Report of the Air Quality Task Group- May 2017

Foreword-signed by Councillor Andrew Smith

Westminster City Council has made tackling air pollution one of its priorities. In order to help the development of the Council's approach, the Scrutiny Function wanted to make sure that we understand the extent of the problem, what causes it, what we are already doing about it, and what more the Council and others can do. We are delighted that the Leader has made tackling air quality one of her top priorities.

There is a growing body of evidence that poor air quality is bad for our health and this evidence highlights heath impacts right through from the unborn child in the womb through to the elderly. Poor Air Quality is identified as the second biggest cause of premature death after smoking.

We were keen to hear from our large business community too. We found that for many businesses, the high level of air pollution in Westminster is bad for business and London as a location for business. Crucially, according to our latest residents' survey, carried out in September 2016, a quarter (25%) of residents say that pollution is one of the main things they like the least about living in their local area. Over time, that saying that poor air quality is a very or fairly big problem has risen from 13% in 2011 to 26% in 2016.

This Scrutiny investigation highlighted that the Council is already doing a great deal to tackle air pollution, but we believe that we can do more and set ourselves some ambitious and quantifiable targets. Air pollution cannot be solved by local authorities alone. As well as our efforts, we need action from the Mayor and the Government. We recognise that residents, business and community groups have an essential role to play in both helping to reduce the levels of air pollution and in mitigating its impact. We therefore suggest that Westminster City Council use its civic leadership role to:

- Ensure that its own buildings, vehicles etc. are the cleanest that they can be;
- Use its purchasing power to improve air quality;
- Inform residents about how they can help to reduce emissions and to avoid the harmful effect of poor air quality on their lives;
- Support other stakeholders to do their bit to reduce pollution and to engage in solving the problem; and
- Lobby the Government at the London and national level for more action and resources to reduce the problem.

The evidence we commissioned from King's College London suggests that what works best is a combination of top down enforcement and bottom up community activity. The evidence from this international trawl of cities also suggests that designing and delivering solutions with stakeholders works well. We are aware that Westminster already does a lot of this, for example, with the Business Improvement Districts, but we think there is scope to do more. Many key stakeholders now want to take more action and support the Council to do so. We are committed to working in partnership with residents and all stakeholders to both reduce

our collective impact on air pollution and mitigate some of the harm caused by it. This work has been undertaken at a time of unprecedented media, government and legal interest in air quality. We are hopeful that with coordinated action together we can make a difference.

Executive Summary

The focus of this study has been on three areas. We have tried to:

- understand the health impacts of air pollution
- understand the emissions caused by transport and
- Understand the emissions caused by buildings.

Health Impacts

Whilst air quality has been gradually improving, most of Westminster still breaches EU and World Health Organisation standards for some pollutants. The level of research about health impacts is growing all the time. We now understand the impacts ranging from on the unborn child in the womb, on children's lungs, on adults and on elderly people. The impacts vary from increased medicine use, increased emergency hospital admissions right through to premature death. As well as the impact on the individual and families, there are also financial impacts on our health and social care services.

Emissions from Transport

We know that nearly 60% of NO_2 emissions and nearly two-thirds of $PM_{2.5}$ emissions come from road transport. There is therefore a push to move to electric vehicles. However, although this would reduce pollution by removing particulates from exhausts, a significant amount of pollution is created by the wear of brake pads and tyres on the roads. The ultimate solution is therefore to reduce traffic overall; both personal car use and commercial vehicles servicing our businesses.

Emissions from Buildings

There is much less awareness about the significant contribution of emissions from buildings and construction to air pollution. In Westminster, this comprises about a third of our air pollution. One of the things the Council can do more of is to raise awareness of this both with residents and with businesses. The boilers and heating systems selected by residents' and commercial and residential landlords can make a real difference to levels of pollution. This is an area where both the Council and the Mayor can and do set and enforce standards for development, construction and refurbishment. For Westminster, with our many heritage buildings, the refurbishment of buildings to excellent environmental standards is crucial. Whilst we found there is already much good practice e.g. the Green Club in the Low Emission Zone, managed by the Portman Estate, emissions from buildings are not predicted to fall (unlike emissions from transport). Therefore it is important that Westminster considers what more we can do to accelerate the improvement of the building stock in the City.

In conclusion, Westminster City Council has a leadership role to play both by improving our own policy and practice, but also by acting as a catalyst for residents, businesses and visitors to minimise the pollution we cause and mitigating the harmful effects of pollution on ourselves. The Council also has a respected voice in influencing those things that are outside our control. We should be even bolder in what we urge the Mayor and Government to do for the levers that are within their control.

Introduction

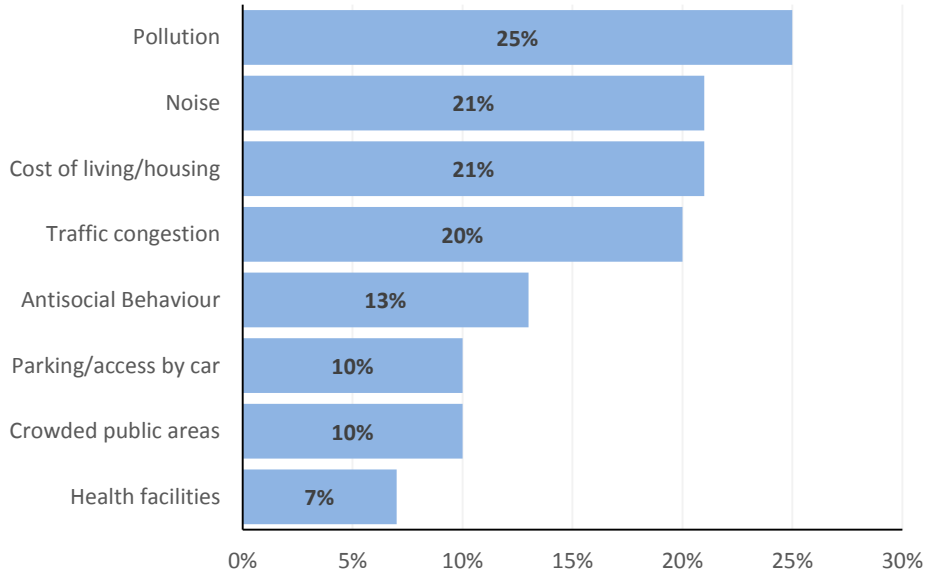
Purpose of the Task Group

In July 2016, the then Environment and Customer Services Policy and Scrutiny Committee decided to launch an investigation into Air Quality in Westminster.[1] The Committee knew that Air Quality was an area where the Council had shown significant leadership for some time, but we also knew that it was one of the top concerns for our residents. According to our latest residents' survey, carried out in September 2016, a quarter (25%) of residents (aged 16 and over) say that pollution is one of the main things they like the least about living in their local area. This is the top concern over cost of living/housing (21%), noise (21%) and traffic congestion (20%). More specifically, over time, those saying that poor air quality is a very or fairly big problem has risen from 13% in 2011 to 20% in 2015 and 26% in 2016. It has consistently been seen as the biggest problem in Westminster. We also know from our engagement with our business community, through the Business Improvement Districts (BIDs) and others, that it is also a top concern for businesses and employers. In response to these concerns and to shape the policy response from the Council and the Mayor of London, we established the Air Quality Task Group (the Task Group) with the aim of developing our understanding of air quality, and identifying national and international best practice solutions that could be applied to central London.

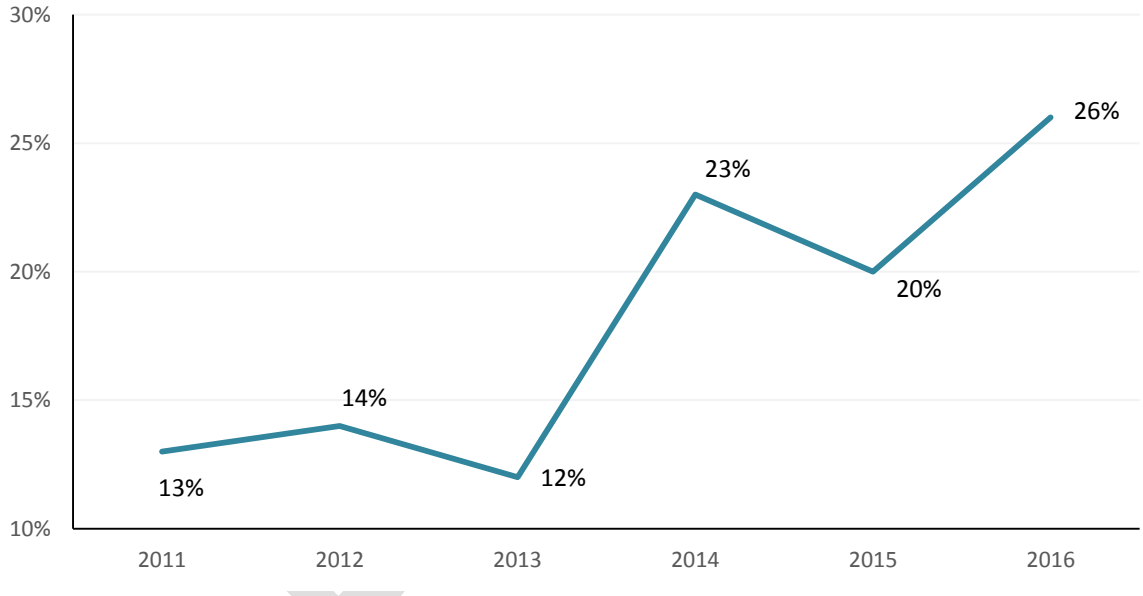
City Survey[2] Question: What two or three things do you like the least about living in your local area? (top responses only)

[1] From January 2017, the responsibility for Environmental Policy Scrutiny passed to the Children's Environment and Culture Policy and Scrutiny Committee and, to reflect this change, the Chairman also changed.

[2] The City Survey is an annual face to face survey of over 1,000 residents. This is a representative sample. It captures resident perceptions of the City and the services provided by the Council.



City Survey Question: Thinking about your local area, how much of a problem do you think air pollution is? (number of respondents who think it is a very/fairly big problem)



Resident Concern about Air Pollution

08.05.2017

The full terms of reference and membership are attached at Appendix 1. In recognition of the cross-cutting nature of the issue, the membership was also drawn from the Adults, Health and Public Protection Policy and Scrutiny Committee and the then Children, Sports and Leisure Policy and Scrutiny Committee. Essentially, the Task Group set out to ***"Further develop understanding of the issue of air quality citywide in Westminster and to identify what additional steps can be taken if necessary to focus on it. The findings/recommendations of the Task Group were designed to be able to inform the refresh of the Westminster Air Quality Action Plan."***

Evidence the Task Group heard from eminent experts identified air pollution as the second highest preventable cause of premature death after smoking. People choose whether to smoke or not but breathing is not a voluntary activity.

1. Structure of the report

Each section provides the policy context, sets out the key elements from the evidence and suggests some recommendations that would improve the air quality. In doing so, they will draw on the commissioned evidence from KCL, the evidence heard at the meetings and submitted to the Task Group either in writing or online.

