

**Report of the Director of Resources and Housing, the Director of City Development and the Director of Public Health**

**Report to EXECUTIVE BOARD**

**Date: 13<sup>th</sup> December 2017**

**Subject: IMPROVING AIR QUALITY WITHIN THE CITY**

Are specific electoral wards affected? If relevant, name(s) of ward(s):	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Are there implications for equality and diversity and cohesion and integration?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Is the decision eligible for call-In?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Does the report contain confidential or exempt information? If relevant, access to information procedure rule number: Appendix number:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

**Summary of main issues**

1. Air quality is now a major issue of growing interest and significance at a national and international level. Leeds was identified in 2015 by DEFRA as one of six locations in England that is not expected to meet air quality standards by 2020 and to require the introduction of a Clean Air Zone.
2. DEFRA published its final National Air Quality Plan in July 2017 in response to the high court ruling in December 2016. The new plan uses more realistic emission factors and is intended to achieve compliance in the shortest possible time.
3. The number of local authorities included in the plan has increased from 5 to 28. All the core cities are now included with the exception of Liverpool.
4. In the National Plan it states that the UK government continues to expect local authorities in the original five cities named to deliver their Clean Air Zones by the end of 2019, with a view to achieving statutory NO<sub>2</sub> limit values within the shortest possible time, which the latest assessment indicates will be in 2020
5. Compliance with air quality targets requires a wide variety of actions to be taken, including but not limited to improvement of the taxi and private hire and bus fleet, greater

public awareness to enable behaviour change, greater investment in alternative modes of transport and infrastructure to support the growth of alternative fuelled vehicles.

6. A number of options have been analysed to identify the solution which will achieve compliance in the shortest possible time and improve health outcomes across the city whilst minimising economic impacts and inequalities.

7. We have modelled the improvements that are likely to occur by 2020 due to the natural improvements in vehicle performance and the introduction of initiatives such as the park and rides and new stations and have concluded that the city will be unable to meet its legal obligations to meet the target of  $40\mu\text{g}/\text{m}^3$  without introducing a charging clean air zone.

8. We have dismissed the option of a clean air zone restricted to the inner ring road due to the displacement of traffic likely to occur into residential areas which would adversely affect health within those communities.

9. We have dismissed the option of charging private vehicles and light good vehicles because of the economic impact upon a large portion of the population, the absence of practical transport alternatives for those affected and the difficulties of implementing in the shortest possible time.

10. We are advocating an outer ring road clean air zone which will affect buses, coaches, HGVs, taxis and private hire because it can achieve the target and improve health outcomes across the wider district, whilst minimising economic impact. The council will work with the affected sectors to secure funding from central government to enable them to transition to a cleaner fleet.

## **11. Recommendations**

The Executive Board is recommended to:

- Approve entering into a period of public consultation on the proposal to introduce a Clean Air Zone B within the Outer Ring Road/ Motorway network with additional measures

### **1 Purpose of this report**

1.1 The report to Executive Board will:

- Provide an update on the new national air quality plan and national Clean Air Zone Framework that have been published in July;
- Provide an update from the last Executive Board report that was brought in November 2016 on the actions being taken in Leeds to improve air quality;
- Detail the solutions considered and the optimum solution identified to meet the city's Air Quality obligations as set out in UK law;
- Detail the timetable up to the point when the final plan will be presented for sign off to central government.

## 2 Background information

### 2.1 Outdoor Air Quality and Health

- 2.1.1 Both long- and short-term exposure to air pollution are known to adversely affect health. Short-term exposure (over hours or days) to elevated levels of air pollution can cause a range of effects including exacerbation of asthma, effects on lung function, increases in hospital admissions and mortality. Epidemiological studies have shown that long-term exposure (over several years) reduces life-expectancy, mainly due to increased risk of mortality from cardiovascular and respiratory causes and from lung cancer. The most consistent and convincing evidence suggests an important role for fine particulate matter (PM<sub>2.5</sub>) in causing the observed adverse health effects, although other outdoor air pollutants such as nitrogen dioxide and ground-level ozone are also known to cause adverse health effects<sup>1</sup>.
- 2.1.2 Air pollution causes a considerable burden of death and disability annually and costs the UK economy £20bn every year<sup>2</sup>. Research carried out by Imperial College London showed that there were higher concentrations of particulate matter and nitrogen dioxide in the most deprived 20% neighbourhoods in England<sup>3</sup>.

#### Particulate Matter (PM):

- 2.1.3 Particulate air pollution is a complex mixture of many chemical components which form particles of different sizes (PM<sub>2.5</sub> and PM<sub>10</sub> are the regulated size fractions). Particles are emitted directly from a range of human-made sources, such as road traffic, solid fuel combustion, and natural sources such as desert dust and sea salt, or are formed by chemical reactions in the atmosphere<sup>4</sup>. Epidemiological evidence for PM is supported by toxicological evidence for some health outcomes, thus allowing a causal interpretation of some associations with PM. Although it might be expected that some particle components are more harmful to health than others (e.g. diesel particles), the evidence available from epidemiological studies does not give a consistent view of their relative toxicity. It is estimated that long-term exposure to particulate air pollution (PM<sub>2.5</sub>) alone has an effect equivalent to

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<sup>1</sup> National Institute for Health and Care Excellence (NICE) - Expert testimony from Public Health England to inform NICE 'Air pollution: outdoor air quality and health' guideline 2017 <https://www.nice.org.uk/guidance/ng70>

<sup>2</sup> Royal College of Physicians, 'Every Breath We Take: The Lifelong Impact of Air Pollution', February 2016, available here: <https://www.rcplondon.ac.uk/projects/outputs/every-breath-we-take-lifelong-impact-air-pollution>

<sup>3</sup> Fecht, D. et al. 'Associations between air pollution and socioeconomic characteristics, ethnicity and age profile of neighbourhoods in England and the Netherland', Environmental Pollution (2014), <http://dx.doi.org/10.1016/j.envpol.2014.12.014>

<sup>4</sup> AQEG (2012). Fine Particulate Matter (PM<sub>2.5</sub>) in the UK. Air Quality Expert Group. UK, available at: [https://uk-air.defra.gov.uk/assets/documents/reports/cat11/1212141150\\_AQEG\\_Fine\\_Partuculate\\_Matter\\_in\\_the\\_UK.pdf](https://uk-air.defra.gov.uk/assets/documents/reports/cat11/1212141150_AQEG_Fine_Partuculate_Matter_in_the_UK.pdf)

around 25,000 deaths a year in England (around 29,000 deaths a year in the UK)<sup>5</sup>  
6.

