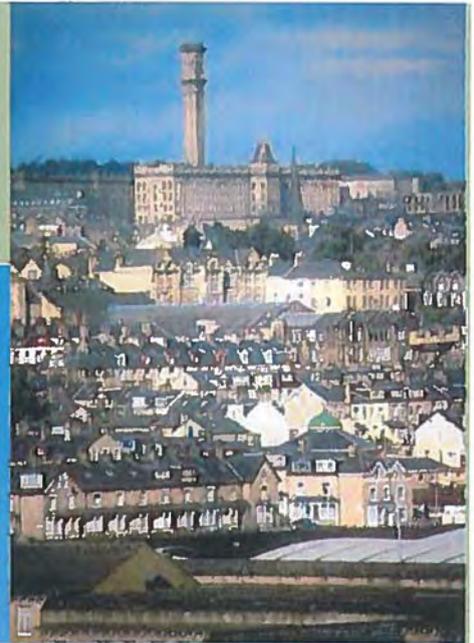


# West Yorkshire Low Emissions Strategy 2016 to 2021



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*Delivering Cleaner  
Air for All in  
West Yorkshire.*

*1<sup>st</sup> August 2016*

## About the West Yorkshire Low Emissions Strategy

The West Yorkshire Low Emissions Strategy (WYLES) has been developed through collaboration between the West Yorkshire local authorities (Bradford MDC, Calderdale MBC, Kirklees MDC, Leeds CC and Wakefield MDC); West Yorkshire Combined Authority (WYCA) and Public Health England (PHE), with each organisation having an input and contributing to the content of the Strategy.

Funded by the Department for the Environment and Rural Affairs (DEFRA) the WYLES project has been managed by Bradford MBC, with technical support provided by Low Emissions Strategies Ltd. and Public Health England and specific acknowledgements are given for their contribution into the development of this Strategy.

This Low Emissions Strategy outlines what the key challenges are in relation to air quality within West Yorkshire and how, together, we can deliver cleaner air for all to create a healthier place for people to live, work and visit.

After considering the evidence which supports the need to improve air quality this Strategy then considers air quality in the context of other key regional plans and strategies and how we can use these to **Create a Low Emissions Future**, including consideration of the region's economic and transport plans, changes in energy production and use, land-use planning, supporting walking and cycling and finally how local authorities can lead by example.

The Strategy then moves on to its main focus: **Tackling Transport Emissions** as pollution from transport causes most local air quality problems. All transport modes are considered as each has a part to play, to a greater or lesser extent, in delivering the necessary improvements to air quality.

The key aims and objectives are set out early within the Strategy document and will act as a reference point to monitor progress towards achieving cleaner air for all. Finally, the delivery and funding arrangements are considered and set out how, together with our partners, we will make the best use of existing funding and access new funding streams and co-ordinate activity across West Yorkshire to make air quality better now and for future generations.

## Consultation

Public consultation on the draft WYLES was undertaken during November and December 2015 via an on-line survey. The key messages taken from the consultation, together with direct feedback from other key stakeholders were:

- A more ambitious Strategy which has more "teeth" to improve air quality using Low Emission Zones / Clean Air Zones.
- A more focussed Strategy, with fewer, but more targeted objectives that will deliver the greatest benefits to air quality.
- Tackling emissions from the most polluting vehicles in towns and cities: buses, lorries and taxis.
- Better public transport and greater support for walking and cycling, not just reducing emissions.
- Linking in with other initiatives, such as green infrastructure, energy efficiency and carbon reduction to improve air quality.

This feedback has been used to help shape the final version of the WYLES together with other key developments such as the refresh of the Leeds City Region Strategic Economic Plan 2016 to 2036; the development of the West Yorkshire Transport Strategy 2106 to 2036 and the Government's Plan<sup>1</sup> for improving air quality in the UK which was published in December 2015. One other key development since the public consultation has been the UK referendum result to leave the European Union in July 2016. It is far too early to say how this decision will affect air quality policy at a national level, but as far as this Low Emissions Strategy is concerned, the fundamental principle of protecting health through improved air quality remains un-changed and therefore, whether operating outside or within a wider European framework, should not alter our strategic aims and objectives.

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<sup>1</sup> <https://www.gov.uk/government/collections/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2015>

## Our Key Messages:



## Foreword

*West Yorkshire has a rich industrial heritage, which has evolved and adapted over the decades resulting in one of fastest growing economies in the UK. We are also blessed with beautiful countryside and majestic open spaces for both residents and visitors to enjoy. There is much to be proud of and levels of air pollution have much improved over the decades, but we expect even better air quality now and for future generations.*

*The challenges are not insignificant. Reducing emissions from road traffic, particularly from older diesel vehicles in towns and city centres, is our greatest priority, but we need to recognise that increased traffic can also be associated with the need for more housing and more jobs for the region. We are confident that collectively we can achieve “good growth”, i.e. more and better homes and jobs and a vibrant economy, while at the same time reducing emissions and improving air quality.*

*The energy market is also changing, with a move from large central power stations, to more localised heat and power generation and the use of renewable fuels and technology in order to meet carbon reduction targets and tackle climate change. Energy production closer to where people live and work can deliver significant environmental benefits, but we recognise that this can also introduce localised pollution and has the potential to negatively impact on air quality. We will ensure that in responding to the changing energy market, air quality will be preserved and protected.*

*There is no “silver bullet” to protecting and improving air quality, which requires action at international, national, local and individual level and on a range of areas including transport, housing and economic development and changing behaviour. The West Yorkshire Low Emissions Strategy recognises our collective responsibility and sets out what we can achieve in our respective roles on behalf of the public which we serve to make sure that air quality in West Yorkshire continues to improve for a cleaner and healthier place to live, work and visit.*



*Name, designation and signature of representative + photo.*



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## List of Abbreviations

## 1. Executive Summary

The West Yorkshire Low Emissions Strategy demonstrates the commitment of the West Yorkshire local authorities, together with West Yorkshire Combined Authority and other key stakeholders to work together to improve air quality for the benefit of all in the region. This Strategy sets out the overall vision, aims and objectives which the WYLES intends to deliver over the next five years. This Strategy document has four main sections:

- Evidence for Change
- Creating a Low Emission Future
- Tackling Transport Emissions
- Delivery and Funding of the WYLES

### 1.1. Evidence for Change

Most of West Yorkshire benefits from very good air quality and, overall, air quality has improved relative to air pollution levels experienced by previous generations. However, traffic in our urban centres and on busy roads result in levels of air pollution which have a significant impact on the health of the population, with those having underlying health conditions being most at risk. There are two pollutants of greatest concern: nitrogen dioxide (NO<sub>2</sub>) and particulate matter (PM<sub>n</sub>), which have an adverse impact on health and are mainly caused by emissions from traffic, particularly exhaust emissions from older diesel vehicles.

Unlike the smoke and smog problems of the past, nitrogen dioxide and particulate matter emissions are invisible, leading to a perception that the air is “clean”. However, fine particulate matter is inhaled deep into the respiratory tract and, in the case of very fine particles and nitrogen dioxide may transfer into the blood stream. A range of health problems are attributed to exposure to high levels of nitrogen dioxide and particulate matter, the most obvious being respiratory conditions, asthma and cardio-vascular disease, but evidence is now also showing an association with cancer, strokes, low birth-weight babies and even childhood development. These health conditions impact both on quality of life and life expectancy. The Public Health Outcomes Indicator<sup>2</sup> for air pollution points to the equivalent of one in twenty deaths in West Yorkshire each year being attributable to poor air quality, which equates to approximately 1,000 deaths annually and poor air quality has been estimated to cost £16 billion to the UK economy.

Nitrogen dioxide and particulate matter, together with other air pollutants, have been set an upper air quality limit value that the general population should not be exposed to and are legally binding through EU and UK law. The urban areas of West Yorkshire have been identified as having some of highest levels of nitrogen dioxide concentrations in the UK, with only London showing higher levels at a regional level. Current projections indicate that concentrations of nitrogen dioxide will not fall below the limit values in some parts of West

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<sup>2</sup> [Public Health Outcomes Framework, 3.1 fraction of Mortality attributable to particulate air pollution, Public Health England](#)

Yorkshire until 2025 at the earliest unless urgent action is taken to reduce pollution in our towns and city centres and particularly the emissions coming from the most polluting vehicles: older diesel cars, vans, buses and lorries.

Continued failure to meet the limit values will put the UK Government at risk of legal action being taken against it under European law, with the further risk of any fine imposed on the UK Government being passed down to local authorities if their action, or in-action, has contributed to the limit value being exceeded. In April 2015 the Supreme Court ordered the UK Government (Secretary of State for the Environment, Food and Rural Affairs) to produce a revised Plan setting out how it intended to meet the Air Quality Limit values in the shortest possible time and submit this to the European Commission by the end of 2015. This Plan was duly produced and introduced a number of measures intended to meet the air quality limit value for nitrogen dioxide. Perhaps the most significant aspect the Plan is the intention to require Clean Air Zones (CAZ) to be implemented within a number of cities in the UK where the air quality limits were not predicted to be achieved by 2020, including an area within the Leeds district. The CAZ is a means of regulating vehicles entering the Zone unless minimum emission standards are met, and for charges to be levied against vehicle owners that don't meet the minimum emission standard. This form of vehicle control is similar to Low Emission Zones which already operate in some parts of the UK, but follow a standardised national framework. Clean Air Zones are discussed in further detail within Section 6 of this Strategy: Tackling Transport Emissions.

It is too early to say how the UK referendum decision to leave the European Union will impact on the legal position with regard to the EU Air Quality Directive and the possibility of legal action outlined above, however, we recognise the underlying importance of reducing emissions to improve and protect public health and therefore we will continue with the ambitions and objectives of this Low Emissions Strategy irrespective of our relationship within the European Union.

## **1.2. Creating a Low Emission Future**

This section recognises that reducing emissions and improving air quality does not sit in isolation from wider economic, social and environmental activity within the region and considers how the WYLES objectives fit, or may be at risk, from these other policy considerations and considers how we can ensure that air quality continues to improve as our economy and society develops in the future.

The Leeds City Region Strategic Economic Plan 2016 to 2036 and the draft West Yorkshire Transport Strategy both offer significant opportunities to improve air quality, although it must also be recognised that economic growth, more housing and the potential for more traffic on our roads has the potential to make air quality worse unless this is considered at an early stage and action is taken to mitigate and reduce emissions. The Strategic Economic Plan includes ambitions to reduce carbon emissions and to improve resource efficiency, which can also benefit air quality and the objectives of the WYLES, for example through improved

resource efficiency, improving green infrastructure and further development of alternative fuels and technologies such as hydrogen, hydro-electric, wind and solar power. However, some carbon reduction initiatives have the potential to give rise to adverse impacts on air quality, such as decentralised energy production and the use of biomass fuels and it is therefore important that we recognise these potential conflicts and ensure any unintended consequences are identified and addressed at an early stage

Given that the greatest impact on local air quality arises from road traffic the Draft Transport Strategy for West Yorkshire is extremely important to the delivery of the Low Emissions Strategy objectives. The draft Strategy incorporates many aspects which have the potential to improve air quality, including greater public transport provision, more attractive and safer places where walking and cycling become a natural part of everyday life as well as initiatives to reduce emissions from transport including buses, lorries, taxis and private vehicles.

This section also considers the role of Planning in the development of Local Plans and determining individual planning applications. An important feature of the West Yorkshire Low Emissions Strategy has been the development an Air Quality and Planning Technical Guide which helps to inform developers, planners, consultants and air quality leads on how the air quality impact from developments can be assessed and mitigated against under the principles of sustainability and in accordance with national and local planning policies. The Guide uses the concept of the Damage Costs associated with the any increase in NO<sub>x</sub> and particulate emissions as a result of development proposal, requiring appropriate mitigation which proportionate to the scale and kind of development.

This Low Emissions Strategy inevitably focuses on tackling emissions from transport, but we also recognise that emissions from energy production and use also contribute to overall air pollution. The energy sector is undergoing significant change, with a commitment to reduce the use of fossil fuels to help tackle CO<sub>2</sub> emission reduction targets and tackle climate change. Although these changes are positive for the environment, we are also mindful of potential unintended adverse consequences for air quality which could arise from decentralising heat and power production, for example through Combined Heat and Power (CHP) plant, and Short Term Operating Reserve (STOR) generators which bring emission sources closer to where people live and work and also the use of alternative fuels such as biomass, wood-burning and energy from waste facilities. When considering new energy generating facilities, the potential impact on air quality will be considered through feasibility studies, planning and other regulatory controls.

When considering how we shape the future to reduce emissions and improve air quality we must consider the roles which cycling and walking have to play: the ultimate forms of low-emission transport, which also deliver significant additional health benefits. We have seen significant increases in the number of people cycling and steady growth in the number of people walking as part of their travel and leisure activity. Cycling and Walking is set to continue to play a significant role and feature strongly within the West Yorkshire Transport Strategy, with particular emphasis on creating places not dominated by cars, but which are

pedestrian and cyclist-friendly; developing transport hubs to better integrate cycling and walking as part of multi-modal travel arrangements; building on City Connect and Cycle Superhighway projects to develop cycling and walking infrastructure and maximises opportunities from the Government's Cycling and Walking Investment Strategy to help bring further investment in cycling and walking into the region. Because active travel is so important, a separate Walking and Cycling Plan will be developed to support the West Yorkshire Transport Strategy and this will complement our ambition to create a low emission future.

Finally, in this section we look at our own role and leading by example to reduce emissions from the vehicle fleets operated by local authorities; how we can support and encourage the people we employ to reduce their own impact on air quality by considering how they travel and using low-emission alternatives; and how we can encourage the suppliers of goods and service to reduce their emissions from our procurement policies.

### 1.3. Tackling Transport Emissions

In some parts of West Yorkshire, like many urban areas in the UK and other developed countries across the world, road traffic is having a significant impact on air quality. Factors such as the growth of diesel passenger cars and vehicle technology not achieving anticipated emission reductions has led to air pollution (NO<sub>2</sub> in particular) remaining unacceptably high in some areas. This Strategy seeks to reduce emissions from all sectors of road transport, although buses, lorries, taxis and other diesel vehicles operating within towns and cities will be the focus of our attention in order to achieve air quality improvements as quickly as possible.

This section looks at each of the main vehicle categories in turn, including passenger cars, buses, trains, freight transport, taxis and our own fleet vehicles, and considers what local authorities are able to do as part of a West Yorkshire Vehicle Emissions Plan (WYVeP) through regulatory means, infrastructure development, our influencing role and other support to achieve a reduction in transport emissions than would otherwise occur without such intervention.

A very important feature of the WYVeP will be the mandatory introduction of the Leeds Clean Air Zone, which will regulate access of certain categories of vehicle to an area of Leeds dependant on the emission standard of the vehicle: targeting buses, coaches, taxis, HGVs and vans. In addition to the mandatory Leeds CAZ, we will consider whether Clean Air Zones will be necessary to reduce transport emissions in other parts of the region if air quality is found not to be improving through the implementation of the WYLES.

**Passenger Cars** account for 78% of the 9.8 billion miles driven on West Yorkshire roads each year and they are a significant contributor to overall emissions which impact on air quality. In real-world driving conditions it has been shown that diesel cars can produce 22 times more particulate emissions and four times more NO<sub>x</sub> emissions than petrol cars and this, together

with a rapid growth in the number of diesel cars on our roads compared to a decade ago is one of the main reasons why air quality targets have not been achieved across the UK. This Low Emission Strategy will focus on reducing emissions from cars, by making it easier for people to switch to ultra-low emission alternatives, such as plug-in electric, hybrid and hydrogen fuel-cell power-trains and developing the necessary infrastructure to support this change. Although this is our main focus, this will also be supported by our wider strategic ambition to reduce the dominance of cars in our towns and cities and to create places which are more pedestrian and cyclist friendly and increasing public transport integration for example with increased park & ride / park & rail schemes.

**Buses** provide a valuable public transport option and are part of the solution to air quality problems. However, buses, which are a type of heavy goods vehicle and predominantly run on diesel fuel, give rise to relatively high NO<sub>x</sub> and particulate emissions. It is also common for buses to be kept in operation for many years and therefore turn-over to newer buses which have more stringent emission standards can be relatively slow. These factors, together with the recognition that buses also operate in our towns and cities where air quality needs to improve the most, means that reducing emissions from a relatively small number of buses will yield the most significant air quality improvements and is therefore a key priority for the delivery of the Low Emissions Strategy.

We are developing a Bus Strategy and supporting the bus industry through a Bus18 project which will accelerate a reduction in bus emissions through investment in new buses, fitting pollution abatement technology where appropriate, introducing the Eco Stars fleet recognition scheme and supporting alternative fuels and technologies including biomethane, electric and hybrid variants. These supportive measures, together with the introduction of a Clean Air Zone in Leeds and elsewhere if needed, will accelerate the reduction in bus emissions than would occur without such intervention.

**Trains**, particularly those driven by diesel engines, can contribute to the overall air pollution, however their contribution is relatively insignificant in the region when compared to other transport modes such as buses, lorries, vans and (diesel) cars, particularly when considered in relation to the emissions per passenger carried. Trains are therefore considered within this Strategy principally as a means of helping to resolve air quality in towns and cities: the more people who are able to move away from cars, even if for part of their journey, will have a positive contribution to air quality. The draft West Yorkshire Transport Strategy 2016 to 2036 will consider in further detail the significant role that trains will have in meeting our future transport needs and improving connectivity and capacity on local, regional and national rail network, including integration with HS2, further electrification of the rail network and better integration to facilitate multi-modal travel increased car-parking capacity and electric vehicle charging at railway stations and improving facilities to support cyclists to create door-to-door connectivity.

