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A Significant cause of poor Urban Air Quality


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The OSLO EFFECT

(The Elephant in the room Killer)

A not for profit organisation promoting & lobbying for Green, Sustainable Low Cost Tramways, Light Rail Other guided modes & multi mode transport studies
Secretariat to the All Party Parliamentary Light Rail Group @ Westminster UK
A member of the Transport & Training Services Group
No 04533783

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Oslo Effect (2)

How transport air pollution harms your health

1. Outdoor air pollution caused three million premature deaths worldwide in 2012.
2. A positive relationship exists between vehicle weights and non exhaust emissions
3. Electric vehicle on average 24% heavier than their conventional counterparts
4. Electric PM emissions are comparable to those of conventional vehicles
5. Non-exhaust sources account for 90% of PM10 and 85% of PM2.5 from traffic
6. Future policy should focus on reducing vehicle weight

The European Commission has told the UK to clean up its air. Levels of nitrogen dioxide – which is linked to heart and lung disease and contributes to the early deaths of 40,000 people a year in the UK – are particularly bad. We're not the only ones with filthy air; the five most-developed countries in the EU (Germany, France, Italy, Spain and the UK) are all in breach of the recommended limits and have been given two months to take action. Yet gone are the days of epic smogs, such as the great smog of 1952 that enveloped London in a thick fog for four days and killed an estimated 12,000 people. That crisis led to a new awareness of the dangers of air pollution and the need to protect our air with legislation. So surely our health is less at risk now?

London breaches annual air pollution limit for 2017 in just five days

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Does air quality matter?

7. Yes. Ambient (outdoor air pollution) in cities and rural areas caused three million premature deaths worldwide in 2012 – predominately in low- and middle-income countries. And the World Health Organisation (WHO) is confident that, if we reduce air pollution, it would cut rates of stroke, heart disease, lung cancer, asthma and respiratory disease. Researchers at King's College London (KCL) have recently confirmed that high levels of toxic air particles from traffic and combustion are associated with an increase in hospitalisations and deaths from heart and lung disease in children and younger adults.
8. But it is a huge task; in 2014, only 8% of the world's population lived in places where the WHO air quality guidelines were met.
9. The vast majority of us are breathing sub-standard air. Yet change is possible. According to the Department for Environment, Food and Rural Affairs (Defra), between 1970 and 2015, there was a long-term decrease in UK emissions of all air pollutants (ammonia, nitrogen oxides, non-methane volatile organic compounds, particulate matter and sulphur dioxide).
10. What is air pollution?
11. Air pollution has four key pollutants – particulate matter (PM), ozone, nitrogen dioxide and sulphur dioxide – can cause health risks if limits set by the WHO are exceeded. PM is a mix of solid and liquid particles suspended in the air and it affects more people than any other pollutant.
12. In 2012, there were 37,800 premature deaths in the UK attributed to PM exposure, compared with 14,100 premature deaths from nitrogen dioxide pollution. Size matters; the smaller the particle, the worse it is:
13. "The most health-damaging particles are those with a diameter of 10 microns or less, (PM10), which can penetrate and lodge deep inside the lungs. Chronic exposure to particles contributes to the risk of developing cardiovascular and respiratory diseases, as well as of lung cancer," says the WHO.
14. Ozone at ground level – which is different to the ozone layer in the atmosphere – forms when sunlight reacts with air pollutants. So, high ozone levels occur when it is sunny and can trigger asthma attacks and breathing problems in susceptible people. Nitrogen dioxide is a product of combustion (burning fuel for heat, power, engines and ships) and has a negative effect on lung function, especially in children with asthma. Sulphur dioxide is a colourless gas released when sulphur-containing fossil fuels are burned to produce heat and power. High levels cause eye irritation, breathing difficulties and an increase in hospital admissions and mortality among people with heart disease.

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What can we do on bad air days?