The structure of the report is as follows:

1. Introduction to the task group and how it carried out its work
2. Background on air pollution
3. Evidence base setting out the extent of the problem in Westminster
4. Health impacts
5. Impact of transport and recommendations
6. Impact of buildings and recommendations
7. Next steps and conclusions

2. How the Task Group carried out its work

The Task Group met from July 2016 to March 2017 to agree the scope of the work, to agree the score of the research review and to start taking evidence from experts on the three key themes they were interested in:

- Emissions from transport;
- Emissions from buildings; and
- Health impacts (including on children).

The Task Group heard evidence directly from Professor Frank Kelly of King's College London (KCL).[3] The Task Group also put out a wider call for evidence via a press release at the beginning which encouraged people to share their views about the problems it causes and about potential solutions. A page for the Task Group was opened on Open Forum, our online engagement vehicle, and residents and local organisations were invited to submit evidence.

[3] Professor Frank Kelly BSc, PhD, FRSA, is the pre-eminent expert on air quality and holds the chair in Environmental Health at King's College London, where he is Director of the Analytical & Environmental Sciences Division. His other positions of responsibility are Director of the Environmental Research Group and Deputy Director of the MRC-PHE Centre for Environment & Health.

We also created a dedicated email address to which people could send concerns, evidence or ideas about solutions. One residents' association decided to hold a meeting on air quality and invited a member of the Task Group and officers to attend and speak. We received 26 responses via Open Forum and the key concerns/ problems that air quality causes for residents were: health concerns especially for children, increases in asthma symptoms, respiratory problems and making clothes dirty. The increase in home deliveries, and idling of coaches and other vehicles were seen as a significant cause of the pollution. When asked what action we should take, respondents urged us to be bold. Popular suggestions included phasing out diesel, whilst planting more trees on busy routes and more green space generally, car bans and punishment/enforcement for idling. We also had some very specific suggestions such as change the traffic lights so that pedestrians do not have to wait in the central reservation of very busy polluted roads such as Marylebone Road.

Critically, the Task Group also commissioned the Policy Institute at KCL, under the leadership of Professor Frank Kelly, to conduct an independent of initiatives to improve air quality in other cities globally, and in other London boroughs, with a view to exploring whether there are lessons that can be applied for Westminster City Council (WCC). The Task Group wanted its recommendations to be evidence-based and have the rigour to be acted upon. A summary of this piece of work is shown at **Appendix 3** and its rich findings have been used throughout this report and informed the recommendations. The full report is published at **add link when done.**

3. What is air pollution?

The table below explains the sources of air pollution, the health and environmental effects, and current London concentrations.

Table 1 Air pollutant sources, health and environmental effects, and current London concentrations (adapted from [4])

Pollutant	Key sources of emissions	Health/environmental effects
Particulate matter (PM) Typically referred to as particles under 10 μm in diameter (PM_{10}) and fine particles less than 2.5 μm in diameter ($PM_{2.5}$)	Transport (exhaust, tyre and brake wear), combustion, industrial processes, construction and demolition, natural sources. Also created by interaction of other pollutants.	Linked to asthma, lung cancer, respiratory and cardiovascular diseases, infant mortality and low birth weight. The smallest particles are of greatest health concern (e.g. $PM_{2.5}$). PM exposure can lead to growth stunting or mortality in plants. Black carbon (a component of PM) contributes to global warming.
Nitrogen oxides (NOx), including nitric oxide (NO) and nitrogen dioxide (NO_2)	Transport, combustion.	Exposure to NO_2 can cause lung irritation, decrease lung function, and increase chance of respiratory infections. Long term exposure is associated with low birth weight babies and excess deaths. NO and NO_2 are precursors to formation of Ozone, and acid rain. NOx can be deposited into fresh water and land, harming biodiversity in sensitive sites.
Sulphur dioxide (SO_2)	Combustion (particularly coal) and road transport.	Causes irritation of lungs, nose and throat, and exacerbates asthma. Precursor to formation of smog. Forms acid rain, which damages freshwater

		environments, soils and vegetation.
Carbon monoxide (CO)	Road transport (particularly petrol), combustion, industry. CO arises from incomplete combustion.	Headaches, nausea, dizziness, affects lung performance. Precursor to formation of Ozone.
Ozone (O_3)	Formed by reaction of hydrocarbons, NOx, and Volatile Organic Compounds in sunlight.	Harms lung function and irritates respiratory system. Can increase incidence and severity of asthma and bronchitis. Long term exposure can lead to cardiorespiratory mortality. Acts as a powerful greenhouse gas. Stunts plant growth.

For the position in Westminster, please see Table 2 below.

Table 2 Summary table comparing Westminster's average annual concentration levels for $PM_{2.5}$, PM_{10} and NO_2 compared to the London average, the EU Limit Values and the WHO's guideline limit taken from LINK TO KCL report

Pollutant	EU limit values	WHO limit values	Current Westminster values[4]	Current London values
PM_{25}	25 µg/m^3 annual mean	10 µg/m^3 annual mean 25 µg/m^3 24-hour mean	17.7 µg/m^3 annual mean	15.3 µg/m^3 annual mean
PM_{10}	40 µg/m^3 annual mean 50 µg/m^3 24-hr mean	20 µg/m^3 annual mean 50 µg/m^3 24-hr mean	28.0 µg/m^3 annual mean	24.0 µg/m^3 annual mean
NO_2	40 µg/m^3 annual mean 200 µg/m^3 1-hr mean	40 µg/m^3 annual mean 200 µg/m^3 1-hr mean	50.2 µg/m^3 annual mean	30.6 µg/m^3 annual mean

4. The Evidence Base on Air Quality in Westminster

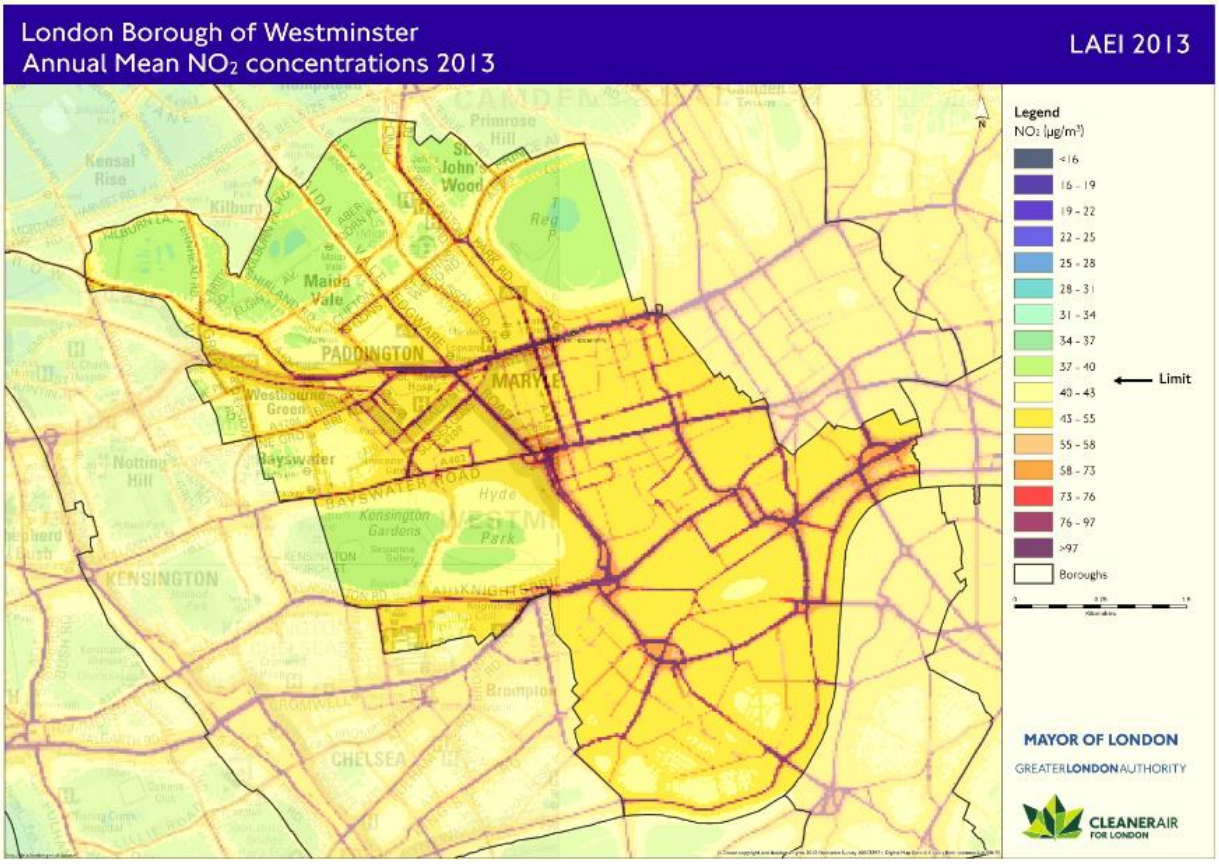
London also has a comprehensive monitoring network, funded by London boroughs, the Greater London Authority (GLA), Transport for London (TfL) and Heathrow Airport. Many of these sites are part of the London Air Quality Network (LAQN), managed by KCL's Environmental Research Group, enabling the region to understand trends in air quality. Removing the weather effects from trends in concentrations of the main pollutants monitored at these sites, the LAQN has identified a reduction of NOx and PM from 2008 to 2013.[5] This is encouraging as it shows that overall air quality is improving in London, but the

[4] Data taken from LAEI 2013. Air quality in Westminster is monitored through the London Atmospheric Emissions Inventory (LAEI) data and five automatic monitoring sites: Victoria Palace Theatre, Strand, Oxford Road, Marylebone Road and Horseferry Road. The latest release of the LAEI provides concentration data for the year 2013, the reason for this time lag is that the dataset is vast and it takes time to be calibrated.

[5] NOx roadside sites show a downward trend of 1.25% per year, equating to a total reduction over the six year period of 7.5%. NO_2 roadside sites show a downward trend of 2.1% per year, equating to a total reduction over the six year period of 12.6%. PM_{10} roadside sites show a downward trend of 1.4% per year, equating to a total reduction over the six year period of 8.4%. PM_{10} background sites show a downward trend of 0.65% per year, equating to a total reduction over the six year period of 3.9%. $PM_{2.5}$ roadside and background sites show a downward trend of 2.2% per year equating to a total reduction over the six year period of 13.2%.

dynamic nature of air pollution means concentrations at some sites may be going up while the overall trend is improving.[8]

The whole of Westminster was designated an Air Quality Management Area (AQMA) in 1999 due to high levels of NO_2 and PM_{10} in breach of EU limits. The AQMA was adopted based on evidence/monitoring of all pollutants, but PM and NO2 were found to be in excess of EU health standards. Since the turn of the century, air quality has improved in Westminster but pollution remains a significant problem, with EU limit values for NO_2 still being breached on a regular basis. Westminster has significantly higher average mean concentrations for $PM_{2.5}$, PM_{10} and NO_2 compared to the London average (Table 2). NO_2 exceeds the EU Limit values, though particulate matter (PM_{10} and $PM_{2.5}$) both meet the EU objectives. **However, all three emissions exceed the World Health Organisation's (WHO) annual mean guidelines**. Levels of Ozone, Carbon Monoxide and Sulphur Dioxide are under WHO limits. Looking more closely at Westminster, the following map shows that most of the Borough is in breach of EU limits which are themselves above the rates recommended by the WHO. It is important to distinguish the EU standards from the WHO guidelines which are more ambitious. Best practice dictates that a good borough should aim to fall within WHO guidelines. Professor Kelly informed the Task Group that the WHO guidelines are reviewed every seven years based on the latest available evidence, before undergoing some political discussion and then becoming somewhat diluted. In other words, left purely to the scientists, the WHO guidelines would be stricter than they currently are.