**Freight** and commercial operations are a significant contributor to the West Yorkshire economy, taking advantage of the excellent links to the strategic highway to deliver goods

and services nationally and internationally as well as within the region. Consequently, the number of HGVs on the West Yorkshire road network contribute significantly to local and regional air pollution. The Leeds Clean Air Zone will mean that lorries and vans will need to meet newer (Euro VI/6) emission standards where the CAZ applies, which will accelerate a reduction in emissions, but as well as a regulatory approach, this Low Emission Strategy will also support the commercial sector to reduce emissions from their fleet operations, for example by providing advice and training through the ECO Stars fleet recognition scheme, and supporting trials and infrastructure for low emission alternatives including compressed natural gas (CNG), liquefied natural gas (LNG), hybrid, electric and hydrogen fuel options.

**Taxis** (hackney carriage and private hire vehicles) are predominantly diesel cars or vans, with the majority of journeys being within town and city centres and therefore contribute to local air pollution issues. Taxis, like buses, lorries and vans, will be included in the class of vehicles that will need to meet minimum Euro standards as part of the Leeds Clean Air Zone. The West Yorkshire local authorities will also be using their influence when licensing hackney carriages and private hire vehicles and contracting taxi transport services to improve vehicle emission standards. These measures will accelerate a reduction in emissions coming from taxis, but the role taxis play as part of the integrated transport network, particularly for people with limited mobility, is also important and therefore we will continue to support the role of taxis at transport hubs and encourage the uptake of ultra-low emission vehicle options and the provision of dedicated electric vehicle charging infrastructure and allowing access to bus lanes where appropriate.

**Public Sector Fleet vehicles** also contribute to local air pollution problems and it is important that we play our part and also lead by example by doing all we can to reduce emissions from the fleet vehicles which we operate. All fleet managers in local authorities are signed up to the Eco Stars fleet recognition scheme and will reduce emissions from fleets through a combination of upgrading fleets to the latest Euro VI emission standard and integrating the use of alternative fuels and technologies, such as CNG / LNG, hydrogen fuel cell and electric vehicles where we can.

#### **1.4 Funding and Delivery of the West Yorkshire Low Emissions Strategy**

Accelerating the reduction in emissions and creating a low emission future will require funding. This will be provided through a number of avenues including maximising opportunities that arise from existing funding streams, such as Growth Deal funding used to deliver objectives of the Strategic Economic Plan and the West Yorkshire Transport Fund used to deliver the West Yorkshire Transport Strategy. New developments will also fund initiatives to reduce emissions, such as improved cycling and walking provision and electric vehicle charging infrastructure either directly as part of a development proposal, or indirectly through contributions from Section 106 Planning Obligations or Community Infrastructure Levy (CIL) arrangements. We will also work together to apply for new funding from grant schemes, such as those administered by the Department for Transport, and seek

opportunities for private and public sector investment, for example in new low emission infrastructure such as alternative fuels and technologies.

Delivery of the WYLES will be overseen by the West Yorkshire Transport & Health Board, which has representation from Public Health England, West Yorkshire Combined Authority and West Yorkshire district Environmental Health professionals and will in turn report on progress through the governance arrangements of the West Yorkshire Combined Authority. Progress in achieving the WYLES objectives will be monitored and reported through each local authority and made available to the public and the WYLES will also be used to inform each local authority's Annual Status Report and development of Air Quality Action Plans as part of their local air quality management duty.

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## 2. Vision, Aims and Objectives of the WYLES

### Vision

*Delivering Cleaner Air for all in West Yorkshire.*

### Aims

In working towards achieving the above vision the West Yorkshire local authorities together with West Yorkshire Combined Authority will use this Strategy as a framework to achieve the following aims:

Aim 1: Accelerate improvements in air quality, above that which would occur without intervention, to achieve air quality limit values set out in law in all parts of West Yorkshire by 2020 at the latest.

Aim 2: Working within the wider economic, social and environmental context for West Yorkshire to create a Low Emissions Future that will maximise opportunities to improve air quality, minimise risks of worsening air quality and create healthier places to live, work and visit.

Aim 3: Immediate focus on tackling transport emissions, targeting interventions that will deliver the most significant air quality improvements in the areas of greatest concern.

## Objectives

The West Yorkshire local authorities (WYLA) and West Yorkshire Combined Authority (WYCA) will work together to achieve the above aims and will commit to the following strategic objectives:

Ref:	Objective:
001	A Clean Air Zone will be introduced within the Leeds district, and elsewhere where necessary, to control emissions <u>from the most</u> polluting vehicles.
002	We will work with West Yorkshire bus operators to accelerate investment in newer buses, emission abatement technology and alternative fuels and technologies to reduce emissions through the implementation of the West Yorkshire Bus Strategy and Bus 18 Project.
003	We will accelerate the uptake of plug-in electric cars and vans through improved electric vehicle charging infrastructure and the implementation of an Electric Vehicle Strategy.
004	We will introduce the Eco Stars fleet recognition scheme to support businesses, bus operators and public sector fleet managers to reduce emissions from their fleet operations.
005	We will work with our partners to develop infrastructure to support alternative fuels and technology for transport including: natural gas, bio-methane, LNG and hydrogen.
006	We will support the taxi industry to help the transition to low emission vehicles including demonstrating economic benefits; supporting funding bids and considering policy incentives to promote the uptake of ultra-low emission taxis.
007	We will use the West Yorkshire Transport Strategy and Leeds City Region Strategic Economic Plan to help deliver the WYLES objectives, including improved cycling and walking provision; better public transport; low emission energy production and use, and sustainable infrastructure to deliver "Good Growth".
008	We will use the <i>West Yorkshire Air Quality and Planning Technical Guide</i> to deliver sustainable developments and deliver air quality improvements.
009	We will use our influence to promote low emission transport through the use of the <i>West Yorkshire Low Emission Procurement Guide</i> in the procurement of vehicles, goods and services and lead by example to reduce emissions from our own fleet operations.
010	We will continue to raise awareness of the impact of poor air quality with the public, policy makers and partners to improve air quality through changing behaviour, influencing policy, access funding and working together to deliver the objectives of this low emissions strategy.

### 3. Introduction

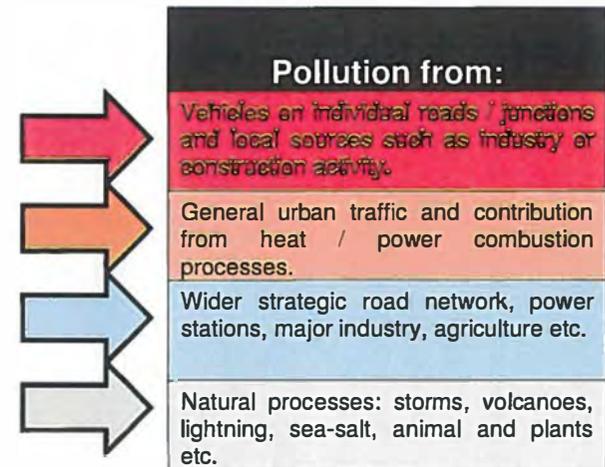
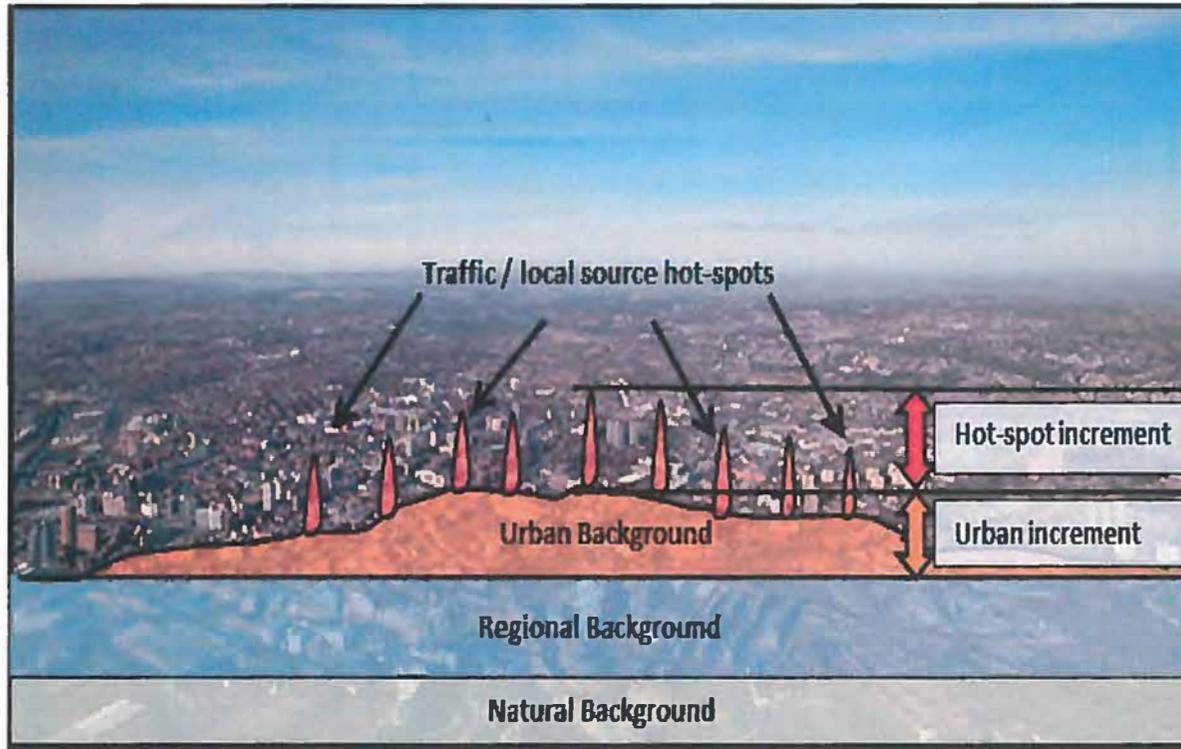
Breathing clean air, which does not adversely affect health, should be a basic requirement of any society. Air quality has improved significantly over recent decades from the days when smogs and smoke could be seen coming from chimneys in the region. Where visible smoke emissions, mainly from domestic and industrial combustion processes, were once the major cause of concern, today we face different, but no less significant challenges to our air quality although now the emissions are largely unseen and mainly come from the traffic on our roads.

The “quality” of air describes its composition, i.e. the mixture of gases and fine particles in a given volume of air (usually one cubic metre (m<sup>3</sup>)). These gases and particles are made up from the millions of chemical, biological and physical reactions and processes that occur on a daily basis, including those resulting from human activities that we have all become used to in today’s world, such as driving a car, using public transport, generating heat and power, construction, agriculture, manufacturing and transport of goods and services. Emissions from these activities, together with the emissions from natural processes, add to the overall composition of the air we breathe.

Levels of air pollution are affected by a number of factors including the amount of primary pollution produced at source and how this is then dispersed in the atmosphere. However, the effect or impact that air pollution has depends on the level of exposure, (how much and for how long), and the susceptibility of the person (or other organism) to the particular pollutant or pollution mix.

Air pollution at a particular location is made up from a number of different pollution sources, both near and far, but generally the closer a person is to a pollution source and for a longer period of time the more likely they are to be exposed to “poor” air quality. Figure 1 illustrates how air quality becomes a problem due to “layers” of pollution building up from different sources. In rural or semi-rural areas the levels of pollution may mainly come from distant sources and therefore air quality is likely to be very good. In urban areas the amount of pollution from traffic and other sources can add to general background levels and can result in an elevated “urban background” so that the population living in that area is exposed to “poor” air quality. In other cases, although urban background levels may be below threshold levels which impact on health, localised pollution sources, for example a busy road or combustion plant can elevate the level of air pollution close to that source resulting in a local “hot-spot” of poor air quality and only the population in the “hot-spot” area will be affected.

Figure 1 - How air pollution builds up in urban areas (illustrative only).



The World Health Organisation has considered over thirty different pollutants that contribute to air pollution and recommended guideline values to help inform policy development for the protection of public health. The most common pollutants, and the ones which are considered to be a priority in terms of protecting public health, together with the WHO short-term and long-term guideline values are listed in Table 1 below.

<b>Table 1: Air Quality Guideline Values (WHO)<sup>3</sup></b>		
<b>WHO Guideline Values</b>		
<b>Pollutant</b>	<b>Short Term Exposure</b>	<b>Long Term Exposure (annual mean)</b>
<b>Nitrogen Dioxide (NO<sub>2</sub>)</b>	200 µgm <sup>-3</sup> (24hr)	40 µgm <sup>-3</sup>
<b>Particulate Matter (PM)</b>	<b>PM<sub>10</sub></b>	50 µgm <sup>-3</sup> (24hr)
	<b>PM<sub>2.5</sub></b>	25 µgm <sup>-3</sup> (24hr)
<b>Sulphur Dioxide (SO<sub>2</sub>)</b>	20 µgm <sup>-3</sup> (24hr) 500 µgm <sup>-3</sup> (10 min)	Not Required <sup>4</sup>
<b>Ozone (O<sub>3</sub>)</b>	100 µgm <sup>-3</sup> (24hr)	

Air pollution is monitored in the UK through a combination of measurement of pollutant concentrations at different locations and using computer modelling based on calculated emissions from various pollution sources. The results of this monitoring can be viewed on DEFRA's ambient air quality interactive map<sup>5</sup>, which provides data on background and roadside levels of air pollution. In addition, local authorities also monitor air quality at a local level, so overall we have a good understanding of the pollutants which are of concern and the sources of pollution which needs to be addressed.

Of the pollutants listed in Table 1, the Guideline Values for Sulphur Dioxide is consistently being met within West Yorkshire, largely as a result of a reduction in the use and content of sulphur containing fuels, such as coal, and the introduction of Smoke Control areas by local authorities. Ozone is not a primary source of pollution, but is produced through a photo-chemical reaction in the atmosphere with other pollutants, and therefore Ozone pollution is greatly affected by the amount and intensity of sunlight and the prevalence of other pollutants, such as Nitrogen Dioxide and Volatile Organic Compounds (VOCs). Ground-level Ozone is not exceeding the WHO guideline values within West Yorkshire, but there is a concern that levels may increase over time due the effect of climate change and the changing concentrations of other primary pollutants. Action to reduce primary pollutants,

<sup>3</sup> [Air Quality Guidelines - Global Update 2005, World Health Organisation](#)

<sup>4</sup> The short term exposure value is considered sufficient for the protection of health.

<sup>5</sup> <https://uk-air.defra.gov.uk/data/gis-mapping>

such as Nitrogen Dioxide, and limit greenhouse gases, such as Carbon Dioxide, will also have a beneficial effect in limiting Ozone production and therefore this Strategy, although not specifically aimed at Ozone, will also seek to achieve outcomes which will have a positive benefit on ground-level Ozone levels.

Levels of both Nitrogen Dioxide and Particulate Matter are exceeding WHO Guideline values in some urban areas of West Yorkshire. Both pollutants are largely associated with combustion processes, including internal combustion engine (ICE) vehicles (particularly those using diesel fuel), and the generation of heat and power using fossil fuels. Poor air quality occurs in areas where a large number of these combustion processes occur in close proximity to where people live and work – i.e. in urban areas and near to busy roads.