## **Nitrogen dioxide (NO<sub>2</sub>):**

2.1.4 Epidemiological studies have shown associations of NO<sub>2</sub> in outdoor air with adverse effects on health, including reduced life expectancy. It has been unclear whether these effects are caused by NO<sub>2</sub> itself or by other pollutants emitted by the same sources (such as road traffic). Evidence associating NO<sub>2</sub> with health effects has strengthened substantially in recent years and we now think that, on the balance of probability, NO<sub>2</sub> itself is responsible for some of the health impact found to be associated with it in epidemiological studies. The Committee on the Medical Effects of Air Pollutants (COMEAP) is due to publish an assessment on how changes in NO<sub>2</sub> affect mortality in the UK in 2017.

## **Sensitive population groups**

2.1.5 Children, older people, and people with chronic health problems are among the most vulnerable to air pollution<sup>7</sup>. Short-term (e.g. day-to-day) peaks of elevated air pollution are associated with increases in hospital admissions for respiratory and cardiovascular conditions. Individuals with pre-existing cardiovascular and respiratory conditions may experience worsening of symptoms when air quality is poor. Evidence that air pollution causes COPD is not conclusive, but there is good evidence that air pollution triggers worsening of symptoms in those living with related conditions<sup>8</sup>.

2.1.6 There is evidence associating exposure to air pollutants with a worsening of asthma symptoms. Traffic-related air pollution may play a role in inducing asthma in some individuals, particularly those who live near busy roads carrying high numbers of heavy goods vehicles<sup>9</sup> (COMEAP, 2010b). Taking action to reduce levels of air pollutants could potentially allow more young people to achieve their maximum lung function growth potential.

## **2.2 Air Quality Targets**

2.2.1 There are no absolutely safe levels of the main pollutants of concern, however, guideline targets have been established as national air quality objectives and European Directive limits. These targets are summarised below:

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<sup>5</sup> PHE (2014) Estimating Local Mortality Burdens Associated with Particulate Air Pollution, available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/332854/PHE\\_CRCE\\_010.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/332854/PHE_CRCE_010.pdf)

<sup>6</sup> COMEAP (2010a). The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom. Committee on the Medical Effects of Air Pollutants. Available at: <http://www.comeap.org.uk/documents/reports>

<sup>7</sup> RCP/RCPCH (2016). Every breath we take: the lifelong impact of air pollution. Royal College of Physicians. Available at: <https://www.rcplondon.ac.uk/projects/outputs/every-breath-we-take-lifelong-impact-air-pollution>

<sup>8</sup> COMEAP (2016). Long-term exposure to air pollution and chronic bronchitis. Committee on the Medical Effects of Air Pollutants. Available at: <http://www.comeap.org.uk/documents/reports>

<sup>9</sup> COMEAP (2010b). Statement and supporting papers on 'Does Outdoor Air Pollution Cause Asthma? Committee on the Medical Effects of Air Pollutants. Available at: <http://www.comeap.org.uk/documents/reports>

<i>Pollutant</i>	<i>Sources</i>	<i>Targets</i>
Nitrogen dioxide (NO <sub>2</sub> )	Key source: vehicles with internal combustion engines. Diesel engines typically produce more NO <sub>2</sub> than petrol, although industry standards are reducing emissions.	Annual mean: 40µg/m <sup>3</sup>
		Hourly: 200 micrograms per cubic metre (µg/m <sup>3</sup> ) – not to be exceeded more than 18 times per year.
Particulate matter (PM10) – particulate matter 10 micrometres or less in diameter	Produced by a variety of sources, in particular road transport and other combustion sources. Also occurs as a result of chemical reactions of other pollutants in the atmosphere	Annual mean: 40 µg/m <sup>3</sup>
		24 hour average mean: 50 µg/m <sup>3</sup> – not to exceed more than 35 times per year
Particulate matter (PM2.5) – particulate matter 2.5 micrometres or less in diameter	Produced by a variety of sources, in particular road transport and other combustion sources. Also occurs as a result of chemical reactions of other pollutants in the atmosphere	Additional target to meet annual mean of 10 µg/m <sup>3</sup> WHO target by 2030
		Annual mean: 25µg/m <sup>3</sup>

## 2.3 Past National Air Quality Plan & Client Earth Legal Action

- 2.3.1 DEFRA carried out a national assessment of air quality based on the requirements of the EU Directive on air quality. As a result of this, in December 2015 DEFRA published their updated air quality action plan that named Leeds, along with Nottingham, Birmingham, Derby, Southampton, and London as places in the UK that will be not be compliant with nitrogen dioxide levels by 2020, in line with EU air quality targets.
- 2.3.2 DEFRA stated in the original Air Quality Improvement Plan 2015 that Leeds could only become compliant by 2020 if a Clean Air Zone (CAZ) were to be implemented. It was anticipated by DEFRA that a CAZ proposal would introduce a charge for diesel buses, coaches, taxis, HGV's and LGV's but not domestic cars, which have pre Euro 6 engines.
- 2.3.3 A Joint Air Quality Unit (JAQU) has been set up, which is a combined team of the Department for Transport and Department of Environment, Food and Rural Affairs (DEFRA).
- 2.3.4 Following legal action by non-governmental organisation Client Earth, the government has lost two successive trials at the supreme court resulting in a verdict that previous plans to tackle air quality were illegal on the basis that:
- Best effort was not being made to meet air quality standards as soon as possible

- Over-optimistic pollution modelling had been used, which produced inaccurate representations of air quality in towns and cities.

## **2.4 Revised National Air Quality Plan**

- 2.4.1 The government published its updated national air quality plan in July 2017 in response to the high court ruling in December 2016. The new plan uses more realistic emissions factors and is intended to achieve compliance in the shortest possible time rather than by 2020.
- 2.4.2 The number of local authorities included in the plan has increased from 5 to 28. All the core cities are now included with the exception of Liverpool.
- 2.4.3 The plan places greater responsibility for reaching compliance upon local authorities than before. The plan discusses a limited scrappage scheme aimed at in the region of 15,000 cars nationally and potential changes to taxation for diesel cars to deter their uptake but these are not prominent parts of the recommendations.
- 2.4.4 The plan modelled that a charging Clean Air Zone is the optimum way to achieve compliance in the shortest possible time when all factors are considered, including economic impact and value for money.
- 2.4.5 The National Clean Air Zone framework provides much greater freedom at a local level in terms of exemptions and hours of operations but this will create challenges for people moving between locations as the original high level of national consistency of the framework has been weakened.
- 2.4.6 The Council met with senior representatives from DEFRA and DfT to review the air quality solution proposed for the city at the end of November. Government has acknowledged that, working with local authorities, they need to resolve the difficulties caused by a lack of a national database for taxi and private hire. They will also work with the Council to develop a package of funding to support the implementation and any additional measures that are required to achieve compliance, subject to the Government being satisfied that the proposed option will deliver in the shortest possible time, demonstrate value for money, and that the effects and impacts on local residents and businesses have been assessed, including on disadvantaged groups, and there are no unintended consequences.

