during our investigation, but not answered, as to how electric and plug-in hybrid minicabs will charge up. Many minicab (and taxi) drivers keep their vehicles at home and do not have access to off-street parking, which would enable them to charge a vehicle outside of working hours. There will increasingly be a need for a network of rapid charging points available for minicabs and other vehicles across London.[36]

Recommendation 9

The Mayor should, in his response to this report, set out (following further consultation with the taxi industry where necessary) how:

- **sufficient zero-emission capable taxis will be available from 2018 to support the requirement that all new taxis must meet this standard**
- **the necessary infrastructure (rapid charging network and/or hydrogen stations) will be delivered to enable a large fleet of zero-emission capable taxis, and another of minicabs, to operate across London from 2018**
- **the heavily-polluting pre-Euro 6 taxis will be phased out before 2025, rather than between then and 2030**

5. Minority opinion from the GLA Conservatives

5.1 The GLA Conservatives are unable to support the findings of this report. We are particularly concerned about the recommendations to bring forward the ULEZ from 2020 and to impose additional restrictions from the outset, such as an increased daily charge for vehicles, a further tightening of ULEZ standards, and to widen the ULEZ area beyond the Congestion Charge Zone.

5.2 We do not feel that there would be sufficient benefit to justify the additional restrictions and costs to vehicle owners, or the impact on London's economy that these measures are likely to bring.

5.3 We strongly feel that a far better approach to tackling diesel is through a focus on incentives, including a diesel scrappage scheme, as well as the taxi incentives recently announced by the Mayor.

5.4 We would therefore request that our opposition to this report be noted.

Appendix 1 – Recommendations

Recommendation 1
The Mayor, working closely with the boroughs and national government, should show how the whole of London could achieve full compliance with air pollution limits by 2020.

The Mayor should consider again our recommendations on the ULEZ:

- implementation should be brought forward from 2020;
- the non-compliance charge should increase over the zone's first years and consideration should be given to increasing the charge for heavily polluting vehicles to a more punitive level, to enhance the zone's impact and reflect the generous time to change vehicles or routes to avoid the charge; and
- discussions with boroughs on the costs, benefits and practicalities of a wider ULEZ should be progressed rapidly, and with a view to widening the ULEZ beyond the Congestion Charge Zone as soon as is practically possible, following further public consultation.

Recommendation 2
The Government should take forward the Mayor's proposals for fiscal reform in motoring, starting with an urgent review of Vehicle Excise Duty to reflect local toxic pollutants such as NOX and PM as well as CO2.

Recommendation 3
The Mayor should model the CO2 impact of the Euro 4 and 5 petrol vehicle exemption, to ensure it will not jeopardise his transport CO2 reduction targets.

Recommendation 4
The Mayor should continue to lobby the EU for effective Euro 6 testing to be implemented as soon as possible, and the tests to include as realistic a reflection of urban driving as possible. The Mayor should report the lobbying work and responses to this committee by the end of 2015.

Transport for London should carry out regular testing on London's roads to see if Euro 6 vehicles are reducing the expected level of emissions in the way their model predicts. It should explore the possibility with the European Commission of removing the ULEZ exemption from vehicles registered as Euro

6 which do not meet the required standards in London's urban conditions, and of Transport for London undertaking its own emissions tests if necessary.

Recommendation 5

The standards for the ULEZ must be kept under review, and should be tightened to drive the uptake of lower-emissions vehicles as they become more widely available. In particular, consideration should be given (in tandem with measures to assist consumers – see recommendation 6) to removing all diesel cars from the exempt category.

The committee supports the Mayor's further proposal to tighten the ULEZ standard to zero-tailpipe-emission for cars in a second phase, and recommends that it be brought in sooner than 2025 (supported by effective provision of charging infrastructure).

Recommendation 6

The Government should take forward the Mayor's proposal for a scrappage scheme linked to replacing non-compliant vehicles with low-emission vehicles – provided it can be assured that the replacement vehicles achieve low emissions in urban driving.

Recommendation 7

The Mayor should continue to actively promote very low emission technologies for heavy vehicles, such as plug-in hybrid, plug-in electric, hydrogen fuel cell electric or others.

The Mayor should re-examine whether goods vehicles should also be included in the introduction of the zero-emission standard for ULEZ exemption, proposed for cars from 2025.

The Mayor should also drive forward smarter freight management to minimise the demand for goods transport in and through London.

Recommendation 8

TfL should not drive its own non-Euro-VI buses in the zone where others are penalised. All London's Euro V hybrid buses, including New Routemasters, should be retrofitted to meet Euro VI standards by 2020. If cost-benefit considerations preclude this, non-retrofitted Euro V buses should be redeployed away from central and inner London as soon as enough Euro VI buses can be procured to serve the central and inner London routes.