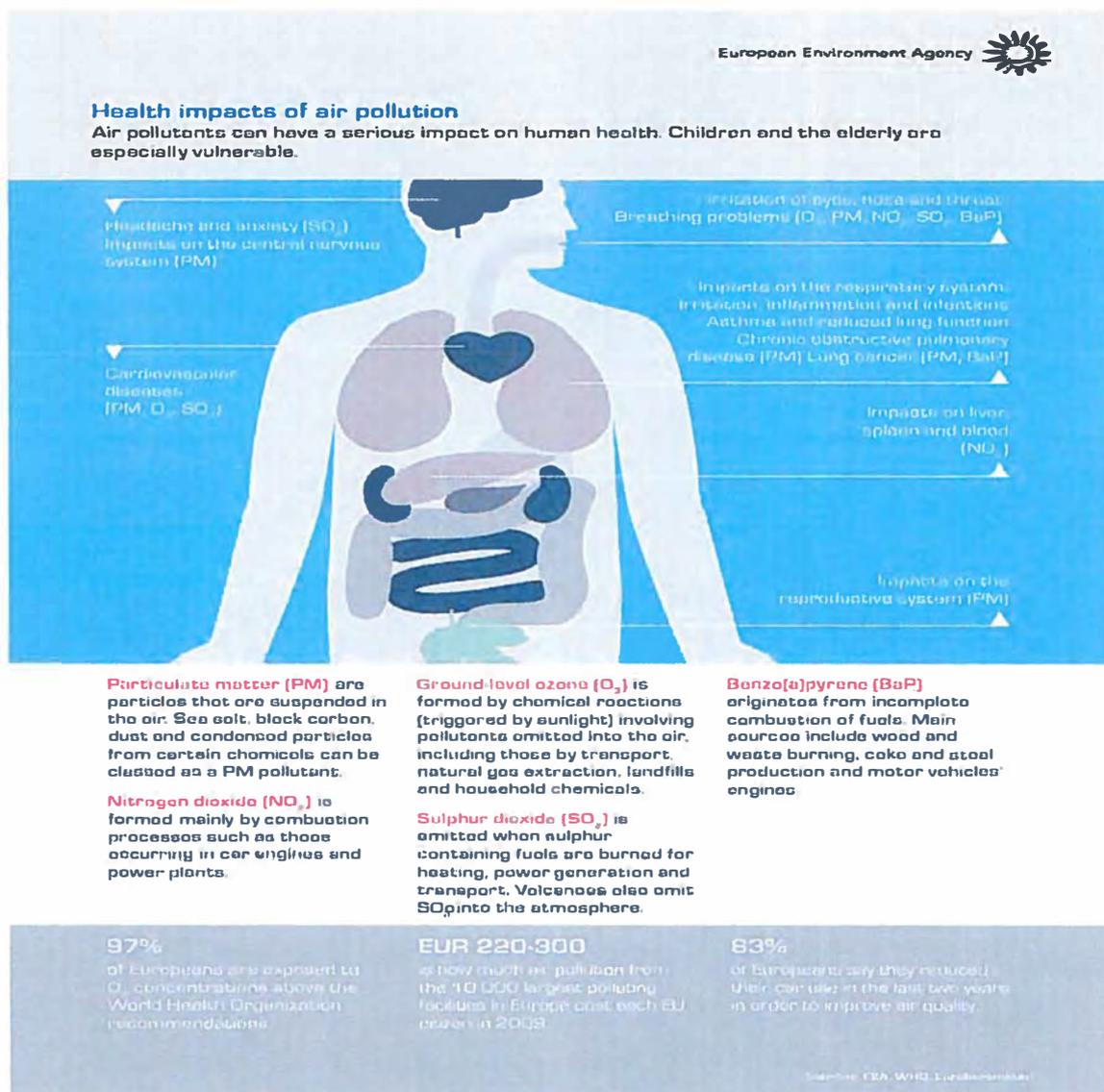
Everyone in West Yorkshire has a role to play in improving air quality, including individuals, businesses, public sector organisations and local and national Government. However, the West Yorkshire local authorities together with West Yorkshire Combined Authority (WYCA) recognise their collective role in shaping the region's economic, social and environmental future through their administrative and political decision-making powers and the allocation and use of public money. This Low Emissions Strategy provides a strategic framework to help shape regional and local strategies, policies and plans and demonstrate their commitment to ensure the people of West Yorkshire can continue to enjoy cleaner air over the next five years and for future generations.

## 4. Evidence for Change

### 4.1. Health Impact

The adverse health effects from short and long-term exposure to air pollution range from premature deaths caused by heart and lung disease to worsening of respiratory symptoms (i.e. asthma, chronic obstructive pulmonary disease (COPD, commonly known as chronic bronchitis), which lead to a reduced quality of life and increased health care costs. There is also evidence linking air pollution with lung and bladder cancer<sup>6</sup>, low birth weight babies<sup>7</sup> and subsequent neurodevelopment problems in children<sup>8</sup>. The main health effects associated with air pollution are illustrated Figure 2 below:

**Figure 2: Main health effects of air pollution (European Environment Agency)**



<sup>6</sup> Diesel Engine Exhaust Carcinogenic, International Agency for Research on Cancer, WHO, 12 June 2012

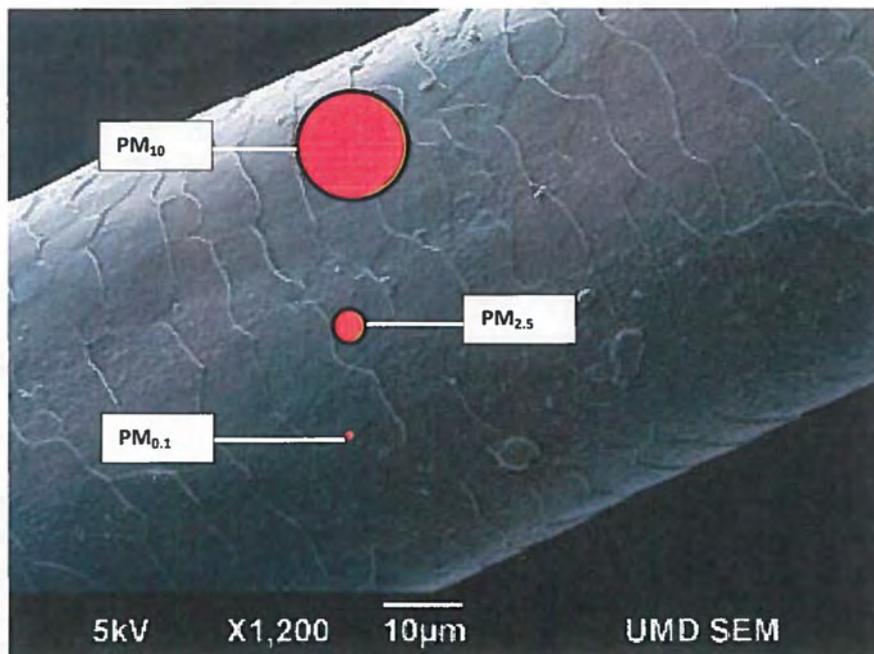
<sup>7</sup> Ambient air pollution and low birthweight: a European cohort study (ESCAPE), The Lancet v1, No9 p695 - 704, Nov 2013

<sup>8</sup> <http://bmjopen.bmj.com/content/6/5/e010004.full>

The two main pollutants of concern in urban areas of West Yorkshire are Nitrogen Dioxide (NO<sub>2</sub>) and Particulate Matter (PM<sub>n</sub>). The Committee on the Medical Effects of Air Pollutants (COMEAP), a panel of independent experts, provide advice on the associated health risk from various air pollutants based on the best available evidence. In 2015 COMEAP reported<sup>9</sup> that the evidence linking exposure to NO<sub>2</sub> concentrations and adverse health effects such as asthma, respiratory conditions and increased cardiovascular risk has strengthened significantly over recent years and DEFRA estimate that this has an effect on mortality equivalent to 23,500 deaths annually in the UK<sup>10</sup>.

Particulate matter is the generic term used to categorise air pollution caused by very small particles which arise from a range of sources and are categorised by the particle size (Figure 3).

**Figure 3: Particle size relative to human hair.**



PM<sub>10</sub> – coarse particles (smaller than 10 microns / 0.01mm)

PM<sub>2.5</sub> – fine particles (smaller than 2.5 microns / 0.0025mm)

PM<sub>0.1</sub> – ultra-fine particles (smaller than 0.1 microns / 0.0001mm)

The small particle size means that that these pollutants are inhaled deep into the lung tissue and ultra-fine particles can pass into the bloodstream and circulate around the body and may lodge in tissue causing a disruption of function. Although much remains to be understood about the toxicity of different particle sizes, chemical composition and particle structure, COMEAP reports<sup>11</sup> a clear causal link between exposure to fine particulates and adverse impacts on health, estimated to have an effect on mortality equivalent to 29,000 deaths, 340,000 life-years lost across the UK.

<sup>9</sup> [Statement on the Evidence for the Effects of Nitrogen Dioxide on Health, COMEAP \(March 2015\)](#)

<sup>10</sup> [Improving air quality in the UK, Tackling nitrogen dioxide in our towns and cities, UK overview document, December 2015](#)

<sup>11</sup> [Statement on the Evidence for Differential Health Effects of particulate Matter According to Source or Components, COMEAP \(March 2015\)](#)

Using Public Health England (PHE) methodology<sup>12</sup> for assessing the health impact from particulate air pollution it is possible to understand the impact on mortality levels at a West Yorkshire Level (for PM<sub>2.5</sub> fine particulate air pollution) (see Table 2). The figures show that an equivalent of one in twenty deaths in West Yorkshire can be attributed to exposure to fine particulate matter alone, which, when also taking into account the effect of other air pollutants, is likely to underestimate of the true impact on health and mortality.

	% Mortality	Equivalent number of deaths per year
<b>West Yorkshire (total)</b>	<b>5.0%</b>	<b>992</b>
Bradford	4.7%	213
Calderdale	4.5%	86
Kirklees	4.8%	173
Leeds	5.0%	329
Wakefield	6.0%	189

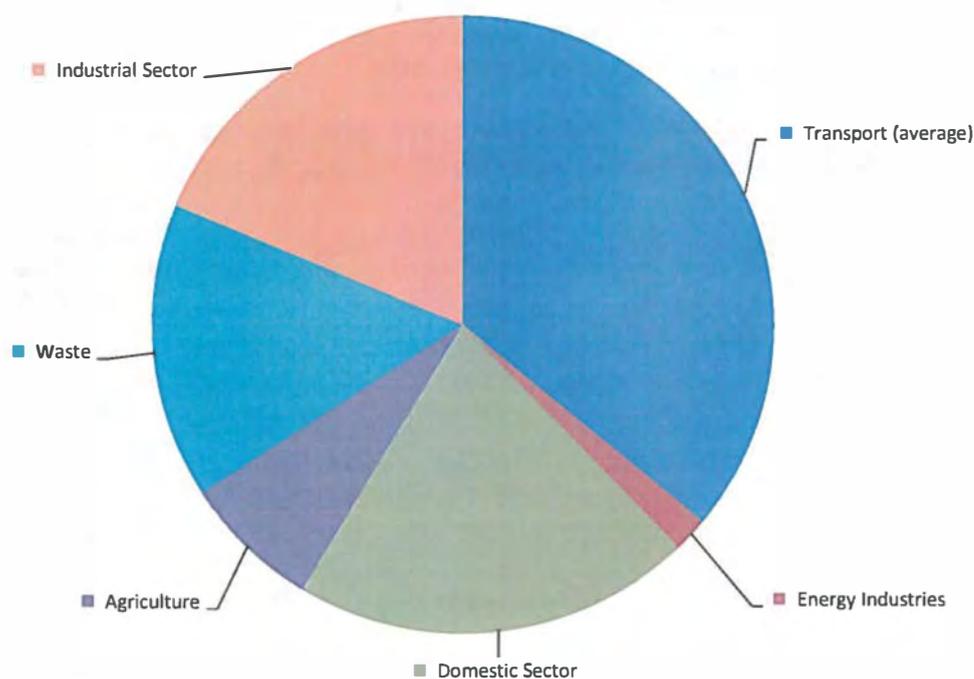
Premature death is the ultimate health impact associated with air pollution, but poor air quality particularly affects people with pre-existing respiratory and cardiac problems. It can be seen from Table 2 that the number hospital admissions for asthma, coronary obstructive pulmonary disease (COPD), and heart conditions (in this instance myocardial infarctions), in West Yorkshire are considerably higher than those for England as a whole. If the incidence rates for England were to apply in West Yorkshire there would be 678 fewer asthma admissions, 1,245 fewer for COPD and 463 fewer heart attacks. These figures give an indication of the levels of ill health and the size of the 'high risk' population that will benefit most from improvements in air quality in the region.

	Admissions per 1000 population		Additional admissions in West Yorkshire compared to England overall
	West Yorkshire	England	
<b>Asthma</b>	<b>1.39</b>	<b>1.09</b>	<b>678</b>
<b>COPD</b>	<b>2.63</b>	<b>2.07</b>	<b>1,245</b>
<b>Myocardial Infarction</b>	<b>1.39</b>	<b>1.18</b>	<b>463</b>

<sup>12</sup> [Estimating Local Mortality Burdens Associated with Particulate Air Pollution, Public Health England, 2014](#)

The mortality and morbidity effects of exposure to poor air quality can be translated into an economic cost to society. It is estimated that air pollution imposes a cost of £16 billion<sup>13</sup> per year in the UK. HM Treasury together with DEFRA have developed guidance<sup>14</sup> on how to quantify the economic impact that policies, plans and projects have on air quality. The guidance uses annual “damage costs” to quantify the impact of different pollutants from different sectors (Figure 4).

**Figure 4: Relative Air Quality Damage Costs (PM and NOx) by Sector**



Transport accounts for the most significant economic impact on air quality with an average “cost” of £44,430 and £25,252 per tonne of emissions for particulate matter (PM) and Oxides of Nitrogen (NOx) respectively. This impact is even greater in urban areas, for example in urban conurbations, such as large parts of West Yorkshire, the damage cost associated with transport rises to £107,965 and £61,365 per tonne for PM and NOx respectively.

The concept of damage costs associated with air quality is used later within this Strategy when considering “good growth” and particularly in relation to new developments and the role of the planning system to contribute to the achievement of sustainable development.

When considering interventions to reduce emissions and improve air quality, it is helpful to understand and compare the relative impact of different interventions. Leeds and Bradford Councils used this approach to help understand the health impact of introducing transport

<sup>13</sup> <https://www.gov.uk/guidance/air-quality-economic-analysis>

<sup>14</sup> [Valuing impacts on air quality: Supplementary Green Book guidance, HM Treasury and DEFRA, May 2013](#)

initiatives to reduce emissions as part of a Low Emission Zone (LEZ) feasibility study<sup>15</sup>. Table 4a summarises the estimated health benefit, in terms of actual health events being averted, if various transport initiatives were introduced. A further parameter used by health professionals to compare alternative health interventions is Quality Adjusted Life Years (QALY) which assigns a cost (or saving) to NHS and Personal Social Services (NHS / PSS) for each life year that is lost (or saved) as result of a particular health intervention.

The QALY framework was applied to the estimated health benefits arising from the LEZ study in a report<sup>16</sup> carried out by the University of York, Centre for Health Economics and concluded that the QALY methodology should be applied when assessing interventions to improve air quality. A summary of the NHS / PSS benefits associated with the transport interventions considered as part of the LEZ study are summarised in Table 4b below.

**Table 4a: Health Impact (Benefit) Associated with transport Interventions modelled as part of a Leeds and Bradford Low Emissions Zone Feasibility Study.**

Transport Intervention:		pre Euro IV buses and HGVs to Euro VI by 2016	pre Euro V buses to Euro VI by 2021	Ratio of Petrol : Diesel cars to year 2000 levels (50:50 to 80:20)	10% reduction in car journeys by 2021
Health Event	Pollutant	Number of Cases Averted per year	Number of Cases Averted per year	Number of Cases Averted per year	Number of Cases Averted per year
All-cause mortality	PM <sub>2.5</sub>	15	18	18	19
Cardio-pulmonary deaths	PM <sub>2.5</sub>	8	11	10	10
Coronary events (Bradford only)	PM <sub>2.5</sub>	24	45	45	45
Low birthweight babies (at term)	PM <sub>2.5</sub>	12	14	14	15
Low birthweight babies (at term)	NO <sub>2</sub>	19	38	45	37
Pre-term birth	PM <sub>2.5</sub>	3	4	4	4
Cases of childhood asthma*	NO <sub>2</sub>	254	506	596	494

**Table 4b: Estimated Cost Saving to NHS / PSS using QALY methodology.**

Annual Saving	£3.9m	£5.5m	£5.5m	£5.7m
One-off Saving*	£4.3m	£8.6m	£10.1m	£8.4m

\*One-off effect due to reduced prevalence of asthma – i.e. incidents no longer recur year on year.

This approach provides useful indicator of the magnitude of the impact which poor air quality has on health and the associated costs in providing NHS and Personal Social Services and also the benefits which targeted interventions, such as those considered as part of the LEZ feasibility study for Leeds and Bradford, can have on the wider population.

<sup>15</sup> [Bradford Low Emission Zone Feasibility Study, Bradford Council Environmental Health Service, November 2014](#)

<sup>16</sup> [A pharmacoeconomic approach to assessing the costs and benefits of air quality interventions that improve health: a case study, Lomas et al, BMJ Open, April 2016](#)

## 4.2. Legal Context

**Note:**

This Strategy was drafted prior to the UK referendum on membership of, and subsequent decision to leave the European Union and therefore this Section should be read within this in mind. It is too early to say how this decision will impact on the legal position with regard to the EU Air Quality Directive and domestic law and the possibility of legal action outlined below, however, we recognise the underlying importance of reducing emissions to improve and protect public health and therefore we will continue with the ambitions and objectives of this Low Emissions Strategy irrespective of our relationship within the European Union.

Although improving public health is the main driver for this Strategy, there is also a legal requirement through European and domestic law to improve air quality. Air Quality Directive 2008/50/EC<sup>17</sup> sets out the obligations for Member States in terms of assessing ambient air quality and ensuring limit values for certain pollutants are not exceeded by a given target date. These legal requirements have been transposed into domestic law<sup>18</sup>. The limit values and target dates to be achieved for the two key pollutants of Nitrogen Dioxide and Particulate Matter are set out in Table 4.

**Table 4: Air Quality Directive 2008/50/EC - Limit Values and Target Dates for compliance for Nitrogen Dioxide and Particulate Matter**

	Limit Value (annual mean)	Target Date
Nitrogen Dioxide	40µgm <sup>-3</sup>	1 <sup>st</sup> January 2010
PM <sub>10</sub>	40µgm <sup>-3</sup>	1 <sup>st</sup> January 2005
PM <sub>2.5</sub>	Stage 1	25µgm <sup>-3</sup>
	Stage 2	20µgm <sup>-3</sup>
		1 <sup>st</sup> January 2020

It is worth noting that the limit values set out in the Air Quality Directive are influenced by the WHO Air Quality Guideline Values (Table 1), but they are not the same, this is particularly the case for the limit values for long term exposure to particulate matter, which are higher than the WHO Guideline values. A review<sup>19</sup> of the evidence on which the air quality guidelines are based has shown that exposure to levels of particulate air pollution even below 10µgm<sup>-3</sup> can have adverse health effects and demonstrate that *there is no safe threshold of exposure to fine particulate matter*. In recognition of this the Directive further requires Member States to achieve an exposure reduction target for PM<sub>2.5</sub>, which for the UK means achieving an average exposure target of 11µgm<sup>-3</sup> by 2020. The Directive is therefore set in a legal and policy context to achieve improvements in air quality, but compliance with the Directive itself is not an assurance that air pollution will be at a level which will still not have any adverse health impact.