15. The Daily Air Quality Index (Daqi) provides reliable information about levels of air pollution with recommended actions and health advice. resource says: "Air pollution has a range of effects on health.
16. Clearly, if your breathing is already compromised by an underlying heart or lung problem (such as angina or asthma), you're more likely to suffer from the effects; those with asthma may need to increase their use of inhalers on days when levels of air pollution are higher than average. Even the healthy general population may notice symptoms such as a dry throat, sore eyes and a tickly cough when pollution levels are very high,

When the air pollution banding is rated as very high, the advice to adults and children with lung problems, adults with heart problems and older people is to avoid strenuous physical activity and, for people with asthma, to use their reliever inhaler more often. And the general population is advised to "reduce physical exertion, particularly outdoors, especially if you experience symptoms such as cough or sore throat".

Are babies at risk?

17. Millions of premature births could be linked to air pollution, study finds
18. Air pollution has a small but significant impact on pregnancy and the health of babies and young children, according to a report from UCLA. It is not as bad as smoking during pregnancy or near your newborn baby, because the air pollutants are relatively diluted. But developing lungs are more susceptible to the damaging effects of air pollution and further study into the effects on pregnant women and infants are needed, says the report.
19. It is not clear whether cyclists are particularly at risk from pollution. KCL air quality experts have suggested that urban cyclists could be exposed to lower levels of particulates than average; either because their journeys tend to be short or because being on the move outdoors means you are not trapped in smog. However logic dictates that cycling in a heavily polluted transport corridor by rubber wheeled buses and truck will significant raise the risk level to a dangerous level. How many cycle lanes have been built in exactly these corridors?
20. A small study of pedestrians in an area of high air pollution in China showed lower blood pressure in mask wearers than non mask wearers, possibly indicating less strain on the heart when exposed to pollution. Masks need to fit snugly and have sub-micron filters to filter out the small particles but most are not capable of filtering out the "Oslo Effect" PM 2.5's
21. The trouble is that these masks that are comfortable enough to cycle in are probably not effective.

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Eco-vehicles fill air with deadly toxins

22. A study found only a third of particles produced by cars came from Tail Pipe Emissions
23. Scientists have found electric, hybrid and other supposedly eco-friendly cars produce as much toxic particulate pollution as the "deadly diesels" they are meant to be replacing by the "Oslo Effect"
24. These tiny particles are produced by Road, Tyre and Brake wear. This happens in all rubber wheeled vehicles, including diesel and petrol, but eco-vehicles produce more because they are on average 24% heavier, owing to the batteries and other parts needed to propel them. They unfortunately produce 37% extra emissions in the form of the "Oslo Effect" with PM2.5's
25. The added weight of rubber wheeled eco-vehicles means that when they accelerate or slow down, the tyres and brakes wear faster, producing more particulates with a high volume of PM2.5s. The weight also whips up more particles from the road surface and on a still day can remain suspended as high as 25 feet+. (8 metre +)
26. "We found that non-exhaust emissions, from brakes, tyres and the road, are far larger than exhaust emissions in all modern cars," said Peter Achten, whose research is published in the journal Atmospheric Environment.
27. "These are more toxic than emissions from modern engines so they are likely to be key factors in the extra heart attacks, strokes and asthma attacks seen when air pollution levels surge."