## **2.5 Clean Air Zones**

- 2.5.1 A Clean Air Zone defines an area where targeted action is taken to improve air quality and resources are prioritised and coordinated in order to shape the urban environment in a way that delivers improved health benefits and supports economic growth.
- 2.5.2 Clean Air Zones aim to address all sources of pollution, including nitrogen dioxide and particulate matter, and reduce public exposure to them using a range of measures tailored to the particular location.

- 2.5.3 Clean Air Zones bring together local measures to deliver immediate action to improve air quality and health with support for cities to grow while delivering sustained reductions in pollution and a transition to a low emission economy.
- 2.5.4 Where there are the most persistent pollution problems, this is supported by restrictions to encourage only the cleanest vehicles to operate in the city. This is summarised in the diagram below.
- 2.5.5 Clean Air Zones do not ban or prevent any vehicle from entering the 'zone'. However, whilst no vehicle will be 'banned' those vehicles that do not meet minimum engine standards would need to pay a daily charge for entering the 'zone'.
- 2.5.6 No charge or levy will be applied to any vehicle that is compliant with the Clean Air Zones standards – essentially newer, cleaner vehicles will be unaffected by these plans.
- 2.5.7 The table below show the different vehicles included within each class. The minimum engine standards that would be applicable are Euro 4 for petrol vehicles or Euro 6 for diesel vehicles.

Clean air zone class	Vehicles Included
<b>A</b>	Buses, coaches and taxis
<b>B</b>	Buses, coaches, taxis and heavy goods vehicles (HGVs)
<b>C</b>	Buses, coaches, taxis, HGVs and Light Goods Vehicles (LGVs)
<b>D</b>	Buses, coaches, taxis, HGVs, LGVs and private cars (option to include motorbikes and mopeds)

Emissions standard	Applied to new passenger car approvals from:	Applied to most new registrations from:
<b>Euro 3</b>	1 January 2000	1 January 2001
<b>Euro 4</b>	1 January 2005	1 January 2006
<b>Euro 5</b>	1 September 2009	1 January 2011
<b>Euro 6</b>	1 September 2014	1 September 2015*

\*Some Euro V vehicles still registered from 1 September 2015 – 1 September 2016. All new registrations from 1 September 2016 are Euro VI

## 2.6 Air quality monitoring in Leeds

- 2.6.1 Detailed air quality monitoring has been carried out in Leeds for more than 20 years. In more recent times, monitoring sites have been chosen alongside the busiest roads to identify the highest pollutant concentrations, thereby giving assurance that other more distant positions will experience cleaner air. The key pollutant of concern in Leeds is nitrogen dioxide (NO<sub>2</sub>) – as a result, the majority of monitoring activity across the city is focusing on tracking this pollutant.
- 2.6.2 Two types of monitoring systems are used. There are 10 automatic monitoring stations across the city, including 4 city centre sites, which continuously monitor air quality in real time. Woodhouse Lane has been part of the national network since 1993, collecting data on urban background concentrations of seven different pollutants. The other three city centre sites are located at, Corn Exchange, International Pool and train station have been located where there have been concerns that the hourly NO<sub>2</sub> objective could be exceeded.
- 2.6.3 There are also approximately 170 diffusion tubes in place at sites across the city. This is a simpler monitoring method that measures the average level of NO<sub>2</sub> over a month rather than at a precise point in time.
- 2.6.4 Air Quality Management Areas (see 2.7) have been identified across the city, as part of Leeds' legal requirements for monitoring air quality.

## 2.7 Air Quality Management Areas

- 2.7.1 AQMAs exist where there is both higher than desired levels of pollution and where people are exposed to it for a significant time, predominantly through living in the area. The exposure of people to pollution through the location of their place of work is specifically excluded.
- 2.7.2 Leeds currently has 6 AQMAs, the most recent declared in 2016. All areas were declared due to annual average nitrogen dioxide (NO<sub>2</sub>) concentrations being above the national air quality objective. The principal source of this pollutant is vehicle emissions. These sites each have an air quality action plan to deliver targeted monitoring and initiatives to improve air quality in the AQMA.

AQMA Location	Number of dwellings within AQMA
Haslewood Close, Burmantofts	50
Caspar Apartments, City	42
The Normans, Kirkstall	32
Tilburys and Eustons, Beeston	130
Main Street, Pool-in-Wharfedale	50
Chapel Hill, Morley	60

## **2.8 Additional Air Quality Concerns**

- 2.8.1 In addition to the AQMAs identified by Leeds City Council, there are other areas of concern identified by the Council and DEFRA that do not meet national regulations. Parts of the Inner Ring Road running from the Armley Gyratory and near the bus station are deemed at risk of being non-compliant with NO<sub>2</sub> EU standards – monitoring equipment has been installed at several sites along this stretch to gain a better understanding of the air quality concern through actual, rather than modelled, data.
- 2.8.2 To gain a better understanding of city centre air quality, above and beyond automatic monitoring stations previously in place, increased monitoring has taken place at City Square and the bus station. This data shows that pollution levels are high in these locations, further monitoring will be taking place and numerous actions on air quality will be actively targeting reductions in NO<sub>2</sub> emissions in the city centre.

## **2.9 Planning**

- 2.9.3 Planning seeks to avoid locating new residential development within the 6 AQMAs so as to minimize the numbers of people living in areas of poor air quality. Planners score proposed locations; those within AQMAs score a double negative and proposals within Areas of Air Quality Concern score a negative.
- 2.9.4 The scoring supports planners in selecting the most sustainable locations for growth, to inform where mitigation is needed and include policies designed to encourage more sustainable forms of transport; as well as evidence how conclusions have been derived.
- 2.9.5 Applications for major developments in Leeds are required to provide an air quality impact assessment and expected to do a sensitivity test based on existing emissions rather than using forecasting (due to reliability issues with data from vehicle manufacturers).
- 2.9.6 Leeds City Council Environmental Health Officers consider the impact of air pollution that would be generated by proposed developments and assess the effect of the existing air quality climate on the proposed development.
- 2.9.7 In December 2015 Leeds City Council's Executive Board endorsed the West Yorkshire Low Emissions Strategy including the West Yorkshire Air Quality & Planning Technical Guide which provides guidance to developers on how they can reduce air quality impacts arising from their development and advice on the measures developers can use to provide mitigation.
- 2.9.8 Policies relating to transport management and accessibility are set out in Core Strategy Policies T1 and T2 and these apply to all development across the district. This includes a car parking policy with adequate provision for shoppers, visitors and commuters whilst supporting sustainable travel measures and the reduction of car use.