Each year DEFRA report on air pollution in the UK and compliance with the Air Quality Directive. These reports provide information of background (at 1km<sup>2</sup>) and roadside air pollution levels. For reporting purposes the UK is divided into 43 zones, one of which is the West Yorkshire Urban Zone.

<sup>17</sup> [DIRECTIVE 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe. \(21 May 2008\)](#)

<sup>18</sup> [Air Quality Standards Regulations 2010](#)

<sup>19</sup> [REVIHAAP Project: Technical Report, World Health Organisation \(2013\)](#)

The latest DEFRA report<sup>20</sup> indicates that in 2014 the limit value for PM<sub>10</sub> and PM<sub>2.5</sub> was being met across the West Yorkshire Urban Area. More detailed consideration using DEFRA's Ambient Air Quality Interactive Map<sup>21</sup> shows significant parts of urban West Yorkshire and particularly areas near to busy motorways and major roads are exceeding WHO guideline values and the 2020 exposure target for PM<sub>2.5</sub> of 11µgm<sup>-3</sup>. Therefore, although levels of fine particulate matter are currently compliant with Air Quality Directive limit values, there is a continuing need to reduce particulate emissions even further in order to sustain compliance with the Directive and to further protect public health.

The current challenge for the West Yorkshire area in terms of compliance with the Air Quality Directive is achieving the limit value for nitrogen dioxide. DEFRA's annual report<sup>16</sup> shows that levels nitrogen dioxide in parts of West Yorkshire, along with other major conurbations in the UK, were exceeding the EU limit value in 2014 and therefore continuing to breach the target compliance date of 2010.

The European Commission has commenced infraction proceedings against the UK Government for failing to meet the limit value for nitrogen dioxide and has indicated that it would like [the UK Government] ***“to achieve full compliance with existing air quality standards by 2020 at the latest”***. The implication being that continued failure to meet the limit value beyond 2020, could result in further legal action and possible infraction fines against the UK Government. It is also recognised that all public authorities have a role to play in improving air quality and DEFRA has written to all local authorities seeking their co-operation in achieving compliance with the air quality limit values, adding: ***“we feel we ought to remind you of the discretionary powers in Part 2 of the Localism Act under which the Government could require responsible authorities to pay all or part of an infraction fine”***.

In April 2015, in a case brought by Client Earth<sup>22</sup>, the Supreme Court ruled that the UK Government must submit new Air Quality Plans to the European Commission by the 31<sup>st</sup> December 2015 on how it intends to achieve compliance with the limit value for nitrogen dioxide in the shortest possible time. In December 2015 DEFRA duly published its Air Quality Plan for Nitrogen Dioxide in UK (2015)<sup>23</sup>, including an overview document and specific plans for each zone, including the West Yorkshire Zone Plan<sup>24</sup>. These Plans include an assessment of compliance with the limit value for nitrogen dioxide for each zone for the baseline year of 2013 and projection for compliance by 2020 and 2025 if no new measures, other than those already proposed, were to be implemented. The West Yorkshire Urban Zone, is one of eight in the UK where the annual mean limit value for nitrogen dioxide is predicted not to be achieved by 2020 unless additional measures as outlined in the Plan are implemented, which include the mandatory introduction of a Clean Air Zone (CAZ) within Leeds to control emissions from buses, coaches, taxis, HGVs and light goods vehicles (LGVs) together with additional measures such as traffic management, promoting alternative travel options and the use of alternative, low emission fuels and technology.

<sup>20</sup> [Air pollution in the UK 2015, DEFRA \(September 2015\)](#)

<sup>21</sup> <https://uk-air.defra.gov.uk/data/gis-mapping>

<sup>22</sup> [R \(on the application of ClientEarth\) \(Appellant\) v Secretary of State for the Environment, Food and Rural Affairs \(Respondent\) \[2015\] UKSC 28, 29 April 2015](#)

<sup>23</sup> [Air Quality Plan for Nitrogen Dioxide in UK, DEFRA \(2015\)](#)

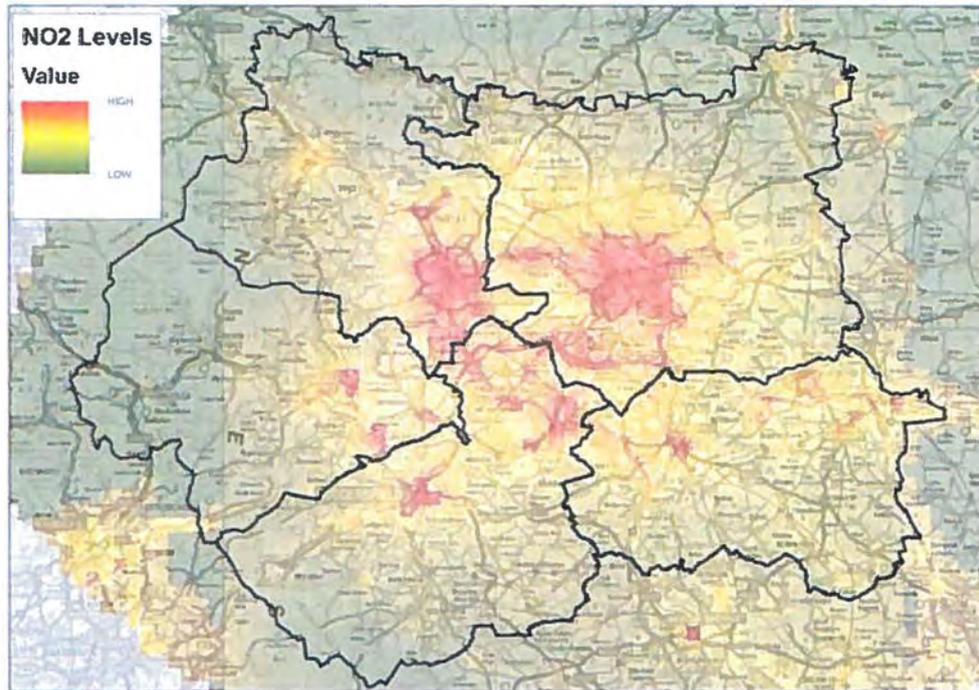
<sup>24</sup> [Air Quality Plan for the achievement of the EU air quality limit value for nitrogen dioxide \(NO<sub>2</sub>\) in West Yorkshire Urban Area \(UK0004\), DEFRA, December 2015](#)

In addition to the specific challenges faced in meeting the air quality limit values and the introduction of a Clean Air Zone within Leeds, other parts of West Yorkshire also need to achieve improvements in air quality and DEFRA's Air Quality Plan makes it clear that, as a minimum, ***all local authorities currently exceeding the air quality limit values should put in place a low emission strategy setting out a range of commitments and actions to tackle air pollution and achieve compliance as soon as possible.*** This Clean Air Strategy fulfils the collective ambitions and commitments to achieve the necessary improvements in air quality in West Yorkshire.

### 4.3. Air Quality in West Yorkshire

Air quality in West Yorkshire varies and is largely dependent on geographical location and proximity to the sources of air pollution. Figure 4 shows the modelled concentrations of nitrogen dioxide in West Yorkshire.

**Figure 4: Modelled levels of nitrogen dioxide (NO<sub>2</sub>) in the West Yorkshire area.**

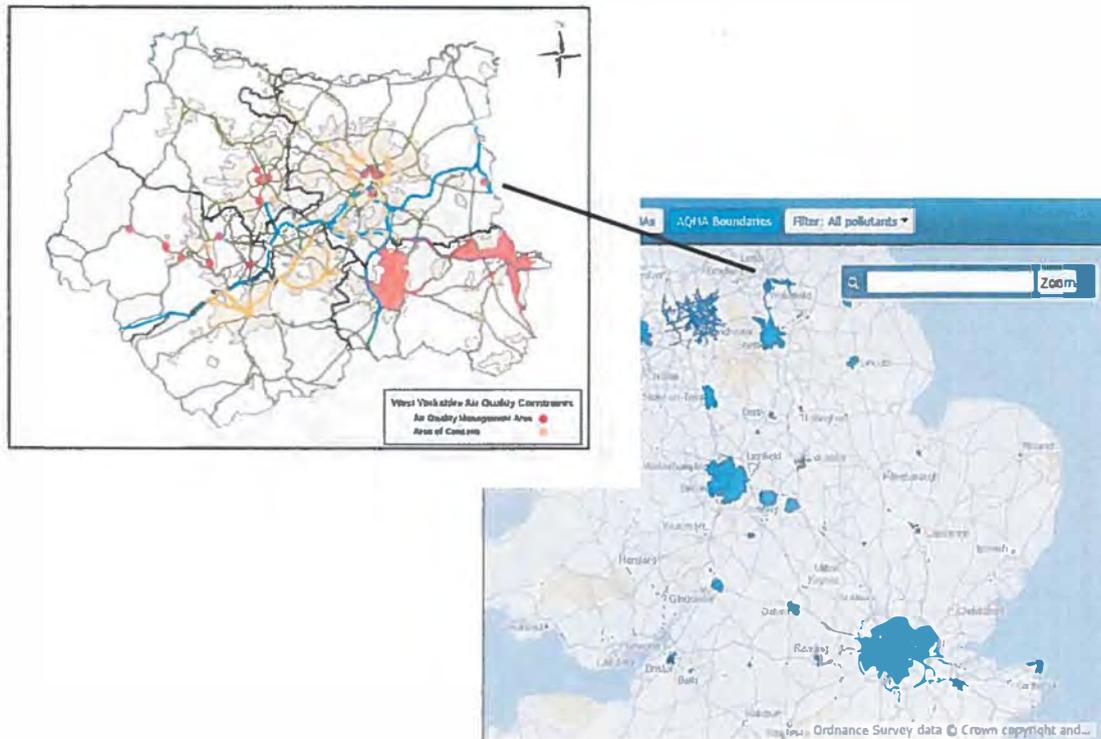


Local authorities are required to review and assess air quality in their administrative areas and declare air quality management areas (AQMAs) if they find that air quality is exceeding objective levels<sup>25</sup>. Twenty-nine AQMAs have been declared in the West Yorkshire area: 28 because of NO<sub>2</sub> concentrations and one because of particulate (PM<sub>10</sub>) concentrations (Figure 5). All the AQMAs in the region have been declared because of pollution arising from road traffic.

These monitoring and modelling results tell us that air quality is poorest in urban areas and near to busy roads and is caused by emissions from road traffic.

<sup>25</sup> [National Air Quality Objectives and Limit Values, DEFRA](#)

**Figure 5: Air Quality Management Areas Declared by Local Authorities**

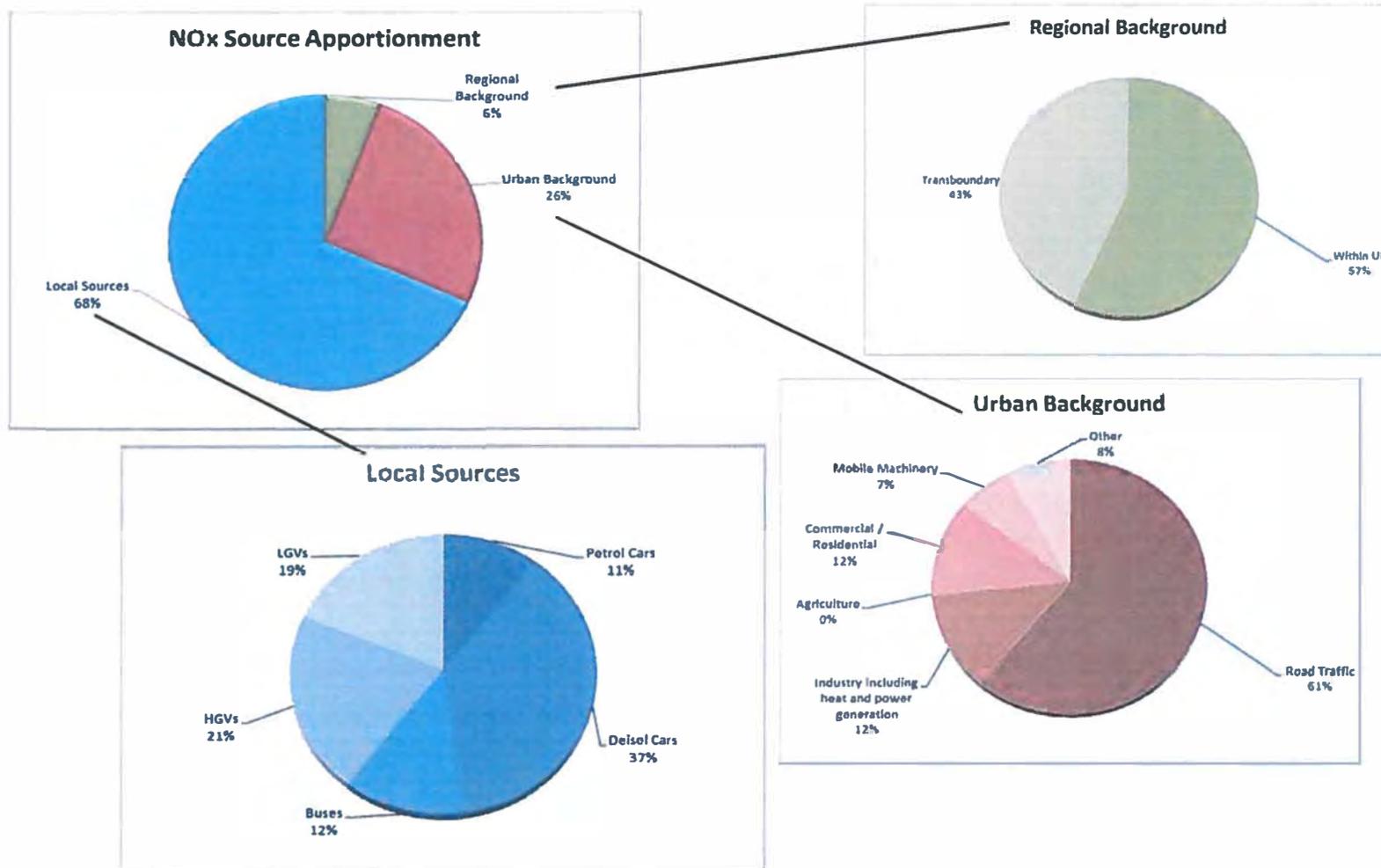


The West Yorkshire Plan for reducing Nitrogen Dioxide in West Yorkshire<sup>26</sup>, published by DEFRA in December 2015, identified that areas of the West Yorkshire agglomeration are currently exceeding the air quality objective levels at roadside locations and that air pollution levels in some areas is not predicted to fall below the legal limits before 2020 unless targeted action (through the introduction of Clean Air Zones) is taken to reduce emissions from transport.

Figure 6 shows the sources of air pollution at the location identified within the West Yorkshire Plan as having the highest concentration of nitrogen dioxide air pollution. Although the specific source apportionment of air pollution will vary from place to place the sources identified are quite typical of the transport-related air pollution in other parts of the region and emphasise the need for this Strategy to focus on reducing transport emissions.

<sup>26</sup> [Air Quality Plan for Reducing Nitrogen Dioxide in West Yorkshire Urban Area UK0004, DEFRA, December 2015](#)

Figure 6: Modelled Concentrations of NO<sub>x</sub> (µg<sup>m</sup><sup>-3</sup>) on the A58 within the West Yorkshire Urban Zone by Source<sup>27</sup>



<sup>27</sup> Air Quality Plan for the achievement of the EU air quality limit value for nitrogen dioxide (NO<sub>2</sub>) in West Yorkshire Urban Area (UK0004), DEFRA, December 2015

## 5. Creating a Low Emission Future

### 5.1. Links with other Strategies, Policies and Plans

This Low Emissions Strategy should be used to help inform and influence other relevant strategies, policies and plans both at a regional and local level and Figure 7 illustrates how the WYLES links with other policy areas and key stakeholders. It is also important to ensure that this Strategy is informed by, and is consistent with, the wider strategic priorities for the region. Notable regional strategies are the Leeds City Region Strategic Economic Plan 2016 - 2036<sup>28</sup> and the developing West Yorkshire Transport Strategy 2016 – 2036<sup>29</sup>, which set out the over-arching plans for the economy and transport over the next 20 years. As well as these regional strategies each local authority has implemented or is in the process of implementing local development plans, which set out each local authority's plans and policies for the allocation of land for employment, housing and other uses.