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28. Achten, who runs a scientific consultancy in Holland, and his co-author Victor Timmers, of Edinburgh University, used technical data from the motor industry and government research agencies, including direct tests of brake, tyre and road wear rates, to show that the non-exhaust emissions produced by a vehicle are directly related to its weight.
29. They also built a database of vehicle weights.
30. "We found that electric and eco-friendly cars typically weigh 24% more than conventional cars," said Achten.
31. The findings fit with anecdotal complaints from electric and hybrid car owners that their tyres wear out faster than on conventional vehicles.
32. The impact of non-exhaust emissions has long been suspected but is hard to measure.
33. Scientists at Hertfordshire University overcame this problem by installing particulate air pollution monitors in the southbound Hatfield tunnel on the A1(M), which carries up to 49,000 vehicles a day.
34. They found each vehicle produced 34-39 micrograms of particles per kilometre but only a third came from the engine.
35. The rest comprised mainly tiny pieces of bitumen whipped up from the road, rubber from tyres and brake dust. In towns — where cars brake and accelerate more often — this proportion may reach 90%.
36. Such findings are a problem for policy-makers whose anti-pollution efforts have been focused on regulating engines.
37. Professor Ranjeet Sokhi, of Hertfordshire University, who led the study, said: "This highlights the significance of non-exhaust emissions and a need for legislation."
38. The Society of Motor Manufacturers and Traders said the industry was working to make eco-friendly cars lighter. "Such vehicles have zero or ultra-low tailpipe emissions and have energy recovery systems, which limit the need for active braking, reducing brake and tyre friction that may contribute to particulate emissions."
39. Toyota, a market leader in hybrid, plug-in hybrid and fuel-cell cars, said the firm had no data on particulate emissions from brakes and tyres but added: "An advantage of hybrid cars over diesel is that nitrogen dioxide and hydrocarbon emissions are incomparably better."
40. Frank Kelly, professor of environmental health at King's College London, said one hope lay in changing the composition of tyres and road surfaces. "Non-exhaust PM [particulate matter] emissions are greater than exhaust and we do not have regulations to deal with these emissions."
41. A Department for Transport spokesman said eco-vehicles still had huge benefits in cutting CO2 emissions but no comment on the "Oslo Effects"
42. It is doubtful that most rubber wheeled, either IC or Non IC vehicles above push bikes or trikes will be in compliance with the new Clean Air Zones (CAZ) which are being revised and rolled out possibly take into account the higher levels of PM2.5+ pollutions being experienced other than just Tail Pipe Emissions to meet the Gothenburg 2020 Protocols

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UK annual emissions and Targets 2010 - 2020 (ktonnes)

43.	44. Nox	45. SO2	46. NH3	47. NMVOC	48. PM2.5
49. 2014 emissions	50. 949	51. 308	52. 281	53. 819	54. 105
55. 2010 Gothenburg Protocol Ceiling	56. 1181	57. 625	58. 297	59. 1200	60. n/a
61. 2020 Gothenburg Protocol ERC	62. 728	63. 292	64. 282	65. 773	66. 76

67. A woman whose daughter died from an asthma attack wants an investigation to find out whether worsening air pollution in London contributed to the death.
68. Ella Kissi-Debrah, nine, from Hither Green near the capital's busy south circular road, died in February 2013.
69. Through a lawyer, her mother, Rosamund, is calling on the attorney general to order a second inquest or to set up an independent inquiry to determine the impact of pollution on her child's asthma and death.
70. She is also calling for immediate action to reduce exposure to toxic air for children such as her son, Robert, whose lives she believes, remain at risk.

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71. Kissi-Debrah's nine-year-old daughter Ella died four years ago (2013), after repeated asthma attacks and seizures brought on by a lack of oxygen left her in a coma.
72. The pathologist at Ella's inquest said her death may have been due to airborne particles.
73. Her mother believes the capital's illegal levels of air pollution are responsible.
74. Kissi-Debrah said she was asking for Great Ormond Street Hospital to examine her daughter's remains to determine what levels of pollution particles were in her body.
75. "It's incredibly hard. It's been four years and still we've had no answers.
76. The doctor in Ella's case has now retired, but it's always going to be hanging over me until these questions are answered," she said.
77. "Scientists say thousands of people die due to air pollution. The problem is, all these people in the studies are faceless, but Ella is a person.
78. "She wanted to know why she was having such bad attacks, and we promised we would find an answer for her."
79. The moves could pave the way for ground-breaking legal action against the Greater London Authority and other government bodies for failing to protect her child and others from air pollution.
80. Jocelyn Cockburn, a human rights lawyer who is working with the family, said: "There are strong grounds to believe that our government may be in breach of its duty to protect life in Ella's case."
81. Concern is growing about air pollution in London, which is currently ranked 15 out of 36 world cities, behind Paris, Berlin and Chicago.
82. According to City Hall, almost 10,000 Londoners die every year because of polluted air and the capital does not meet the legal requirements for pollutants such as nitrogen dioxide.
83. Research published by the World Health Organisation in May showed that London has breached safe levels of pollutant particles known as PM10 and PM2.5

