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Joint Report of: The Director of Environment and Housing, the Director of City Development and the Director of Public Health

Report to: Executive Board

Date: 17th December 2014

Subject: Low Emission Zone (LEZ) Feasibility Study

Are specific electoral Wards affected? If relevant, name(s) of Ward(s):	No
Are there implications for equality and diversity and cohesion and integration?	Yes
Is the decision eligible for Call-In?	Yes
Does the report contain confidential or exempt information? If relevant, Access to Information Procedure Rule number: Appendix number:	No

1 Summary of main issues

1.1 In July 2014 the Council resolved that a report should be presented to Executive Board to set out the conclusions of a study into the feasibility of introducing a Low Emission Zone (LEZ) in Leeds.

1.2 The LEZ feasibility study has assessed the current levels of air quality in Leeds, the contribution made by key elements of the traffic fleet and explored a range of scenarios that could bring about improvements. Scenarios have been assessed in terms of their impact on future levels of air quality, impact on health and mortality and also their economic impact or 'value'.

1.3 At present Leeds fails to meet air quality standards with regard to NO_2 levels in six areas of the city, and whilst there is no evidence that it is failing to meet standards with regard to particulates, it is acknowledged that present levels have an adverse impact on health. It is estimated poor air quality contributes to 350 early deaths in Leeds, with those affected concentrated in poorer inner city areas.

1.4 Poor air quality is principally caused by transport, particularly diesel fuelled engines. It is acknowledged that there are significant tensions between achieving progress on this matter when balanced against wider economic considerations and matters of public choice. At present, a Low Emission Zone which restricts the access of cars, buses and HGV's to the city or parts of it, is not favoured due to the unknown economic impacts and uncertain levels of public support. Given, however, the significance of the health challenge, it is proposed that the Council

seeks to positively impact upon air quality by making concerted efforts in the following areas:

1.5 Working with the combined authority to establish a minimum standard for bus and HGV emissions;

1.6 Reducing emissions of taxi and private hire vehicles by incentivising a shift towards hybrid vehicles;

1.7 Working with large fleet operators of vans and HGV's to reduce emissions;

1.8 Demonstrating by example through the procurement of a greener council fleet;

1.9 Development of an alternative fuel infrastructure, promoting electric and gas vehicles;

1.10 Encouraging the use of public transport, walking and cycling, as realistic alternatives to the use of the private car.

1.11 The LEZ feasibility study has identified tools and approaches that both help us to understand the current situation and can also be used to model changes which will have the greatest impact in terms of air quality and health. More work is needed, however, to set clear targets in terms of emission standards and implementation dates for key components of the fleet based on public consultation and dialogue with key bodies. The aim will be to bring about identified improvements by dialogue where possible but with the clear understanding that improvements might have to be achieved ultimately via a Low Emission Zone.

1.12 The development of Low Emission Strategy is proposed to build upon the work, setting out an action plan to deliver the improvements required in partnership with key stakeholders, business and transport operators.

2 Recommendations

2.1 That dialogue with key interest groups in the transport sector be commenced to assess the practicality of measures that may be introduced to improve air quality and health. The aim would be to deliver changes by dialogue where possible but with the clear understanding that improvements could be achieved ultimately via a Low Emission Zone.

2.2 That the findings of this work be shared regionally with the other West Yorkshire Authorities and the Combined Authority to assist in providing a regional solution to the air quality challenge that the whole of West Yorkshire faces. Air quality is a trans-boundary issue and can only be effectively addressed across West Yorkshire by all partner authorities and organisations working together.

2.3 That the key findings of the LEZ study be used to influence future funding bids as they become available e.g. Office for Low Emission Vehicles (OLEV) Green Bus Fund.

2.4 That any future decision to introduce a Low Emission Zone be taken in the context of a wider Leeds Low Emission Strategy that is expected in 2015.

3 Purpose of this report

3.1 This report sets out the background to and main findings of a Low Emission Zone (LEZ) feasibility study. The study has looked at air quality in Leeds, the main contributors and scenarios to bring about reductions of key pollutants and the associated health and economic implications.

3.2 The report sets out the initial response to the study, describing measures which are currently being taken to improve air quality and pointing to further areas where progress can be made.