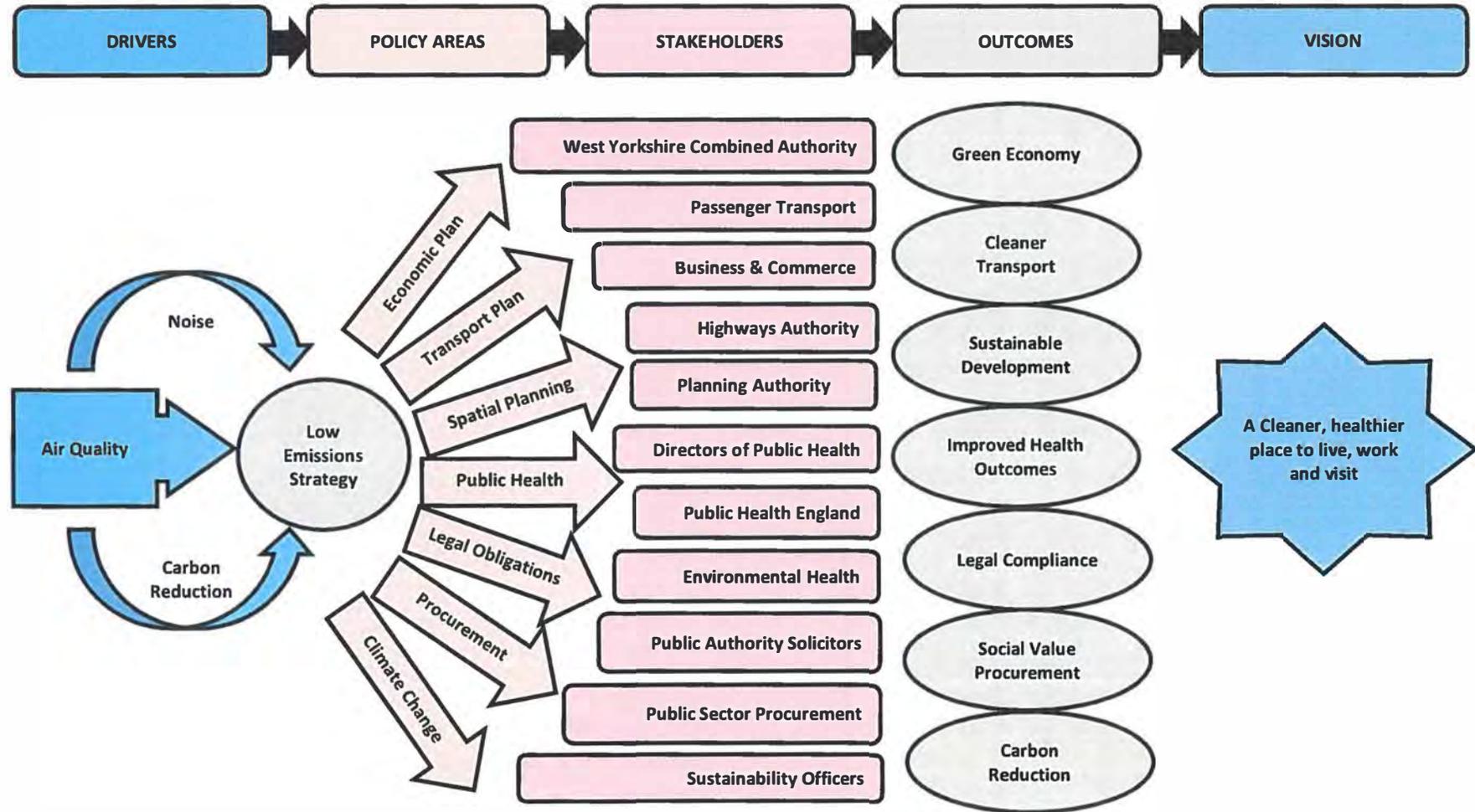
These Strategies and Plans will result in additional jobs and housing for the region, which has the potential to create more air pollution, particularly from transport, and it is therefore important to consider how regional and local growth will impact on air quality now and in the future and how we take the opportunities which arise from this growth to improve the environment and places where we live and work. These Strategies and Plans and how they link with this Low Emissions Strategy are considered in further detail below.

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<sup>28</sup> [Leeds City Region Strategic Economic Plan 2016 - 2036, Leeds Enterprise Partnership, May 2016](#)

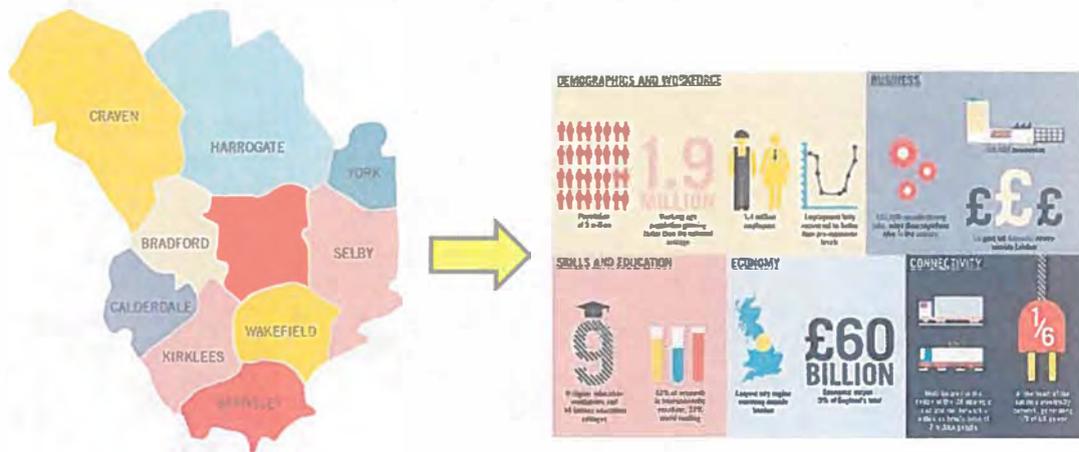
<sup>29</sup> [Single Transport Plan, West Yorkshire Combined Authority](#)

Figure 7: West Yorkshire Low Emission Strategy and links to other key Policy Areas



### 5.2. Leeds City Region Strategic Economic Plan 2016 – 2036

The Leeds City Region has the biggest economy outside London and the Leeds Enterprise Partnership (LEP), together with other partners, are working to improve the economic prosperity of the region. In May 2016 the LEP updated its Strategic Economic Plan (SEP) for the region with an overall ambition of delivering upwards of 35,000 jobs and an additional £3.7 billion of annual economic output by 2036.



Central to the SEP is the concept of “Good Growth”, to support and grow businesses that deliver good jobs, higher wages, better standards of living and improvements to the environment and places where people live and work. The SEP priorities include Clean Energy and Environmental Resilience (Priority 3), and although principally aimed at reducing CO<sub>2</sub> emissions and adapting to climate change, it sets out the principle that the environment is a key priority while growing the economy. In delivery economic growth, the SEP therefore creates potential risks to air quality, but also has the potential to deliver air quality improvements which complement this Low Emissions Strategy. The key opportunities and risks from the SEP are highlighted in Table 5 below.

The Strategic Economic Plan therefore provides significant opportunity and potential access to funding to improve air quality and help deliver the objectives of this Low Emissions Strategy. Priority 3: Clean Energy and Environmental Resilience provides some of the most significant opportunities to contribute to the objectives of this Strategy through the development. We will work with our partners to maximise the opportunities presented by the SEP, and also raise awareness of the potential risks to air quality and ensure these are fully considered and impacts are mitigated.

<b>Table 5: Leeds City Region Strategic Economic Plan 2016 to 2036 - Opportunities and Risks to Air Quality</b>		
	<b>Opportunities</b>	<b>Risks</b>
<b>Priority 1: Growing Businesses</b>	<ul style="list-style-type: none"> <li>• <i>Investment in Low Carbon and Environmental industries.</i></li> <li>• <i>Improved Digital Capacity: reducing reliance on travel and transport.</i></li> <li>• <i>Embedding resource efficiency to support business productivity.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Generation of more traffic on our roads.</i></li> <li>• <i>More businesses using more energy and creating more emissions.</i></li> </ul>
<b>Priority 2: Skilled People, Better Jobs</b>	<ul style="list-style-type: none"> <li>• <i>Skilled workforce in low Carbon, resource efficiency and environmental industries.</i></li> <li>• <i>Higher paid jobs: more likely to invest in cleaner vehicle technology.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>More people travelling to work, education or training.</i></li> </ul>
<b>Priority 3: Clean Energy and Environmental Resilience</b>	<ul style="list-style-type: none"> <li>• <i>Reduction in Carbon-based fuels and development of low emission fuels and technology (e.g. Hydrogen, hydro-electric, wind, solar etc).</i></li> <li>• <i>More resource efficient businesses.</i></li> <li>• <i>More and better use of trees and green space (Green Infrastructure) to promote active travel and help improve air quality.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Decentralised energy production: localised power and heat generation may cause localised air quality problems.</i></li> <li>• <i>Biomass fuels: risk of higher particulate and NOx emissions.</i></li> </ul>
<b>Priority 4: Infrastructure for Growth</b>	<ul style="list-style-type: none"> <li>• <i>Improved Public Transport, more capacity and better connectivity.</i></li> <li>• <i>Reduced congestion.</i></li> <li>• <i>Removal of traffic from town and city centres.</i></li> <li>• <i>Investment in Walking and Cycling infrastructure.</i></li> <li>• <i>Infrastructure to support alternative, low emission transport: e.g. electric / hydrogen / gas vehicles</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Greater capacity on roads generating more emissions from vehicles.</i></li> <li>• <i>Moving air quality problems away from city centres to residential areas.</i></li> </ul>

### 5.3. West Yorkshire Transport Strategy 2016 – 2036 (Draft)

An efficient and effective transport system is of vital importance for connecting people to the places they need to be and to support businesses and the local economy, but at the same time we know that transport contributes most to local air quality problems. Our plans and investment strategies for transport now and in the future are key to ensuring air quality improves and the objectives of this Low Emissions Strategy are met.

The impact transport has on the environment is recognised in the current West Yorkshire Local Transport Plan 2011 to 2026<sup>30</sup> (LTP), with a particular commitment to progressing to a low Carbon, sustainable transport system. However, emissions from transport which contribute to poor air quality (NO<sub>x</sub> and PM) have not fallen in the way that was predicted when the current Transport Plan was drafted, largely due to the growth of diesel cars and the failure of Euro standards to achieve the expected reduction in exhaust emissions in real-world driving conditions. Reducing CO<sub>2</sub> emissions continues to be an important feature of transport policy, but it is recognised that more action in the short to medium term is required to also reduce transport emissions which cause air quality problems at a local level.

West Yorkshire Combined Authority (WYCA) is developing a new Transport Strategy<sup>31</sup>, which will replace the current LTP and support the economic ambitions outlined in the Strategic Economic Plan, running alongside the same twenty-year time-frame.

Although yet to be finalised, the Transport Strategy is likely to have a number of core themes to improve the transport network and making a positive contribution to the places where we live and work. The importance of improving air quality and delivering benefits to health and the environment will feature strongly, cutting across all the core themes of the Strategy and linking closely with this Low Emissions Strategy.

The draft Transport Strategy offers many opportunities to make a positive contribution to air quality and, although to a far lesser extent, also presents some risks to improving air quality which are highlighted in Table 6.

Table 6: Draft West Yorkshire Transport Strategy 2016 to 3036 - Opportunities and Risks to Air Quality		
	Opportunities	Risks
Theme 1: Road Network	<ul style="list-style-type: none"> <li>• <i>Reducing congestion.</i></li> <li>• <i>Support for multi-modal travel, including park and ride, park and rail and cycling facilities.</i></li> <li>• <i>Managing vehicle use in town and city centres.</i></li> <li>• <i>Support for ultra-low emission vehicles – e.g. electric charging network.</i></li> <li>• <i>Support for alternative fuels in the freight sector – e.g. CNG / LNG and biofuels.</i></li> <li>• <i>Better walking and cycling routes.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Greater capacity on roads, leading to more vehicles and more emissions.</i></li> </ul>
Theme 2: Places to Live and Work	<ul style="list-style-type: none"> <li>• <i>People-friendly town and city centres, encouraging walking and cycling and reducing dominance of cars.</i></li> <li>• <i>Better rail and bus transport hubs to encourage greater public transport use.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>None</i></li> </ul>

<sup>30</sup> My Journey, West Yorkshire Local Transport Plan 2011 to 2026

<sup>31</sup> <http://www.westyorks-ca.gov.uk/stp-survey/>

	<ul style="list-style-type: none"> <li>• <b>Enhancing community settings to create safer, healthier and more attractive places to live and work.</b></li> </ul>	
<b>Theme 3: One System Public Transport</b>	<ul style="list-style-type: none"> <li>• <b>Improved connectivity and capacity of local, regional and national rail network, including HS2.</b></li> <li>• <b>Electrification of trans-Pennine railway routes.</b></li> <li>• <b>A new Bus Strategy<sup>32</sup> to improve bus services and increase bus use.</b></li> <li>• <b>Reducing emissions from buses to directly benefit air quality.</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Investment by commercial bus and train operators to improve bus fleets, rolling stock and infrastructure.</b></li> </ul>
<b>Theme 4: Smart Futures</b>	<ul style="list-style-type: none"> <li>• <b>Using the latest technology to improve traffic management.</b></li> <li>• <b>Smart Card to support multi-modal travel.</b></li> <li>• <b>Better information to support public transport.</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Measures to reduce congestion may not translate to reduced emissions.</b></li> </ul>
<b>Theme 5: Asset Management</b>	<ul style="list-style-type: none"> <li>• <b>Improved condition of highway infrastructure to reduce congestion, and support cycling and walking.</b></li> <li>• <b>Incorporation of green infrastructure to highway improvement schemes.</b></li> <li>• <b>Improved energy efficiency and resource efficiency.</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Better roads could create more vehicle use and reinforce car dominance.</b></li> </ul>
<b>Cross-cutting Theme: Environment, Health &amp; Wellbeing and Inclusion</b>	<ul style="list-style-type: none"> <li>• <b>Adoption of the West Yorkshire Low Emissions Strategy.</b></li> <li>• <b>Implementation of Leeds Clean Air Zone</b></li> <li>• <b>Electric vehicle recharging infrastructure.</b></li> <li>• <b>Moving to near zero bus emissions.</b></li> <li>• <b>Green infrastructure to enhance the environment and promote active travel options.</b></li> <li>• <b>Investment in cycling infrastructure.</b></li> <li>• <b>Safer roads which are pedestrian and cyclist friendly.</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>None</b></li> </ul>

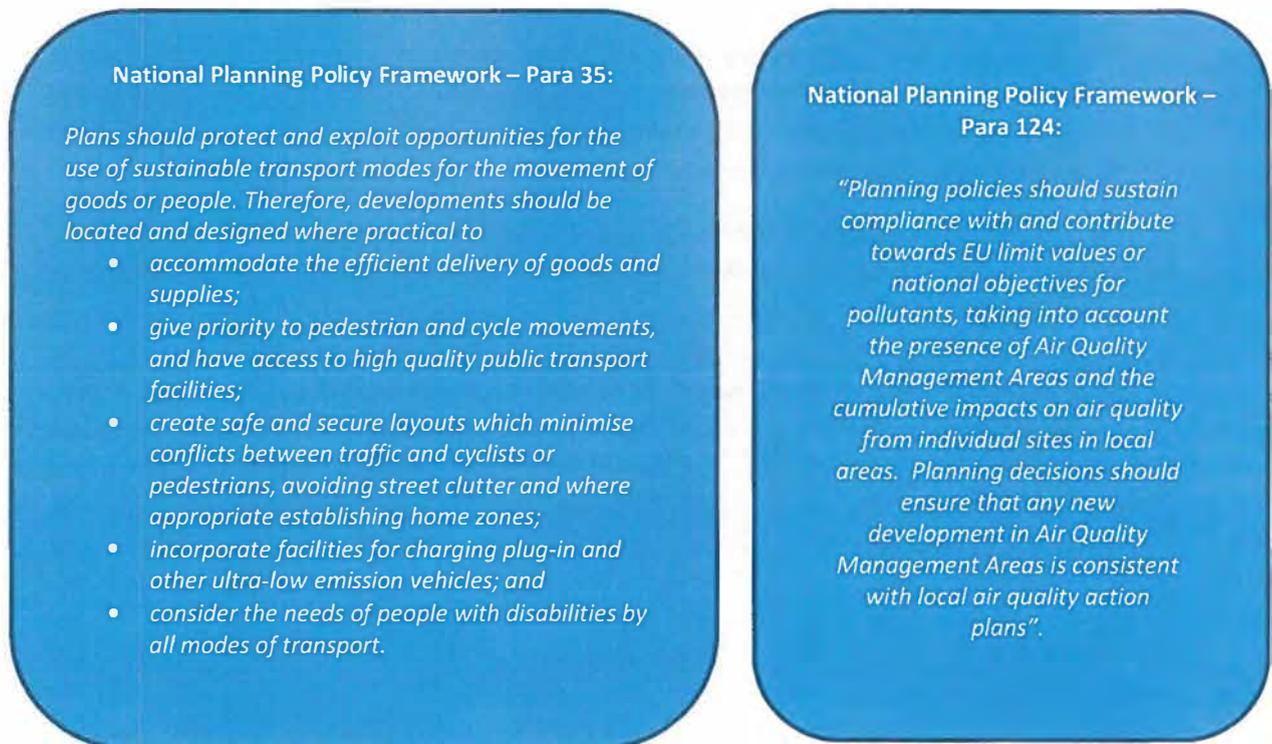
The Transport Strategy and the funding which flows from its implementation through successive delivery plans will form one of the primary means by which the objectives of this Low Emissions Strategy are delivered. The West Yorkshire local authorities, together with West Yorkshire Combined Authority and the various partners and stakeholders will continue to work together to implement the complimentary objectives of this Low Emissions Strategy and the West Yorkshire Transport Strategy.