Recommendation 9

The Mayor should, in his response to this report, set out (following further consultation with the taxi industry where necessary) how:

- sufficient zero-emission capable taxis will be available from 2018 to support the requirement that all new taxis must meet this standard
- the necessary infrastructure (rapid charging network and/or hydrogen stations) will be delivered to enable a large fleet of zero-emission capable taxis, and another of minicabs, to operate across London from 2018
- the heavily-polluting pre-Euro 6 taxis will be phased out before 2025, rather than between then and 2030

Appendix 2 – Euro standards

The NO_X emissions standards for diesel cars are failing. Table 1 below shows the emission levels required in laboratory tests for diesel and petrol vehicles at the different Euro standards. Table 2 shows emissions measured in more realistic tests at the lower speeds typical of urban driving, for vehicles certified as meeting those standards.

Table 1: Euro emission standards (grammes per kilometre)

Tier	Date	Diesel		Petrol	
		NO_X	PM	NO_X	PM
Euro 1	1993	-	0.14	-	-
Euro 2	1997	-	0.08	-	-
Euro 3	2001	0.50	0.05	0.15	-
Euro 4	2006	0.25	0.025	0.08	-
Euro 5	2010	0.180	0.005	0.060	0.005
Euro 6	2015	0.080	0.005	0.060	0.005

Source: "Regulation (EC) No 715/2007 of the European Parliament and of the Council of 20 June 2007" and earlier editions
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32007R0715:EN:NOT

Table 2: Tested emissions (grammes per kilometre)

Tier	Date	Diesel		Petrol	
		NO_X	PM	NO_X	PM
Pre-Euro		0.479	0.171	2.278	0.003
Euro 1	1993	0.570	0.054	0.260	0.003
Euro 2	1997	0.600	0.043	0.144	0.003
Euro 3	2001	0.687	0.028	0.072	0.001
Euro 4	2006	0.482	0.027	0.047	0.001
Euro 5	2010	0.593	0.001	0.035	0.001
Euro 6	2015	0.207	0.001	0.035	0.001

Source: Transport Research Laboratory, citing many tests for the European COPERT emissions model based on realistic driving cycles
Note: Emissions from simulated driving at 48km/h in models with engines under 2.0l

Appendix 3 – Endnotes

[1] A GLA study comparing pollution levels in world cities ranked London, on the measure combining NO_2 and PM_{10}, 17th out of 36 – worse than Berlin, New York or Singapore, about the same as Paris, but better than Rome, Tokyo or a number of large developing cities such as Beijing and Mumbai. http://www.london.gov.uk/priorities/environment/publications/comparison-of-air-quality-in-london-with-a-number-of-world-and

Other analyses show that some specific monitoring sites in London are among the worst monitoring sites in Europe, especially for NO_2. https://fullfact.org/factchecks/london_2012_does_london_have_the_worst_air_quality_in_europe-24372

[2] Information on air pollution compared to other public health hazards is brought together by the Department of Health here http://www.publications.parliament.uk/pa/cm200910/cmselect/cmenvaud/229/229ii.pdf (pages 144-145 as numbered on the page) and more recently by the Clean Air for London campaign here http://cleanair.london/health/guide-to-health-impacts-invisible-air-pollution-is-the-biggest-public-health-failing-or-cover-up-for-decades/

[3] http://ehp.niehs.nih.gov/wp-content/uploads/advpub/2015/4/ehp.1408795.acco.pdf

[4] http://www.bmj.com/content/350/bmj.h1295

[5] http://www.who.int/mediacentre/factsheets/fs313/en/

[6] http://stroke.ahajournals.org/content/early/2015/04/23/STROKEAHA.114.008348.abstract

[7] http://www.iarc.fr/en/media-centre/pr/2012/pdfs/pr213_E.pdf

[8] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/332854/PHE_CRCE_010.pdf - page 15

[9] http://www.theguardian.com/environment/2015/apr/02/air-pollution-may-cause-more-uk-deaths-than-previously-thought-say-scientists - see also the evidence from Dr Frank Kelly to the Environment Committee meeting of 6 November 2014

[10] http://www.euro.who.int/__data/assets/pdf_file/0004/276772/Economic-cost-health-impact-air-pollution-en.pdf?ua=1 reported on at

http://www.airqualitynews.com/2015/04/28/air-pollution-costs-uk-economy-54-billion-a-year/

[11] http://uk-air.defra.gov.uk/library/no2ten/index

[12] https://www.supremecourt.uk/decided-cases/docs/UKSC_2012_0179_PressSummary.pdf

[13] EC announcement of the current action here http://europa.eu/rapid/press-release_IP-14-154_en.htm discussed by London campaigners here http://cleanair.london/hot-topics/europe-at-its-best-takes-legal-action-against-uk-at-its-worst-on-air-pollution/. For an effort to establish some idea of the potential magnitude of fines, see paragraph 5.34 of this TfL paper http://cleanair.london/wp-content/uploads/CAL-269-LEZ-VO-Supplementary-Information-May-2010_%C2%A3300-million-fines-pa-per-pollutant_5.34-page-19-May-2010.pdf; the breaches have been ongoing since 2010 and look set to continue to at least 2020.