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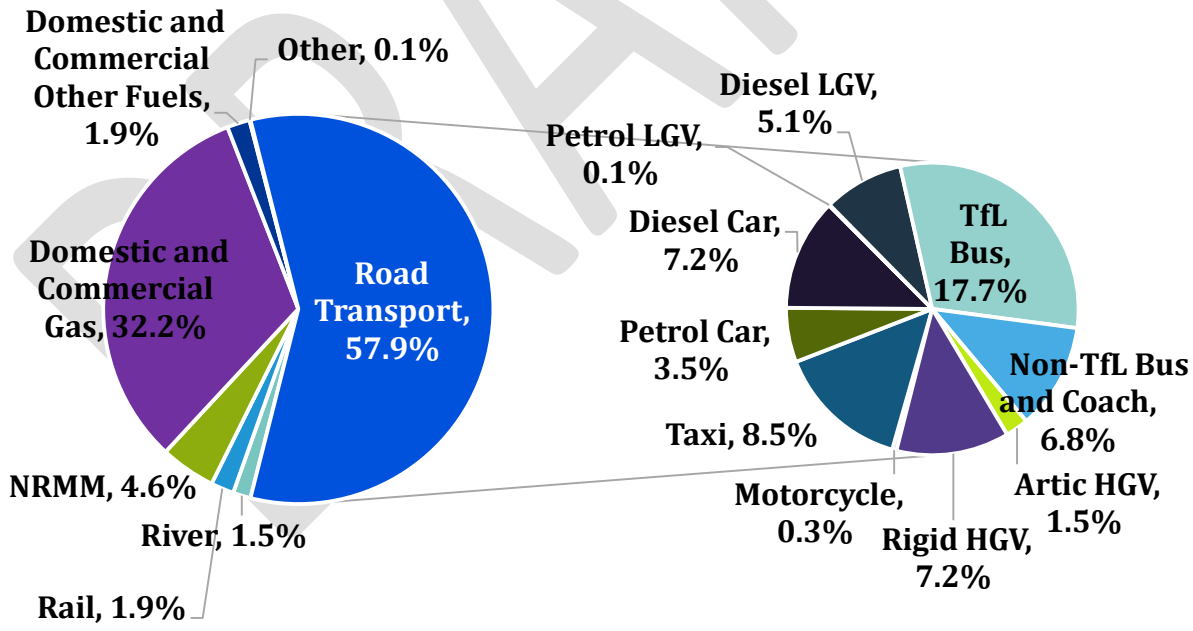
The pattern of NO_2 in Westminster is related to the population density. Population density in Westminster is 10,900 people / km² compared to the London average of 5,500 people / km²; Westminster's population density is about double that of the average London borough. More people equates to more infrastructure and more emissions. The map above shows that, in 2013, over 80% of Westminster exceeded EU limits. The general trend in Westminster shows high emissions in central and eastern areas such as the West End and Marylebone, and that residential areas in the north are less affected, as are the Royal Parks.

5. The Sources of Air Pollution.

As shown by the first table, pollution comes from a number of causes. Particulate Matter ($PM_{10}$and $PM_{2.5}$) comes from transport (exhaust, tyre and brake wear), combustion, industrial processes, construction, demolition and natural causes. Nitrogen oxides (NO_x) including NO_2 come from transport and combustion. O_3 is formed by reaction of hydrocarbons, NO_x and Volatile Organic Compounds in sunlight.

Source Composition of NO_x for Westminster (LAEI 2016)



6

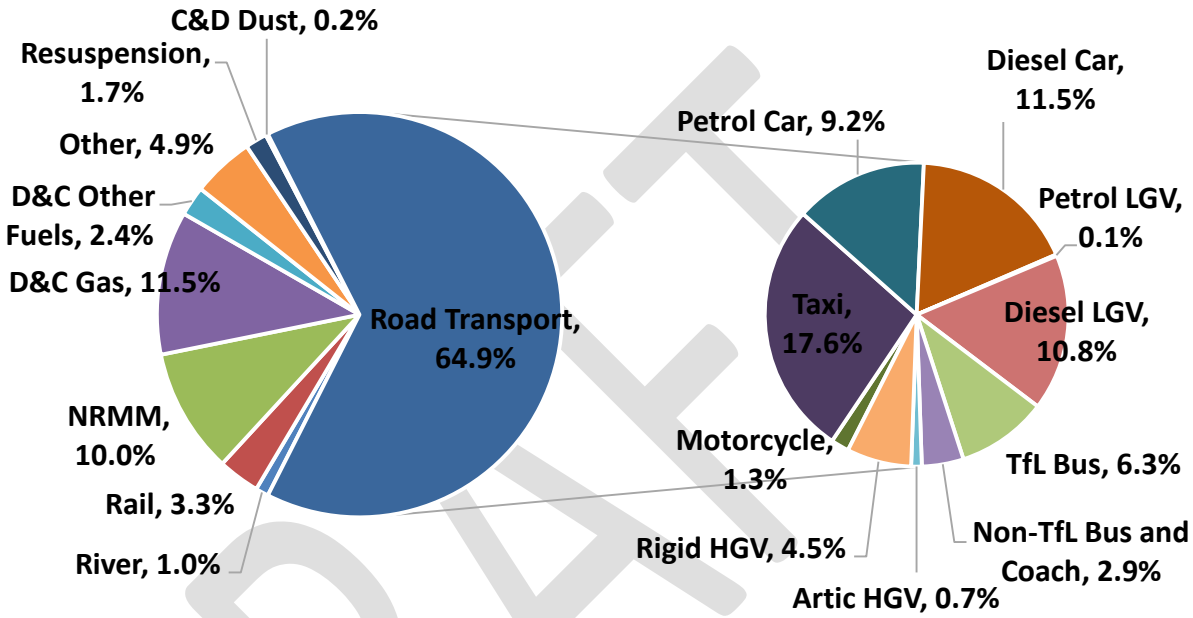
This shows that nearly 60% of NO_2 emissions come from road transport. The largest contributors to this are TfL buses (18%), Taxis (8.5%) and diesel cars (7%). Roughly one third

[6] NRMM = Non Road Mobile Machinery- Construction Machinery

of emissions are from Domestic and Commercial Gas sources. The latter are discussed in more detail under the Buildings Section of this report.

The equivalent chart for $PM_{2.5}$ shows the following:

Source Composition of $PM_{2.5}$ for Westminster (LAIE, 2016)



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Again, Road Transport contributes nearly two-thirds of emissions, the largest polluters being Taxis (18%), diesel cars (12%) and diesel Light Goods vehicles at 11%, with Domestic and Commercial gas, i.e. boilers contribute 12% and Non Road Mobile Machinery (NRMM) contributes 10%.

Given that transport and emissions from buildings are the two key sources of air pollution in Westminster, the Task Group decided to focus its work on these two areas in order to have the biggest impact.

6. The Health impacts of poor air quality

6.1 Policy Context

The failure to meet air quality objectives in a number of cities has a direct impact upon the health and life expectancy of those who live and work in our cities. It is estimated that 9,400 deaths in London were attributable to poor air quality. The health of London's population and its status as a global city and leading economic and commercial centre are all threatened by the levels of pollution.

As stated previously, under UK legislation, local authorities and the GLA are required to assess air quality and take action to reduce pollution where it is in excess of national standards. Westminster's most recent Air Quality Action Plan (AQAP) was adopted in 2013 and aims to protect health, ecosystems and buildings; reduce pollution to below national air quality objectives; and comply with air quality legislation. The AQAP contains a number of measures aimed at communicating the health impacts from poor air quality, protecting the most vulnerable and seeking to minimise personal exposure to poor air quality.

6.2 Evidence

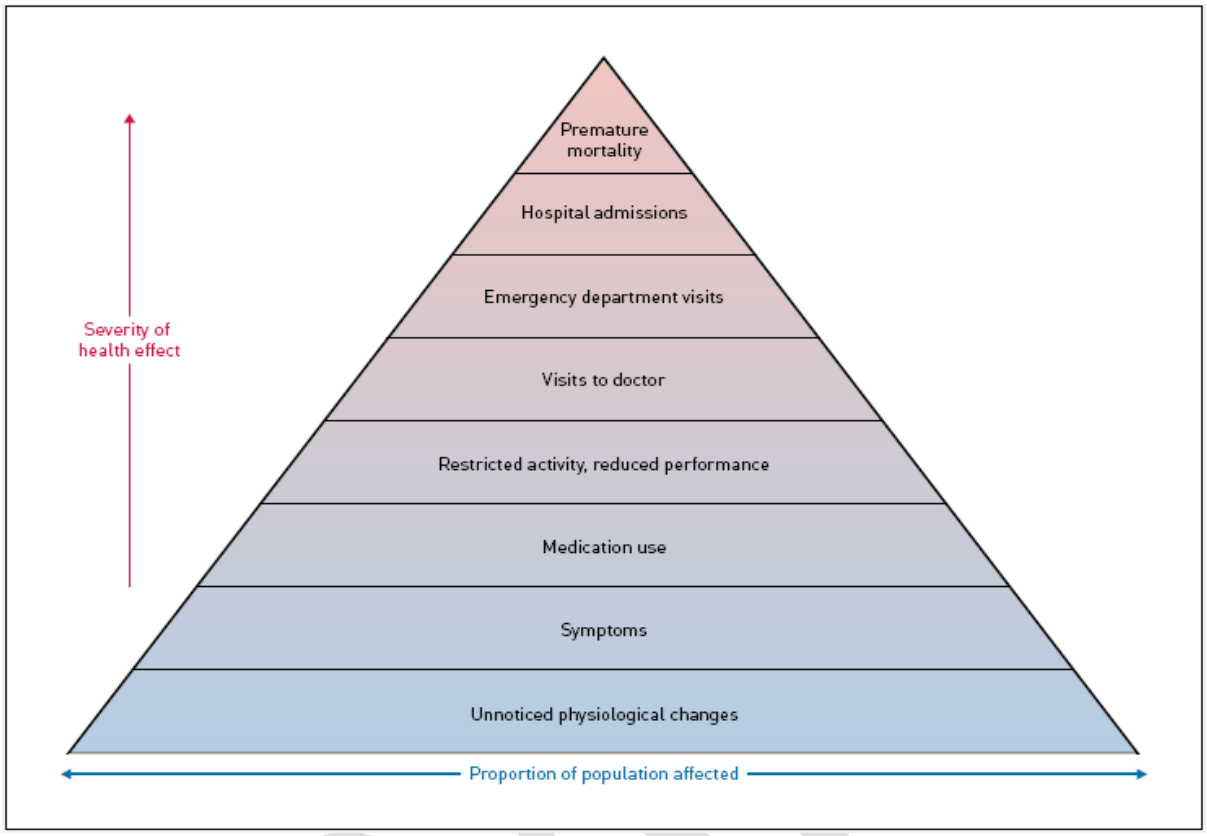
Evidence presented to the Task Group by Professor Kelly suggested that, across the UK, poor air quality is responsible for the equivalent of 29,000 premature deaths due to breathing in tiny pollution particles. The average loss of life is six months, (although the actual amount varies between individuals, from a few days to many years).[7] In Westminster, this equated to 88 attributable deaths from $PM_{2.5}$ exposure in 2014[8]. He noted that the 2010 data shows that the biggest cause of premature deaths is from active smoking, accounting for 89,000 deaths. The second biggest cause is poor air quality at 29,000 premature deaths. Premature deaths from alcohol and obesity are lower at between 15 - 20,000 each. **This makes poor air quality the second biggest public health challenge after smoking.** Premature deaths come at the top of the pyramid and there were many other health impacts as shown by the picture below.

