

Air quality

THIS BRIEFING COVERS

Legal duties, strategies and standards; road transport emissions; effects on health and equality; costs; reducing pollution from road transport; central and local government roles, responsibilities and actions.

HEADLINE MESSAGES

- Motor vehicles are a major source of pollution, which imposes significant human and financial costs on society.
- Cyclists are probably less exposed to pollution than drivers and, in any case, the health benefits of cycling significantly outweigh the risks presented by pollution.
- Cycling should therefore be encouraged as a way of reducing pollution. This would help the UK comply with its legal limits on air quality and improve public health.

KEY FACTS

- In the UK, road transport is responsible for about a third of nitrogen oxides emissions, and over a quarter of particulate matter. These are known health hazards.
- Poor air quality in urban areas costs the English economy between £4.5 to £10.6 billion a year (at 2009 prices and values).
- Road transport is likely to be responsible for about half of the deaths attributed to air pollution in the 34 OECD countries.
- Every year in the UK, outdoor pollution is linked to around 40,000 deaths.
- 74% of Londoners see air cleanliness as a problem in central London, and 67% think the same of London as a whole.
- Exposure to roads with high vehicle traffic accounts for 14% of all asthma cases in children (a similar impact to that of passive smoking).
- Air pollution has been classified by the World Health Organisation (WHO) as a leading cause of cancer, especially lung cancer. WHO recognises that transportation is one of the predominant sources.



CYCLING UK VIEW

- The cumulative effect of traffic-related pollution undoubtedly causes serious, significant and costly harm to health, leads to health inequalities and has a detrimental impact on cyclists, pedestrians and drivers alike.
- Evidence suggests that the health benefits of cycling still outweigh the risks, even when exposure to pollutants is taken into account.
- Cycling should be seen and promoted to the public as a way to help reduce a major source of pollution (i.e. motor traffic), for improving compliance with EU air quality laws (especially on NO₂) and for its benefits to public health.
- The UK should introduce a new Clean Air Act.
- Central government and/or its agencies should:
 - Co-ordinate effective action by local authorities and other bodies to tackle air pollution, and in particularly in areas with Clean Air Zones (CAZs);
 - Use the tax system to discourage activities that contribute to traffic-related air pollution through, for example, fuel duty, vehicle tax and emissions based road user charging;
 - Produce a national framework for local road user charging, which should adopt a presumption in favour of charging for CAZs;
 - Regard cycling as a preferable solution to relying on 'green' cars and other 'techno-fixes', given its wider benefits;
 - Introduce a nationally co-ordinated scrappage scheme that not only supports the purchase of the cleanest new cars, vans, buses and lorries, but also pedal cycles and cargo bikes, including e-bikes;
 - Take full account of the impact of road building on air quality;
 - Make it clear in national planning guidance that all development projects should be vetted for the impact they are likely to have on road traffic pollution, and ensure that local planning authorities can easily dismiss applications on air pollution grounds.
 - Work through Public Health England to ensure that local authorities recognise air pollution as an urgent public health problem.
- Local authorities should:
 - Recognise that tackling air pollution is a key duty;
 - Make the most effective use of local air quality management measures available to them (e.g. Ultra Low Emission Zones and Air Quality Management Areas);
 - All charging CAZs areas should be covered by a Local Cycling and Walking Infrastructure Plan (LCWIP), and some of the revenue generated should go towards high quality infrastructure improvements to make non-polluting, active travel more appealing;
 - Build strong partnerships between those responsible for transport, air quality and public health to address the harm caused by road transport pollution in the locality, and promote cycling as a healthy and sustainable alternative;
 - Promote car-free days and other events as a means of highlighting the need to improve air quality through local action and behaviour change.



BACKGROUND INFORMATION

1. Legal duties, strategies and standards

a. European legislation

The UK will be leaving the European Union (EU) in due course, but for now it is subject to the following:

All EU member states, including the UK, must comply with the EU directives on ambient air quality and cleaner air for Europe (2008/50/EC)¹, and on arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air (Fourth Daughter Directive) (2004/107/EC).²

These directives require all members to carry out air quality assessments, and to report back to the European Commission (EC) each year. The directives are legally binding, and the EC can take action against breaches. Also, a *National Emission Ceilings Directive* sets pollution limits for each member.³

Amongst other requirements, the 2008 Directive says that Member States must report on measures: “to limit transport emissions through traffic planning and management (including congestion pricing, differentiated parking fees or other economic incentives; establishing low emission zones)”; and “to encourage a shift of transport towards less polluting modes”.

In 2013, the European Commission (EC) adopted a *Clean Air Policy Package*. Its components include: a new *Clean Air Programme for Europe* with measures to ensure that existing targets are met in the short term, and new air quality objectives for the period up to 2030; along with support to help cut air pollution, with a focus on improving air quality in cities, research and innovation, and promoting international cooperation.⁴

b. The UK’s National Air Quality Strategy

The UK’s *National Air Quality Strategy*, first published in 1997 and last reviewed in 2007, sets out the issues for the UK and its policies for reducing various hazardous pollutants.⁵ It also includes standards and objectives, most of which are subject to regulations made under the *Environment Act 1995* and European law (see above).

For more on the strategy, see:

www.environmental-protection.org.uk/policy-areas/air-quality/air-pollution-law-and-policy/air-quality-policy/

c. UK Air Quality Plans and ClientEarth’s challenge

In November 2014, following a successful case brought by ClientEarth against the UK Government for failing to meet its legal limits on air pollution, the European Court of Justice ruled that the UK courts must order the Government to produce a plan to achieve the limits for nitrogen dioxide (NO₂) as *soon as possible*. The UK Supreme Court acted accordingly and, as a result, the UK was tasked with considering a number of remedial measures to reduce NO₂, including low emission zones, congestion charging and other economic incentives.⁶

In response, Defra (Dept for the Environment, Food & Rural Affairs) released a new air quality plan in December 2015, which included proposals to introduce Clean Air Zones (CAZs) in Birmingham, Leeds, Nottingham, Derby and Southampton. The plan also referred to government support for existing plans for the ‘Ultra Low Emission Zone’ in London.⁷

ClientEarth did not believe that the plan went far enough, especially as it did not require other cities such as Glasgow, Manchester and Liverpool to create CAZs, while the Zones were only targeted at old diesel buses, coaches, taxis and lorries, rather than private cars.

ClientEarth thus launched another challenge and, in November 2016, won its second High Court case. The judge (Mr Justice Garnham) agreed that: the Government's 2015 air quality plan failed to comply with the Supreme Court ruling and relevant EU Directives; that ministers knew that the pollution modelling being used was over-optimistic; and that the Environment Secretary had failed to take measures that would bring the UK into compliance with the law "as soon as possible", opting instead to achieve compliance by 2020 for some cities and by 2025 for London – but only because it was then that EC fines were likely. The court also heard evidence that Defra had originally planned a more extensive network of CAZs, but this had been ruled out on grounds of cost.

Subsequently, Mr Justice Garnham ordered the Government to draw up an improved and final air quality plan by July 2017 and publish the technical data behind it (which campaigners urged should this time be based on reality). When the Government tried to delay publishing its plans until after the General Election in 2017, the request was denied (again by Justice Garnham).