4 Introduction

4.1 Poor air quality today is far less visible than the smoke and smogs that dominated much of the 20th century. Modern air quality problems, however, are still dangerous in terms of their impact on human health. Overall approximately 25,000 premature deaths are attributed annually to poor air quality in England and these impact most markedly on the young, the old, those from lower socio-economic groups and those with existing cardio-respiratory conditions. Poor air quality also has an estimated cost to the national economy of somewhere between £9 billion and £19 billion; Leeds 'share' of that is between £155 million and £328 million.

4.2 For those most vulnerable, it is estimated that average life expectancy can be reduced by as much as eleven years, whereas for the whole population the estimated average reduction is six months.

4.3 There are three main transport related air pollutants of concern; all can cause both long and short term effects:-

- **Nitrogen Dioxide (NO_2)** - effects include shortness of breath and inflammation of airways in healthy people. For more sensitive people, existing lung diseases can be significantly worsened. Recorded levels of NO_2 have fallen in recent years due to cleaner vehicles.

- **Ozone (O_3)** – O_3 is formed when NO_2 combines with hydrocarbons in bright sunlight – higher levels therefore tend to be found in summer months. O_3 can cause throat and lung irritation, coughing and inflammation of the airways. O_3 can also worsen the effects of bronchitis, emphysema and asthma. UK Government data shows that in 2010 12,000 early deaths and 10,000 additional hospital admissions were attributable to O_3.

- **Particulate Matter (PM)** – are tiny particles that penetrate deep into the lungs and enter the bloodstream; they can affect respiratory, heart and immune systems. Exposure to PM has also been linked to low birth weight in babies. PM is measured in differing sizes e.g. PM_{10}, $PM_{2.5}$ etc. Whilst limit values set for $PM_{2.5}$ are in the main achieved it is now accepted that there is no safe level for PM and any reduction is beneficial and will reduce health impacts. PM levels have fallen steadily for most of the last 20 years,

however in recent years they have plateaued and indeed started to rise slightly; this is attributed to the significant increase in private cars that are diesel engined.

4.4 Modern day air quality problems are now mostly related to transport and so are often regional or sub-regional in nature; this requires concerted, joined-up action.

4.5 Whilst nationally air quality has improved over recent years the UK has still failed to comply with the EU targets in relation to Nitrogen Dioxide (NO_2). In February this year the European Commission commenced legal proceedings in the European Court against the UK Government. Under the Localism Act 2011 there is the potential for any fines levied on the UK government to be passed on to individual Local Authorities. Full Council has requested that a report is brought forward on the feasibility of introducing Low Emission Zones to combat the problem in Leeds.

5 Low Emission Zones

5.1 The LEZ feasibility work has been supported by funds from DEFRA and carried out in partnership with the City of Bradford Council. Officers are also working with all the West Yorkshire authorities and the Combined Authority to develop a high level low emission strategy to guide the future development of interventions for improving transport related air quality.

5.2 Low Emission Zones (LEZ's) provide an opportunity to improve air quality and are defined as follows: - "A Low Emission Zone is a geographically defined area where the most polluting of vehicles are restricted, deterred or discouraged from access and use. The aim is to reduce the number of more polluting vehicles being used in a particular area by setting particular emission standards or criteria, with the aim of improving the air quality". At the same time an LEZ is only one part of a wider strategy that looks at a range of complementary issues such as encouraging healthier lifestyles, improved transport policies and behaviour changes.

5.3 Four LEZ's are currently in operation in the UK in Greater London, Norwich, Nottingham and Oxford. They each provide for restrictions on older, more polluting vehicles from entering certain areas in an attempt to reduce pollution and improve air quality. The Greater London LEZ applies to a range of commercial vehicles registered either before 2002 or 2006 and does not apply currently to private cars. Both the Norwich and Oxford LEZs apply only to buses. The Norwich scheme commenced in 2008 and includes other measures that encourage eco-driving and discourage un-necessary engine idling, while the Oxford LEZ was implemented in 2014 and generally restricts buses to post 2009 vehicles or upgraded older vehicles complying with at least the same standard.

5.4 The introduction of an LEZ is a significant step that needs careful consideration. The decision to introduce an LEZ needs to consider the air quality and health improvements it will deliver versus the costs of actually introducing and policing the scheme and the assessment of any economic impact. An LEZ also needs to be able to demonstrate significant and worthwhile benefits over and above those

that would be delivered by other relevant measures and actions that are already in place or form part of a wider Low Emission Strategy.