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Dirty diesel 'doubles risk of dementia'

84. New evidence has emerged to show that diesel pollution can double the risk of getting dementia and may be responsible for as many as a fifth of cases worldwide.
85. It adds to the growing list of medical conditions linked to air pollution and comes as the government faces legal action for allowing nitrogen dioxide levels repeatedly to breach EU limits around the country.
86. Poor air quality has previously been more associated with health conditions with sudden onset, such as heart attacks and strokes.
87. The new research shows the consequences of this pollution could be far more long term.
88. Researchers at the University of Southern California (USC) analysed health data collected over a decade from 3,647 women across America aged between 65 and 79.
89. The new evidence on pollution
90. It found that those exposed to levels of air pollution above US legal limits were 81% more at risk of global cognitive decline and 92% more likely to develop dementia-related diseases including Alzheimer's.
91. If the scientists' findings are replicated in men and women of all ages, air pollution could also be responsible for about 21% of dementia cases, according to the study, published in the Nature journal Translational Psychiatry.
92. "Air pollution is a global public health issue," said Jiu-Chiuan Chen, lead author of the paper. "It is well known that outdoor air pollutants kill people and increase the risk of asthma and heart disease.
93. Our study greatly strengthens the emerging evidence that the hazards of air particles extend to brain health, including the dementia risk."
94. Dementia and Alzheimer's have overtaken heart disease as the biggest killers in England and Wales, according to ONS figures released last year.
95. We do have more people these days with dementia and other so called age related disease and illness. However, the incidence also increases with age, and there are more older people than ever before, so an increase is to be expected
96. However there is anecdotal evidence emerging that the high cost to the NHS of an aging population are not just "age related illness" but are in actual fact are transport pollution related and the age profile of those affected seems to start earlier at around 45 years old and not at 65 years old as stated.

A further study to confirm this link is required.

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97. The USC study focused on the smallest particles in air pollution, called PM2.5s.
98. Scientists say these are the most dangerous, as they are small enough to cross from the lungs into the blood and then travel around the body, lodging in organs such as the heart, liver and brain.
99. The paper prompted concerns from British scientists, who found air pollution levels in London last month were worse than in the notoriously smog-prone Chinese capital, Beijing.
100. Readings from the air quality index on January 23 showed 197 micrograms of particulate matter per cubic metre of air (µg/m3), compared to 190µg/m3 in Beijing.
101. The UK capital's air pollution levels are so high that in the first week of January they breached EU limits so many times that they exceeded the quota for breaches allowed for the entire year.
102. When released into the atmosphere air quality pollutants can have a transboundary and/or local impact. Transboundary impacts occur when a pollutant from one area (or country) impacts on another after being transported by weather systems.
103. Examples of transboundary pollutants are acidifying pollutants such as nitrogen oxides (NOx) and sulphur dioxide (SO2) as well as ozone (O3) which is not emitted directly into the atmosphere but may be formed over a large distance by reactions of emitted non-methane volatile organic compounds (NMVOC) with NOx in sunlight.
104. Acidifying pollutants can adversely affect buildings, vegetation and aquatic systems, whilst ozone formed in the lower atmosphere (the troposphere) can be damaging to human health, materials, crops and plants.
105. Particulate matter (PM) is formed from chemical reactions in the atmosphere involving NOx, SO2 and ammonia (NH3), as well as being directly emitted from human activities, and is damaging to health.
106. Atmospheric pollution can also impact on local air quality. Where high concentrations occur, there can be a wide range of negative impacts to human health or ecosystems.1
107. At the national level, the Department for the Environment, Food and Rural Affairs is responsible for the national programme of policies and measures that help to ensure that air quality standards are met. However, the development and implementation of air quality policies is the responsibility of the devolved administrations and maybe liable in court in the event of a prosecution
108. See outcome of the Kissi-Debrah case
109. Meeting the air quality standards can be achieved in different ways, and controlling emissions is one of several options.
110. The continued breaches led to the European Commission issuing the government with a "final warning" recently threatening to launch a case in the European Court of Justice if air pollution levels were not substantially reduced within two months.