In July 2017, the Government released a plan specifically to tackle roadside NO₂ concentrations in the UK, rather than one to tackle air quality as a whole.⁸ This gave councils eight months and a small amount of money to develop initial plans to lower local levels of the pollutant in their areas. These plans need to be submitted to the Government for scrutiny by the end of March 2018, with final versions to follow by the end of December 2018. The plan has been criticised by campaign groups, not least because it puts too much onus on local authorities and not enough on central government, and is unlikely to tackle the NO₂ threat "as soon as possible". ClientEarth stated: *"This plan is, yet again, a plan for more plans."*

See www.clientearth.org/uk/ for updates.

d. Parliamentary committees

- **Environment, Food and Rural Affairs (EFRA) Committee**

In April 2016, the House of Commons' Environment, Food and Rural Affairs Committee reported back on its inquiry into air quality, highlighting a wide range of deficiencies in the Government's approach to tackling air pollution.⁹ They said:

"Many witnesses, including the Local Government Association, considered that Defra failed to take a "coherent, cross-government approach", which, if true, would be a critical omission given the range of sectors including transport, energy and agriculture which contribute to poor air quality. The LGA cited Defra's lack of dialogue with the Department for Transport as particularly problematic." (Para 8)

"We recommend that the Department publish by the end of 2016 a comprehensive strategy for improving air quality and report annually to Parliament on progress". (Para 14)

"... the Government must publish proposals to make it easier for local authorities to use powers over traffic movement and new development to tackle air pollution as and when the need arises, whether inside or outside Clean Air Zones." (Para 35)

"Since Defra's plans rely on local action to cut pollution, councils must be given support to implement programmes to encourage people to drive less and use public transport and cycle and walk more. [...]. Defra and the Department for Communities and Local Government must also preserve funding for wider programmes, such as those supported by the Local Sustainable Transport Fund, which can demonstrate they deliver benefits in a cost-effective manner." (Para 40)

In December 2016, EFRA wrote to the Government asking it to explain why it had failed to act on the Committee's recommendations. In response, ministers from Defra and the DfT conceded that more needed to be done.¹⁰

- **Environmental Audit Committee**

EFRA's conclusions (above) echo many of the points made during the Environmental Audit Committee's *Action of Air Quality* inquiry (December 2014).¹¹ In its final report, the Committee urged the Government to clarify the responsibilities of local and central government, and of individual Government departments, identify cross-departmental actions, and ensure that localism does not undermine countrywide air quality monitoring, which *"must be a responsibility that central government cannot absolve itself from."*

The Committee came to a number of other conclusions about the role the Government needs to play, many relating specifically to road transport because the bulk of the submitted evidence focused on it. It recommended, for instance, that the Government should:

- Encourage active travel;
- Establish a national framework of Low Emission Zones, all with the same approach and standards;
- Rebalance fuel duty and Vehicle Excise Duty to reduce NO₂ and PM (particulate matter) impacts;
- Toughen up on diesel emissions;
- Issue National Policy Planning Framework (NPPF, England) guidance on protecting air quality;
- Impose a legal obligation on the Highways England to protect air quality;
- Call an independent public inquiry on air pollution and update the *Air Quality Strategy* of 2007.

Responding to the Committee's inquiry report, the Government broadly accepted most of the above recommendations, saying that they had or already were taking action on the matter, or were reviewing it. However, it did not support the idea of an independent public inquiry on air pollution on the basis that: *"We are working, and will continue to work, with all the relevant organisations to ensure a consistent approach to air pollution."*

2. Road transport emissions and the UK's record

a. Main emissions

Pollutants come from a variety of sources, some of them natural and some of them generated by human activity, e.g. industrial processes, agriculture and transport. They are not only harmful to human health - outdoor pollution causes around 3.7 million deaths worldwide a year¹² - but can also adversely affect habitats and wildlife, and contribute to climate change. Most pollutants from road transport are regulated by EU vehicle emission standards.¹³

The main pollutants emitted by petrol, diesel and alternative fuel engines are:

- **Nitrogen oxides** (NO_x): a generic term for nitric oxide (NO) and nitrogen dioxide (NO₂)
- **Particulate matter** (PM): this is classified by size, i.e. PM10 (coarse particles) and PM2.5 (fine particles). Tyre and brake wear can also produce fine particles.
- **Carbon monoxide** (CO)

Road transport also emits benzene, 1,3 butadiene and polycyclic aromatic hydrocarbons.



b. Emission levels

A single car - especially if it's a newer model - may emit only a small quantity of pollutants, but the cumulative impact of emissions from motor vehicles is both significant and harmful, despite technological advances and increasingly stringent limits.

Road transport is one of the most substantial sources of NO_x, CO and PM (see table right).

Emissions of air pollutants by source, UK (2015)			
Pollutant	NO _x	PM ₁₀	PM _{2.5}
All sources (thousand tonnes)	918.3	145.5	104.8
Road transport (thousand tonnes)	311.45	20.6	13.9
Road transport - % of all sources	33.92%	14.16%	13.26%

Source: Defra Emissions of Air Pollutants in the UK, 1970 to 2015.¹⁴

Although there are other sources of the above pollutants, those from road transport pose an increased risk to human health because they tend to be released in close proximity to people (both inside and outside vehicles) and, in urban areas, are less likely to be swept away by wind because of buildings lining the road.

Diesel emits significantly more NO_x than petrol, but the Government encouraged its use in the past because it emits far less carbon dioxide (CO₂), a gas that impacts on climate change, and diesel engines are more efficient. According to a report released in 2015, diesel road traffic is responsible for around 40% of London's NO_x emissions and a "broadly similar proportion" of PM10.¹⁵

c. Europe's record on emission limits

According to the European Environmental Agency's (EEA) 2016 TERM (Transport and Environment Reporting Mechanism) report:¹⁶

"Air quality in urban areas is significantly influenced by local traffic. While considerable progress has been made over the past twenty years in improving urban air quality, a number of issues remain. [...] Since the late 1990s, concentrations of NO₂ and PM10 in urban areas have not been declining in line with emissions trends. Although emissions from transport have been declining, there are still many areas where limit values for NO₂ and PM10 are exceeded across Europe, mainly due to road traffic.

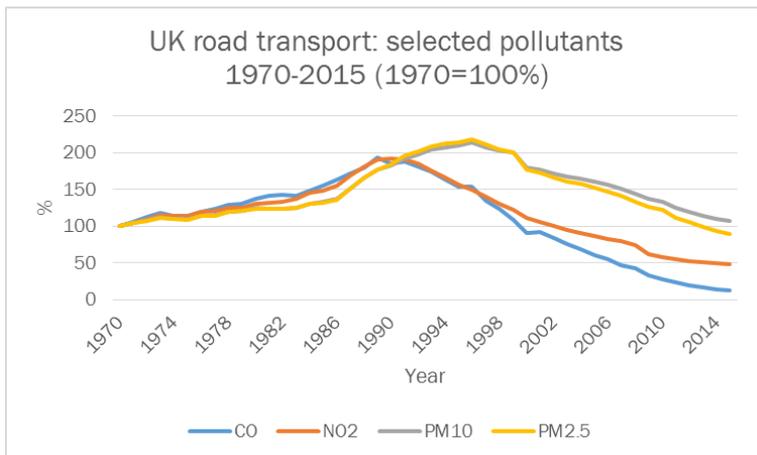
"For example, the annual EU limit value for NO₂, one of the main air quality pollutants of concern and typically associated with vehicle emissions, was widely exceeded across Europe in 2014, with 94 % of all exceedances occurring at road-side monitoring locations. Also, in 2014, about 16 % of the EU-28 urban population was exposed to PM10 above the EU daily limit value."