6 LEZ Feasibility Study – Key Findings

6.1 The current state of air quality in Leeds

6.2 Currently the air quality standard that all Local Authorities are aiming to achieve for Nitrogen Dioxide is 40 micrograms per cubic metre of air in all locations where the public are potentially exposed. This would mean that some areas may still exceed this standard, e.g. the centre of busy roads and motorways, but the trigger for action is where the 40 micrograms target is not achieved and human 'receptors' could be present. It is on this basis that the current air quality regime requires Local Authorities to take action by declaring Air Quality Management Areas.

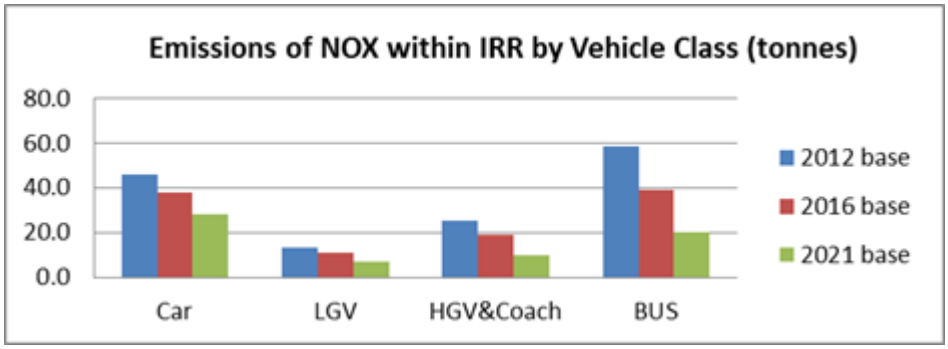
6.3 Where pollutant levels exceed or are likely to exceed the air quality objectives, Local Authorities are required to declare Air Quality Management Areas (AQMAs) and devise Action Plans to improve air quality. Leeds currently has 6 AQMAs declared for Nitrogen Dioxide and nationally there were 613 declared at the end of 2013.

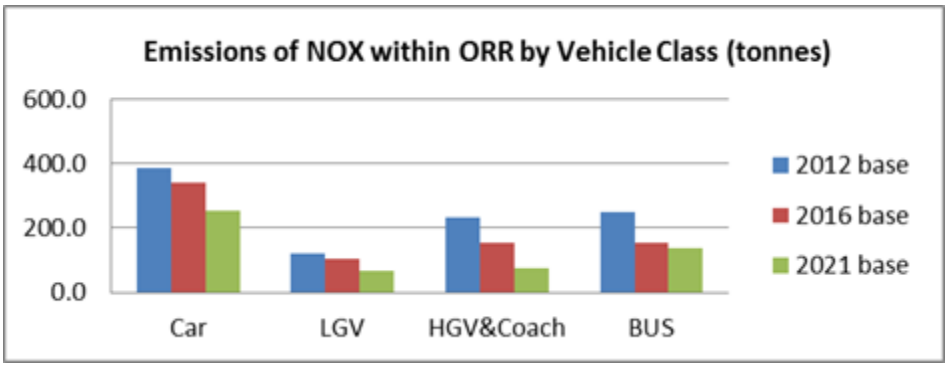
6.4 Moving forward, the ultimate aim of a wider Low Emission Strategy, which could include an LEZ, would be to achieve the 40 micrograms standard across all areas, thereby enabling the revocation of all Air Quality Management Areas across the city.

6.5 In terms of particulate matter (PM) the current standards are 40 micrograms per cubic metre for PM_{10} and 25 micrograms per cubic metre for $PM_{2.5}$. Currently Leeds is achieving these standards across the whole of its area. Leeds currently has kerbside PM monitors on Otley Road in the centre of Headingley where both of the relevant standards are achieved. The Headingley site is part of the national DEFRA air quality monitoring network.

6.6 Notwithstanding the current performance in terms of PM, moving forward any reduction in levels will have beneficial health effects for the whole population.

6.7 The following graphs set out the amounts of $N0_2$ generated by vehicle type in Leeds in 2012 and the projected levels anticipated in 2016 and 2021 within the Inner Ring Road (IRR) and Outer Ring Road (ORR). More restrictive emission standards are being applied to all new vehicles being purchased at a European level and this will bring about significant improvements as the fleet is naturally replaced. Crucially, however, based on this do nothing scenario, Leeds will still be unable to meet the NO_2 standard in 2021, falling 157 tonnes short.