Numerous epidemiological studies have found an association between air pollution and a wide range of adverse health effects in the general population; the effects have ranged from subtle subclinical effects to premature death, as mentioned above. The WHO uses a pyramid which shows the severity of effect and proportion of the population affected by it. For a small number, air pollution will be a source of premature mortality. For a larger number, it will lead to the development of illnesses requiring hospital admission or visits to a doctor; others will face a noticeable impact on respiratory function; and for a larger proportion of the population, pollution will have subtle, sub-clinical impacts.

[7] The Mortality Effects of Long -Term Exposure to Particulates in the UK - Committee on Medical Effects of Air Pollution - published in 2010.

[8] Attributable deaths of 88 are from PHE data, based on deaths in the population age 25+, summing across 10 year age groups also calculated by borough.

Impact of Air Pollution on Health[9]



Impact on Vulnerable groups

A recent report published by a working party of the Royal College of Physicians shows the impact of air pollution on all life stages.[10] In the womb, the harmful effects of air pollution can include: low birth weight, premature birth, still birth or organ damage. In children, there is evidence of damage to their lungs. In adults, impacts include diabetes and heart disease, and in old age there is now some evidence that it contributes to dementia.

A local analysis of air pollution compared the concentrations of PM_{10} and $PM_{2.5}$ particles during 2014/15 and the number of Chronic Obstructive Pulmonary Disease (COPD) and asthma-related emergency hospital admissions during the same period in the London boroughs of Westminster, Kensington and Chelsea, and Hammersmith and Fulham. Public health analysts carried out a linear regression analysis[11] to test the association between health outcomes and exposure to Particulate Matter adjusted for subcomponents of the Index of Multiple Deprivation. The result was that at small area level analysis within Westminster, Kensington and Chelsea and Hammersmith and Fulham, there was found to be

[9] WHO, 2005.

[10] Every Breath We Take: The Lifelong Impact of Air Pollution - Report of the Royal College of Physicians Working Party, February 2016

[11] Explain Linear regression analysis

a clear association between exposure to PM_{10} and $PM_{2.5}$ particulate matter and health outcomes such as COPD and asthma emergency hospital admissions.[12] DEFRA advice states that, "On occasions where levels are high, adults and children with lung problems, and adults with heart problems, should reduce strenuous physical exertion, particularly outdoors, and particularly if they experience symptoms. People with asthma may find they need to use their reliever inhaler more often. Older people should also reduce physical exertion. Anyone experiencing discomfort such as sore eyes, cough or sore throat should consider reducing activity, particularly outdoors."

Written evidence received from **Breathe Easy**, a group for residents living in Westminster with lung conditions, made the following points. Their members have had lots of information about how to mitigate impacts of poor air but this does not mean that they can avoid the most polluted areas, they still need to get where they are going and many members can only walk short distances so it reduces their choice. They support anti-idling campaigns and suggest that literature could be made available to a larger group of volunteers to talk to drivers with. They also suggest a role for libraries in hosting meetings and facilitating local action on air quality. The group is also critical of some of the language that is used in Council plans and gave the example of "a public health intervention" which is not clear to lay people in the Borough.

The current prominence of air pollution in the media might lead to a belief that pollution levels are increasing; in fact the air is getting cleaner. What is changing, however, is the level of understanding of the impact that poor air quality has on health. As the evidence of the health impacts has improved, the urgency of action has increased. The fact that air pollution is the second most preventable cause of death means that we have a duty to take action to reduce the impact of poor air quality on Westminster's residents, workers and visitors.

The official DEFRA figure for the cost of air pollution to the NHS estimates that it is between £9-18 billion per year, which relates only to the life-years lost costs.[13] We are aware that NHS England has recently commissioned a piece of work to estimate the costs of air pollution on the NHS and social care system. This work is being done by Imperial College School of Public Health, Imperial College Business School and the UK Health Forum. The project will produce a tool that will assess the long term impacts of pollutants ($PM_{2.5,}$ Ozone[14] and $PM_{10)}$ on chronic disease and relative cost to the NHS and social care. Costs will include hospital admissions, GP consultations, medication use and social care (if possible). The results will be applicable nationally and locally. This work is due to conclude in June 2017 and should help build the evidence base to help construct the economic case for preventative spending on air quality initiatives.

[12] Triborough Air Quality Analysis - quick review - Dr Connie Junghans, Public Health Epidemiologist – 2016.
[13] https://www.gov.uk/guidance/air-quality-economic-analysis
[14] Also referred to as O_3.

The Role of Westminster's Public Health Team in Dealing with Air Quality Issues

The Task Group took evidence form the Triborough Director of Public Health, Dr. Mike Robinson. Some of the current public health initiatives include:

- Funding the Airtext service;[15]
- Supporting the Clinical Commissioning Groups (CCG) to do more; and
- Funding the Environmental Health's 'Warm Homes, Healthy People' initiative directly and indirectly.

They also support some other work which has indirect or co-benefits for air quality, for example: encouraging more walking and cycling, and less car use; the Annual Public Health Report – Sitting is the New Smoking; Healthy Living Services for Adults; Funding of Active Westminster; and support to WCC Sustainable Transport Officer. These activities and reports are all relevant to air quality as they encourage walking, cycling and active travel and should therefore encourage people away from using vehicular transport.

Supporting the CCG to do more could include working with them to ensure that their commissioning plans and service specifications include reference to embedding air quality messages into patient pathways where appropriate. This would build on previous work completed in 2015/16 to embed air quality messages into patient pathways for residents living with respiratory and/or cardiovascular disease. There may also be an opportunity to embed air quality messages into the North West London Sustainability and Transformation Plan (STP) and in particular their ambition to roll out "Making Every Contact Count" (MECC) across the local health and social care system. MECC is an intervention which seeks to ensure that front-line professionals are trained to deliver opportunistic advice and sign-posting on relevant health and well-being issues when appropriate.

Community Perspective

The Task Group also received evidence from Sheila D'Souza of the Marylebone Neighbourhood Forum. This evidence was very useful in terms of identifying what communities can do.

Case Study

Citizen Science in North Marylebone

There is potential to use ward budgets for small, 'bottom-up' community projects which engage, educate and empower local people to reduce emissions in their neighbourhood and/or take mitigating action to minimise their exposure.

An NO_2 survey was conducted by residents in north Marylebone who wanted to find out how pollution affected their streets. They raised £500 funding from Mapping for Change (a non-profit organisation) and the Dorset Square Trust to buy and set up NO_2 diffusion tubes at 50 locations around their streets for a month in July 2015. Their mapped results showed large variations in pollution between streets and revealed how taking alternative routes could reduce personal exposure. This useful information was shared with local schools.

Ward budget funding to repeat and extend the survey in 2017 has revealed a marked

[15] This alerts those who are signed up to it when the air quality is high or moderate.

increase in pollution in this neighbourhood and its most likely source – the new diesel-hauled train services into Marylebone Station. Ward Councillors are following this up with the Directors of Chiltern Railways.

There is potential to use ward budgets, in highly polluted areas for small bottom up community projects which not only educate local people but also equip them to take some direct action to either reduce the pollutants locally or take mitigating action. There is also potential, learning from this example and the example of the Low Emission Neighbourhood (LEN), to do more work with schools.

Can WCC do more to protect the health of residents, workers and visitors to Westminster? Should Air Quality assessments be carried out when deciding where to put playgrounds? Should we assess occupational exposure for street-based staff? The same principle applies to TfL when considering, for example, the impact of pedestrianising part of Oxford Street.

6.3 Recommendations

1. Consider use of ward budgets for local, community-driven AQ initiatives in wards where pollution is high
2. Consider the results of the work commissioned by Public Health England which should provide a model to estimate the costs of air pollution on the NHS and social care system
3. Train staff in AQ messages as part of the "Making Every Contact Count" initiative
4. Public health to support NHS staff with advice/messaging for the vulnerable groups in self-care and management
5. Through the Health and Wellbeing Board, bring a focus on AQ to all partners to identify additional interventions that services/staff or stakeholders could take which would be effective in improving air quality or mitigating its health impacts.
6. Lobby Public Health England to establish a system of communications jointly with the Mayor that will deliver complementary work when the Mayor issues AQ alerts to get information and advice to local schools, care homes and nursing homes.
7. Until PHE implement the above, WCC's Public Health team to encourage take up of the airTEXT service so that establishments of "at risk groups" receive direct alerts and health protecting action to take during periods of high pollution.
8. Support individuals to reduce their exposure to air pollution.
9. WCC to consider looking at targeted interventions to reduce exposure in areas of high concentration of pollution, such as greening measures.
10. WCC/CityWest Homes to consider AQ assessments when new siting playgrounds.
11. Public health to consider how they can advocate for air quality with NHS and other partners
12. working to integrate health into every policy

7. Transport

7.1 Policy Context

Air Quality is of increasing media, business and public interest. Good air quality is a priority for residents and businesses in Westminster, with our most recent 'City Survey' indicating air quality to be of most concern to our public. Business raises the issue of Air Quality with WCC on a regular basis and is supportive of actions to reduce its impacts.

Air quality legislation and regulation in the United Kingdom is largely shaped by a series of directives introduced at European level - based on WHO standards - which are subsequently transposed into UK law by Part IV of the Environment Act 1995 and Air Quality Regulations 2000, 2002 and 2010. This transposition of legislation means that EU legislative changes resulting from the EU referendum result need not directly affect UK air quality legislation in the short term, although it is likely that leaving the EU will ultimately result in changes to UK environment regulation.

Under UK legislation, local authorities and the GLA are required to assess Air Quality and take action to reduce pollution where it is in excess of national standards. Westminster's most recent AQAP was adopted in 2013 and aims to protect health, ecosystems and buildings; reduce pollution to below national air quality objectives; and comply with air quality legislation.

To deliver air quality improvements, we work with partners including the Cross River Partnership (CRP), TfL, the Mayor of London, landowners and Business Improvement Districts. Together we focus action on tackling emissions from transport; tackling emissions from buildings and development and increasing awareness of air pollution.