The European Environmental Agency has published a non-technical guide to road transport emissions: www.eea.europa.eu/publications/explaining-road-transport-emissions



d. UK's record on emission limits

- Every year in the UK, outdoor pollution is linked to around 40,000 deaths.¹⁷



- The UK's emissions of the principal pollutants emitted by road transport (CO, NO_x, PM₁₀ and PM_{2.5}) began to fall in the 1990s (see table left).

Source: <http://naei.defra.gov.uk/data/>

However, while the UK meets almost all of its EU limits on CO and particulate matter, it fails badly on NO₂:

- As mentioned in section 1c, the UK Government has been successfully challenged in court for its failure to meet its legal limits for NO₂.
- The UK is not predicted to meet its EU commitments on NO_x in either 2020 or 2030.¹⁸ In February 2017, the UK was amongst five members states sent a final warning by the European Commission for failing to address repeated breaches of NO₂ limits.¹⁹
- The European Environment Agency says: *"The largest health impacts attributable to NO₂ exposure are seen in Italy, the United Kingdom, Germany and France."*²⁰
- The UK is divided into 43 zones for air quality assessment. In 2015, only six of them met the annual mean limit value for NO₂ in 2015. The remaining 37 zones had locations with measured or modelled annual mean concentrations higher than the annual mean limit value.²¹
- Also, official projections published in 2014 estimated that three zones in the UK would not meet the annual mean limit set by the EU until after 2030, 20 years after original deadline. The zones are Greater London, West Midlands and West Yorkshire.²²
- One in six of the 2,500 monitoring tubes used in a 'citizen science' experiment conducted by Friends of the Earth (2016), detected NO₂ pollution levels above the legal limit. 133 local authorities and 181 Westminster Parliamentary constituencies were affected, representing every region of England, as well as Scotland, Wales, Northern Ireland, plus the Isle of Man and Jersey.²³
- The European Environmental Agency estimates that there were 37,930 premature deaths in the UK attributable to PM_{2.5} in 2013, and 11,940 from NO₂.²⁴





- The table to the right shows how many deaths were thought to be attributable to PM2.5 in the UK, in 2010.

Deaths from PM2.5, 2010			
	Attributable deaths (aged 25+)	Life years lost	% deaths
England (inc. London)	25,002	264,749	5.6%
London	3,389	41,404	7.2%
Scotland	2,094	22,474	3.9%
Wales	1,320	13,549	4.3%
Northern Ireland	553	6,063	3.8%
UK	28,969	306,835	5.3%

Source: Public Health England. *Estimating Local Mortality Burdens associated*

with Particulate Air Pollution. 2014.²⁵ This report also estimates the deaths attributable to PM2.5 in every local authority in England.

- As far as World Health Organisation (WHO) guidance on particulate matter is concerned, ten urban areas in the UK were found to be in breach of its PM10 limits in 2013 (Oxford, Southampton, Nottingham, Eastbourne, Leeds, Scunthorpe, London, Glasgow, Stanford-Le-Hope and Port Talbot). Also, 38 urban areas exceeded WHO limits for PM2.5.²⁶
- In London, in 2010:²⁷
 - The total mortality burden of long-term exposure to NO₂ is estimated to be up to 88,113 life-years lost, equivalent to 5,879 deaths at typical ages;
 - The total mortality burden of human-generated PM2.5 for 2010 was 52,630 life-years lost, equivalent to 3,537 deaths at typical ages;
 - NO₂ and PM2.5 were associated with approximately 420 and 1,990 respiratory hospital admissions respectively; an additional 740 cardiovascular hospital admissions were associated with PM2.5.

For more on air quality in London, see:

<http://researchbriefings.files.parliament.uk/documents/LLN-2017-0035/LLN-2017-0035.pdf>

- An investigation by Greenpeace, based on government modelling data for 2015, found over 2,000 education or childcare providers across England & Wales within 150m of a road breaching the legal limit for NO₂. Around half of these were nurseries, many outside London.²⁸

Even with the progress made on tackling other pollutants, serious public health problems remain. This suggests that the UK should have supported moves to make EU limits far more stringent. Instead, it has been criticised amongst other member states for trying to dilute them.²⁹

Leaving the EU: Whatever the UK's future relationship with the EU, campaigners want to ensure that the legal protections afforded by EU membership are safeguarded in future. This means that the UK must remain bound by the *National Emissions Ceiling Directive* (see section 1a) and press for tougher EU limits. Stronger domestic legislation would help make sure that the UK's withdrawal from the EU does not compromise the protection against harmful levels of air pollution that citizens enjoy from the law. ClientEarth is therefore calling for a new *Clean Air Act*.³⁰ As a member of ClientEarth's Healthy Air Campaign, Cycling UK is supporting these calls (see 5a below).

For more on air pollution in the UK, see the European Environmental Agency's fact sheet:

www.eea.europa.eu/themes/air/air-pollution-country-fact-sheets-2014/united-kingdom-air-pollutant-emissions/view



3. The effects of pollutants: public concern, health, equality and the economy

Cycling UK view:

- The cumulative effect of traffic-related pollution undoubtedly causes serious, significant and costly harm to health, leads to health inequalities and has a detrimental impact on cyclists, pedestrians and drivers alike.
- Evidence suggests that the health benefits of cycling still outweigh the risks, even when exposure to pollutants is taken into account.

a. Public concern

- According to the *British Social Attitudes Survey*, in 2015, 60% of respondents felt that exhaust fumes from traffic in towns and cities were either a very serious, or serious problem. This figure has been rising over the last few years – in 2012 only 44% said the same.³¹
- The results of a survey carried out in 2016 suggest that 74% of Londoners see air cleanliness as a problem in central London, and 67% think the same of London as a whole.³²
- The OECD has estimated that people in its 34 member countries would be willing to pay USD 1.7 trillion to avoid deaths caused by air pollution.³³

b. The main pollutants and their health impacts

All the following traffic-related pollutants are harmful to health, and people who live near busy roads and/or in urban areas are particularly affected. In general:

- **NO_x (nitrogen dioxide):** at high levels, NO_x can inflame the airways, and long-term exposure may affect lung function. For those who are sensitive to allergens, NO₂ can make their symptoms worse.
- **PM (particulate matter):** both short and long-term exposure to PM are consistently associated with respiratory and cardiovascular illness and mortality. The 'Fraction of mortality attributable to particulate air pollution (PM2.5)' is an indicator for health protection in the *Public Health Outcomes Framework for England 2016-2019*.³⁴
- **CO (carbon monoxide)** reduces the blood's capacity to carry oxygen to the body's tissues. It is also associated with admissions to hospital or death from strokes.³⁵
- **Benzene, 1,3 butadiene and some polycyclic aromatic hydrocarbons:** these are human carcinogens (i.e. can cause cancer).

c. Health

- The World Health Organisation (WHO) classifies air pollution as a leading cause of cancer, especially lung cancer. WHO recognises that transportation is one of the predominant sources.³⁶
- Ambient air pollution contributes substantially to the global burden of disease, with ambient PM2.5 the fifth-ranking mortality risk factor in 2015, causing around 4.2 million deaths.³⁷
- There is a significant association between PM generated by road traffic and lung cancer.³⁸
- In 2012, The International Agency for Research on Cancer (part of WHO), classified diesel engine exhaust as carcinogenic to humans as it increases the risk of lung cancer.³⁹
- Roadside pollution exacerbates bronchiectasis (a condition in which the airways in the lungs become abnormally widened), and makes sufferers more likely to die from it.⁴⁰
- NO₂ and PM all have a marked association with admissions to hospital for stroke or likely death from stroke. PM2.5 appears to be the worst offender.⁴¹
- Nearly 4,800 early deaths amongst people with heart problems in England and Wales are caused by long-term exposure to PM2.5.⁴²