6.8 In 'headline' terms the LEZ feasibility study has shown us the following:-

- Passenger cars, in particular diesel ones, are the main contributors to particulate and elevated NO_2 levels within the Leeds Outer Ring Road area.
- Within the Inner Ring Road area buses and cars are the main contributors to particulate and NO_2 levels.
- Buses and Heavy Goods Vehicles (HGVs) provide a disproportionate amount of NO_2 per km driven; this is also the case with particulates.
- Light Goods Vehicles (LGVs) produce more NO_2 and particulates than HGVs.

Scenarios

6.9 Given that the projected improvements are insufficient to meet air quality standards, this study looked at a series of measures which if taken could lead to further reductions. The following table demonstrates the impact that the implementation of the highest current European emission standards (Euro6) in new vehicles would have upon emissions if they replaced older fleet by 2021, as well as the impact of reducing car journeys and the use of diesel:

Table - Estimates emission reductions beyond Business as Usual

Measure	Reduction, tonnes
	2021
Reducing diesels car mileage to 10% of car journeys	132
All buses Euro VI	54
All HGV Euro VI	35
All vans Euro 6	14.7

All Pre Euro IV buses Euro VI	24.6
10 % reduction in car movements	25.5.

6.10 From the modelling scenarios explored, those which provide greatest benefit are those which accelerate the improvement in bus and HGV emissions and reduce the proportion of older diesel cars.

6.11 From a health impact perspective a number of key headlines can also be drawn from the LEZ study findings:-

- Whilst current particulate levels – both PM_{10} and $PM_{2.5}$ - do not breach current EU requirements they nevertheless have an impact on health that is also disproportionate due to its increased impact on areas of deprivation.

- A large group of people would experience health benefits including a fall in premature and low birth weight babies and childhood asthma, and fewer hospital admissions for heart and respiratory problems.

- Some measures will provide 'double benefits' by both reducing emissions and improving health e.g. less car use and more cycling or walking giving improvements in physical and mental health, reduced obesity rates and improved safety.

- Health improvements delivered through emission reduction measures will have greatest impact on the most vulnerable groups and the inner city and deprived areas.

7 Should Leeds introduce an LEZ?

7.1 Given the unlikely ability of the city to improve its air quality based on the natural replacement of the fleet, there are clearly arguments to support the imposition of restrictions upon older polluting vehicles. At present, however, the consequences of such a restriction in Leeds are not fully understood. At the heart of the argument is the affordability for members of the public and transport operators to replace their fleet.

7.2 No part of the country has sought to impose low emission zones on cars, given the difficulty this would impose on members of the public whose cars did not meet the threshold. It is difficult to foresee individual councils or regions taking unilateral action in this respect.

7.3 With regard to buses there is more likely to be a willingness to take action but again, at this point, there is uncertainty about what the imposition of a restriction would mean with regard to costs for the operators, which in turn may be passed on to the public or may restrict routes due to issues of affordability. Similar issues of affordability are likely to be raised by commercial van owners and HGV operators.

7.4 In these circumstances, it is recommended that the city council, in collaboration with the combined authority seeks to achieve progress through constructive engagement with transport operators and by taking a range of other measures which can improve air quality. It rests with the Authority to revisit the imposition of an LEZ on classes of vehicles, if having sought to make progress by consensus, there is a lack of commitment to address this pressing issue. The Council must also be aware that moves by other authorities to introduce LEZ's could have the effect of pushing poorer vehicles in the direction of those without. It is, therefore, important that the option remains under regular review.

8 Work to address air pollution in Leeds

8.1 Without imposing a LEZ, there remains much that can be done to improve air quality in the city. On the basis of the above analysis, work to address vehicle emissions has been divided into the following categories:

- Greening the council's own fleet;
- Improvement of public transport and public transport emissions;
- Improvements to taxis and private hire;
- An alternative fuel infrastructure;
- Improvement to HGV's;
- Encouraging shifts to walking and cycling.

8.1.3 Work underway is described below, together with initial ideas to take these elements further forward.

8.2 Greening the Council's own fleet.

8.2.1 The Council has a role to provide an example of good practice in the city. The following initiatives are underway or planned.

- **Biomethane fuelled Refuse Collection vehicles (RCVs)** – gas is a clean fuel which produces much less NO_x and particulates when combusted. When biomethane is used, a carbon neutral position can also be achieved. Currently five RCVs and seven smaller vans are operating on gas and performing well. Work is ongoing to explore the potential to install a large scale gas refuelling station close to the Enterprise Zone. Increasing the number of RCVs switching to gas is aimed at guaranteeing a large enough customer base to encourage private investment in to the facility.