Air quality has been a priority for both the current and previous Mayor's. The central London Ultra Low Emission Zone (ULEZ), set to commence operating in 2020, is the most significant London-wide measure aimed at discouraging the use of old vehicles; in particular, older diesel vehicles which are more polluting. For example, petrol cars registered before 2006 and diesel cars registered before Sept 2015 will have to pay a daily chare to enter London's ULEZ or be issued a Penalty Charge Notice (PCN). There is also significant action underway to reduce emissions from both bus and taxi fleets, and to encourage the uptake of electric vehicles.

In addition, the Mayor has recently agreed the Emissions Surcharge of £10 to apply to older polluting vehicles driving into the Congestion Charge zone from October 2017. The Mayor has also proposed options for expanding the ULEZ to the North/South Circular or tightening vehicle emissions standards across all London.

The Mayor's powers over issues such as transport means that he has an important role to play in reducing pollution in Westminster. But, action to improve air quality in needed at all levels of Government if we are to reduce pollution to acceptable levels for health. Westminster's current AQAP contains a suite of measures aimed at reducing pollution from Transport, but there is scope for stronger and more focused action.

What is the Cross River Partnership?
The Cross River Partnership (CRP) is a public-private partnership that has been delivering regeneration projects in London since 1994. It is a voluntary association of local authorities, business organisations and other strategic agencies relevant to London. They deliver programmes alongside Transport for London, the Greater London Authority, eight central London boroughs including Westminster City Council, and 17 Business Improvement Districts (BIDs).The CRP supports many projects which have a positive impact on air quality. This is achieved by supporting businesses/the BIDS and by providing information to individuals/workers to make healthier choices

7.2 Evidence

The meeting, which focused on Transport, took evidence from TfL and Great Western Railways (the operator of diesel trains from Paddington Station) and received an update from the team at KCL regarding the progress of their research and key findings so far. This meeting was also provided with written evidence from DriveNow, a car-sharing company, and the CRP, which submitted excellent evidence on many of their projects in addition to some reflections on what works and what could be rolled out. Written evidence has also been received from the Westminster BID. This section draws on the commissioned research from KCL as well as all the evidence received in meetings and in written form. [16]

It was acknowledged that WCC already implements many air quality measures, but the call to action from Professor Kelly was that the Council had to do more if we wanted to tackle poor air quality. He urged Westminster to be much more imaginative, stringent and daring. There is a demonstrable difference that lack of traffic makes; there were measurable improvements in NO_2 in Oxford Street during a bus strike and when Regent Street has held traffic-free events. One role that he suggested that WCC could play is by lobbying for an increase in the number of buses that are either all electric or, if hybrid, run on electric mode whilst travelling through the most polluted parts of Westminster. He observed that delivering a switch to zero tailpipe emission electric vehicles would help to reduce the problem of NO_2 pollution but it would not solve the problem of particulate emissions. Delivering a switch to zero emission vehicles would reduce pollution by removing particulates from exhausts, but that a significant amount of particulate pollution is created

[16] Air Quality Improvement Initiatives in other cities: A brief review of evidence to inform Westminster City Council Air Quality Task Group.

by the wear of brake pads and tyres on the road. The ultimate solution to reduce PM pollution is by reducing traffic overall rather than just switching to cleaner fuels.

7.3 What Does the Evidence Tell Us?

We know from the data above that road transport causes 58% of NO_x pollution in Westminster. We also know that NO_x is the pollutant in Westminster which still breaches the EU limits. The top polluters, under the heading of road transport are, of that 58%:

- Buses, which cause 18%,
- Taxis, which cause 8.5%,
- Diesel cars, which cause 7.2%; and
- Rigid HGVs, which also cause 7.2%.
- LGV's 5.2%

So these are the causes we at WCC need to focus on in order to have an impact on our pollution levels in Westminster.

7.4 What is already happening?

On buses, the Mayor has indicated that he will:

- Introduce the ULEZ standards a year early for double decker buses in 2019;
- Ensure that single decker buses meet minimum Euro VI standard in 2019 and be all electric/hydrogen in 2020;
- Implement up to 12 Low Emission Bus Zones (N.B. these will generally be in outer London as inner London has the ULEZ);
- Only procure hybrid or zero emissions double decker buses from 2018; and
- Expand the Euro V retrofit programme from 800 to over 4,000 buses and to 5,200 by 2021.

On Taxis

The Mayor has published an action plan with the ambition of delivering the greenest taxi fleet in the world.[17] Key elements of this include:

- not licensing any more diesel taxis;
- providing a £3,000 grant towards the first 9,000 Zero Emission Capable taxis; and
- delivering a rapid charging network from 2017 to enable electric taxis.

On Private Hire Vehicles (PHVs), the Mayor's plans include a gradual toughening of standards to be met before they can be licensed, starting with insisting from 2018 that all PHVs must meet either Euro VI standards or at least Euro IV standards for diesel/petrol

[17] Taxi and private Hire Action Plan-GLA 2016

hybrids. By 2020 all newly manufactured PHVs presented for licensing for the first time must be zero emission capable and from 2023, all PHVs presented for licensing for the first time must be zero emission capable.

On Diesel Cars

Following extensive consultation, the Mayor has announced plans for a Toxicity Charge (T Charge) of £10 to be payable by the most polluting diesel vehicles if they want to enter central London. This will involve a payment during congestion charging hours over and above the current Congestion Charge of £11.50. It will apply to pre-Euro IV and VI vehicles. These are generally those vehicles registered up to and including 2005. This will come into effect from October 2017.

Locally, as part of a package of measures within the Marylebone LEN, Westminster City Council has announced that it will be piloting an emission based charging scheme for on street parking in Zone F in Marylebone. In this most polluted area and with the support of many of the local stakeholders, the Council is providing a disincentive for diesel drivers to drive into this area. Parking is one of the few levers within the control of the local authority.

Marylebone LEN

Background

Westminster City Council has been successful in securing funding to develop and implement a 'Low Emission Neighbourhood' (LEN) for the Marylebone area of central London to reduce vehicle trips and improve air quality. It is a high profile, three year programme with over £2 million committed funding.

What is a Low Emission Neighbourhood?

A LEN will include measures to reduce emission of nitrogen oxides (NOx) and particulate matter (PM). There will be a transport focus with measures to reduce emissions from vehicles as well as improvements to public realm. Changes will be visual and visible and will include the greening of deliveries and business servicing. The LEN will be complementary to existing TfL programmes for the greening of buses and taxis as well as existing walking and cycling schemes.

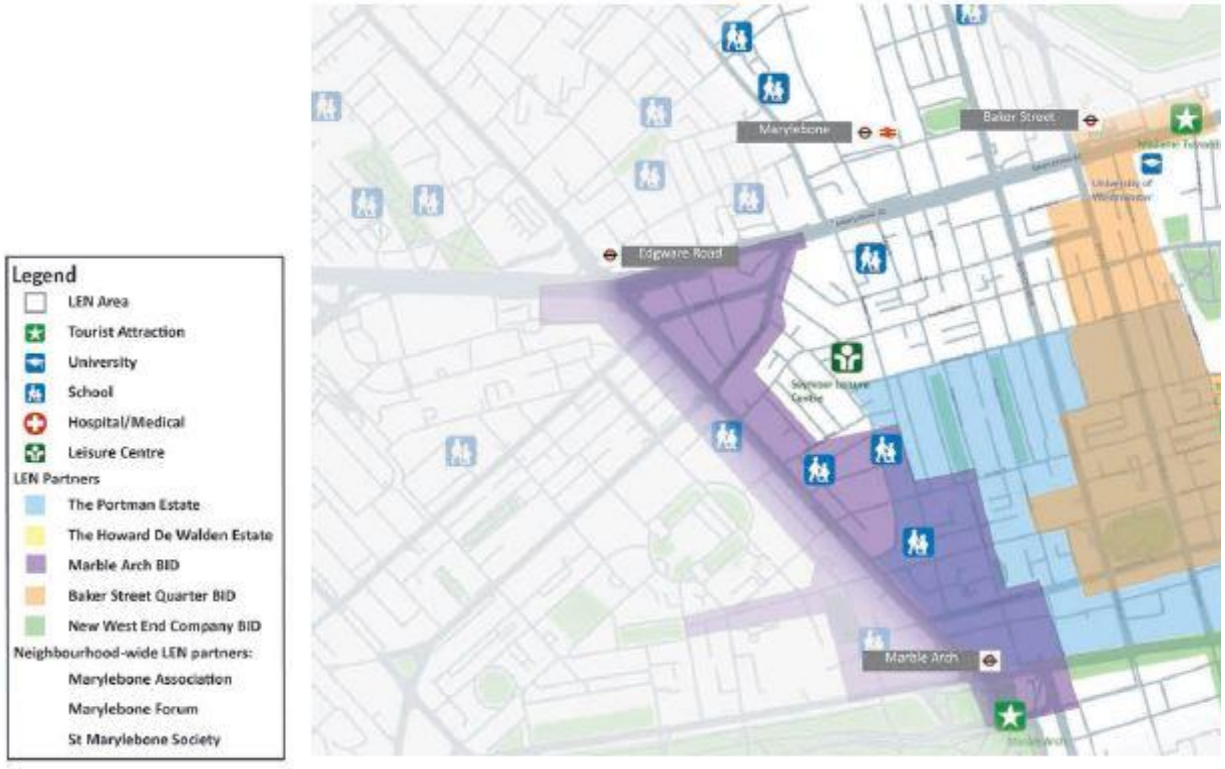
What is proposed?

The LEN proposals include:

- Tree planting, pocket parks to create a green spine along George Street and Marylebone High Street
- New planting on Paddington Street and outside Westminster University on Marylebone Road.
- Electric vehicle charging points, residents' charging schemes, electric vehicle deliveries and smart taxi management
- 'No idling' campaigns to reduce unnecessary vehicle idling
- Deliveries and waste collection consolidation programme for local businesses
- Energy efficiency audit programme for local businesses and residential buildings
- A parking charge trial that makes the most polluting vehicles pay more and the least polluting vehicles pay less to park on our streets
- Air quality awareness raising project with local communities and schools, including creating' play streets'.

Making the heart of London a more sustainable, greener and healthier place to live, work and visit is crucial if London is to continue to grow and thrive. The LEN is a unique programme, developed collaboratively to be delivered in partnership with key central London stakeholders, including the Marylebone Forum, the Marylebone Association, St Marylebone Society, the Marble Arch BID, Baker Street Quarter BID, New West End Company BID, the Howard de Walden Estate and The Portman Estate. Proposed changes to the public realm would be subject to public consultation.

LEN Area Map



Reducing Emissions form HGV's

Add introductory text

Commercial vehicles are a significant cause of both NO_2 and particulate pollution in the city. The Mayor's work to reduce the air quality impact of commercial vehicles is focused in a project called LoCity. This project has a number of facets including:

- Helping fleets prepare for ULEZ;
- Stakeholder engagement including an annual conference; and
- Some industry-led working groups covering: vans under 3.5t, construction and waste HGVs, HGVs over 3.5t and Policy, Planning, Procurement and Practice (4Ps).