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"Toxicity charge"

111. Recently the London mayor, Sadiq Khan, announced a £10 "toxicity charge" to be introduced on October 23 for drivers of the most polluting vehicles.

112. The fee will be on top of the £11.50 congestion charge, and will affect up to 10,000 vehicles in the capital that do not meet Euro 4 emission standards.

113. Rosamund Kissi-Debrah, a south London mother who plans to sue the mayor's office for failing to achieve safe pollution levels after her daughter died from a severe asthma attack, said she was unsure how effective the policy would be.

114. "The £10 charge is great, but from my point of view if you look at what Paris and Madrid are doing, we're miles behind," she said.

115. "I don't know how many people are going to be deterred by the charge. As long as they continue to produce diesel cars, people are going to buy them."

116. This "toxicity charge" is a very small plaster on a very large wound and could be viewed as a revenue raising charge

117. Particulates and NOX emissions are completely different; they were known to be dangerous to humans in high concentrations years ago, but by the mid-90s diesels were believed to have become so clean and efficient that they emitted too little to be a problem - and they've become cleaner since. Sadly, we now know that the airflow in urban areas concentrates pollutants, so that the lower amounts emitted by more modern diesels remain a problem in cities.

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Light Rail and Trams, the part solution to poor Urban Air Quality

118. A recent study that we have completed for the All Party Parliamentary Light Rail Group has thrown up these alarming but ignored statistics. They show that Governments major thrust to EVs will be a repeat of the "Diesel is cleaner" and why corridor non exhaust transport pollution has significantly increased and will continues to increase as long as there is Tarmac, Rubber and Brake lining in use in the urban area.
119. A positive relationship exists between vehicle weights and non exhaust emissions
120. Electric vehicle on average 24% heavier than their conventional counterparts
121. Electric PM emissions are comparable to those of conventional vehicles
122. Non-exhaust sources account for 90% of PM10 and 85% of PM2.5 from traffic
123. Future policy should focus on reducing vehicle weight
124. The European Commission has told the UK to clean up its air. Levels of nitrogen dioxide – which is linked to heart and lung disease and contributes to the early deaths of 40,000 people a year in the UK – are particularly bad. We're not the only ones with filthy air; the five most-developed countries in the EU (Germany, France, Italy, Spain and the UK) are all in breach of the recommended limits and have been given two months to take action. Yet gone are the days of epic smogs, such as the great smog of 1952 that enveloped London in a thick fog for four days and killed an estimated 12,000 people. That crisis led to a new awareness of the dangers of air pollution and the need to protect our air with legislation. So surely our health is less at risk now?
125. There is a confusion in the term used to describe Light Rail as the scope of this and operations are very wide so I will use the term Light Rail in specific and the term Tram in general as the term Light Rail generally has now become polluted by the sub conscious thoughts of over engineering, over costs and general urban blight etc. , where as the term Tram is more acceptable in human and affordable cost terms
126. Light-rail transit, (LRT) or Trams, is a relative newcomer to the world of mass transit. Heavy rail, subways take a long time to build and they're expensive.
127. This is a mode of transport which uses rail vehicles which are more versatile than conventional "heavy rail" trains and have street running capabilities. A light rail vehicle can negotiate sharper curves than a conventional train (both vertical and horizontal), can negotiate steeper gradients and can stop much faster so can operate in line of sight mode without major signaling requirements. The systems available provide the ability to follow the curves and gradients of the urban environment which a conventional train cannot do.