- Air pollution, particularly from PM (but also NO₂ and CO) is closely associated with being admitted to hospital for heart failure and dying from it.⁴³
- A study of more than 100,000 people for an average of 11.5 years confirms that long-term exposure to PM is associated with heart problems. The authors also found that this effect persisted at levels below the EU limit values, leading for calls for them to be lowered.⁴⁴
- A study in ten European countries estimated that an average of 37,200 coronary heart disease (CHD) cases (28% of all older adults with CHD) were attributable to near-roadway traffic-related pollution.⁴⁵
- Research from the USA led the authors to suggest that air pollution damages 'good' cholesterol.⁴⁶
- Air pollution (NO₂ and PM_{2.5}) could be linked to poor sleep.⁴⁷
- There seems to be a significant association between PM_{2.5} from road traffic and anxiety amongst women with an average age of 70.⁴⁸
- A study of 6.5 million Ontario (Canada) residents found that people who lived within 50 metres of high-traffic roads had a 7% higher likelihood of developing dementia compared to those who lived more than 300 metres away from busy roads.⁴⁹

For a summary of the main health effects of pollutants, see:

http://uk-air.defra.gov.uk/assets/documents/What_are_the_causes_of_Air_Pollution.pdf

d. Air pollution and children

- Research carried out in ten European countries calculated that exposure to roads with high vehicle traffic accounted for 14% of all asthma cases in children (a similar impact to that of passive smoking).⁵⁰
- PM has been associated with type 1 diabetes in children.⁵¹
- Studies have found that children who live in areas with high levels of traffic-related air pollution during their first year of life are three times as likely to develop autism.⁵²
- Exposure to traffic pollution during pregnancy (particularly PM_{2.5}) could cause low birthweight at term and reduced average head circumference at birth.⁵³
- The WHO says that, around the globe: *"Air pollution causes approximately 600,000 deaths in children under five years annually and increases the risk for respiratory infections, asthma, adverse neonatal conditions and congenital anomalies."*⁵⁴

The 'How polluted is my school?' webpage allows users to identify the 1,148 schools located within 150 metres of roads used by 10,000 or more vehicles per day and at substantial risk from air pollution. www.howpollutedismyroad.org.uk/schools.php

e. Air pollution and inequality

Researchers who found higher concentrations of PM₁₀ and NO₂ in the most deprived 20% of neighbourhoods in England and that air pollution inequalities were mainly an urban problem, suggested that *"... measures to reduce environmental air pollution inequality should include a focus on city transport."*⁵⁵

Doctors against Diesel is a campaign supported by hundreds of doctors, health professionals and medical students calling for diesel fuels to be phased out as a priority in urban areas. www.medact.org/2016/actions/sign-ons/doctors-against-diesel/



f. The effects of pollution on cyclists and other road users

Although cyclists usually ride in close proximity to motor traffic in urban areas, assessments of the overall health impacts of cycling have consistently concluded that the benefits outweigh the disbenefits. Not all assessments have factored in traffic pollution, but even those that have still suggest that cycling as a physical activity does more good than harm.

For instance, a study that weighed up the health benefits of switching from driving to cycling for a 5km commute, and included the impact of injuries, breathing in polluted air and the effects on society of a non-polluting form of transport, estimated that the annual value of mortality benefits outweighed the disbenefits by 19:1, per person per year.⁵⁶

For a table summarising various estimates of the health benefit of cycling v the health risks, see www.cyclinguk.org/campaigning/views-and-briefings/health-and-cycling

Other studies have specifically examined the health impact of cycling in a polluted environment, some of which have compared cyclists' exposure to that of drivers. While cyclists may inhale larger doses of pollutants because of their faster breathing rate, car drivers are at risk because vehicles in close proximity suck in each other's emissions through the engine compartment, or via open windows etc.

Generally speaking, the findings show that it is better to exercise (or cycle) in a polluted environment than to remain inactive. Chosen routes, breathing rates and other factors do make a difference to how much pollution a cyclist is likely to inhale, of course. Research also tends to suggest that car drivers are exposed to more pollution than cyclists, although not all studies come to this conclusion:

- In 2016, the authors of an academic paper which examined the risk v benefits of travelling actively at the same time as being exposed to polluted air, concluded that the benefits *"outweighed the harm caused by air pollution in all but the most extreme air pollution concentrations."* They also said that if cycling replaces driving, the trade-off would be even more beneficial.⁵⁷
- A paper published in 2014 concluded that: *"In a healthy population, intermittent moderate PA [physical activity] has beneficial effects on pulmonary [lung] function even when performed in a highly polluted environment."* The researchers chose cycling as the physical activity to test, and the participants were exposed to traffic-related pollution.⁵⁸
- A review of various studies comparing cyclists with car drivers concluded that, overall, *"air pollution exposures experienced by car drivers were modestly higher than those experienced by cyclists."* However, assuming cyclists' breathing rate per minute is just over twice that of car drivers, the authors concluded that cyclists inhale larger doses of PM2.5. They also pointed out that exposure for both types of road user depends on many factors, e.g. route, car speed, trip duration, car type, whether the window is open or not, the street, weather, etc. Nevertheless, the authors still concluded that: *"On average, the estimated health benefits of cycling were substantially larger than the risks relative to car driving for individuals shifting their mode of transport."*⁵⁹
- An earlier study (2001) from Copenhagen, concluded that *"... even after taking the increased respiration rate of cyclists into consideration, car drivers seem to be more exposed to airborne pollution than cyclists."*⁶⁰
- A Dutch study (2008) that specifically looked at ultra-fine particles, found that in the Netherlands car drivers' exposure to "particulate number concentration" and PM2.5 was slightly higher than that of cyclists. The authors also said that cyclists are confronted with mainly short, but very high peaks, yet could take more direct routes avoiding busy roads. Car drivers, on the other hand, encounter lower peaks for a longer time. For cyclists, peaks were caused by passing vehicles, waiting for traffic lights, passing different types of (large) intersections, and cycle lanes/paths close to motorised traffic.⁶¹