We also know from the CRP and the BIDs that there is some great work going on with freight that should help improve air quality.

The case for reducing freight and deliveries is clear; freight is responsible for a significant portion of London's road transport – up to a third within the congestion charging zone – and produces 36% of London's road transport NOx emissions and 39% of road transport PM_{10} emissions[18].

They work to reduce demand for deliveries by consolidating orders, deliveries and the number of suppliers a business or group of businesses procure from, as well as by redirecting personal deliveries. There is good evidence of the success of many of these initiatives. Full details can be found at **add link to their evidence.** One such example is shown below.

The Council has also undertaken work to reduce freight vehicle travelling within the central area through the Low Emission Neighbourhood (LEN) programme. This involves working with local businesses to consolidate procurement, through group purchasing, in order to reduce deliveries in the area. We also manage the kerbside, via the enforcement of parking and loading bays.

Good Practice Example

New West End Company's preferred suppliers for waste collection on Bond Street has delivered:

- A reduction in waste providers from 47 to 5
- 75% reduction of waste vehicles
- 40% less bags left on the street
- 25% of annual waste removal and recycling costs saved on average

Following the success of this scheme, the CRP has been commissioned to develop the 'New West End Buyers Club', a preferred supplier scheme for businesses across the whole New West End Company BID area and including a range of good and service types. In addition, the CRP has just begun a project to deliver a similar BID area scheme with Heart of London Business Alliance.[19]

Advancements in vehicle technology, infrastructure and procurement and behaviour change are required to reduce emissions from road transport that cannot be avoided or shifted to other modes. The CRP has a number of years' experience in reducing vehicle emissions, including researching and enabling electric vehicles, enabling and promoting uptake of ultra-low emission vehicles and reducing emissions and fuel costs by delivering efficient driver training.

Their experience leads them to the following conclusions: there needs to be better promotion of the incentives to encourage the switch to more sustainable vehicle types.

[18] LAEI

[19] The CRP Evidence submitted to AQ Task Group 30.1.2017

Experience suggests organisations typically resist changes to their supply chain despite cleaner alternatives. Barriers to change that need to be addressed include:

- Limited awareness of the impact of freight movements;
- Perceived high costs of low emission vehicles;
- Low visibility of alternative solutions and their benefits; and
- City policies preventing an alternative solution e.g. planning conditions that ban deliveries at certain times.

A Business Perspective

The Westminster Property Association is concerned about air quality because pollution is one of the few negative factors on London's scorecard when comparing it to other world cities when comparing business locations. Making London a good place to do business is key to its economic success. **Poor air quality is bad for London's economy as well as its health**. Therefore they have a target of achieving a 50% reduction in vehicles on Regent Street, including working on consolidation of deliveries. Over 7-8 years, they have got 50 shops signed up to a consolidation scheme. This is about 80% of the available businesses but they had reached a threshold and couldn't get any more unless there were further charges involved. They felt the Council could help by working very closely with the BIDs and by encouraging the Mayor and TfL to apply sanctions.

It was also noted that there are not many electric freight vehicles on the market in this country. However, there is some work going on to encourage manufacturers to offer more at affordable prices both from the Mayor (LoCity-a stakeholder engagement initiative) and from the CRP (FREVUE- working with all stakeholders including suppliers to encourage increased supply).

Written evidence submitted by the BIDs coming together was very appreciative of the many initiatives that the Council already takes and of the Low Emission Zone in Marylebone, but urged the Council and other stakeholders to go further.[20]

Active Travel

Reducing the number of vehicles on our roads is fundamental to improving air quality in Westminster and encouraging greener ways of travel, including walking and cycling, and is one of the five deliverables in the Greener City Action Plan. The benefits of active travel are not limited to improving air quality. Active travel is considered the only viable option for significantly increasing physical activity levels across London's whole population.[21] This is vital as everyone needs to be physically active every day to prevent a wide range of illnesses including heart disease, stroke, depression, Type 2 diabetes and some cancers. These are

[20] The Westminster BIDs- Response to Air Quality Task Group Call for evidence-28.2.2017. Includes Baker Street Quarter Partnership, Heart of London Business Alliance, Marble Arch Partnership, New West End Company, The Northbank, PaddingtonNow and the Victoria BID.

[21] A. Rabl R and de Nazelle.

some of the biggest health challenges in Westminster. The health benefits of active travel far outweigh the risks from poor air quality. [22]

7.5 What gaps are there?

The evidence presented above suggests there is more to do for the Council, the BIDs and the CRP in communicating these messages to the right stakeholders to encourage the spread of much of the good practice already taking place around the Borough.

As part of the Kings research they looked at what other authorities in the UK and cities across the world are doing to reduce emissions. They looked at the Royal Borough of Kensington and Chelsea (RBKC), the London Borough of Camden and the City of London Corporation. Internationally, the search focused on six cities: Copenhagen, Los Angeles, Paris, New York, San Francisco and Singapore. These locations were selected for their potential comparison to central London due to their characteristics and the expert steer of the advisor to the project, Professor Frank Kelly.

They found, as the Task Group heard from others, that London is already taking action to tackle air pollution. They also found the following high level issues emerging with respect to the evidence from other cities and regions in their study:

1. Most interventions focus on discouraging private car use and reducing emissions from industrial vehicles, using primary legislation/legislative enforced mechanisms and investing in infrastructure;
2. There is a lack of rigorous evaluation of interventions and little information specifically on the resulting health outcomes/knock on effects; and
3. Collaborations and partnerships with other districts may be necessary to make them work effectively, and they observed in some of these initiatives that i**nvolving stakeholders from different sectors** in both design and delivery of interventions can lead to better compliance with initiatives. It may also be necessary to combine a range of approaches, including top-down enforcing policies or financial incentives together with community engagement, as these could lead to larger scale improvements.

For example, we learnt that the RBKC trains “Green Champions”. At Westminster we train volunteers to talk to motorists and encourage them not to run their engines whilst they are stationary. This is targeted activity on particular days in particular hotspots. Perhaps this work could be extended to reach a greater number of volunteers. The research also uncovered the CityAir App launched by the City of London as a great example of a simple technological innovation that enables greater user participation and engagement.

[22] ‘Transport and Health in London: The Main Impacts of London Road Transport on Health’, GLA (2014)

In terms of ambitious targets, many cities have tried to 'green' their fleet, but the researchers found that Copenhagen has committed to have 100% of their passenger cars electric or hydrogen run by 2025. The plan in Paris includes a total ban on diesel cars and a completely electric or hybrid city fleet by 2020. Camden introduced a borough-wide 20 mph speed limit in 2013. It is worth noting that WCC has agreed to pilot a trial of 20 mph zones in 30 sites encompassing 40 schools in Westminster including 20mph streets in areas that in areas that have a history of speed-related accidents, for their careful monitoring and analysis of the impacts.

7.6 Potential Recommendations

Westminster City Council

1. Agree a Target Date to ban High Polluting Vehicles from all contracts we procure and build this into our next AQAP and Strategy.
2. Once the Strategy is agreed, ensure effective communication with all commissioners to ensure this is built into future contract specifications.
3. WCC to work with the BIDs to raise awareness of the zero and low emission suppliers directory-*add link*
4. Identify existing contracts and discuss improvements to emissions that can be achieved within those contracts.
5. Review existing Fleets Policy to ensure it specifies best in class standards for all vehicles.
6. Westminster City Council works with the GLA to consider other solutions such as dynamic road pricing and an increase in the types of public transport and active travel such as walking and cycling and more public engagement.
7. Whilst many of the ideas may already be under consideration in Westminster, the literature indicates the importance of using more ambitious targets (e.g. the WHO targets).

Lobbying Priorities

8. Lobby TfL to speed up the introduction of zero emission buses on routes travelling through Westminster.
9. Lobby Government to improve data availability from DVLA to allow LAs to identify the most polluting vehicles
10. Lobby Government to introduce a 'scrappage' scheme which is targeted at taking out the most polluting vehicles in the areas with the worst air pollution problems
11. Lobby for Vehicle Excise Duty Reform to bring in fiscal incentives to discourage diesel vehicles
12. Lobby for a new Clean Air Act

Business, Council and Communities Supporting Change

13. Support Business and individuals to take action to reduce the demand for deliveries
14. Working the BIDs to promote the switch to more sustainable vehicle types in commercial fleets operating in Westminster
15. The Council to demonstrate leadership, working with the BIDs to encourage a step change in the scale of freight consolidation initiatives. We want to go as far as possible using voluntary means and would only consider lobbying for sanctions if voluntary action was insufficient to achieve the required change
16. Support individuals to reduce their exposure to air pollution

Westminster City Council

17. Consider the use of bay censors for taxis to prevent them roaming plying for trade
18. If the trial of the zone F diesel parking surcharge is successful, the Council should consider its extension to other areas of Westminster where air quality is a concern
19. Evaluate the impact of our 30 trial 20mph zones on air quality and consider extending across Westminster if the pilots are successful
20. Keep car clubs under review and seek to utilise changes to operations (flexible car clubs) if beneficial to air quality
21. Consider doing more to encourage play streets and introduce 5mph zones to discourage driving in narrow residential streets

8. Emissions from Buildings

8.1 Policy Context

The Mayor currently requires development to be air quality neutral. This means that, per square metre, the building can emit no more than x and that this is enforced at the planning applications stage. These requirements are tighter in central London and will become more challenging in future. Improving the environmental performance of new buildings is important but, to have a real impact on air quality, it is essential to improve the sustainability of the existing building stock in Westminster. Westminster has the largest number of listed buildings of any local authority. The Council has worked with property owners and heritage experts to consider the most effective way to improve building efficiency whilst preserving heritage assets.

The Task Group heard that the National Planning Policy Framework has two main requirements in relation to Air Quality. These are that planning policies should sustain compliance with, and contribute towards, EU limit values or national objectives for pollutants, and that planning decisions should ensure that any new development in AQMAs is consistent with the local air quality action plan. Westminster is an AQMA, defined as any areas where the air quality is in breach of EU air quality standards.

Regionally, the Mayor devises the London Plan which is the spatial development strategy for London; it sets the vision for next 20 years. This is to be reviewed this year. The overarching

policy within it is one of sustainable development. It identifies levels of growth and the associated infrastructure needs. Crucially, boroughs' plans have to be in general conformity with the London Plan. In other words the London Plan guides and sets out the requirements for development in London. Specifically the London Plan Policy on Air Quality States the following:

> A The Mayor recognises the importance of tackling air pollution and improving air quality to London's development and the health and well-being of its people. He will work with strategic partners to ensure that the spatial, climate change, transport and design policies of this plan support implementation of his Air Quality and Transport strategies to achieve reductions in pollutant emissions and minimise public exposure to pollution.

Sitting beneath this broad policy is some Supplementary Planning Guidance (SPG) which tells boroughs and others how that policy should be implemented. There is some guidance on sustainable design and construction. It gives guidance on air quality assessments, minimising air quality emissions, developments that are air quality neutral (i.e. contribute no additional emissions) and provides emission standards for combustion plant-explain. This SPG also sets out the Mayor's objectives and identifies some best practice.