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128. Light Rail systems offer an attractive and effective system, reducing congestion and pollution by offering motorists an alternative to car use, Manchester Metrolink registered a modal switch approaching 32%, helping to create pollution-free zones in cities (clear zones).
129. It moves large passenger flows in a more cost-effective way than buses, but at a fraction of the cost of a full urban railway. Light rail/tram is mainly appropriate in urban or inter-urban systems in medium-sized cities where full metro systems are inappropriate.
130. In the largest cities underground/metro systems tend to be the mainstay of public transport but such cities might use a light rail solution to supplement the metro system.
131. Light Rail vehicles can provide the ambience of a train, but can run in places where a train cannot. They are thus able to attract motorists out of cars where a bus would not be successful. Even when running on former rail alignments, light rail vehicles can offer a better service because they can offer a more frequent service. They can stop at more places because the stops are much easier and cheaper to construct than railway stations. On roads as trams, they can offer attractive journey times in comparisons with cars and buses by taking advantage of segregated alignments and the latest traffic engineering techniques to avoid road congestion .
132. A frequent light rail/tram service provides security in city streets throughout the day, both on and off the vehicle. Low-floors together with a spacious layout provide easy access to mainstream public transport for everyone including parents with buggies and disabled people using wheelchairs.
133. Trams are generally electric vehicles which produce no pollution at the point of service delivery, may use locally produced "green" electricity and the visible path makes sharing precincts with pedestrians a safe option. Thus pedestrian precincts with trams can provide access to city centre areas where buses and cars would be obtrusive.
134. A significant part of the success of any system is the demonstration that changing peoples life styles away from the car and its choking consequences and can be of considerable benefit to them and their surroundings
135. In some situations, where conventional tramway systems are not appropriate, intermediate rail can be considered.
136. Intermediate rail vehicles can be a TramTrain which can run on main line railways but have some of the characteristics of light rail vehicles. Typically they would have (in the UK) a floor height of 950 mm to give level access on standard Railtrack platforms and the flexibility for street level platform, magnetic track brakes and balancing, capable of running on line of sight, inter-working with conventional trains and frees up capacity at main stations
137. This would enable them to run on non-segregated alignments providing better access in places where the railway route is not near to the destination of passengers and where it would be difficult or prohibitively expensive to construct a conventional railway.
138. In the meantime, LRT technology has made great advances. It's clean, relatively quiet, and can quicker to build than heavy rail systems, for example Manchester Metrolink Airport Line which came in significantly under budget and a year early

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139. Tram Train has the potential to provide a new passengers to rail, a better transport offering whilst reducing overall costs to UK plc, development of a new service to rail users, providing new journey opportunities, taking the railway to where people want it to go to both origin & destinations, providing easier access to trains, in effect taking the railways to the people again. May have higher upfront costs but deliver lower whole-life costs. Substantial evidence from Europe shows that this develops into a significant revenue streams and enhances the modal switch from road to rail in the urban area, but will only be delivered if the wider industry work in partnership to make it happen

Examples in the UK are:

140. Greater Manchester with plans for TramTrain in the Stockport/Marple area, Birmingham, Glasgow, Edinburgh, Liverpool, Leeds, London, Bristol, Cheshire, Cardiff Bay development but to name a few who are almost TramTrain ready
141. A recent development in light rail/tram is the growth of on board fuel supplied vehicles giving catenary free vehicles powered by hydrogen fuel cells.
142. Foshan, a city of some eight million in southern China, has rolled out the first of what will be many trams powered by hydrogen. When they enter service, each will carry up to 380 passengers, have a range of 100 km, and a top speed of 70 km/h. Refueling it will take just three minutes. Hydrogen fuel cells generate electricity by creating a chemical reaction using hydrogen and oxygen. That means their exhaust is nothing but water.
143. The trams are manufactured by Sifang, a subsidiary of state-owned China South Rail Corp.
144. If the new trams turn out as planned, China plans to spend US$32 billion in the next five years to build and equip 2,000 km of lines.
145. At the other end of the scale, several relatively low cost hydrogen trams have been developed in service.
146. One successful hydrogen tram is operating in Aruba linking the Port with the capital city Oranjestad

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An example of a low cost hydrogen tram in the tourist role, there are standard type vehicles with this manufacture.