- Despite the fact that exercising in a polluted environment means that the lungs take in more pollutants because of an amplified breathing rate, a study of residents aged 50-65 living in Aarhus and Copenhagen suggested that the long-term benefits outweigh the risks. The researchers focused on NO₂, and looked at various activities, including cycling.⁶²
- A 2010 study carried out in Belgium concluded that previous research had underestimated cyclists' ventilation rate and that it was 4.3 higher than that of car drivers (i.e. not just above twice as much). They found, for instance, that in Brussels and Louvain-la-Neuve, concentration of PM2.5 and PM10 "was significantly higher for the bicycle compared to the car". The authors also said that concentrations are heavily dependent on location. (In their trials, however, they examined the effects of cycling and driving along identical routes, whereas in practice cyclists often choose routes with less traffic and better air quality. Also, the type of cyclists who do this may well be slower and/or less confident, who probably breathe more slowly).⁶³
- A 2011 study found that: "Use of off-road cycle routes in the city of York led to a significant reduction in the time-weighted concentration of, and exposure to, NO₂ compared to on-road routes. Therefore the provision of additional off-road cycle routes has benefits beyond improved safety."⁶⁴
- A Canadian study from 2011 concluded that: "Short-term exposures to traffic pollution may contribute to altered autonomic modulation of the heart in the hours immediately after cycling." As this is a detrimental effect on heart function, the authors suggested: "it may be prudent to select cycling routes that reduce exposure to traffic and to avoid cycling outdoors or to exercise indoors on days with elevated air pollution levels." The study did not, however, "... observe strong associations between traffic-related air pollution and acute changes in respiratory outcomes."⁶⁵
- Research from the University of Surrey (2015) found that although commuting drivers spend just 2% of their journey time passing through junctions with traffic lights, it contributed to about 25% of their total exposure to PM. This is caused by decelerating, stopping and then revving-up to move away. Peak PM concentration proved to be 29 times higher than it is in free-flowing traffic conditions.⁶⁶
- Monitoring devices fitted to five MPs from the Environmental Audit Committee as they travelled round London showed that their greatest exposure to carbon particles occurred during taxi rides.⁶⁷

g. Costs to the economy

- According to The Cabinet Office Strategy Unit, poor air quality in urban areas costs the English economy between £4.5 to £10.6 billion a year at 2009 prices and values.⁶⁸
- WHO estimated the economic cost of deaths from air pollution (both outdoor and indoor) in the UK to be around £54 billion, or about 3.7% of GDP.⁶⁹
- The cost of the health impact of air pollution in OECD countries (including deaths and illness) was about USD 1.7 trillion in 2010. Road transport almost undoubtedly accounts for c.50% of this cost.⁷⁰

4. Active travel and air quality

Cycling UK view: Cycling should be seen and promoted to the public as a way to help reduce a major source of pollution (i.e. motor traffic), for improving compliance with EU air quality laws (especially on NO₂) and for its benefits to public health.

Cycling is zero-emission and is a viable and healthy alternative for most people for many short trips, or in combination with public transport for longer journeys. As such, it can make a significant contribution to reducing levels of pollution from road transport in urban areas, and its value should be fully

recognised by national and local government. Likewise, the link between air quality and travel choice should be made clear to the public via the media and behaviour change programmes.

Increasing levels of active travel as one of the solutions to poor air quality has many supporters, including the Parliamentary Environmental Audit Committee. Following its 2014 inquiry on air quality (see 1d), it urged the Government to: "... encourage active travel such as walking and cycling - the ultimate low emission options." In its response, the Government expressed support for efforts to encourage active travel and said that it is working to ensure that this is embedded in all departmental policies. In its plan for tackling roadside NO₂ concentrations (2017), promoting and providing for cycling is identified as an effective measure to take.⁷¹

Also, having examined the impact of lifetime exposure to outdoor air pollution, in 2016, The Royal College of Physicians, together with the Royal College of Paediatrics and Child Health, set out six steps for the public to take to reduce the threat, including: "Take the active travel option: bus, train, walking and cycling".⁷²

For more on cycling as part of local and national government transport policy, see:
www.cyclinguk.org/campaigning/views-and-briefings/national-transport-policy-cycling
www.cyclinguk.org/campaigning/views-and-briefings/cycling-and-local-transport

5. Roles, responsibilities and actions: central government and its agencies

Cycling UK view:

- The UK should introduce a new Clean Air Act.
- Central government and its agencies should:
 - Co-ordinate effective action by local authorities and other bodies to tackle air pollution, and in particular in areas with Clean Air Zones (CAZs);
 - Use the tax system to discourage activities that contribute to traffic-related air pollution through, for example, fuel duty, vehicle tax and emissions based road user charging;
 - Produce a national framework for local road user charging, which should adopt a presumption in favour of charging for CAZs;
 - Regard cycling as a preferable solution to relying on 'green' cars and other 'techno-fixes', given its wider benefits;
 - Introduce a nationally co-ordinated scrappage scheme that not only supports the purchase of the cleanest new cars, vans, buses and lorries, but also pedal cycles and cargo bikes, including e-bikes;
 - Take full account of the impact of road building on air quality;
 - Make it clear in national planning guidance that all development projects should be vetted for the impact they are likely to have on road traffic pollution, and ensure that local planning authorities can easily dismiss applications on air pollution grounds.
 - Work through Public Health England to ensure that local authorities recognise air pollution as an urgent public health problem.

Cycling UK believes that central government should take a lead role on improving air quality, and ensure that all its departments work together on the issue, including those for transport, health, environment, education and local communities. After all, irrespective of its failure to keep NO₂ within its legal limits, the Government has a financial incentive to tackle air pollution given its huge costs to the economy (see 3g).

As mentioned above (see 4a), promoting and providing for active travel makes an important contribution to managing air quality and, in Cycling UK's view, should be integral to all policies and strategies at both national and local level.

However, we share concerns that 'localism' (i.e. expecting more and more action at local level with less central intervention) confuses responsibilities over managing air quality and who is supposed to pay for what. It also leads to a lack of consistency in the way that air quality is addressed at local level.

Unfortunately, the Government's plan to tackle roadside concentrations of NO₂, which it was obliged to produce because of the UK's failure to meet its legal limits, also adopts the 'localism' approach and still expects local authorities to take the bulk of the action.⁷³

a. New Clean Air Act

A new *Clean Air Act* would help make sure that the UK has domestic legislation in place to protect its citizens more effectively against air pollution, particularly if legally binding EU limits no longer apply or are weakened as a result of leaving the Union. The last *Clean Air Act* was passed in 1956 following the 'great smog' of 1952.

ClientEarth is campaigning for a new Act to:

- Tackle the sources of modern air pollution, such as diesel, and accelerate the shift to zero emissions transport;
- Improve and strengthen existing legislation, enshrining the right to breathe clean air into law, so the UK has the most ambitious air quality legislation in Europe;
- Make the UK a world leader in clean technology, creating the jobs and industries that will help us, and others, clean up our air.⁷⁴

A YouGov survey found that 65% of the British public would support a Clean Air Act.⁷⁵



The Healthy Air Campaign aims to encourage behaviour that helps cut air pollution and our exposure to it. It also wants the Government to take action so that the UK fully complies with legal limits for air quality. Cycling UK is a partner. www.healthyair.org.uk/

b. Clean Air Zones

The Government defines a Clean Air Zone (CAZ) as "... an area where targeted action is taken to improve air quality and resources are prioritised and coordinated in a way that delivers improved health benefits and supports economic growth."

Any local authority can implement a CAZ to address a local air quality issue and in 2017, the UK Government published a *Clean Air Zone Framework in England*.⁷⁶

Charging v non-charging CAZs: The best way to ensure that CAZs reduce pollution from road transport as quickly as possible is to charge vehicles that do not meet certain emission standards to enter them. Councils are empowered to introduce such charges under the *Transport Act 2000*.

However, even though its plan to tackle roadside NO₂ concentrations is accompanied by a technical report acknowledging the superiority of "charging CAZs", the Government advises local authorities to identify other measures that are "at least as effective" and prioritise them.⁷⁷ This means that, rather than opting for a charging scheme that is virtually certain to reduce NO₂ to the required level, authorities are expected to investigate alternatives first (e.g. improving bus fleets, infrastructure changes etc.). This imposes an enormous burden on them, and makes it very difficult for them to meet air quality standards in the shortest time possible.