Our own **Westminster City Plan** also has an air quality policy, **Adopted Air Quality Policy S31**. This states:

- "*The City Council will require a reduction of air pollution, with the aim of meeting the objectives for pollutants set out in the national strategy.*
- *Developments will minimise emissions of air pollution from both static and traffic-generated sources.*
- *Developments that include uses that are more vulnerable to air pollution (Air Quality Sensitive Receptors) will minimise the impact of poor air quality on occupants through the design of the building and appropriate technology."*

Explain Air Quality Sensitive Receptors

The Task Group noted that the City Plan was consulted on two years ago due for review in 2017/18 and so asked for Scrutiny to be consulted on the revisions to the City Plan. They were also informed that by 2020 emissions from transport would be greatly reduced and that commercial gas would be responsible for 42% of emissions. The Task Group noted that the level of awareness of the role of buildings in contributing to air pollution was little

known and that there was a role for the Council in communicating these messages and raising awareness.

Apart from the specific air quality policy, the Task Group was informed that there are many other policies within the City Plan that contribute to good air quality. These include the following policies:

- Policy S35 - Open Space
- Policy S38 - Biodiversity and Green Infrastructure
- Policy S39 - Decentralised Energy Networks
- Policy S40 - Renewable Energy
- Policy S41 - Pedestrian Movement and Sustainable Transport
- Policy S42 - Servicing and Deliveries
- Policy S47 - The Presumption in Favour of Sustainable Development

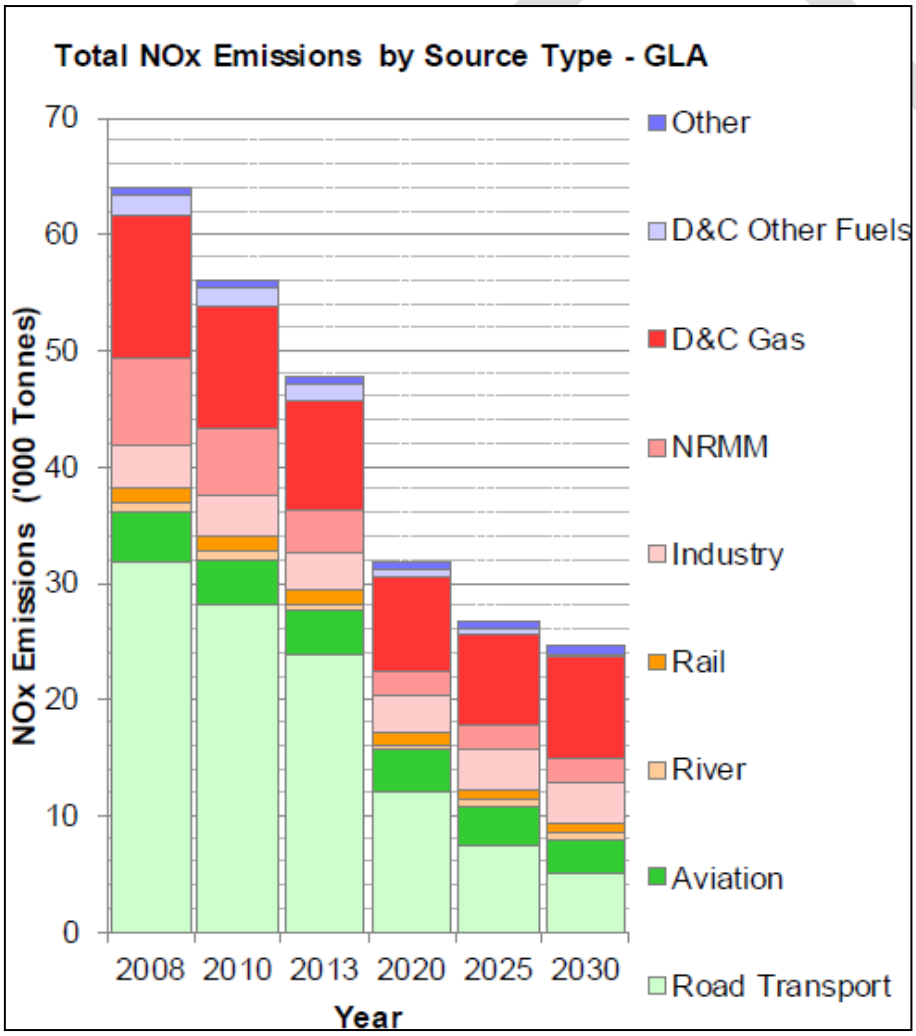
Further Air Quality policies are likely to come forward as part of the revisions of the City Plan. These are likely to place more stringent requirements on developers to carry out air quality assessments and then take mitigating action if the impact on air quality was negative. These requirements will be more stringent if the building emissions would affect vulnerable groups such as children or older people. Planning permission would only be granted if the Council were satisfied that the mitigation plans would reduce air pollutants to acceptable levels. In addition, all new development will be required to achieve a standard equivalent to the lowest NO_X emission criteria (as defined in the Code for Sustainable Homes Technical Guidance or appropriate Building Research Establishment Environmental Assessment Methodology (BREEAM) document). In the case of residential developments, this is currently equivalent to ≤40 mg/kWh dry NO_x. This will make a contribution to improving air quality within Westminster. The next version of the London Plan is looking to improve this to 30mg/kWh dry NO_x.

The Council has a broad approach to improving air quality and a number of other strategies or plans are also designed to have a positive impact on good air quality. These are: the sustainable design booklet, 'Retrofitting Historic Buildings' (2012) (highlighted on the Council's website), the guide publication, 'Improving Soho's Environmental Performance' (2012), the District Heating Master Plan, the AQAP, the Greener City Action Plan, the Air Quality plans of the West End Partnership, the Cycling Strategy, the Walking Strategy and a Car Club Options Paper.

'Retrofitting Historic Buildings' (2012) was a guide the Council produced to promote a range of sustainability measures in historic buildings, ensuring they remain fit for the future.[23] Whilst not directly looking at air pollution, it sets out advice on typical measures that might be undertaken to improve environmental performance, thereby encouraging retention rather than redevelopment, as well as an upgrade of the overall energy efficiency, which contributes to a direct reduction in emissions to air. It set out guidance as to whether measures require planning permission, and where permitted development rights apply.

WCC also jointly commissioned more detailed work, using a number of typical Soho building typologies, modelling costs of measures, energy bill savings and payback times for these types of measures if undertaken in listed buildings.

8.2 What Does the Evidence Tell Us?



[23] https://www.westminster.gov.uk/retrofitting-historic-buildings

The chart above confirms that for NO_x emissions, second only to transport, the biggest source of emissions comes from domestic and commercial boilers. This is around 20% of NO_x emissions today but, because other sources decrease at a faster rate whereas it is assumed gas boilers will remain the dominant heating technology, is set to be >30% in 2030. **In other words, emissions from transport are predicted to reduce over time, whereas emissions from buildings are not**.

The review of interventions conducted by KCL identified a number of interventions taken by others that might be beneficial to Westminster. For example, the RBKC have committed to:

- Lead by example to reduce pollution and improve energy efficiency within the Council's estate and operations;
- Improve energy efficiency in the RBKC's housing stock; and
- Conduct an annual publicity drive over smokeless fireplaces.

The City Of London Corporation has committed to:

- Lead by example: in assessing the impact of its activities on local levels of air pollution in the Square Mile and taking steps to minimise it whenever possible;
- Promote, reward and disseminate best practice for tackling poor air quality through its award schemes; and
- Raise awareness amongst City residents and workers about air pollution and provide information on how to reduce exposure on days of high levels of pollution.

A look at international comparisons from the six cities reveals that two types of initiatives are used in New York, California and Copenhagen, to try to reduce emissions from buildings. These are;

1. Reducing emissions from energy usage by buildings (making electricity and heat generation cleaner); and
2. Reducing energy usage by buildings.

Further details on the types of initiatives in the six cities from the KCL report are provided below ADD REFERENCE/LINK.

Making electricity and heat generation cleaner

The Cities of Los Angeles and San Francisco have provided extensive support for solar power in the form of financing options, piloting technology for solar energy storage and introducing feed-in tariff systems to incentivise property owners and developers to generate solar power on rooftop space. [26, 49, 50, 54] New York has also introduced a financial incentive in the form of a Solar Property Tax Abatement; a measure that helps eligible owners offset the costs of their photovoltaic and green-roof installations. [15, 77].

In 2008, San Francisco introduced a law that prohibits the use of wood-burning devices from November to February at times when air quality is forecast to be unhealthy and Paris has gone further, implementing a full ban on wood fires from January 2015. Prior to this, wood fires were responsible for 23% of the city's particulate pollution. [27, 60]

Reducing energy usage by buildings

San Francisco has the Green Building Program, which ensures that all new buildings are built and operated according to third-party verified energy standards, which means that buildings must conform to set standards for sustainability in terms of the site and location, water efficiency, energy consumption and atmosphere, materials and resources, and indoor climate. [54, 55] New builds in Copenhagen must comply with the Danish building code, which has been gradually tightened since 1961 and now stipulates that the energy needs of new buildings must be 'nearly zero' by 2020, with energy needs covered primarily by renewables or district heating.[65, 68, 86] The City of Copenhagen had lead the way in more energy-efficient construction, developing so-called 'lighthouse projects' that provide examples for other developers. [68] The first such building constructed as a public-private partnership at the University of Copenhagen is Denmark's first public CO_2 neutral building relying on district heating and solar power and seasonal storage.[87] The City of New York is also leading by example in this area, trialling an approach to house building termed 'passive building design'. This utilises high levels of insulation and other design features to moderate a building's heat loss and gain and improve air quality. According to the City of New York, these standards have the capacity to reduce a building's heating and cooling energy demands by 90 per cent. [13]

Full details of the research can be found at ……**add link.**

8.3 What is already happening?

The majority of building emissions comes from burning gas for space and water heating, so reducing the emissions associated with heating is essential. Communal heating systems can have an important role to play in improving the efficiency of heating over each property having its own boiler. It is, however, important to ensure that communal heating systems are not adding to the air pollution problems. There is concern that small scale Combined Heat and Power (CHP) systems can add to localised air pollution by creating more local air pollution than would be created by heating boilers.

<u>Reducing emissions from heating</u>

The GLA also set limits for emissions from District Heating Networks (DHN). In polluted areas, these limits are tighter and will be tightened even further. CHP networks burn more gas in dirtier machines. The District Heating System in Pimlico was considered by the Task Group but, due to its large size, it does not cause major problems as it is the smaller ones which cause more difficulty.

District heating also provides a route to deploy alternative zero NO_x technologies such as heat pumps which are electrically powered devices which concentrate ambient (e.g. from a river) or low grade waste heat (e.g. from air conditioning) to temperatures high enough for use in buildings. Adding a heat pump to a DHN replaces the existing heat sources, which might be boilers or CHP, with a zero NO_x heat source.

WCC has obtained grant funding to explore deployment of a river source heat pump in Pimlico and is developing another large district heating network around the regeneration of Church Street which would also incorporate heat pump technology.