A study using this technology has been proposed for Dundee

147. Air pollution has been linked to coronary artery disease, heart attacks and strokes, with studies showing that traffic-related air pollution affects lung function in children and older people. Diesel vehicles emit more of the dangerous pollutants than petrol vehicles. Sixteen cities and regions including London, Manchester, Leeds, Birmingham and Glasgow have illegal levels of air pollution long after they were obliged to comply with agreed limits

148. It is noted that theses cities have high levels of city centre bus penetration and service

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Wednesday 6 August 2014 16.55 Photograph: Peter Macdiarmid/Getty Images

149. Particulates are one of the worst offenders in air pollution because they damage the lungs when inhaled.

150. Stand at a busy road junction on a bright day and chances are you will see it: a Wacky Races cloud of black smoke left hanging in the air after a car pulls away. These clouds are actually particles of soot – partially burnt fuel from diesel engines – and they are arguably the worst environmental menace facing city-living Britons – and children in particular.

151. Particulates are one of the worst offenders in air pollution because

152. "Exposure to air pollution affects the health of everyone, especially children, and those living with pre-existing lung conditions. Developing and implementing a coherent strategy for reducing air pollution is therefore essential if we are to clean up our dirty air and protect the health of us all."

153. Air pollution causes 29,000 early deaths a year in the UK, more than obesity and alcohol combined

154. A look back at the costs in1999/2000 to the NHS (when these figures in this format were last readily available to the author) there were over 10,500 operations for respiratory disease.

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155. The total cost of respiratory disease to the NHS 1999/2000 £2,576 million made up of Primary Care for respiratory disease across the UK costs £647.5, hospital inpatient care costs £1,062.2 million, hospital day case care costs £18.2 million, outpatient care costs £40.7 million, 2,800,000 bed days per year used for treatment alone. In 1999 alone, respiratory disease caused 153,000 deaths (74,000 men and 79,000 women) production losses due to respiratory disease £3,194 million, mortality £1,643.6 million morbidity, working days lost 28,309,000 multiplied by the average daily earnings produces an estimated £2,239 million pound

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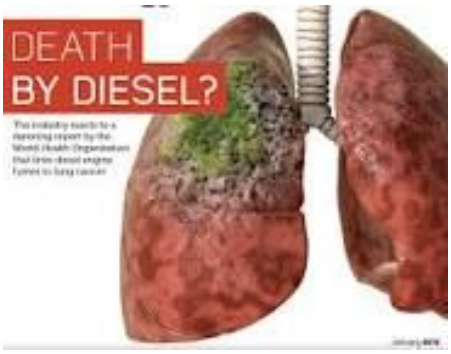

156. The Government must take immediate action to tackle high levels of nitrogen dioxide (NO2) pollution in the UK following a landmark court ruling.

157. Supreme Court justices announced the verdict today and said ministers must draw up new air quality plans to meet obligations under European law on pollution limits.

158. A panel of five judges, headed by the court's president Lord Neuberger, ordered "that the Government must prepare and consult on new air quality plans for submission to the European Commission, no later than December 31 2015

159. The Secretary of State "admits in this case the UK has failed to comply with the nitrogen dioxide limits first laid down by EU law in 1999, now contained in Article 13 of the directive". A DEFRA report from 2014 has lain unheeded until this court case

160. Some areas such as London, Birmingham Glasgow, Edinburgh, Dundee, Aberdeen, Liverpool, Bristol and Leeds will not meet pollution limits until 2030, 20 years after the original deadline of 2010.

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The "Green bus solution", an oxymoron in itself may be electric and therefore "Green" the wearing out of the road surface, the dust from brake lining and the microscopic dust created by tyre wear produces a greater combination of heavy metals in the PM2.5 pollution, a extremely lethal combination over and above any tail pipe emissions in the urban area

161. By forcing the Government to urgently clean up pollution from/and including diesel vehicles, by implementing as France has done light rail and tramway systems which are emission free and can use energy from non polluting means of power generation.
162. If has been evident on "Strike" days when buses have not been running the amount of air pollution has fallen by a significant level. Hybrid buses must be seen as a hybrid solution only
163. All governments have tried to sell us the low cost options of more efficient roads, cars, buses and trucks etc., but the evidence shows that these do not work on the scale now needed
164. This is a fatal path for many
165. It would appear that that lip service is being paid to cleaning of the urban air, saving the planet etc., a step change is now needed by Government

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166. Now that the facts are in the public domain the Government morally needs to do this to reduce the illness and death of hard working families, our very young and to enable our older citizens to enjoy considerable healthy, happy longevity as well as long term public purse savings

167.