Cycling UK therefore believes that the Government should instead adopt a presumption in favour of charging CAZs and include it in a national framework for local road charging (5c below).

With regard to charges for non-compliant vehicles entering a CAZ, we believe they should be set at a level likely to maximise compliance, and that they should be designed to tackle emissions from private cars as well as old diesel buses, HGVs etc.

Furthermore, the revenue generated should be enough not merely to cover the cost of administering the Zone, but also to provide funding for high quality walking and cycling schemes in the area to encourage non-polluting travel (see 'Local Cycling & Walking Infrastructure Plans' below, 6a). The money could also go towards cycle training and community-club cycling programmes for people of all abilities and demographic groups.

Cycling UK also believes that the Government should encourage local authorities to use the power and duties they have under the Road Traffic Reduction Acts of 1997 and 1998. Putting both of these Acts into practice has the potential to make significant contributions to air quality objectives.

c. Polluter pays principle: tax and emissions based road user charging

Road user charging schemes usually target either congestion or emissions, although in practice they help to tackle both.

As mentioned in 5b above, Cycling UK believes that the Government should produce a national framework for road user charging and positively back this measure both for national and local roads. From a local point of view, a national framework would help relieve individual local authorities of the need to spend their limited resources on their own research/gathering evidence etc. (e.g. on adopting a charging CAZ). They would also be more likely to take a consistent approach between them.

Emission-based schemes could, for example, take account of exhaust, time of day, location and distance driven by size.

Merton Council in London charges a levy on diesel vehicle owners within a Controlled Parking Zone.
www2.merton.gov.uk/transport-streets/parking/parkingconsultations/diesellevy.htm

Other taxes: Cycling UK believes in the 'polluter pays' principle, i.e. that those who cause pollution should pay for the harm it causes. The most effective means of doing this is through the national tax system - e.g. via fuel duty (which the Government consistently freezes), taxing vehicles on the basis of their emissions, and (as discussed above) national and local road charging. These measures also help encourage people to cycle and walk instead.

Vehicle Excise Duty (VED) is based on CO₂ emissions (rather than pollutants that affect air quality). However, the Government has guaranteed that all revenue raised from it will be allocated to a new National Roads Fund and invested directly back into the road network.⁷⁸ This will undoubtedly include road-building.

A 2017 report from the Policy Exchange, *Driving Down Emissions: How to clean up road transport?*, recommends that central and local government increase the budget for cycling and walking, given the significant emissions reduction and net benefits this would realise compared to other forms of transport infrastructure.

It also highlights the conundrum the Government faces over the impact that decarbonizing road transport and the uptake of lower emission vehicles could have on its revenue from tax. The authors say: "... in order to shore up road taxes, the Government may need to tax road use directly, rather than taxing road use indirectly through fuel duties."

<https://policyexchange.org.uk/publication/driving-down-emissions-how-to-clean-up-road-transport/>



d. Technological solutions, low emission (motorised) vehicles

The Government has invested in a number of schemes to advance technological solutions to improve air quality. For example, it has set up The Office of Ultra Low Emission Vehicles (OLEV), a team working across government to support the early market of such vehicles.

However, while technological solutions do make a contribution to improving air quality in urban areas where motor vehicle is high, shifting people away from driving to walking and cycling, especially for short trips, makes the best sense as it helps tackle physical inactivity and all the associated health problems it causes at the same time.

Also, while electric cars may help clean up urban air, the impact on the wider environment is compromised unless their power comes from a sustainable, pollutant-free source. Only about 7% of the UK's energy supply is generated from renewables, while 81.5% still comes from fossil fuels, which are responsible for high levels of pollutants, including NO_x, CO, PM, along with the greenhouse gas CO₂.⁷⁹

To help tackle NO₂ emissions, the Government has committed to end the sale of all new conventional petrol and diesel cars/vans by 2040.⁸⁰ However, this has been criticised as not soon enough.

Excessively 'smoky' buses, coaches or lorries can be reported to the DVSA through www.gov.uk/report-smoky-vehicle

e. Scrappage

The UK Government seems to be reluctant to support vehicle scrappage directly, having identified a number of problems with a scheme it introduced in 2009, (e.g. poor value to the tax payer, high cost, unfairness, fraud etc.).⁸¹

Nevertheless, Cycling UK believes that a UK air quality strategy should include a nationally-coordinated vehicle scrappage scheme, with incentives targeted initially at the most polluting cars and vans, along with diesel buses and lorries, and progressing over time to less polluting vehicles. The cost should be covered at least in part through a purchase levy on sales of the most polluting new vehicles, with the threshold shifting over time.

This progressive shift in the thresholds both for the purchase levy and for scrappage scheme incentives would help ensure that the most polluting vehicles were removed from the UK's vehicle fleet at first, while progressively reducing total emissions from the UK's vehicle fleet over time.

We also believe that scrappage incentives should be available not only to support the purchase of the cleanest new cars, vans, buses and lorries, but also for pedal cycles and cargo bikes, including e-bikes.

f. Road building

Although the Government is investing in technology to make motor travel less polluting (see 5d), promoting active travel and reducing the need to travel by car in the first place makes better sense. Spending large sums on road building is counterproductive but, despite this, in 2015 the Government launched a £15billion 'road investment strategy' to increase the capacity and improve the condition of England's roads. Also, major investment in road building is hard to reconcile with Highways England's new duty, under The *Infrastructure Act 2015*, to consider the impact of its operations on air quality.

For Cycling UK's views on road building see:

www.cyclinguk.org/campaigning/views-and-briefings/national-transport-policy-cycling

Highways England has published its strategy to improve air quality. Although it focuses mainly on design measures, it does promise to use its £100m cycling fund to make its network "less of a barrier to cycling." www.gov.uk/government/publications/highways-england-air-quality-strategy

h. Planning

National guidance on planning covers how local authorities should approach pollution control when they draw up their development plans and make decisions on planning applications.⁸²

For instance, in England, the *National Planning Policy Framework* (NPPF) says: “*Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan.*”

However, the Environmental Audit Committee (EAC) highlighted concerns that the “*NPPF does not provide any guarantee of avoiding worse pollution as a result of development, but rather a means of considering all aspects of sustainability, balancing or trading-off sometimes conflicting economic, social and environmental objectives.*” The Committee therefore suggested that the NPPF should be much clearer about the importance of protecting air quality.

In July 2015, a Planning Inspector dismissed an appeal to build 97 homes in West Sussex close to an Air Quality Management Area (AQMA), saying: “*I cannot be certain that the development would not be detrimental to air quality, and therefore to human health, within the designated AQMA. Consequently, it would conflict with the environmental role of sustainable development.*”

www.scribd.com/doc/270316561/Appeal-Decision

As all national and local planning policies and local decisions on development make a significant impact on travel patterns and travel choice, Cycling UK believes that they need to promote cycling and other healthy, non-polluting and sustainable options. They can do this, for example, by locating development where it can be easily reached by walking, cycling and public transport, and providing good cycle access to and within new developments.

For more on planning, see Cycling UK’s briefing:

www.cyclinguk.org/campaigning/views-and-briefings/national-planning-policies

Environmental Protection UK and the Institute of Air Quality Management have published guidance for professionals working in the planning system on how best to consider air quality within the land-use planning and development control processes.

www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf

i. Public Health England (PHE)

PHE already recognises that air pollution causes a serious threat to health and regularly issues advice and information on it. The Environmental Audit Committee also recommended that PHE should engage with the local authority Health and Wellbeing Boards in England (see 6d) to make sure that they give air pollution the priority it deserves.