The City of Westminster is well placed for deploying district heating due to the density of heat and the presence of numerous existing large heating systems in the borough. As well as WCC's district heating scheme in Pimlico, there are several other district e schemes in Westminster; the government estate around Whitehall is connected to a single heat network and there is a large CHP energy centre in the new Nova development and a large network is also being built around Battersea Power Station and Nine Elms. There is scope to interconnect these 4 networks (using an existing pipe-tunnel to connect under the River Thames). PDHU would be at the heart of the enlarged network and WCC continues to explore various opportunities with its neighbours (Since the 1950s, WCC has already expanded PDHU to around twice its original size through growth in Pimlico and the scheme continues to make incremental expansion e.g. the Sir Simon Milton Westminster UTC has recently been connected).

Apart from interconnection of large district scale schemes, Westminster's existing built environment contains a significant penetration of medium sized heating systems. For example, there are over 700 communal heating systems in apartment blocks serving around 35% of the homes in Westminster. These systems tend to be concentrated in certain areas; St John's Wood has around 90% of homes on communal heating. These building based systems could be joined together rapidly to create large networks by installing a district network in the public highway connected to an energy centre with a green heat source to replace gas boilers. Planning policy requires new developments to have communal heating and to explore linkages with nearby existing buildings. WCC is exploring creating a new heat network along these lines in Church Street triggered by the existing communal heating systems in the area and the Council's large regeneration programme.

Larger heat networks also provide opportunities to move heat sources away from sensitive areas. For example, much of Paris is heated from plant located on the edge of the city. Growth and expansion of district heating would also help reduce emissions by reducing the need for gas boilers.

Evidence submitted to the Task Group from the Business Improvement Districts suggests that some commercial premises are using their diesel generators to top up the national grid on a commercial basis. The use of these diesel generators in the City produces localised air quality impacts. Further work is required to understand the extent of this issue within Westminster.

The Mayor promotes "Beyond Air Quality Neutral Development" i.e. by looking at ways where new development can actually make a positive contribution to local air quality. CHP networks can, for example, displace boilers in surrounding buildings thus negating the

emissions they cause. "Air Quality Positive" development can do more than just hit minimum standards. The GLA explained that developments on the master planning scale provide significant opportunities to do more to reduce not only their own emissions but improve surrounding areas as well by:

- Ensuring that new public spaces are separated from sources of pollution, reducing exposure
- Designing out new emissions sources
- Making sure new cycling and walking infrastructure serves existing as well as new residents
- Providing access to new district heat networks, ideally using low or zero emission heat sources, so that old boilers can be replaced
- Supporting infrastructure such as freight consolidation centers and transport hubs that can help reduce the need for more vehicles on the road.

By doing all of this, new developments can contribute to meeting a progressive emission ceiling for London.

The Mayor also offers a 'Better Boilers' scheme which provides funding towards new clean boilers for Londoners on a low income with old dirty boilers. This is something that the Council could promote locally.

At a local level, the Green Club Building Energy Efficiency Scheme (within the LEN) will improve emissions from businesses by making improvements to the operation of the building and by retrofitting energy efficiency measures. All of the cost saving from the measures will then be fed back into the system to make more of the improvements.

Construction

The Council has strong policies to enforce against emissions during the construction process. The council has adopted its new Code of Construction Practice in 2016, which applies to all major developments as well as all basement excavations. This requires sites to engage with residents, submit information, and adhere to the best practice contained in the CoCP in order to minimise the environmental impacts of construction projects within Westminster. Emissions from Non Road Mobile Machinery (NRMM), a source of NO2 pollution, are managed using strict emission standards via the CoCP.

The GLA operates a NRMM (this relates mainly to construction equipment and generators) Low Emission Zone which has standards that machinery (between 37 and 560 kW) on construction must meet. These standards are higher in more polluted areas and will be tightened further in 2020. They are also seeking additional powers to be able to apply these standards more widely to machinery of all sizes.

Westminster City Council is currently refurbishing its own City Hall. The example below shows how we are showing leadership by working to the best possible standards.

Westminster City Hall Refurbishment

The refurbishment project has been designed to incorporate as many green and environmentally friendly elements that are practical and feasible and achieve an Excellent BREEAM rating.

The limitations of the structural design of the building, its location and tower format limit the amount of improvements that can be applied and make achieving a BREEAM Outstanding Rating impossible.

Nevertheless, the design of the refurbishment has incorporated significant improvements and the initial BREEAM assessment is that the completed scheme should achieve an 'Excellent' BREEAM rating.

In addition, the EPC[24] rating will improve from the current 'G' to 'B' which is a very significant gain.

Specific Measures

To achieve the 'Excellent' rating, improvements have been made across all of the BREEAM criteria categories. The most significant elements are as follows:

- Micro CHP for basement showers and hot water
- Air Source Heat Pumps for 19th floor catering
- High Efficiency Boilers
- New Building Management System with connections to Energy meters
- High efficiency lighting and controls
- Low water flow sanitary fittings
- Responsibly sourced materials including FSC timber

By replacing the equipment which creates emissions, namely the boilers and standby generator it will improve external air quality. Our Engineers BDP have estimated the likely emissions of the refurbished building as detailed in the table below. Actual reduction will depend on how the building is actually used and occupied.

	Actual Jan 2017		**Proposed**		**Percentage Reduction**
	kWh	**Tonnes CO2**	**kWh**	**Tonnes CO2**	
Elec	**5,660,002**	**2,809**	**3,231,800**	**1,604**	**43%**
Gas	**4,744,328**	**873**	**2,421,250**	**446**	**49%**
Total		**3,683**		**2,050**	**45%**

The contractor will incorporate specific measures in the BREEAM categories of Pollution, Waste and Transport which will also minimise impacts on air quality during construction by reducing plant and equipment emissions and creation of dust.

[24] Explain EPC

St James's Market below is an example of how the private sector is already operating to excellent standards for good business reasons.

St James's Market Tour

The Task Group was hosted for the evidence session focusing on buildings by the Crown Estate and Oxford Properties at St James's Market. This is an example of how environmental excellence can be achieved in refurbished buildings in the centre of London.

It is the use of technology that is driving the improvement of emissions from this building. They have achieved Excellent in the BREAAM standard and the Energy Performance (EPC) rating A, the highest possible. The EPC A rating they have achieved is 25% better than Building Regulations requirements. It was felt that building regulations can be met very easily but that tenants expect more sophisticated technology.

There is a new scheme from the USA called 'WELL'. This is concerned with the question of how you design spaces which benefit people's wellbeing. They are going for certification for WELL for this development. As part of asset management, the development has put in programme of internal air quality monitoring and testing. This system is the best they have ever seen in terms of internal air quality. In relation to the cost of such initiatives, research shows that 90% of occupiers' costs relate to staff; therefore healthy buildings are productive buildings. There is an expectation from occupiers in a prime location like this, that environmental standards are very high - there is a growing interest in health and wellbeing. Occupiers are in fact driving this agenda. It was noted that these excellent measures will not achieve higher rents but will achieve higher quality tenants. It was also noted that these standards are now rolling out beyond the West End to other parts of London.

Sustainable buildings rely on more than good design and technology rather on how the buildings are managed. St James's Market has a sustainability business plan and working group to ensure they can work well within the building e.g. that they use one commercial waste company and do not have 6six different ones servicing the building. They also make it an obligation that all tenant restaurants join the Sustainable Restaurant Association - this is because they are experienced and they can help with refining waste management, how to deal with fuel waste, recruiting from the local community and how food is sourced etc.

The building also contains state of the art facilities and bike storage for cyclists to encourage staff to cycle to work. The loading is designed to support sustainable delivery and waste management strategies aimed at consolidating deliveries and, in the longer term, collecting waste from within the building so that it never goes onto the street. Add photo

8.4 Recommendations

WCC's main areas of influence regarding emission from buildings can be summarised as:

- Our role as a planning authority, through the City Plan, which determines the standards for new development and refurbishment of buildings in Westminster
- Our leadership, by getting our own stock to meet the highest environmental standards
- Our role as a large district heating operator / supplier of heat and our ability to coordinate heat network opportunities in Westminster provide opportunities around expanding district heating systems and diversifying into low/zero-NO_x technologies N.B. There is scope to support this with CIL –district heating is infrastructure
- Our role in communicating the significance of the harm from building emissions and working with stakeholders to reduce it

There is further work that would enable us to achieve improvement in building performance.

1. The Council should consider further work to identify the feasibility of different funding models to help accelerate the improvement of the current building stock.
2. The Council should look at targeted interventions to reduce exposure in areas of high concentrations of pollution, such as greening.
3. Consider lobbying landowners regarding the boilers they fit, using learning from the Portman Green Club
4. Promote more widely the Mayor's 'Better Boilers' scheme in Westminster to enable local people who qualify to access financial support to buy more efficient lower polluting boilers
5. Review how we manage the built environment to ensure the best outcomes for Air Quality- build into City Plan revisions E.g. dilemma of off peak deliveries. Will the new policy be best in class?
6. Undertake City Plan revisions to target new development so that it makes a positive contribution to the surrounding area e.g. district heating systems can negate the need for old boilers in surrounding buildings leading to a net positive impact
7. Promote best practice guidelines for retrofitting heritage buildings.
8. Raise awareness about the significant contribution of emissions from building to air pollution
9. Ensure that we have sufficient resource/powers to enforce the policies within the City Plan and Code of Construction Practice both on construction sites and in refurbishments/new developments. There is a potential gap for smaller sites which are not covered.
10. The Council's response to the Mayor's Environment Strategy should take account of the findings from this Task Group.
11. The council should work with others to stop the use of diesel generators as part of commercial demand management rather than for emergency use only during power cuts

12. to encourage others to avoid running diesel generators on a commercial basis during times of high electricity demand to generate income, due to the localised air quality impacts resulting from running temporary diesel generators (apart from during blackouts) and instead would encourage the National Grid to invest in expanding the existing grid infrastructure for the long term. This is new wording hopefully clearer? Do you want to keep the second part?
13. The Council to work with the BIDs to raise awareness of the Zero and Low Emission Suppliers Directory *add link*
14. New development should encourage the use of car clubs rather than car ownership.
15. Lobby the Mayor to specify that all boilers in new developments must be ultra-low NO_2 specification
16. Consider whether WCC could use its carbon offset fund for upgrades especially if targeting large older boilers or even oil fired boilers
17. The Council to ensure that its own building stock, including housing stock reduces impact on air pollution, through retrofits and ensuring that new buildings are of the highest standards.

CONCLUSION AND NEXT STEPS

This report will be presented to the Cabinet members responsible for taking forward the recommendations within it. The Task Group hope that they will accept as many of the recommendations as possible, both for action within the Council and to inform Westminster's lobbying priorities. Internally we are hopeful that this work will influence the next Air Quality Action Plan and Strategy. This will be the subject of consultation and publication in 2018. But we do not have to wait until then to take more action and show leadership by showcasing excellence in our own operations. We are aiming to launch the report with our stakeholders in the coming month. Westminster recognises that action on air quality demands commitment at all levels of government, by residents and communities and by business. Having carried out this work, we are confident that all stakeholders within Westminster are eager to achieve change in order to protect the health and well-being of those who live, work and visit our City. We hope that the Council will use this report and the Kings Report evidence to influence those levers that are beyond our control.