2.9.9 In future growth across Leeds, planning seeks to include a choice of sustainable means of travel, so encouraging other means of travel rather than the private car. For example, in the Aire Valley Action Plan it identified locations for growth alongside green cycle and footpath routes and the public transport network.

2.9.10 The Aire Valley Leeds Area Action Plan brought together land-use and transport planning in a way that delivers growth whilst minimising effects on air quality. Measures include:

- that the area is well connected to the city centre by sustainable transport modes including public transport, cycling and walking also making better use of the waterways network as a leisure route
- connecting communities in east and south by reducing barriers (river corridor and main road network) to provide direct, safe and attractive pedestrian and cycle links
- Integrating potential key national and city region transport proposals, such as HS2, with the local transport network
- making better use of the rail and waterways network as a mode of transport for freight, where appropriate.

2.9.11 The Natural Resources and Waste Local Plan seeks to improve opportunities for the movement of freight by canal and rail and thereby reduce HGVs and other road based freight which adds to air pollution.

### **3 Main Issues**

#### **3.1 Air Quality Modelling**

3.1.1 Leeds has secured over £400,000 in funding to undertake a detailed assessment of the air quality challenges and potential solutions across the city. This funding has allowed resource to be utilised to complete upgrades to IT infrastructure, collection of further localised transport and air quality data, and modelling of multiple air quality scenarios.

3.1.2 Additional monitoring equipment has been put in place at the site of the original stretch of the inner ring road that the National Air Quality Plan identified would still be non-compliant in 2020. A full year's data has now been collected and in 2016 the annual average of 42 µg/m<sup>3</sup> measured at the automatic monitoring site located by the International Pool site and 53 µg/m<sup>3</sup> was monitored at the diffusion tube located by the Yorkshire Post site. These are above the legal level but substantially lower than that originally indicated by the national model.

3.1.3 To support the detailed transport and air quality modelling, the Council has collected detailed traffic data at a number of sites. This allows us to use real life fleet profiles rather than the national averages in our local models, providing a more representative picture.

3.1.4 This local-level modelling will enhance Leeds' proposals through ensuring that decisions are made using local data, alongside the national model. An exercise is underway with the government to agree what is the right target for the city in terms of emissions reduction. This has required the council to submit reports and data to substantiate the modelling undertaken and to allow a comparison between the local and national model. Where the two models differ significantly this will be reviewed by a panel of independent experts who will review both sets of outputs.

## 3.2 Options Appraisal

3.2.1 A transport and air quality model baseline have been established for 2015 and 2020. Different potential solutions have then been modelled, including Clean Air Zones to see what will provide the optimum solution for the city.

### Non – Charging Option

3.2.2 The 2020 baseline demonstrates what air quality would be like if we were to rely on natural fleet changes to reduce emissions as well as reflecting the impact of the recently delivered transport measures such as the park and rides and new train stations. This model shows that without any additional intervention there would be some areas of the city that would remain non-compliant.

3.2.3 Without a charging intervention, the council would have to evidence beyond reasonable doubt that the city would still achieve compliance through voluntary action such as increased use of public transport and business transformation. The council can support these changes by introducing initiatives such as park and ride, new stations, free ULEV parking and they all contribute to the reduction in emissions but not to a large enough extent nor quickly enough to guarantee compliance in the shortest possible time. Achieving compliance on the inner ring road is particularly difficult via these measures as 70% of traffic using the ring road doesn't have a city centre destination but are through trips.

### Charging Options

3.2.4 Within the different scenarios that have been modelled, and in the absence of any national guidance, the charges that are to be applied in London's Ultra Low Emission Zone (ULEZ) have been used (see below). Further work is planned to determine an appropriate charging framework for any Leeds CAZ but the charge set will need to ensure that a sufficient level of replacement and retrofit is delivered.

<b>Vehicle Class</b>	<b>Daily Charge for non-compliant vehicles</b>
Buses/ Coaches	£100.00

HGVs	£100.00
Taxi and private hire	£12.50
LGVS	£12.50
Private Car	£12.50

3.2.5 A number of scenarios have then been modelled to look at the impact of different classes of Clean Air Zones on air quality across the city.

**Option 1 – CAZ D inside the inner ring road/M621**

3.2.6 A high level review was undertaken on a wide range of scenarios to look at the reduction in NOX emissions that different interventions would lead to. The smallest CAZ that was considered was one that incorporated all vehicle types but only covered the city centre within the IRR/M621. However the high level model showed that the reduction in emissions wasn't sufficient to reach compliance across the city. This was excluded from further detailed modelling.

**Option 2 – CAZ B or CAZ C on the inner ring road (but excluding M621)**

3.2.7 Both a CAZ B and CAZ C on the inner ring road were modelled. Using the inner ring road or driving inside the inner ring road would attract a charge for non-compliant vehicles in these scenarios. These both showed significantly higher emissions reductions on the inner ring road but this was achieved by non-compliant vehicles changing their routes and driving into residential areas rather than through an upgrade of vehicles. Consequentially air quality in certain residential areas was worsened although it still remained below the legal limit. The displacement would not only have an adverse air quality impact in the residential areas but would also increase congestion, noise and raises road safety concerns as HGVs and LGVs divert through the minor road network.

**Option 3 – CAZ B within the outer ring road**

3.2.8 This option allows vehicles to use the outer ring road without being charged but buses, coaches, HGVs and taxi and private hire vehicles would be charged when entering inside the outer ring road. This option achieves compliance across the majority of the road network but due to the tolerances of the modelling would not be sufficient without other additional measures. However, displacement in this scenario is minimal and air quality improvements are achieved across the city.