6. Roles, responsibilities and actions: local government

Cycling UK view: local authorities should:

- Recognise that tackling air pollution is a key duty;
- Make the most effective use of local air quality management measures available to them (e.g. Ultra Low Emission Zones and Air Quality Management Areas);
- All charging CAZs areas should be covered by a Local Cycling and Walking Infrastructure Plan (LCWIP), and some of the revenue generated should go towards high quality infrastructure improvements to make non-polluting, active travel more appealing;
- Build strong partnerships between those responsible for transport, air quality and public health to address the harm caused by road transport pollution in the locality, and promote cycling as a healthy and sustainable alternative;
- Promote car-free days and other events as a means of highlighting the need to improve air quality through local action and behaviour change.

In Cycling UK's view, tackling pollution from road transport is a key duty for local authority health and transport departments to share and prioritise. There are a number of channels and schemes that local authorities can use to do this.

a. Local air quality management (LAQM), Air Quality Management Areas (AQMAs)

Under the *Environment Act 1995* (s.83(1)), all local authorities (borough, district, city and metropolitan etc.) in England, Scotland and Wales, have to designate areas where national air quality objectives are not being (or are unlikely to be) met as AQMAs. Most councils have declared at least one AQMA, the vast majority as a result of NO₂ road transport pollution. PM10 features heavily too.

Once an AQMA has been declared, the authority has to develop and implement an *Air Quality Action Plan*, but they are not obliged to achieve the objectives because they do not have enough control over all the sources of pollution (e.g. from a road for which Highways England is responsible). This arrangement has meant that direct responsibility for achieving air quality objectives is diffuse.

Under *Road Traffic (Vehicle Emissions) (Fixed Penalty) Regulations*, local authorities in England, Wales and Scotland can carry out emissions testing on vehicles being driven through or about to pass through, an AQMA. Offenders are subject to a fixed penalty fine.

Having analysed all AQMAs and published a map of them (2015), the Institution of Environmental Science highlighted inconsistencies in the approach that local authorities take - e.g. some declare their whole area or a large part of it (making the problem harder to tackle), while others target only a small proportion.⁸³ As discussed above (section 5), Cycling UK believes that it is the Government's role to ensure that local authorities all take consistent approach to air quality management.

- For more on each local authority's AQMAs, see: <http://uk-air.defra.gov.uk/aqma/list>
- In 2017, the Welsh Government issued guidance to local authorities on LAQM. <http://gov.wales/docs/desh/publications/170614-policy-guidance-en.pdf>

b. Local Cycling & Walking Infrastructure Plans (LCWIPs, England)

As part of the Government's *Cycling and Walking Investment Strategy (CWIS)*⁸⁴, local authorities in England are being encouraged to draw up plans for comprehensive local cycling and walking networks, and identify and implement a prioritised list of schemes to help develop them. In its guidance on LCWIPs, the DfT lists 'air quality' as one of the factors it should typically consider when prioritising infrastructure improvements.⁸⁵

In Cycling UK's view, all charging CAZs should be covered by an LCWIP and, as mentioned in section 5b, some of the revenue generated should be used to fund high quality infrastructure improvements to make non-polluting, active travel more appealing. Given how under-funded the CWIS is, and local authorities' stretched finances, using revenue from CAZs to support LCWIPs should make a significant difference.

Cycle lanes and pollution: Cycling UK knows of no evidence to support claims made by MPs and the media that cycle lanes cause an overall increase in congestion or pollution.⁸⁶ Conversely, they can be expected to reduce it.

International evidence that cycle infrastructure causes overall reductions in traffic volumes and/or congestion levels (and thus presumably also pollution levels) has been documented by the EU-funded FLOW project.⁸⁷

It is nonetheless possible that the provision of new cycling infrastructure at the expense of motor traffic capacity could cause localised increases in congestion and pollution in the short-term, despite causing an overall (and longer-lasting) reduction in congestion and pollution from the transport network as a whole.

This can be seen as the converse of the effect of building new road capacity. For instance, new bypasses can reduce congestion and pollution in the immediate vicinity of the scheme, but these effects are typically short-term and are outweighed by the increased motor traffic generated by the road scheme. This can be expected to increase congestion and pollution more widely across the transport network, and has been shown to grow over time.⁸⁸ By contrast, removing road network capacity may cause localised increases in congestion and pollution, but allows more people to make more efficient use of road-space, reducing motor vehicle use and hence lowering overall levels of congestion and pollution beyond the immediate vicinity of the scheme.

c. Local Enterprise Partnerships (LEPs, England)

LEPs are voluntary partnerships between local authorities and businesses set up in 2011 by the Department for Business, Innovation and Skills to help determine local economic priorities and lead economic growth and job creation within the local area. There are 39 of them. As they have control over much of the local transport budget, they are in a good position to prioritise investment in sustainable and non-polluting transport but, unfortunately, the Campaign for Better Transport's 'LEP Watch' suggests that this is far from the case: www.bettertransport.org.uk/roads-nowhere/local-transport

Exeter City Council has adopted a three-year low emission strategy (2015-18) which aims to cut traffic pollution from council, business and private vehicles. This will be complemented by promoting sustainable travel choices and championing the development of enhanced walking and cycling routes alongside new infrastructure and development.

<https://exeter.gov.uk/clean-safe-city/environmental-health/pollution-control/air-pollution/>

d. Health and Wellbeing Boards and Directors of Public Health (England)

Under the *Health and Social Care Act 2012* (England), each local authority is expected to set up a Health and Wellbeing Board and produce a *Health and Wellbeing Strategy*. Directors of Public Health (DsPH) now operate within local authorities, making it easier to build partnerships between departments responsible for health and those responsible for transport. Both the Board and the DsPH, working in partnership with transport departments, are in a good position to take a leading role in promoting public awareness about air quality and promoting active travel.

- NICE (National Institute for Health and Care Excellence) have published a guideline on road-traffic-related air pollution and its links to ill health. It recommends a number of actions in combination because, it says, “multiple interventions, each producing a small benefit, are likely to act cumulatively to produce significant change”. Amongst them are: incorporating air quality outcomes in travel plans; supporting active travel (e.g. through clean air zones); and encouraging employees to cycle to work www.nice.org.uk/guidance/NG70
- The Local Government Association has produced a briefing on air quality for DsPH. www.local.gov.uk/air-quality-briefing-directors-public-health

e. Ultra Low Emission Zones (ULEZs)

Following a consultation demonstrating significant public support,⁸⁹ an ULEZ will operate in London from 7 September 2020 (or maybe earlier), to “encourage the use of newer, cleaner vehicles, improving the quality of life and health of Londoners.” Reducing NO₂ is the main target (as mentioned, London is in breach of its legal limit).⁹⁰

The zone will operate all the time and require all cars, motorcycles, vans, minibuses and HGVs entering the current congestion charging zone to pay an additional daily charge unless they meet EU exhaust emission standards. TfL has said that it would prefer drivers to meet the standards than pay the charge, and that making journeys by public transport, walking and cycling instead is one good way for people with non-compliant vehicles to avoid it.

Air Quality in the City Regions: A Transport Toolkit

This is a toolkit for transport and planning professionals in the UK’s city regions who want to know about options to tackle air pollution from transport (e.g. reducing travel, behaviour change, and technological developments). It offers cost comparisons, advice on the likely effectiveness of the interventions, examples of good practice and case studies.