[14]https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6070/2180375.pdf.

[15]

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/388195/Emissions_of_air_pollutants_statistical_release_2014.pdf
The chart shows total UK emissions for each pollutant type by year, as a percentage change from 1970 emissions (for ammonia, as a percentage change from 1980 emissions and excluding natural sources)

[16] http://data.london.gov.uk/dataset/london-average-air-quality-levels

[17] The TERM gives emissions by vehicle type; to derive the 40 per cent figure we have assumed that goods vehicles, buses, coaches and taxis are all diesel, as well as diesel cars. We have not included emissions from diesel trains, shipping or non-road machinery for the purposes of this report though they are also significant, as the chart shows.

[18] Evidence from Dr Frank Kelly at the Committee meeting of 6 November 2014

[19] http://www.london.gov.uk/media/mayor-press-releases/2013/02/mayor-of-london-announces-game-changer-for-air-quality-in-the

[20] TfL ULEZ web page http://www.tfl.gov.uk/modes/driving/ultra-low-emission-zone?cid=ultra-low-emission-zone

[21] http://www.london.gov.uk/mayor-assembly/london-assembly/publications/environment-climate-change/assembly-calls-mayor-s-plan-for-ultra-low-emission-zone-ulez-too

[22] https://www.tfl.gov.uk/cdn/static/cms/documents/transport-emissions-roadmap.pdf

[23] Evidence of the Mayor's Environment and Energy Adviser to the Committee on 4 June 2015, and Mayoral Answer 2015/1498, to Jenny Jones AM on 21 May 2015. See also subsequent letter from the Mayor to the Chair of the Assembly, 29 June 2015.

[24] http://www.autocar.co.uk/car-news/industry/paris-moves-ban-most-polluting-vehicles-its-roads See also

http://www.theguardian.com/cities/2014/mar/20/licence-plate-driving-bans-paris-ineffective-air-pollution

http://www.autoblog.com/2008/01/02/new-year-new-bans-berlin-hannover-and-cologne-banning-non-cat/

[25] The Committee's past reports on the subject include the below. They are accessible via the Assembly's environment and climate change publications index http://www.london.gov.uk/mayor-assembly/london-assembly/publications/environment-climate-change.

- Response to ULEZ consultation (2015)
- Response to Defra consultation on Local Air Quality Management (2013)
- Correspondence with the Mayor on ULEZ proposals (2013)
- Response to TfL consultation on Congestion Charge discounts (2013)
- Air pollution in London – issues paper (2012)
- Response to the Mayor's final Air Quality Strategy (2011)
- Response to the Mayor's draft Air Quality Strategy (2009)
- Every Breath You Take: air quality in London (2009)

London Low Emission Zone (2006)

[26] http://www.whatcar.com/car-news/petrol-diesel-work-costs-less/1198033 ; http://www.thisismoney.co.uk/money/cars/article-2332107/Petrol-vs-diesel-cars-Drivers-warned-diesel-filter-trap.html ; http://www.thecarexpert.co.uk/diesel-cars-city-driving/ ;

http://www.dailymail.co.uk/debate/article-2175879/The-great-diesel-exposed-Its-time-ditched-inferior-vehicles.html

[27] Discussion at the Environment Committee meeting of 6 November 2014

[28] VED, as announced in the 2015 Summer Budget, will retain a banding based on CO_2 emissions but only (apart from zero-emission vehicles) for the first year. No role is being introduced for NO_X, PM or other toxic local pollutants. See paragraph 2.145 of the Summer Budget Report https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/443232/50325_Summer_Budget_15_Web_Accessible.pdf

[29] https://www.gov.uk/government/publications/car-scrappage-scheme-in-2009

[30] See also http://www.gocompare.com/covered/2014/10/was-the-scrappage-scheme-worth-it/

[31] http://data.london.gov.uk/dataset/number-buses-type-bus-london

[32] The latest announcement is of a trial of fully electric double decker buses. http://london.gov.uk/media/mayor-press-releases/2015/06/pure-electric-double-decker-london-bus-trial-announced-at-world

[33] http://www.standard.co.uk/news/transport/nissan-hold-back-new-black-cab-over-emission-zone-plan-9875311.html

[34] https://tfl.gov.uk/info-for/media/press-releases/2015/new-vision-for-cleaner-greener-taxi-and-private-hire-services-in-the-capital ; see also https://www.gov.uk/government/news/black-taxis-go-green-with-45-million-government-investment

[35] https://www.london.gov.uk/media/mayor-press-releases/2015/03/mayor-confirms-world-s-first-ultra-low-emission-zone-and

[36] Discussion at Environment Committee meeting of 4 December 2014

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یا مذکورہ بالا ڈاک کے پتے یا ای میل
پتے پر ہم سے رابطہ کریں۔

Arabic

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