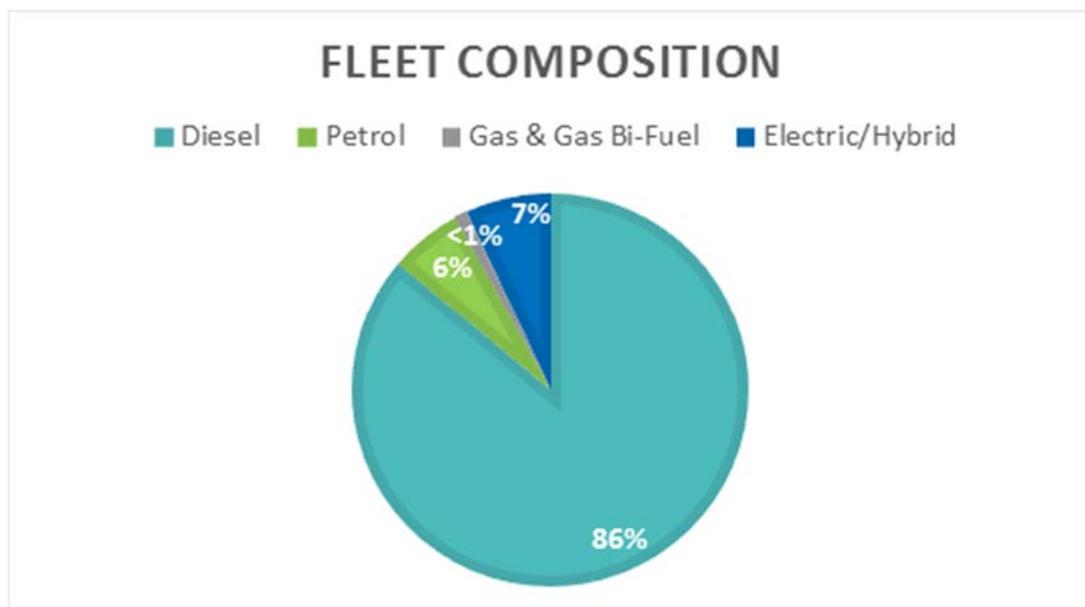
**Option 4 – CAZ D within the outer ring road**

3.2.9 This geographical scope of option 4 is the same as option 3 but it includes additional vehicles classes to option 3. This would require all LGVs and domestic cars to be compliant to avoid paying the charge. This option would achieve compliance and allow for the tolerances of the model, however it has significant economic impacts. Around 47% of the population live within the outer ring road and it is provisionally estimated that circa 500,000 cars, 120,000 LGVs and 40,000 HGVs would be impacted by this proposal on an annual basis. The charge would be likely to hit our poorest communities the hardest as this is where many of the non-compliant cars will be based. There is currently no intention by government to offer any diesel scrappage scheme to support these individuals to upgrade. Compliant diesel LGVs have only been in existence for 2 years and petrol vehicles have been limited in this class of vehicle so the opportunity for second hand vehicles is limited, again meaning that the financial impact for SMEs would be high. The implementation of this scheme will be difficult within the timescales as so many people would have to take action with only a twelve month lead in period. The enforcement would also have to be more extensive to ensure that the scheme doesn't lead to the creation of rat runs inside the outer ring road where people try to avoid the camera network.

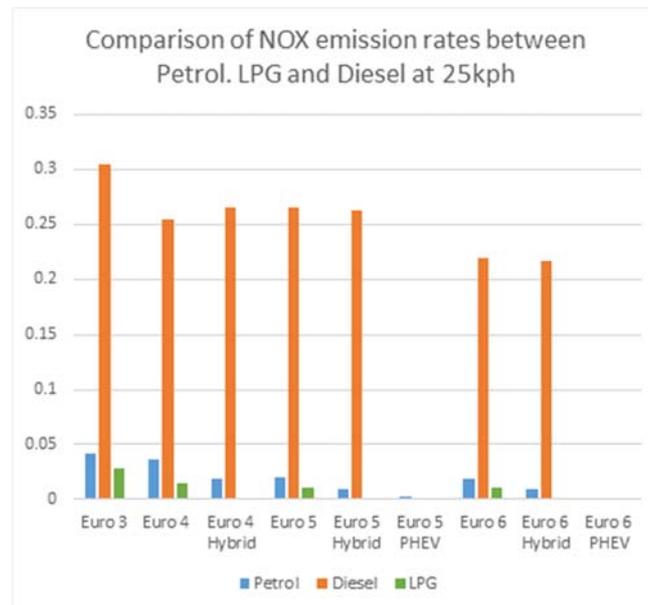
### Recommended Proposal

3.2.10 Option 3 is the council's preferred option but due to the marginal nature of its compliance in some areas, the council is proposing that additional measures are also introduced to ensure that the overall solution does reach compliance.

3.2.11 There are over 11,000 taxis and private hire vehicles licensed by authorities in West Yorkshire. Around 4,900 of these vehicles are licensed by Leeds City Council. Due to the high mileage and city centre focus of these vehicles, they contribute disproportionately to emissions, especially within the central urban area and therefore are a key sector that the council wants to work with to help improve the air quality of the city.



3.2.12 The below graph demonstrates that a considerable reduction in NOx is achieved through replacing a diesel Euro 6 car with a petrol hybrid or electric car. As part of the consultation we will be exploring how we can best achieve the shift of the taxi and private hire fleet to ULEV whether it be via charging any non ULEV or whether simply a robust package of incentives can be relied upon.



3.2.13 Whilst Euro 6 buses are showing an almost 95% reduction in emissions against the earlier Euro standards, this is not the case for cars. The step change in emissions from a diesel Euro 5 to a diesel Euro 6 for a car is limited.

3.2.14 In key areas of concern such as the city centre or the inner ring road, taxi and private hire account for a disproportionate number of trips and therefore an increase in standard will demonstrate a significant reduction.

3.2.15 The council is aware that in order to make this step change that it must look to provide additional support to this sector. The Council has already worked with partners within the West Yorkshire Combined Authority to secure funding from the Office for Low Emission Vehicles (OLEV) to deliver an ULEV taxi infrastructure scheme. £1.98 million capital grant funding has been secured to deliver 88 charge points over the three year delivery period to 2019/20, of these 33 will be located in Leeds – with funding of just under £750,000 allocated to the city.

3.2.16 The council has also requested additional funding from central government to provide incentives to those drivers who make the transition to petrol hybrids or electric. The council will also work with government to explore other potential ways of supporting this sector and will ask that the T&PH industry provide feedback via the consultation process as to which support measures they feel would be most effective.

3.2.17 The institute for transport undertook a study to look at the business case comparison between a standard diesel and petrol hybrid. The high level table of this is included below for reference but in summary the fuel consumption of a petrol hybrid is lower so although there is an initial uplift in purchase price, there is

a lower whole life cost. The higher the mileage that a vehicle does, the quicker the payback of the initial difference in capital.