Light Rail, a popular solution already started

168. Light rail usage increased in 2014/15. Passenger journeys and vehicle miles reached the highest figures recorded in the modern era, continuing two decades of growth without any direct operational subsidies unlike that a significant number of bottom end Train Operating Companies enjoy at the moment

169. Across the 8 light rail systems in England continued to rise with record numbers of passenger journeys (252.0 million) and vehicle miles (21.0 million) since comparable records began in 1983

170. Growth in passenger journeys occurred mainly in England outside London with a 11.0% increase to 108.1 million journeys

171. Since the financial year ending 2005, the first full year when all current systems were in operation, light rail journeys have grown by 58.8%

172. Around 2.7% of all public transport journeys in Great Britain are made on light rail systems

173. The rising passenger journeys and vehicle miles can at least in part be attributed to network expansion, for example route miles on the Manchester Metrolink increased by 15% from 2012/13 to 2013/14.

174. Light rail and tram revenue increased by 6% in real terms to £290 million in 2013/14 compared to 2012/13. Average revenue per journey has increased 4.6 pence (3.8%) in real terms to 128 pence between 2012/13 and 2013/14

175. A simple method of doing this is to change the DfT measurement tool Cost Benefit Ratio from the short number of years (12/20yrs) to something to reflect the generational benefits of Light Rail to 60 years + and be imaginative to capture many of the soft benefits as is done on many continental countries and then we can be a one nation enjoying our movements and health together and not one at the expense of the other

176. A recent report launched by UKTram at the summer meeting of the All Party Parliamentary Light Rail Group shows the significantly higher regeneration and jobs created in the 8 city regions in UK with this mode which will power the rebalancing and growth of the economy

177. We have the money, experts and this nasty nettle has to be grasped and a statesman's view over several generation funding is needed and we will go a very long way to cleaning up and regenerating our cities

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Conclusions

The most modern electric engines in cars and buses and so on are almost totally tail pipe emissions clean but unfortunate by encouraging this switch, the unintended consequences have created an emerging greater, more toxic pollution problem in the "Oslo Effect"

The "Oslo Effect " is very much the "Elephant in the Room" problem and will only be solved by a significant step change in thinking by all concerned and will need to grasp such measures that have been adopted by a growing number of cities around the world with measures such as time slot banning rubber tyred vehicles from the urban area, the increase use of steel on steel vehicles which have no pollution at point of use as the power generation can be scrubbed elsewhere, achieving a high modal switch out of cars into rail vehicles.

Possible additional solutions are reformulation tyres and road surfaces, the latter are extremely expensive and short lived, regular street washing.
It is interesting that the first generation trams performed this function as the Edwardians recognised the "Oslo Effect" from the horse pollution of the day, on average 5 litres of urine and 15 kilos of manure! a smaller tonnage compared to that floating now in the atmosphere!

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Glossary

178. AQPI Air Quality Pollutant Inventory
179. CEIP Centre on Emission Inventories and Projections
180. CLRTAP Convention on Long-Range Transboundary Air Pollution
181. DECC Department of Energy and Climate Change
182. Defra Department for Environment, Food and Rural Affairs
183. NAEI National Air Emissions Inventory Spatial disaggregation
184. UN/ECE United Nations Economic Commission for Europe
185. The process by which information at a coarse spatial scale is translated to finer scales while maintaining consistency with the original dataset
186. Transboundary pollution Transboundary pollution is pollution that originates in one City/County/Country but, by crossing the border through pathways of water or air, is able to cause damage to the environment in another City/County/Country.
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190. http://uk-air.defra.gov.uk/air-pollution/ European Environment Agency air pollution pages: http://www.eea.europa.eu/themes/air Further information on CLRTAP: http://www.unece.org/env/lrtap/welcome.html CEIP website, providing links to international inventories: http://www.ceip.at/
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195. Guardian
196. and others