<sup>32</sup> [Bus Strategy, West Yorkshire Combined Authority](#)

#### 5.4. Local Development Plans and Development Management

Local Council planning departments consider how land in their districts should be developed for housing, employment and other uses and determines the policies that should be applied when considering individual development proposals. Sustainability is at the heart of planning policy, whereby environmental, social and economic factors are considered when developing Local Plans and when determining individual planning applications. National Planning Policy Framework (NPPF)<sup>33</sup> (Figure 8) recognises the importance of air quality and sustainable transport when deciding where new development is needed and when determining individual planning applications.

**Figure 8: Extracts from National Planning Policy Framework (NPPF)**



National Planning Practice Guidance (NPPG)<sup>34</sup> provides further detailed guidance and states Local Plans should:

- Consider the potential cumulative impact on air quality from developments.
- Consider the impact of point-sources of air pollution, for example industrial emissions.
- Where air quality may be unacceptable, identifying measures for offsetting the impact including supporting measures in an air quality action plan or **low emissions strategy**.

<sup>33</sup> <https://www.gov.uk/government/publications/national-planning-policy-framework-2>

<sup>34</sup> <http://planningguidance.planningportal.gov.uk/>

West Yorkshire planning authorities use the Health Impact Assessment<sup>35</sup> methodology to assess the impact of certain major developments and each has local planning policies which ensure air quality and other environmental considerations are taken into account when taking planning decisions.

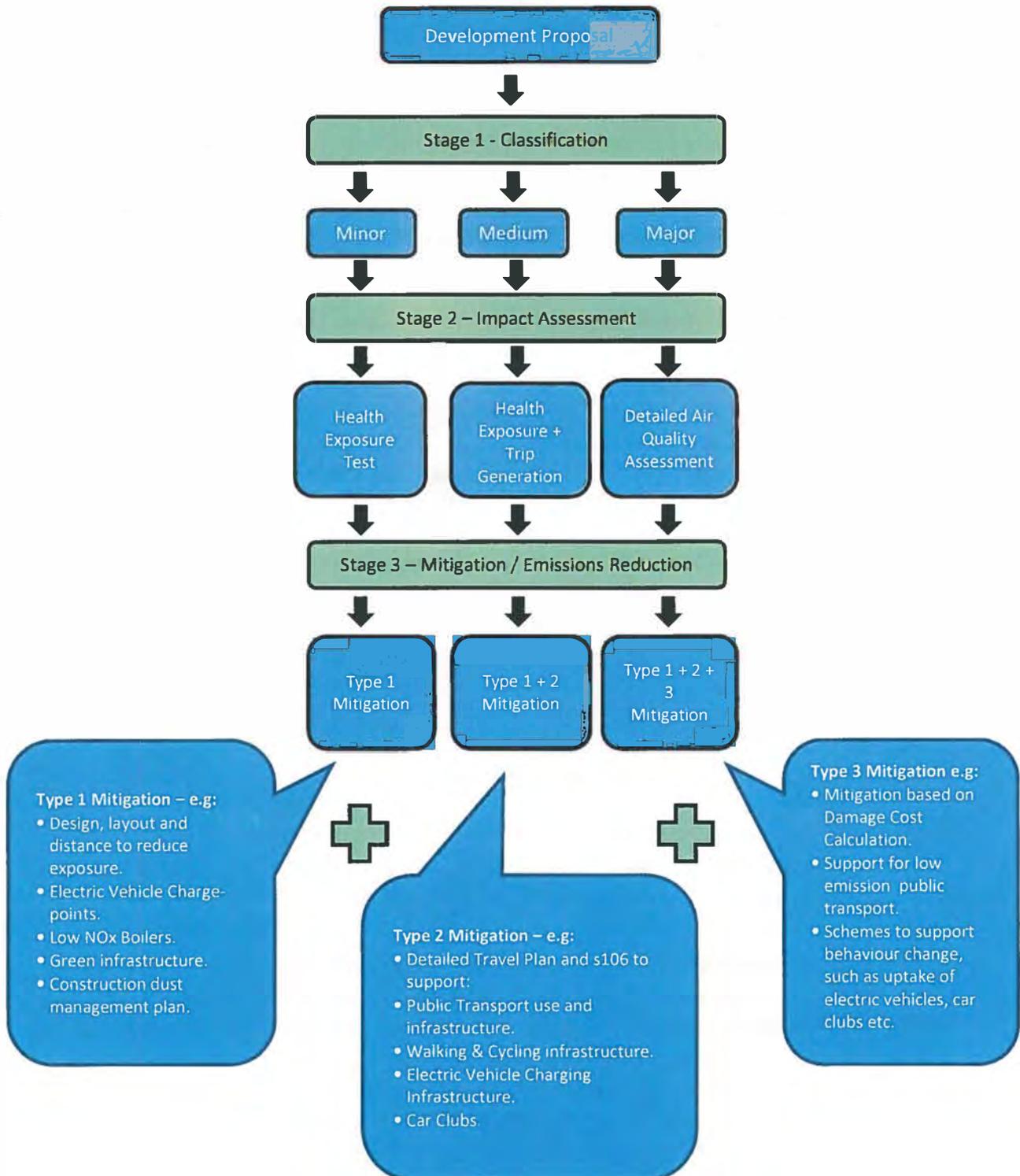
One key strand of the WYLES has been the development of an ***Air Quality & Planning Technical Guide*** to assist developers, consultants, air quality officers and planning authorities to ensure that the principles of sustainable development, with particular reference to air quality, are satisfied when making planning decisions. The Guide, which is a key supporting document of this Low Emissions Strategy, will be used by the West Yorkshire local authorities to help assess the air quality impact of developments and ensure mitigation measures are incorporated into development proposals. The Guide provides a three stage process (Figure 9) which leads the developer through a step-by-step pathway to understand what is required to mitigate the impact that a development would otherwise have on air quality. The concept of Damage Costs associated with Particulate and NO<sub>x</sub> emissions from the development (see Section 4.1 above) are used to help inform the scale and kind of mitigation required and that this is proportionate to the impact on air quality.

Because poor air quality is mainly associated with emissions from road traffic, the Planning Guide necessarily leans towards reducing emissions from transport through the promotion and support for public transport, cycling and walking and low emission vehicles, however the guide can equally be used to consider emissions from developments which impact on air quality in ways other than increased traffic, such as emissions from industrial processes, energy and heat production, construction and minerals extraction. Non-transport mitigation options, such as low NO<sub>x</sub> boilers, emission abatement technology, green infrastructure and dust management plans are examples of how emissions from non-transport sources could be reduced or controlled.

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<sup>35</sup> [Health Impact Assessment, Wakefield Council](#)

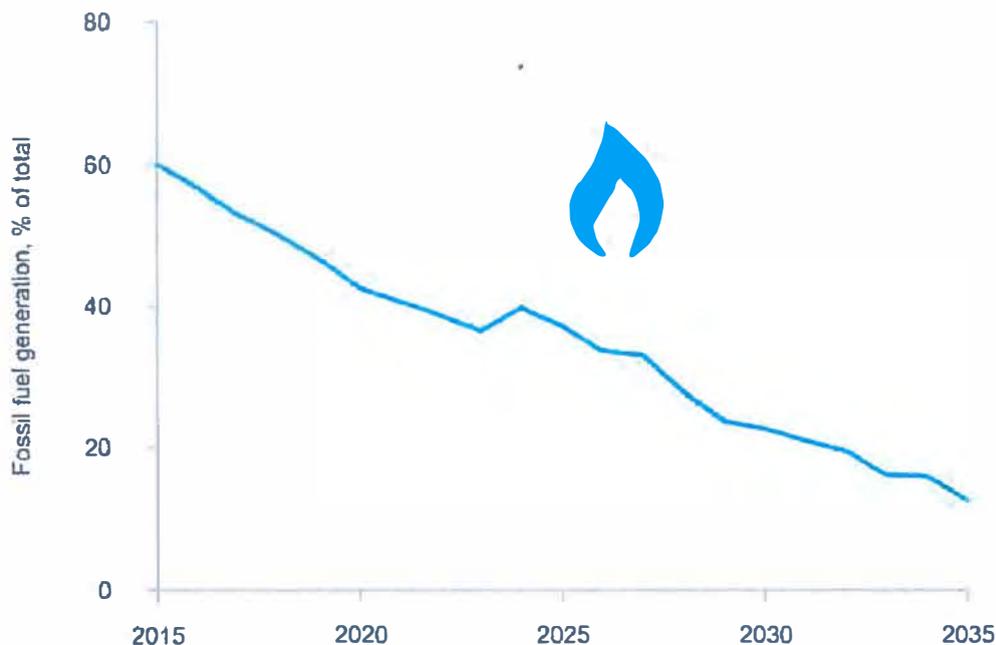
Figure 9: Air Quality & Planning Technical Guide – How it Works.



## 5.5. Emissions from Energy Production and Use

We use electricity and heating in our everyday lives, although most of us are largely unaware of the type of fuel or technology used to generate the electricity or the resulting emissions to the environment. The way in which electricity and heat used in homes and businesses has changed considerably and is set to continue on this journey as Government policy and the need to address climate change concerns drives low-Carbon alternatives. It is predicted that electricity generated from fossil fuels will fall from 60% in 2015 to just 13% by 2035<sup>36</sup> (Figure 10), with greater reliance on nuclear and renewable energy sources. All coal-fired power stations are set to close by 2025, and major power stations in the region such as Ferrybridge C, Eggborough and Drax have either already moved or are planning to move to alternative fuels, such as energy from waste or biomass, although there is likely to be continued investment in gas-fired power generation.

**Figure 10: Projected fall in electricity production from fossil fuels 2015 to 2035<sup>36</sup>.**



In terms of air quality, emissions from large power stations contribute mainly to regional or trans-boundary pollution and are therefore not directly associated with localised hot-spots which cause air quality problems in our town and city centres and near to busy roads. The WYLES focus is therefore to reduce emissions from transport sources, however, we are also aware that the change in energy markets and energy policy can have a knock-effect on local air quality, which we must be mindful of and be prepared for. There are two emerging issues that have the greatest potential to have an adverse impact on air quality: decentralised heat and

<sup>36</sup> [Updated Energy and Emissions Projections 2015, DECC, February 2016](#)

energy production (i.e. combustion processes to generate heat or power near to where people live and work rather than from a regional power-generating station), and the use of some alternative fuels such as biomass, waste and wood-burning, which can give rise to higher particulate and NO<sub>x</sub> emissions when compared to other fuels such as natural gas. The combination of local heat / power generation using a fuel such as biomass, has the greatest potential to adversely impact on local air quality.

In almost all cases the installation of a localised heat or power generating facility, such as a Combined Heat and Power plant (CHP), District Heating Scheme or Short Term Operating Reserve (STOR) facility will require planning permission and the impact of emissions will be fully considered as a part of any planning application process as outlined above. In some cases, such as with some District Heating and CHP Schemes, local authorities themselves will be instrumental in pursuing such developments as part of the wider drive to be more energy efficient, reduce CO<sub>2</sub> emissions and tackle fuel poverty. Where local authorities are directly involved in such schemes we will ensure that the full impacts on air quality are considered at the earliest opportunity as part of any feasibility study.

There has been a recent increase in the number of planning applications for STOR facilities, often multiple diesel generators that can be switched on at short notice under contract with the National Grid to meet a short-term demand for energy. These facilities are a significant concern in terms of air quality, particularly if located near to where people live or work, because particulate and NO<sub>x</sub> emissions can be very high over a short period of time. These facilities also tend to fall outside of other regulatory control such as the need to have an Environmental Permit which applies for larger combustion plant. We believe that these combustion facilities should be subject to the same regulatory control of emissions as other larger combustion processes and will seek to influence and support Government to introduce regulation in this regard. In the meantime, planning applications for STOR facilities will be closely scrutinised as part of the planning application process to ensure air quality concerns are adequately addressed.

In addition to considering emissions from new combustion facilities at the planning application stage, local authorities also have a further regulatory role in relation to controlling emissions and considering chimney heights under Clean Air Act<sup>37</sup>, Environmental Permitting Regulations<sup>38</sup> and statutory nuisance control<sup>39</sup>. Local authorities already widely use these powers to control emissions from domestic, commercial and industrial combustion processes and activities. Local authorities will continue to use these powers to control and contribute to improving local air quality.

In terms of the evolving energy sector it is also worth a note on how hydraulic fracturing (“fracking”) technology in the extraction of shale gas could impact on air quality. There are currently limited studies on the fracking process within the UK although some research<sup>40</sup> suggests that the process does produce emissions such as methane, VOCs, particulates and

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<sup>37</sup> [Clean Air Act 1993](#)

<sup>38</sup> [Environmental Permitting \(England and Wales\) Regulations 2010](#)

<sup>39</sup> [Environmental Protection Act 1990](#)

<sup>40</sup> [A Public Health Assessment of Shale Gas in England, Medact, 2016](#)

oxides of nitrogen which would adversely impact air quality. Areas within West Yorkshire have been identified<sup>41</sup> as having potential shale gas reserves and it would be necessary for any subsequent planning application for exploration or extraction to be fully considered, including any potential impact on air quality, by the relevant minerals planning authority.

As outlined in section 5.1 above, a key feature of the Leeds City Region Strategic Economic Plan 2016 to 2036 is investment in renewable energy, energy efficiency and tackling fuel poverty. Some specific areas which have the potential to support this low emissions strategy are:

- H-21 Project looking into the possibility of using existing gas pipeline infrastructure to transport hydrogen as a fuel to be used in homes, businesses and potential transport fuel resulting in zero emissions at point of use.
- Developing alternative transport fuels and technologies including CNG / LNG, bio-methane, hydrogen and electric vehicle charging infrastructure.
- Incorporating Green Infrastructure (trees and other vegetation) as an integral part of infrastructure projects.
- Improved energy efficiency in businesses.
- Home energy improvements to reduce fuel poverty.

In developing these themes the Leeds Enterprise Partnership will help address air quality and contribute to the objectives of this Low Emissions Strategy.

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<sup>41</sup> [On-shore Licences and Prospective Areas for Shale Gas, DECC](#)

## 5.6. Active Travel: Walking & Cycling

Active travel is cheap, inclusive and accessible, but is also the ultimate “low emission vehicle”. Choosing to walk or cycle instead of getting in the car will not only reduce air pollutants and help with traffic congestion it will also:

- Improve health and well-being for the individual - Inactivity has a health effect comparable in scale to that of air quality. Eliminating inactivity in the UK would cut mortality rates by 7.5%<sup>42</sup>.
- Promote a vibrant local economy.
- Benefit community cohesion.

Figure 11 below shows the economic benefits each year of getting just one child to walk or cycle to school<sup>43</sup>.

**Figure 11 – Illustration of the health benefits from walking and cycling.**



The Government is currently drafting a Cycling and Walking Investment Strategy (CWIS)<sup>44</sup> which outlines a transformational vision with the aim that **“cycling and walking is the natural choice for shorter journeys, or as part of longer journeys”**. The draft CWIS identifies three priority areas (Figure 12):

- Better Safety
- Better Mobility
- Better Streets

<sup>42</sup> [http://www.panorama.am/en/current\\_topics/2015/01/15/inactivity-deaths/](http://www.panorama.am/en/current_topics/2015/01/15/inactivity-deaths/)

<sup>43</sup> Kings Fund infographic 2014

<sup>44</sup> [Draft Cycling and Walking Investment Strategy, Department for Transport, March 2016](#)

**Figure 12: Extract from Department for Transport draft Cycling and Walking Investment Strategy, March 2016**

By 2040 our ambition is to deliver:

**BETTER SAFETY**

*“A safe and reliable way to travel for short journeys”*

- streets where cyclists and walkers feel they belong, and are safe
- reduced community severance
- safer traffic speeds, with 20mph limits where appropriate
- cycle training opportunities for all children

**BETTER MOBILITY**

*“More people cycling and walking – easy, normal and enjoyable”*

- cycling facilities that are recognised by business as in the top ten globally
- urban areas that are considered as amongst the most walkable globally
- dense networks of routes around public transport hubs and town centres, with safe paths along busy roads
- better links to schools and workplaces
- technological innovations which promote walking and cycling
- behaviour change interventions

**BETTER STREETS**

*“Civilised places where people come first”*

- places designed for people, with walking and cycling put first
- improved public realm
- planning for walking and cycling
- community based activities
- a wider green network of walkways, cycleways and open spaces that lets people actively incorporate nature into their daily lives

The Government’s ambition with respect to cycling and walking will help build on the success of the Tour de France *Grand Depart* in 2014 and Tour de Yorkshire in 2015 and the resulting growth of cycling in the region and closely aligns key objectives within the draft West Yorkshire Transport Strategy, including:

- Removing dominance of the car in towns and cities and creating places which are safe and attractive to walk and cycle.
- Building on the City Connect<sup>45</sup> initiative and investment programmes such as the £60m in the Leeds – Bradford Cycle Superhighway.

<sup>45</sup> <http://cyclecityconnect.co.uk/>

- Making it easier for walking and cycling to be an integrated part of longer journeys without having to drive with improvements to transport hubs.
- Introducing traffic calming, pedestrian-friendly initiatives to encourage walking so that this becomes a natural part of everyday journeys to school, work and leisure activities.