VEHICLE	Fuel Economy (MPG)	Fuel Consumption (l/100km)	Price 2010 Model (£)	Price (pence) per litre*	Fuel cost per 10000 miles	Payback time (years) if driven 20000 miles p.a.	Payback time (years) if driven 30000 miles p.a.	Payback time (years) if driven 40000 miles p.a.	Payback time (years) if driven 50000 miles p.a.	Payback time (years) if driven 60000 miles p.a.
Hybrid Normal	56.3	5.02	10000	117.2	807.9	4.4	2.9	2.2	1.8	1.5
Diesel Normal	33.0	8.55	5000	119.3	1376.0	N/a	N/a	N/a	N/a	N/a

3.2.18 Wheelchair accessible vehicles (WAVs) will be exempted from reaching the ULEV standard due to the limited vehicles available in this market currently and the desire not to decrease the supply of WAVs in the city

3.2.19 The council will also explore further ways to increase the uptake of ULEVS in the domestic and LGV market through measures such as improved infrastructure and improved communications and engagement with businesses. To date 435 permits have been issued through the free parking scheme for Leeds' residents with ULEVS. The council will work with government to secure the required funding packages to support these measures.

#### **Other existing additional measures**

3.2.20 The transport strategy for Leeds is being reworked to take on board the latest developments in the city. This includes the new Leeds Public Transport Investment Programme for which the strategic case was approved by Executive Board in December and submitted to the Department for Transport in December for the £173.5 million earmarked for the city last summer. Government approval to this programme was confirmed in April and development is now proceeding alongside the other programmes in the city which are being reported separately to Executive Board.

3.2.21 The programme will make a significant contribution to the development of the low emission and clean air strategy for the city as it progresses towards a target for doubling bus patronage in the city, which will contribute to greater transport efficiency and reduced emissions, alongside the more specific investments by bus operators in new low emission bus fleets, compliant with air quality standards and working towards a longer term migration to Ultra Low Emission Vehicles (ULEV). Specifically First Bus have committed to invest £71 million to bring forward 284 Euro 6 buses by 2020, reducing their fleet's NOX emissions by 90%. As part of this fleet transition, First Bus will also trial alternative fuelled vehicles.

3.2.22 Specific interventions in the development of integrated quality bus corridors as part of the overall package of bus quality improvements will also complement the

existing park and ride schemes in the city with a second 1000 space site at Temple Green having opened earlier this year and further expansion within the programme to deliver a new site at Stourton and expand provision at Elland Road and New Pudsey. Added to this the city centre package highways proposals will rework traffic flows and management in the South Bank and City Square to deliver significant improvements in air quality in the heart of the city, alongside the wider encouragement of ULEVs, smarter travel choices and opportunities for more walking and cycling.

- 3.2.23 Leeds secured £150,000 in partnership with Dearman Ltd to investigate the potential to reduce the impact of refrigerated transport on air quality in Leeds. The Transport Refrigeration Units (TRU's) used in such vehicles are usually diesel powered and are not subject to the same regulations as other vehicle engines, therefore a large part of the project will be to assess their impact by ascertaining the current extent of their operations across the City whilst monitoring the emissions from a sample of vehicles. The project will also trial an alternative low emission TRU based on liquid nitrogen (LiN) technology with a partner company currently operating refrigerated vehicles in Leeds. This will enable us both to ascertain the extent of emissions from diesel TRU's in cities and develop an action plan for reducing emissions from diesel powered TRU's across the UK by the end of the year.

### **Council's Fleet**

- 3.2.24 The high level strategy for the council's fleet is to replace vehicles at the end of their lifecycle with alternative fuelled or ultra-low emissions vehicles wherever possible. There are a number of vehicle types that are not suitable for replacement with ULEV and in these cases, when all options have been exhausted the council would replace with CAZ compliant Euro VI diesel or Euro IV petrol.
- 3.2.25 The council has had several years' experience of using EVs through the use of small vans in Building Services, Highways Services, Parks & Countryside and Pest Control. The approximate range of 70 miles is adequate for the purposes of travelling within Leeds.
- 3.2.26 The council currently has 44 electric vehicles and is about to undertake a procurement to secure a further 51 vehicles that will be in service in early 2018. It is anticipated that a further 100 electric vehicles could be purchased next year if sufficient infrastructure can be developed to support the transition. The council currently has 86 charging points across its depots with a further 4 pending.
- 3.2.27 The shift from the use of diesel vans and cars to electric vehicles has delivered significant savings in nitrogen dioxide emissions. Approximately 660,000 miles have been travelled by the council's electric vehicles to date, which with zero tailpipe emissions of nitrogen dioxide or other air pollutants has saved an estimated 55kg of NOx emissions. Each additional EV (with an assumed annual mileage of 10,000) will deliver a further 1.25kg reduction in NOx emissions per year.
- 3.2.28 To increase the capacity for using electric vehicles working out of depots Fleet Services are currently rolling out a scheme for home charging. Employees who have exclusive use of a small van for their day to day work are able to charge electric vans using charging points installed in their homes by the council.

- 3.2.29 The council's ability to procure the maximum number of operationally suitable electric vehicles to the Corporate Fleet is, in some areas, being prevented by power supply issues to depot locations. The prohibitive cost of delivering additional supply to locations (with a typical cost being in the region of £50,000) means that without additional funding, the business case for electric vehicles cannot be made to work.
- 3.2.30 Leeds is overcoming this barrier by working in partnership with Northern Power Grid to deliver additional power supply to one of the council's fleet locations at Middleton. The council has sought funding (to be approved) from the Joint Air Quality Unit (JAQU) to enable additional supply to be delivered to the site which will support the delivery of 12 charge points. This will involve trial 'load sharing' technology that is able to identify the prioritisation of which vehicles need to be charged using smart technology based on a lower level of power supply.
- 3.2.31 The council is currently rolling out corporate telematics involving a monitoring system installed in council vehicles that collates a suite of fleet management reports, providing feedback on driver behaviour styles, routes, location, fuel use and details of emissions. Through an in-cab visual and audible display drivers are alerted if they are speeding or braking harshly; both of which impact on fuel consumption and therefore emissions. With this information drivers can immediately adjust their behavior. Reports to services are also provided which can be used to coach drivers and promote greener, safer and more efficient driving.
- 3.2.32 The council is currently procuring a Compressed Natural Gas (CNG) station in the Enterprise Zone of the city which will be used to fuel refuse collection vehicles as a base load and will be made available to vehicles from private fleets. The first CNG gritter in the UK will be delivered to the council in December 2017 / January 2018.
- 3.2.33 The council are looking to assist public and private fleets to move towards low emission vehicles through a green fleet forum. This will include presentations on best practice, the practicalities of changing to alternative energy vehicles and to share experience.