Produced by Transport & Travel Research Ltd (TTR) in partnership with TRL; commissioned and published by pteg (Passenger Transport Executive Group).

www.pteg.net/resources/types/reports/air-quality-city-regions-transport-toolkit

f. Car-free days

One way for local authorities to promote non-polluting transport is to organise ‘car-free’ days by temporarily closing off roads to motor vehicles through traffic regulation orders. This can be done regularly, as part of annual nationwide events (e.g. on Car Free Day during European Mobility Week on 22nd September⁹¹), or so that the public can temporarily enjoy motor-traffic free routes as part of a mass ride, cycling festival etc. (e.g. Prudential RideLondon).

Such events do make a difference to levels of pollution in the area affected:

- When city centre roads were closed to motor traffic during Newcastle’s HSBC UK City Ride in July 2017, levels of nitrogen oxide and NO₂ dropped by around 75%.⁹²
- When dozens of roads were closed to accommodate a stage of the 2014 Tour de France in Huddersfield, the council noticed a “dramatic and immediate” drop in pollution levels.⁹³



FURTHER READING

- Travelwest's series of one-page briefings, including a set on air quality - <http://travelwest.info/essentialevidence/air-noise>
- European Cyclists' Federation briefing on cycling and urban air quality - https://ecf.com/files/150119-Cycling-and-Urban-Air-Quality-A-study-of-European-Experiences_web.pdf

WEBSITES

- UK Air quality and emissions statistics:
 - www.gov.uk/government/collections/air-quality-and-emissions-statistics
 - www.scottishairquality.co.uk
 - www.welshairquality.co.uk
 - www.airqualityni.co.uk
- www.gov.uk/government/groups/committee-on-the-medical-effects-of-air-pollutants-comeap - Committee on the Medical Effects of Pollutants: provides independent advice to government departments and agencies on how air pollution impacts on health.
- <http://healthyair.org.uk/> - UK campaign for clean and healthy air
- www.airqualitynews.com/ - regular news updates on air quality
- www.lsx.org.uk/ - London Sustainability Exchange (campaigns on air quality in the capital)
- <http://cleanair.london/> - campaign to achieve full compliance with WHO guidelines for air quality throughout London and elsewhere

¹ European Union. *Directive 2008/50/EC of The European Parliament and of the Council on ambient air quality and cleaner air for Europe*. 21 May 2008. <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32008L0050&from=EN>

² European Union. *Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air*. 26 Jan 2005. <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32004L0107>

³ <https://www.eea.europa.eu/themes/air/national-emission-ceilings/national-emission-ceilings-directive>

⁴ European Union Press Release. *Environment: New policy package to clean up Europe's air*. 18/12/2013. http://europa.eu/rapid/press-release_IP-13-1274_en.htm

⁵ DEFRA, Welsh Assembly, DOENI, Scottish Executive. *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland*. July 2007. www.gov.uk/government/uploads/system/uploads/attachment_data/file/69336/pb12654-air-quality-strategy-vol1-070712.pdf

⁶ The Supreme Court. *Judgment. R (on the application of ClientEarth) (Appellant) v Secretary of State for the Environment, Food and Rural Affairs (Respondent)*. 29 April 2015. <https://www.supremecourt.uk/cases/docs/uksc-2012-0179-judgment.pdf> / ClientEarth press release. *UK Supreme Court orders Government to take "immediate action" on air pollution*. 29 April 2015. <https://www.clientearth.org/uk-supreme-court-orders-government-take-immediate-action-air-pollution/>

⁷ Defra. *Air Quality Plan for Nitrogen Dioxide*. Dec 2015.

<https://www.gov.uk/government/collections/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2015>

⁸ DEFRA. *UK plan for tackling roadside nitrogen dioxide concentrations*. July 2017.

<https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017>

⁹ Environmental, Food and Rural Affairs Committee. *Air quality: Fourth report of session 2015-16*. April 2016.

<http://www.publications.parliament.uk/pa/cm201516/cmselect/cmenvfru/479/479.pdf>

¹⁰ <http://www.parliament.uk/business/committees/committees-a-z/commons-select/environment-food-and-rural-affairs-committee/news-parliament-2015/air-quality-ministers-reply-16-17/>

¹¹ Environmental Audit Committee. *Action on Air Quality: Sixth Report of Session 2014-15*. Nov 2014.

<http://www.parliament.uk/documents/commons-committees/environmental-audit/HC-212-for-web.pdf>



- ¹² WHO. *Burden of disease from Household Air Pollution for 2012: Summary of results*. 2014. http://www.who.int/phe/health_topics/outdoorair/databases/FINAL_HAP_AAP_BoD_24March2014.pdf?ua=1
- ¹³ European Commission. *Transport and the Environment: Road Vehicles* (web page – 17/9/2015) <http://ec.europa.eu/environment/air/transport/road.htm>
- ¹⁴ DEFRA. *Emissions of Air Pollutants in the UK, 1970 to 2015*. December 2016. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/579200/Emissions_airpollutants_statisticalrelease_2016_final.pdf
- ¹⁵ London Assembly Environment Committee. *Driving away from diesel: Reducing air pollution from diesel vehicles*. July 2015. www.london.gov.uk/about-us/london-assembly/london-assembly-publications/driving-away-diesel-reducing-air-pollution
- ¹⁶ European Environment Agency. *Transitions towards a more sustainable mobility system*. TERM 2016 <https://www.eea.europa.eu/publications/term-report-2016>
- ¹⁷ Royal College of Physicians / Royal College of Paediatrics and Child Health). *Every breath we take: the lifelong impact of air pollution*. March 2016. www.rcplondon.ac.uk/projects/outputs/every-breath-we-take-lifelong-impact-air-pollution
- ¹⁸ European Environment Agency. *NEC Directive reporting status 2017*. July 2017. www.eea.europa.eu/themes/air/national-emission-ceilings/nec-directive-reporting-status#tab-data-visualisations
- ¹⁹ European Commission. *Commission warns Germany, France, Spain, Italy and the United Kingdom of continued air pollution breaches*. Press release 15 Feb 2017. http://europa.eu/rapid/press-release_IP-17-238_en.htm
- ²⁰ European Environment Agency. *Air Quality in Europe*. 2016. <https://www.eea.europa.eu/publications/air-quality-in-europe-2016>
- ²¹ DEFRA. *Air Pollution in the UK 2015*. Sept 2016. https://uk-air.defra.gov.uk/library/annualreport/viewonline?year=2015_issue_1
- ²² DEFRA. *Updated projections for Nitrogen Dioxide (NO2) compliance*. July 2014. http://uk-air.defra.gov.uk/assets/documents/no2ten/140708_NO2_projection_tables_FINAL.pdf
- ²³ Friends of the Earth. *Unmasked: the true story of the air you're breathing*. June 2017. <https://www.foe.co.uk/sites/default/files/downloads/unmasked-story-air-youre-breathing-103872.pdf>
- ²⁴ European Environment Agency. *Air Quality in Europe*. 2016. <https://www.eea.europa.eu/publications/air-quality-in-europe-2016>
- ²⁵ Public Health England. *Estimating Local Mortality Burdens associated with Particulate Air Pollution*. 2014. www.gov.uk/government/uploads/system/uploads/attachment_data/file/332854/PHE_CRCE_010.pdf
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