We can all make a positive contribution to improve air quality and deliver significant personal health benefits by walking or cycling more as part of our regular travel arrangements. The importance of active travel extends beyond delivering air quality improvements and will be subject to a separate and more detailed ***Cycling and Walking Plan*** to be developed in conjunction with other key stakeholders as a supporting document to the West Yorkshire Transport Strategy to help shape our investment and support for walking and cycling for the future.

## 5.7. Leading by Example

In order to create change it is important that key organisations, including local authorities and other public sectors organisations and socially responsible companies lead by example. Local Authorities in West Yorkshire operate over 3,000 fleet vehicles and are significant employers in the region, generating many thousands of business miles each year and are responsible for spending public money when procurement of goods and services. These represent significant opportunities for influencing change, both within local authority organisations and beyond, including employees and the many private, public and voluntary sector organisations who engage with local authorities on a daily basis.

### 5.7.1. Local Authority Fleet

Although many factors need to be taken into account when deciding what type of vehicle is most suitable for a particular job it is a legal requirement<sup>46</sup> that public bodies must consider the energy and environmental impact that a vehicle will have during the length of its operational life, which include taking into account emissions which impact on air quality. Initial purchase costs for low emission vehicles and associated infrastructure can be expensive relative to conventional vehicles and fuels, however over the life of a vehicle, because running costs are typically much lower for low emission vehicles than conventional equivalents, the whole-life costs can be lower and therefore represent good value to the tax-payer. The Department for Transport has produced guidance<sup>47</sup> on what authorities need to do in order to comply with the Regulations and, as part the WYLES, this Guidance has been used to develop a **West Yorkshire Low Emission Procurement Guide** to assist fleet managers to purchase or lease vehicles having regard to the environmental impacts for the whole life of the vehicle. This Guidance is available as a supporting document to the WYLES.

West Yorkshire local authorities already run a number of electric and electric-hybrid vehicles, but will continue to review their fleets and use the West Yorkshire Low Emission Procurement Guide to determine whether more fleet vehicles should be replaced with low emission and ultra-low emission alternatives.

### 5.7.2. Local Authority Employees

A large number of public sector employees work and live in the region and therefore this presents an opportunity for local authorities and other public sector organisations to support employees to consider their own travel arrangements, whether as part of their commute to and from work, on work activity or in their personal lives, including

- Workplace Travel Plans to encourage the use of public transport and cycling.
- Flexible working arrangements, including home-working and mobile working to reduce the need to travel to workplaces.

<sup>46</sup> The Cleaner Road Transport Vehicles Regulations 2011

<sup>47</sup> <https://www.gov.uk/government/publications/guidelines-for-the-directive-on-the-promotion-of-clean-and-energy-efficient-road-transport-vehicles-2009-33-ec>

- Pool cars to reduce reliance on individual car ownership and use.
- Salary Sacrifice schemes for cycling equipment.
- Car leasing and salary sacrifice for ultra-low emissions vehicles.
- Workplace electric charging points to support EV car use.

### 5.7.3. Local Authority Spending

The purchasing power of the public sector is significant across West Yorkshire, which is an opportunity to influence the providers of goods and services to ensure the vehicles used by the providers emit the lowest possible emissions

Public Sector organisations must follow strict procurement rules, but included within those rules is a duty<sup>48</sup> to consider “social value” as part of the procurement process. This means that when procuring goods and services authorities must take into account social and environmental considerations and can set criteria when awarding contracts and procuring service how these may be improved. The principles of social value have been incorporated into the *West Yorkshire Low Emission Procurement Guide* which provides a scoring matrix which may be used when evaluating tender applications and awarding contracts giving greater weight to those contractors and providers with better environmental credentials, such as low emission transport, the use of ultra-low emission vehicles and membership of an environmental recognition scheme such as Eco Stars.

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<sup>48</sup> The Public Services (Social Value) Act 2012

## 6. Tackling Transport Emissions

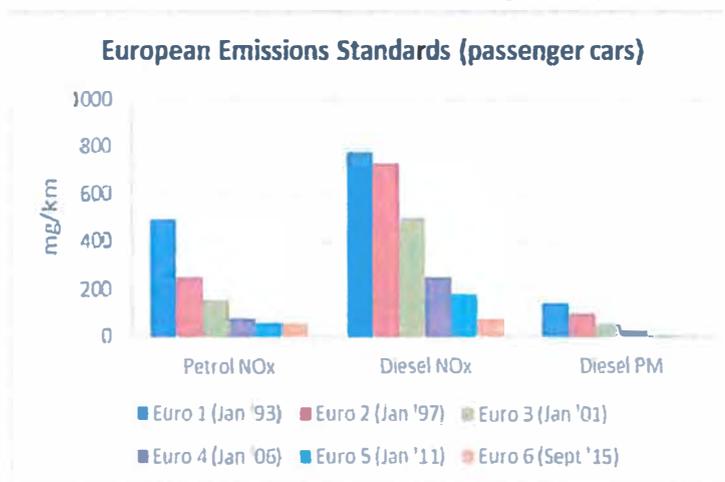
This section sets out the key focus of the West Yorkshire Low Emissions Strategy to reduce emissions from transport over the next five years. After a short introduction into vehicle emissions, each of the main transport modes are considered in turn as part of a **West Yorkshire Vehicle Emissions Plan (WYVeP)**. The WYVeP includes low and ultra-low emission vehicle specific measures that are being developed and implemented in West Yorkshire to accelerate the uptake of cleaner vehicles, including the provision of infrastructure in support of the Leeds City Region Strategic Economic Plan and West Yorkshire Transport Strategy outlined above.

### 6.1. Vehicle Emissions

We normally associate vehicles that either meet or go beyond the latest European Emission Standard (Euro Standard – see section 6.2) as achieving the low emission vehicle status. However, some vehicle emissions are far higher under real-world driving conditions than in official tests and this needs to be recognised when promoting emission standards. The Government defines a low emission bus as meeting Euro VI<sup>49</sup> emission standards while reducing CO<sub>2</sub> emissions by 15% compared with Euro V buses. The Government defines light duty vehicles (cars and LGVs) as ultra-low emission if they emit less than 75 g/km of CO<sub>2</sub>, irrespective of the Euro Standard.

In order for manufactures to sell vehicles within EU Member States they must limit exhaust emissions to a level dictated by the latest Euro Standard, assessed during a standardised test cycle – see Figure 13. It can be seen that diesel cars emit significantly more NO<sub>x</sub> per vehicle than petrol cars. Emissions projections assume the Standards will not be met and there are plans to amend the Euro 6 regulations to use real world testing in the vehicle approval process with the introduction of Euro 6c in 2017 (ICCT 2014)<sup>50</sup>.

Figure 13 – European Emission Standards (Passenger Cars)

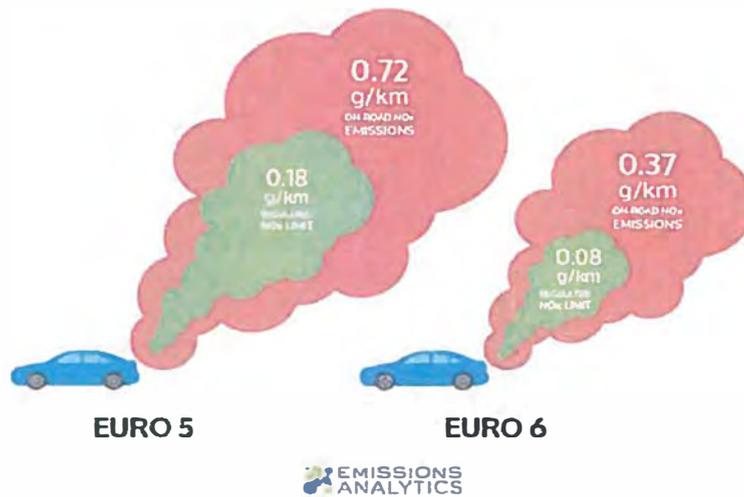


<sup>49</sup> European Emission Standards use normal numbering for light duty vehicles and Roman numerals for heavy duty vehicles

<sup>50</sup> <http://www.theicct.org/real-world-exhaust-emissions-modern-diesel-cars>

Euro 6 and 5 diesel cars have had compliance issues especially with the NOx requirements. Figure 14 illustrates the difference between the test cycle emissions of Euro 5 and 6 diesel cars and their respective real world emissions.

**Figure 14 – Real-world NOx Emissions from Diesel Cars compared with Regulated limits.**



The European Emission Standards for heavy duty vehicles (buses and lorries) are more stringent for Euro VI vehicles compared with previous standards – see Figure 15. Evidence suggests that Euro VI vehicles are demonstrating significant improvements under real world driving conditions.

**Figure 15 – European Emission Standards for Heavy Duty Engines**

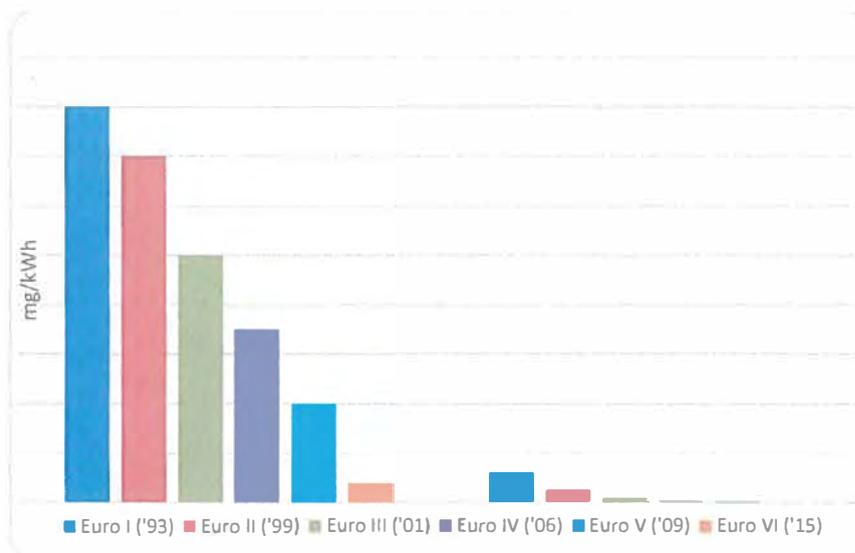
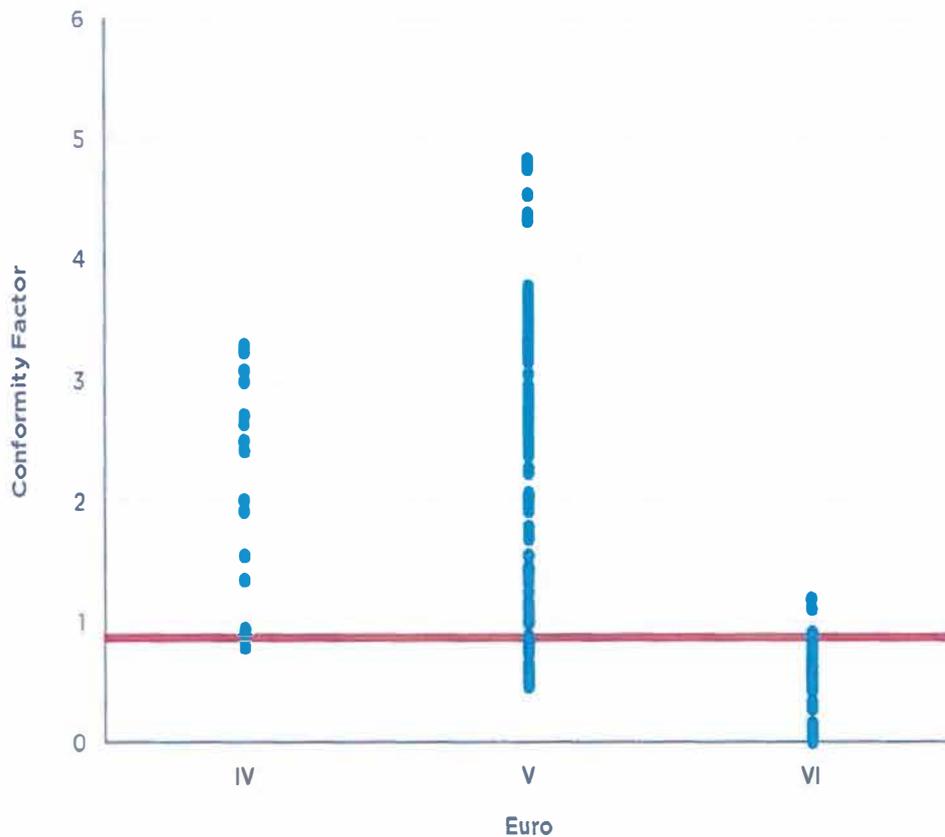


Figure 16 shows the results of conformity tests carried out <sup>51</sup> on heavy duty vehicles with different Euro Standards, including buses and trucks. Each dot represents a real world test. The ‘conformity factor’ is the ratio of the result to the standard limit, so a value of ‘2’ means the vehicle was emitting twice the amount of NOx compared with its Euro standard, and any value under ‘1’ would mean it was cleaner than the Euro standard.

**Figure 16 – Performance of heavy duty engines against Euro Standards (ICCT 2015)**



<sup>51</sup> "Briefing: Comparison of real-world off-cycle NOx emissions control in Euro IV, V, and VI", March 2015, [www.theicct.org](http://www.theicct.org)

## 6.2. West Yorkshire Vehicle Emission Plan (WYVeP)

The West Yorkshire Transport Strategy 2016 – 2036 (draft)<sup>52</sup> provides a strong commitment to improving air quality and health and reducing harmful road transport emissions, including greenhouse gases and noise.

Key WYTS emission policies include:

- *We will adopt and implement the West Yorkshire Low Emission Strategy (WYLES) - and we will look to the WYLES to provide targets for reducing harmful emissions, and in line with the WYLES we will seek to achieve these targets through the appropriate use of technology and encouraging people to switch from their cars to low emission forms of transport for some journeys*
- *Leeds will introduce a Clean Air Zone which will set emission standards for certain types of vehicles permitted to enter the zone, becoming one of the first cities in the country to do so. Leeds may also be required to take additional local action, the extent and details are to be determined but the Leeds Clean Air Zone and additional actions are intended to achieve compliance with the required standards in the shortest timescales possible and by 2020 at the latest. Wider and consistent roll-out of stronger emissions controls will be considered where necessary across West Yorkshire.*
- *We will make significant progress in the electrification of cars, freight and public transport vehicles, by accelerating delivery of recharging infrastructure for electric vehicles and providing facilities for other alternative fuelled vehicles.*
- *We will play our part in creating a low emission future with public authorities leading by example – our District Councils operate over 3,000 fleet vehicles and employ over 30,000 people across West Yorkshire, providing the potential to influence the uptake of low emission vehicles in business operations and in the wider population.*
- *We will implement our draft West Yorkshire Bus Strategy proposals for moving to a clean bus fleet with near to zero emissions.*

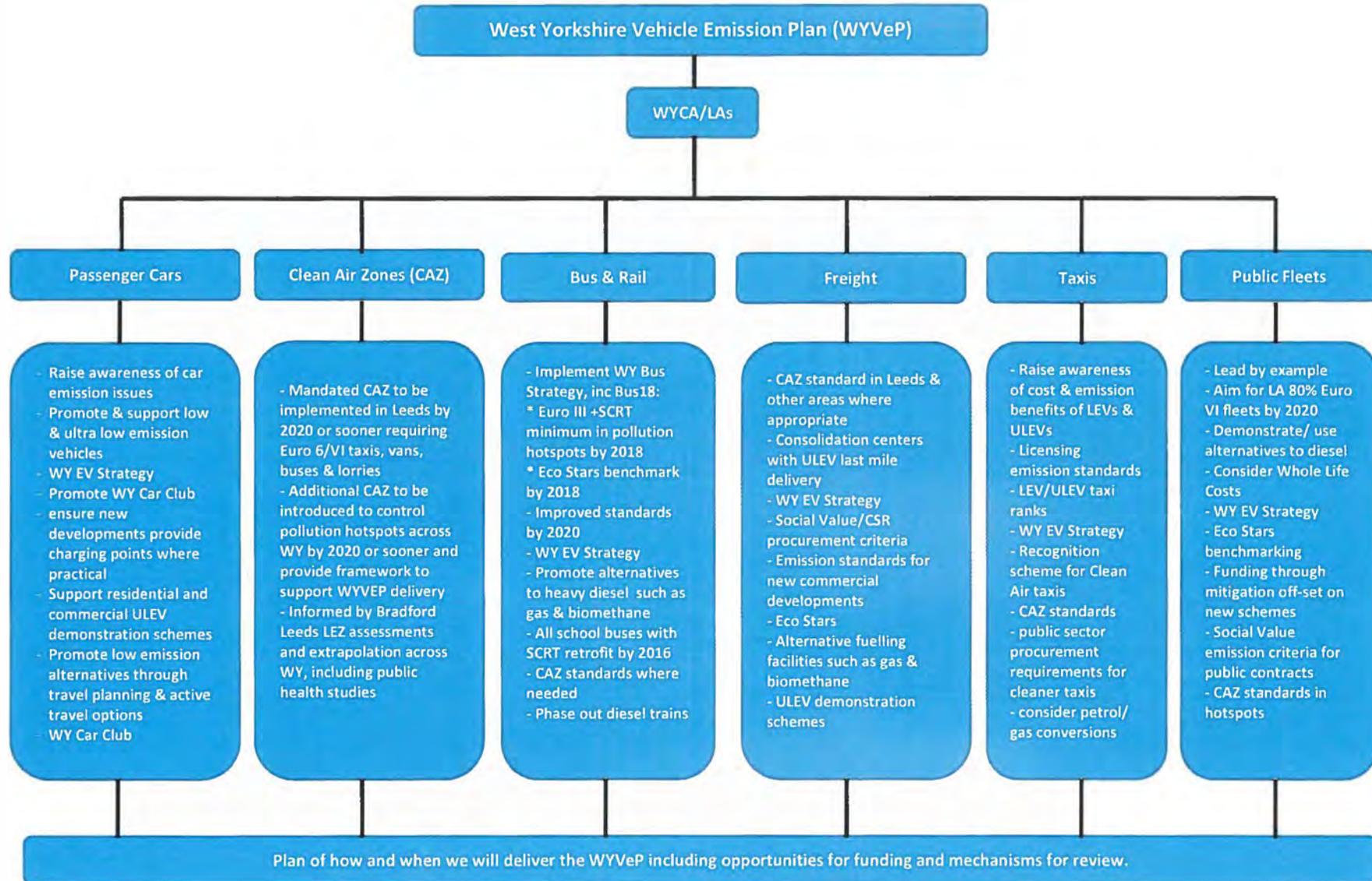
The Transport Strategy outlined above will be informed by this Low Emissions Strategy and the following sections outline vehicle specific measures that will be developed and implemented under a framework called the **West Yorkshire Vehicle Emissions Plan (WYVeP)**. The key features of the WYVeP are outlined in Figure 17 below. While many of the measures covered by the WYVeP have already been, or in the process of being developed and implemented, the Plan provides an overarching structure identifying best practice vehicle emission reduction measures that are appropriate to the challenges we face. The WYVeP outlines roles and responsibilities, delivery mechanisms