### **3.3 Marketing and communications activity to date**

#### **Brand Development**

- 3.3.1 In response to the government's national air quality plans and ahead of potential plans to introduce a Clean Air Zone, Leeds wanted to make significant progress to increase public awareness around what good air quality means and encourage active participation through change in behaviour across the city.
- 3.3.2 With this at the centre of our planning, we wanted to develop a strong brand aligned to our values, proposition and create a sense of trust and reassurance with our key audiences through a carefully crafted visual representation.
- 3.3.3 The creation of a Clean Air Leeds brand and visual representation has been the foundation to start a conversation about clean air in our city and start preparing people for the potential introduction of a Clean Air Zone in 2020.

#### **Behaviour Change Strategy – City Wide Strategy**

- 3.3.4 Subject to government funding, and on the back of the mass awareness opportunity brought about by National Clean Air Day (further detailed below) we will initiate our longer term sustained approach to changing behaviour.
- 3.3.5 Our ambition and commitment to improve the air quality across Leeds will only be fulfilled with the help of businesses, schools and residents across our city to make changes.
- 3.3.6 Even small anticipated changes in behaviour will have a significant impact on improving air quality. It is important that everyone understands their personal responsibility to helping improve the quality of air and how clean air is vital for health, quality of life, and the environment around us.
- 3.3.7 The strategy will look forward over the next 3 years; look to raise awareness of air quality and the impact on health whilst also preparing people for the potential introduction of a Clean Air Zone into the city.

**Progress to date:**

- 3.3.8 Regular and scheduled posts (including air pollution levels and posts with links to health advice) are going from @CleanAirLeedsCC @LeedsCC\_News @LeedsCC\_Help @and LCC Facebook and regular support is seen from @Clean\_Leeds and @Leeds\_Highways.
- 3.3.9 We are continuing work to grow our online audience and optimise social media so we know the content is contributing positively to the campaign and to outcomes.
- 3.3.10 We are linking with existing public health and transport campaigns to promote alternative travel choices to continue to tackle air quality issues in Leeds – including Cycle Superhighway/Park & Ride/Kirkstall Forge station/Free ULEV parking/walking buses and other sustainable school travel choices / Bike to Work - all through our existing free and low cost communication channels.
- 3.3.11 On 15<sup>th</sup> June 2017, Leeds, along with five other UK cities, took part in the first ever National Clean Air Day. This initiative was coordinated by Global Action Plan, an environmental change charity, and is part funded by Global Action Plan, Defra, the Scottish Government and the Scottish Environmental Protection Agency.
- 3.3.12 National Clean Air Day provided the perfect opportunity for high impact and mass awareness raising ahead of our longer term and sustainable approach to behaviour change and the introduction of a Clean Air Zone to the city.
- 3.3.13 The 4 week high impact campaign involved a city dressing programme, competitions with over 28 schools, radio, film, YEP daily features in the week up to NCAD, business pledges, outdoor advertising, social and digital media, rail and bus advertising, council fleet signage, and the lighting up of the First Direct Arena, Town Hall and Civic Hall.
- 3.3.14 In order to sustain the messages from the campaign, we are working with Brainbox Research Limited to assess the impact of the National Clean Air Day campaign, understand which messages resonate best, and what change, if any, the public made to their behaviour. These will inform our longer term work.

### 3.4 Next Steps

3.4.1 The timetable below outlines the proposed timetable from Executive Board until the start of implementation in October 2018.

<b>Activity</b>	<b>Timescale</b>
<b>Executive Board (outline solution)</b>	December 2017
<b>Consultation – Stage 1</b>	January/February 2018
<b>Report Drafted incorporating consultation feedback</b>	April 2018
<b>Executive Board (final proposal)</b>	June 2018
<b>Consultation –Stage 2</b>	July/ August 2018
<b>Final Executive Board Report</b>	September 2018
<b>Final business case and scheme presented to government</b>	September 2018
<b>Scheme approval</b>	October 2018
<b>Project Implementation</b>	October 2018 onwards

## 4 Corporate considerations

### 4.1 Consultation and engagement

- 4.1.1 The Executive Members for Environment and Sustainability and Regeneration, Transport and Planning have both been regularly briefed on the work on air quality.
- 4.1.2 There has also been a full scrutiny inquiry into the work being undertaken into air quality and it has been recommended that a further inquiry is undertaken to monitor progress.
- 4.1.3 Following the Executive board report, a full consultation exercise will take place to get feedback on the proposed solutions. Comments and suggestions will be taken on board and the scheme revised appropriately. A revised air quality solution will be brought to the Executive Board in June 2018. This will then be followed by a further period of consultation.
- 4.1.4 The proposed solution will mostly impact upon buses, coaches, taxis, private hire and HGVs. The consultation would need to ensure that any businesses or organisations that utilise or require these vehicles, are contacted and informed about the details of the scheme.
- 4.1.5 The consultation will be supported by a leeds.gov.uk website where historic data, information about what air pollution is and the details of the consultation will be made available. The Website will consist of:
- Background information (what pollution is and how it affects health and wellbeing in Leeds)
  - Consultation timetable
  - Other city initiatives

- Annotated map of the proposed area of CAZ and location of any other initiatives
- List of events/drop-in centres
- FAQs
- Online link to the questionnaires
- Contact information

4.1.6 Along with information being made available online, it will also be supported with one-to-one meetings and attendance at appropriate events. Consultees will be contacted through a stakeholder relationship management plan that identifies key stakeholders, allowing for one-to-one meetings and/or communication through known organisations as appropriate. A key approach during the informal consultation would be to contact those directly affected and to allow any interested parties within the city region as a whole to participate, in order to gain as varied opinion as possible. This will allow for feedback from those impacted economically, socially and environmentally from the proposed solution.

4.1.7 The team that are working on air quality cuts across many departments of the council including but not limited to PPPU, Highways and Transportation, Planning, Corporate communications, Public Health and Environmental Management.

## **4.2 Equality and diversity / cohesion and integration**

4.2.1 Long term exposure to elevated levels of air pollution can contribute to a wide range of adverse health effects. Those affected by poor air quality are concentrated in our more deprived inner city areas. Deprived areas in cities typically experience heavier than average traffic and consequently potentially higher levels of pollution. Air pollution, deprivation and poor-health status combinations can create increased and disproportionate disease burdens. There is, however, a need to reduce air pollution related risks for all. Health gains can result from considering local air pollution problems. The solution proposed is an intrinsic part of improving air quality in affected areas and reducing health inequalities.