- **Electric vehicles in the LCC fleet** - a recent trial of small EV vans demonstrated that in some roles they might be effective and capable of integrating into the fleet if other obstacles can be overcome. LCC is currently awaiting a report from Energy Savings Trust who have been given a

substantial amount of relevant data to help identify which fleet vehicles might have the most realistic chance of switching to EVs.

- As part of the future strategy work, the Council should consider the practicality of a commitment and timescale to shift its entire fleet away from diesel and petrol engines.

8.3 **Improvement of public transport and public transport emissions**

- **Dedicated bus lanes and priority facilities** – a number are now in place along with camera enforcement to reduce misuse and promote faster bus transit**.**

- **New Generation Transport scheme proposals** – have very clear benefits for air quality for one of the busiest transport corridors in the city.

- **Park and ride schemes e.g. Elland Road** – 800 spaces are now in operation with growing use meeting expectations.

  In terms of future work to develop public transport, key plans include:

  - Development of a 1000 place Park and Ride at Temple Green in the Enterprise Zone in 2015/16.

  - Support for WYCA to adopt a new West Yorkshire bus strategy and develop the collaboration with operators and complementary investments in ticketing and information with support from the Local Transport Plan and West Yorkshire and York transport fund programme

8.4 The issue of reducing bus emissions is an area of activity under review with the WYCA as part of the West Yorkshire bus strategy work. A number of key areas have the potential to be explored by further dialogue and investigation with WYCA such as:

- Setting standards for buses to meet or exceed Euro 5 standard, introduced in 2009.

- Trialling the ultra low emission technologies of Compressed Natural Gas and/or electric buses, or Liquid Air Heat Hybrid buses.

- Opportunities to introduce cleanest buses possible on Park and Ride schemes, such as may be presented by the Temple Green scheme, meeting the new Euro standard 6, introduced this year.

- Scope for using “Clean air zone” measures. For example in York, the more frequently a bus enters certain areas the tighter the emission standard it must meet with incremental steps included for future years.

8.5 **Improvements to taxis and private hire**

8.5.1 The Council as the licensing authority for taxis and private hire vehicles has the ability to influence movement towards a greener fleet. The majority of taxis and private hire cars are diesel and undertake high mileage at slow speeds in urban areas, contributing significantly to air pollution. Again there will be question of affordability for some operators and therefore the Council will wish to engage in practical discussions with the industry. Potential avenues to explore, however are:

- Develop a green taxi scheme and bid for OLEV funding to provide subsidy for electric, petrol/hybrid and gas vehicles.

- Introduce 'low emission taxi ranks' at key locations or allow low emission taxis priority use at existing taxi ranks.

8.6 Improvements to emissions of HGVs

8.6.1 Generally speaking, the HGV fleet has a faster renewal rate than other elements and therefore will improve faster as higher standards bite. Given the nature of the business, the LEZ imposed by London on HGV's is also likely to have effects to the benefit of the rest of the country as operators shift goods around the city. Nevertheless, there remain opportunities for the city and combined authority to engage with the sector to encourage it to speed up replacement to the recent Euro 6 standards.

8.7 **An alternative fuel infrastructure**

8.7.1 Looking forward, the encouragement of cleaner vehicles using alternative fuels is dependent on establishing an infrastructure in the city to support their use. There are currently eight electric car charge points at the Elland Road park and ride. There are a further ten at Woodhouse Lane car park, however due to funding rules these cannot be made publicly available until April 2016. A forward strategy needs to be developed to deliver more publicly available charge points in the correct locations. Plans to develop a biomethane fuel station are covered above. Parking incentives for low emission vehicles – free or reduced price parking, reserved or priority spaces, can also encourage take up.

8.8 Encouraging cycling and walking

8.8.1 Part of the strategy to cut emissions also includes encouragement to people to walk and cycle, which has further health benefits. A number of initiatives are under way.

- **Improved travel planning e.g. school and workplace travel plans** – a large number are in place and form part of a wider behaviour change programme which also form part of the City Connect project.

- **Development of a cycle route network superhighway and improved facilities** – 6 routes are complete and the City Connect route will connect into the network when completed later in 2015/16.

- The Council may wish to consider further options to encourage safe walking and cycling in the city to achieve a greater uptake.