4.2.2 The introduction of any CAZ classification will have equality implications. While the critical success factor of CAZ implementation is achieving compliance with air quality targets, there is also a strong emphasis on doing so whilst minimising economic impact on residents and business, and ensuring that no one group is overly affected more than any other.

4.2.3 The impact on equality for all CAZ scenarios has been considered throughout all modelling and decision-making, and led to the recommendation of a CAZ B ORR as this achieves compliance whilst minimising socioeconomic impacts. The alternative of a CAZ D ORR would impact upon over 47% of Leeds' population, including the majority of households who are classed as being in areas of social deprivation creating clear and unavoidable equality impacts.

4.2.4 Equality and diversity will be considered throughout the development, implementation and review of the CAZ. Officers are aware that existing equality issues still require consideration, and as a result equality will be considered throughout the consultation process with specific groups being targeted for their views to inform the next stage in development of the implementation phase of the CAZ. An initial Impact Assessment Screening has been completed, with a full Impact Assessment to be completed following the first phase of public consultation.

### **4.3 Council policies and best council plan**

4.3.1 The identification of areas of poor air quality and the introduction of AQMA's contributes to the Council's cutting carbon and improving air quality breakthrough project.

4.3.2 The ability to identify and target those areas of most concern is in line with the Council's ambition to reduce health inequalities across Leeds. There is a need to reduce air pollution-related risks for all. However, it is also the case that greater health gains can result from targeting those areas and people most at risk.

### **4.4 Resources and value for money**

4.4.1 As discussed previously, Leeds City Council has sought to bid and secure funding from numerous sources to deliver both independent and collaborative projects that seek to better understand and/or improve air quality in the city.

4.4.2 The government has also indicated that funding will be made available to support development of 'additional measures' in Leeds. These additional measures will be designed to provide actions that encourage fleet and transport changes over and above the EURO standards required in the National Clean Air Zone framework. JAQU have also advised that the five local authorities charged with introduction of Clean Air Zones will receive capital funding for the installation of the infrastructure required to implement such a scheme. As such, if introduced, there should not be a financial burden on the Local Authority for the implementation of a Clean Air Zone as revenue raised should also be sufficient to maintain and administer the scheme.

4.4.3 A full business case will be presented to the government with our proposed solution and funding requirements. It is anticipated that this will be finalised in 2018 following final Executive Board approval.

### **4.5 Legal Implications, access to information and call In**

4.5.1 The Air Quality Regulations 2010/1001 have brought Directive 2008/50/EEC in to Domestic Law. Regulation 26 of the Air Quality Regulations include a requirement for the Secretary of State to draw up and implement an air quality plan to achieve the relevant limit or target value of pollutants in ambient air within the shortest possible time.

4.5.2 The Air Quality Plan was published in July 2017 and requires Authorities to set out their initial plans for improving air quality by the end of October 2017 and their final

plan by the summer of 2018. Failure to meet these deadlines could be scrutinised or challenged by way of a public law challenge.

- 4.5.3 The requirements for consultation and charging schemes are set out in s170 Transport Act 2000 (as amended). Section 170 confirms that it is for the individual Authority to undertake consultation as they consider appropriate. The consultation proposed in this report is considered to be appropriate.
- 4.5.4 There is likely to be a high level of interest and scrutiny in respect of any course of action as Leeds will be a leading Authority.
- 4.5.5 This decision is not exempt from call in.

## **4.6 Risk management**

- 4.6.1 A key risk for Leeds is failure to achieve compliance with air quality standards as defined in EU directives, which have also been incorporated into national legislation. It is unclear what the exit from the EU might mean in terms of the implications for infraction fines if targets are not met. As it stands failure would mean that significant infraction fines could be passed to the local authority by the government utilising the Localism Act. If the council were not to take action to reach compliance, the government could impose a solution on the city. Consequently air quality is included on the Corporate Risk Register and is reviewed by CLT four times a year.
- 4.6.2 Failure to improve air quality also means a risk of failing to deliver the public health benefit and that the impact in terms of deaths and ill health associated with poor air quality aren't reduced.
- 4.6.3 The solution that is proposed is reliant on two key actions at a national level:
- The implementation of a national database for taxi and private hire vehicles;
  - Ability to look at different vehicle classes for taxi and private hire.
- 4.6.4 The proposal does therefore have a key dependency on government, not only in delivering the two items but also doing it to the required timescales.
- 4.6.5 Another key risk is the availability of funding nationally both to implement the required infrastructure but also to provide the support required to the sectors impacted by the solution. The council must submit a full business case to the government in 2018 but at this stage we do not know whether they will approve the funding requests.
- 4.6.6 In the main issues section the timeline is outlined and it is clear that the timeline for implementation is very tight, both from the council's perspective to deliver the required infrastructure but also from those impacted to upgrade their vehicles. There is concern that the vehicle manufacturing industry and the second hand car market will not be able to manage a surge in uptake of alternative vehicles or the move away from diesel. There is also a risk that areas such as sign and camera manufacturers will not be able to manage the demand across all the named cities.

4.6.7 It is also important to highlight that although every care has been taken to make the models as accurate as possible, the model is based on assumptions in terms of how drivers will react and it is impossible to predict this 100% accurately. This risk is mitigated to an extent by looking at other additional measures to reduce emissions as well as the main Clean Air Zone proposal.

## **5 Conclusions**

5.1 Improving air quality in the city will improve health for all residents, workers and visitors and especially those in our most deprived communities. It also supports our ambition to be the best city.

5.2 The recommended option covers a large geographical area but by doing so will improve air quality citywide. By focusing on less categories of vehicles it will enable the council to work with the government to request more support to be provided to those impacted.

5.3 The timetable is very tight and this does create risk in terms of meeting the deadline, especially due to the critical dependency on the government to deliver a national database for taxi and private hire vehicles as well as to review the standards required through the CAZ framework.

5.4 Following the period of consultation, a further report will be brought back to Executive Board that will reflect on the consultation responses.

## **6 Recommendations**

The Executive Board is recommended to:

- Approve entering into a period of public consultation on the proposal to introduce a Clean Air Zone B within the Outer Ring Road/ motorway network with additional measures

## **7 Background documents<sup>10</sup>**

None

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<sup>10</sup> The background documents listed in this section are available to download from the Council's website, unless they contain confidential or exempt information. The list of background documents does not include published works