9 Key Conclusions and Next Steps

9.1 The LEZ feasibility study has produced a wealth of information linking together a series of complex issues and behaviours. The work has helped us to better understand the Leeds position and in particular those issues that have the potential, either singly or combination, to positively impact by improving both air quality and health.

9.2 The study findings, however, do not constitute an LEZ implementation plan. Instead they take us a large step forward but more work is still needed to be clear on what needs to be done to produce achievable policy changes from measures and scenarios that have currently been identified.

9.3 Whilst some of the possible measures to be introduced lie firmly within the Council's remit many others will require dialogue with key partners and organisations e.g. bus and HGV fleet operators, taxi and private hire operators etc.

9.4 Continued close working with other West Yorkshire Local Authorities, the Combined Authority, Health and other partners (e.g. bus and fleet operators) is also seen as essential. Modern day air quality problems are largely transport related and it is clear that Leeds needs to work in close partnership to deliver a solution not only locally but also regionally.

9.5 It is recommended that the further development of a Low Emission Strategy, be pursued which develops and builds upon the work of the LEZ study and what is already in place as described in section 8, which can capitalise on the range of funding opportunities available nationally such as through OLEV and the collaboration with the West Yorkshire authorities and the Combined Authority.

10 Corporate Considerations

10.1 Consultation and Engagement

10.1.1 This report and the associated background documents provide valuable public information on the air quality and health challenges that we face and can help to stimulate the debate around how we improve the position at a cost that can be afforded and in a way that does not impact in a negative way on economic vitality.

10.2 Equality and Diversity / Cohesion and Integration

10.2.1 It is clear that poor air quality and its associated health effects have a disproportionate impact on those communities already suffering from deprivation.

10.2.2 Whilst there are no specific implications at this stage any measures brought forward, either to introduce a Low Emission Zone or as part of a wider Low Emission Strategy, will be subject to a full equality screening exercise prior to implementation.

10.3 **Council Policies and City Priorities**

10.3.1 The issues addressed in the LEZ study impact on a number of City policies and priorities including; 'Promoting sustainable and inclusive economic growth' by 'developing a low carbon resilient energy infrastructure for the city' and also by 'providing a good and efficient transport infrastructure for the city'.

10.4 There are also clear links to the 'Supporting communities and tackling poverty' objective and the priority of 'supporting healthy lifestyles and getting people active'. The Council has also recently launched a cross departmental and partnership initiative to reduce carbon which has a significant overlap with this work.

10.5 **Resources and Value for Money**

10.5.1 The actual LEZ study work has been partly supported by funds secured from DEFRA. Any measures introduced either as part of an LEZ or as separate measures will be subject to a thorough cost benefit analysis to ensure money is spent wisely and value for money obtained.

10.6 **Legal Implications, Access to Information and Call In**

10.6.1 The information contained within this report does not require any key decisions or have any policy or governance implications at this stage.

10.7 **Risk Management**

10.7.1 Any decision to introduce either an LEZ or other significant policy measures will require careful scrutiny in terms of expected benefits and associated risks. Any work on an LEZ will need to take account of the current risk on the Corporate Risk Register relating to carbon emissions i.e. 'Failure to reduce carbon emissions, improve home energy efficiency and prepare sufficiently for the impacts of a change in climate result in increased energy costs, missed investment in Leeds and a city vulnerable to extreme weather events'.

11 Recommendations

11.1 That dialogue with key interest groups in the transport sector be commenced to agree a range of practical measures with timescales for their introduction that will bring about improvements to air quality and health. The aim would be to deliver changes by dialogue where possible but with the clear understanding that improvements could be achieved ultimately via a Low Emission Zone.

11.2 That the findings of this work be shared regionally with the other West Yorkshire Authorities and the Combined Authority to assist in providing a regional solution to the air quality challenge that the whole of West Yorkshire faces. Air quality is a

trans-boundary issue and can only be effectively addressed across West Yorkshire by all partner authorities and organisations working together. Wherever possible it is recommended that any measures introduced reflect the regional situation rather than dealing with issues in isolation.

11.3 That the key findings of the LEZ study be used to influence future funding bids as they become available e.g. Office for Low Emission Vehicles (OLEV) Green Bus Fund.

11.4 That any future decision to introduce a Low Emission Zone be taken in the context of a wider Leeds Low Emission Strategy that is expected in 2015.

12 Background documents[1]

12.1 Leeds Low Emission Zone Technical Feasibility Study; Summary Report, November 2014

[1] 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.