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<sup>52</sup> <http://www.westyorks-ca.gov.uk/transport/>

**& opportunities for funding, timescales, engagement and processes for monitoring and review. The Plan will continue to be informed by robust and ongoing research.**

Figure 17 – West Yorkshire Vehicle Emission Plan (WYVeP)



### 6.3. Passenger Cars

The rise in the number of diesel cars on our roads has been a significant factor in why air quality continues to be a cause for concern. In addition to the many areas of work to promote alternative travel modes, such as public transport, walking and cycling a key feature of the WYVeP will be to encourage and support people to switch to low emission vehicles, including the following initiatives:

- **Raise awareness of car emission issues & benefits of alternative fueled cars.**
- **Promote & support low & ultra-low emission vehicles.**
- **Implement West Yorkshire Electric Vehicle Strategy.**
- **Promote West Yorkshire Car Club.**
- **Ensure new developments provide EV charging points where practical.**
- **Support residential and commercial ULEV demonstration schemes.**
- **Promote low emission alternatives through travel planning & active travel options.**
- **Park & Ride / Park & Rail to integrate active travel and ultra-low emission car use as part wider journey planning.**

One of the key reasons that air quality has not improved in line with expectations is the significant increase in diesel car use in the UK. In 2000, around 20% of cars sold were diesel compared with around 60% today<sup>53</sup>. Diesel cars have been promoted as environmentally friendly with generally lower vehicle excise duty (VED)<sup>54</sup>, however, not only are Euro Standards for diesel cars less stringent than for petrol cars but they are now known to emit far more NOx under real world driving conditions than their Euro Standard limit. Further action is needed by Government to look at the incentives provided for diesel cars and their suitability for use in urban areas needs to be questioned.

The WYVeP seeks to raise awareness about the relative emissions of cars and also the total cost of ownership (TCO) of standard technologies compared with alternative fuelled models. Our research<sup>55</sup>, shows that over a 3 year period, including depreciation, electric and hybrid models are likely to cost the motorist less to own.

The WYVeP will support the take up of ultra-low emission vehicles (ULEVs) with the implementation of the *West Yorkshire Electric Vehicle Strategy* (Section 6.4). Plug-in vehicle registrations in West Yorkshire are showing significant growth, albeit from a low base. Figure 18 shows plug-in vehicle registrations by local authority between 2012 and

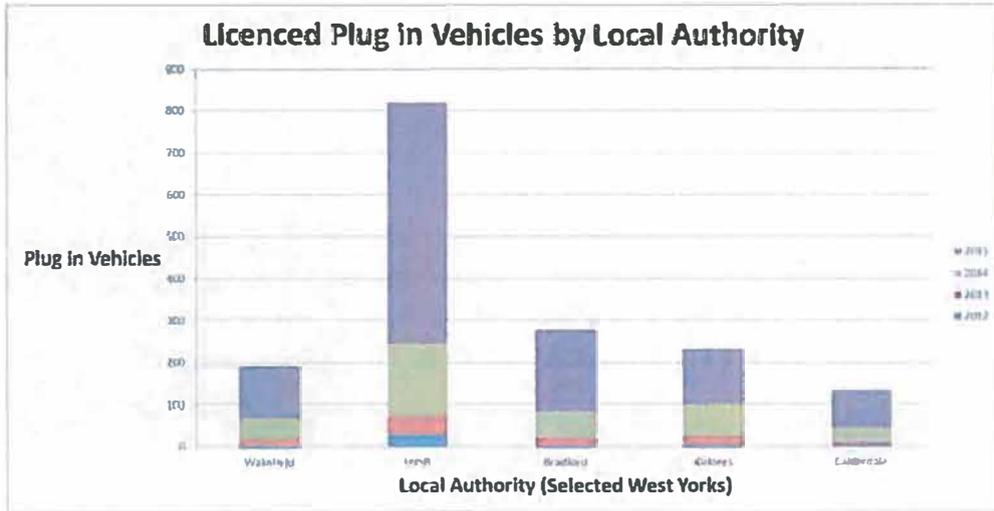
<sup>53</sup> [www.smmmt.co.uk](http://www.smmmt.co.uk)

<sup>54</sup> <https://www.gov.uk/government/publications/vehicle-excise-duty>

<sup>55</sup> Bradford LES update 2016

2015. Data for 2016 indicates that this growth trend is continuing<sup>56</sup>. The number of plug-in model available is increasing<sup>57</sup> while costs are reducing.

Figure 18 – OLEV Plug-in Car Grants 2012-2015



In line with our Air Quality and Planning Technical Guide outlined in Section 5.4 above we will work with developers to provide practical charging solutions and support plug-in vehicle demonstration schemes on new residential and commercial developments.

The Government has pledged that almost all new car and light goods vehicle sales will be zero emission by 2050<sup>58</sup> and will continue to provide a grant of up to £4,500 towards the purchase of ultra-low emission cars, including plug-in vehicles<sup>59</sup> and also provide support for rolling out the charging infrastructure needed to enable take-up<sup>60</sup>.

We will continue to support and expand the **West Yorkshire and York Car Club**<sup>61</sup> and seek to expand on the 8 electric vehicles already available through the Club, increasing the opportunities for users to experience battery technology.



<sup>56</sup> DfT Vehicle Statistics

<sup>57</sup> <https://www.goultralow.com/>

<sup>58</sup> <https://www.gov.uk/government/news/uk-government-pledges-bold-ambition-for-electric-cars>

<sup>59</sup> <https://www.gov.uk/plug-in-car-van-grants>

<sup>60</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/515932/electric-vehicle-homecharge-scheme-guidance-for-customers-2015.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/515932/electric-vehicle-homecharge-scheme-guidance-for-customers-2015.pdf)

<sup>61</sup> <https://www.enterprisecarclub.co.uk/locations/north-east-england/leeds/>

#### 6.4. West Yorkshire Electric Vehicle Strategy

In order to promote and support the take-up of ultra-low emission plug-in vehicles, including cars, taxis and commercial vehicles, we will develop and implement a West Yorkshire wide Electric Vehicle Strategy with the following objectives:

- Support home and workplace charging as the primary charging location utilising the local planning process, business support and private sector investment.
- Creation of a strategic West Yorkshire wide public charge point network that ensures electric car users reach their destination through a simplistic access, usage and payment model.
- Ensure charging opportunities are equitable for residents with and without private driveways.
- Work with developers to support plug-in vehicle demonstration opportunities on new residential and commercial schemes.
- Tackle the perceived and actual barriers to EV ownership through targeted marketing, promotion and information.
- Work with the Leeds City Region Local Enterprise Partnership to help businesses achieve resource efficiency savings and to attract investment in ULEV technology and infrastructure.
- Deliver an exemplary public sector ULEV operation – demonstrating to employees, business and the wider community the benefits and savings of ULEV vehicles and related air quality improvements.
- Seek opportunities for small-scale renewable energy generation to power ULEVs and two-way energy delivery from ULEVs to power homes when appropriate, reducing domestic bills and energy demands on the national grid.
- Support the freight industry to invest in ULEV vehicles, especially in relation to last-mile delivery operations and help with infrastructure installation where possible.



### 6.5. Clean Air Zones (CAZ)

Clean Air Zones will play an important feature of delivering the objectives of this Low Emissions Strategy and allow for a targeted approach to control emissions from certain types of vehicles in specific areas of concern. The key features of how Clean Air Zones will be implemented in West Yorkshire are:

- **Mandated Clean Air Zone in Leeds by 2020 or sooner.**
- **Additional Clean Air Zones in other parts of West Yorkshire by 2020 or sooner where evidence supports the need for implementation.**

Government has set out its plans to improve the UK's air quality, reducing health impacts, and fulfilling its legal obligations<sup>62</sup>. The DEFRA Air Quality Plans sets out an approach for meeting these goals by implementing a programme of Clean Air Zones and that five cities outside London, comprising Birmingham, Derby, Leeds, Nottingham and Southampton will be legally required to introduce Clean Air Zones (CAZ) in the shortest possible time and by 2020 at the latest. DEFRA has identified classes of vehicles that need to be included in the CAZ as set out in Table 7. Leeds will be required to implement a Class C CAZ meaning the types of vehicle falling into Class C will be required to meet a Euro VI Standard for buses, coaches and HGVs and a Euro 6 (diesel) or Euro 4 (petrol) Standard for taxis and LGVs as indicated in Table 8. The DEFRA Plans state that non-compliant vehicles will be required to pay a charge to enter the CAZ, although certain exemptions may be granted for emergency vehicles.

**Table 7 - Clean Air Zone Vehicle Classification**

Clean Air Zone Class	Vehicles included
<b>A</b>	Buses, coaches and taxis (including private hire)
<b>B</b>	Buses, coaches, taxis and heavy goods vehicles (HGVs)
<b>C</b>	<i>Buses, coaches, taxis, HGVs and light goods vehicles (LGVs)</i>
<b>D</b>	Buses, coaches, taxis, HGVs, LGVs and cars

**Table 8 - Clean Air Zone emission standards for vehicle types in Leeds (CAZ Class C)**

Vehicle type	NOx emissions limit
Bus/coaches	Euro VI
HGV	Euro VI
LGVs	Euro 6 (diesel) Euro 4 (petrol)
Taxis	Euro 6 (diesel) Euro 4 (petrol)

<sup>62</sup> <https://www.gov.uk/government/publications/air-quality-in-the-uk-plan-to-reduce-nitrogen-dioxide-emission>

DEFRA will consult with Leeds City Council during 2016 on the approaches by which CAZ duties will be imposed and will make funding available to undertake a more detailed scoping study and implement the CAZ. The area identified for the Leeds CAZ will be the Outer Ring Road area, however, a scoping study will be undertaken prior to formal Clean Air Zone implementation to ensure issues such as traffic and vehicle displacement can be effectively addressed. This will avoid creating new problem areas and can take account of expected growth in and around the key locations. It should be noted that while the DEFRA Plans appear prescriptive, they also state that the final class of the mandated CAZ to be implemented and the area that it should cover will be based on the scoping study findings.

DEFRA are in the process of developing a National Clean Air Zone Framework and any local authority may consider implementing a CAZ by 2020 or sooner where air quality, caused by road transport emissions, is an issue. It is envisaged that 'voluntary' CAZ will retain more flexibility in the types of vehicles included and the emission standards they are required to meet. Additionally, the CAZ framework may be used to include wider measures to support the uptake of ultra-low emission vehicles.

To ensure that there is a clear and consistent approach to implementing and enforcing CAZ in West Yorkshire, the WYCA, in partnership with the district authorities will develop and adopt agreed shared policies and actions for Clean Air Zones in specific and suitable locations.

## 6.6. Buses and Trains

The key features of the WYVeP to reduce emissions from buses and trains are:

### Buses

- **Implement the West Yorkshire Bus Strategy, including Bus18 Project.**
- **Buses to meet minimum Euro III + SCRT abatement technology in pollution hotspots by 2018.**
- **Leeds CAZ and other CAZ areas where necessary to control bus emissions standards.**
- **Eco Stars benchmark by 2018.**
- **Improved bus emissions standards by 2020.**
- **Links with the West Yorkshire Electric Vehicle Strategy to promote electric and hybrid bus technology.**
- **Promote alternatives to diesel such as gas & biomethane.**
- **All Metro school buses retrofitted with SCRT abatement technology by 2016.**
- **Improved Park & Ride Facilities with EV charging infrastructure.**

### Trains

- **Phase out older diesel trains and expand electrification of the West Yorkshire rail network.**
- **Increased capacity on the rail network.**
- **Increased Park & Rail provision.**
- **EV Charging points at railway stations.**

#### 6.6.1. Buses

We recognise the vital role that public transport plays in our everyday lives and buses and trains provide efficient transport modes and an alternative to private vehicle use and potential for reducing congestion. We also understand that older buses and trains can cause significant emissions. Bus emissions in Bradford were found to be responsible for around 40% of NO<sub>x</sub> emissions in the Inner Ring Road area<sup>63</sup>. Table 10 shows the bus emission profile of West Yorkshire buses in 2015.

Figures 20 and 21 show the relative emissions of buses by Euro Standard travelling at urban speeds. It can be seen that Euro V buses tend to emit more NO<sub>x</sub> than Euro IV buses due to the ineffective operation of their NO<sub>x</sub> catalysts at low speeds when the exhaust temperature is insufficient. This can be addressed by retro-fitting thermal management technology.

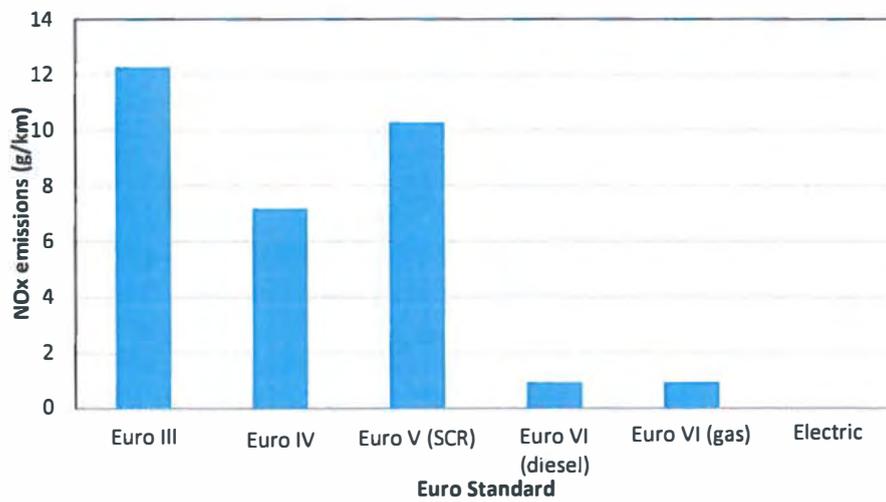
Figure 22 illustrates the greenhouse gas emissions of diesel and alternative fueled buses.

<sup>63</sup> Bradford Leeds LEZ Feasibility Study 2014/15

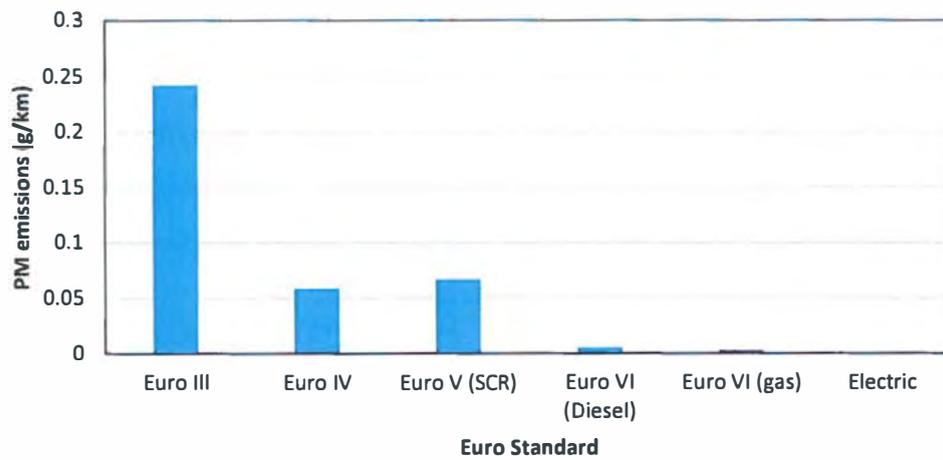
**Table 10 – West Yorkshire Bus Fleet by Euro Standard (2015)**

Euro Standard	% Emissions in West Yorkshire
Euro I	1.2
Euro II	25.3
Euro III	20.8
Euro IV	27.3
Euro V	24.4
Euro VI or equivalent <sup>64</sup>	1.0

**Figure 19 – NOx emissions of buses by Euro Standard and fuel type (at 18 km/hr)**

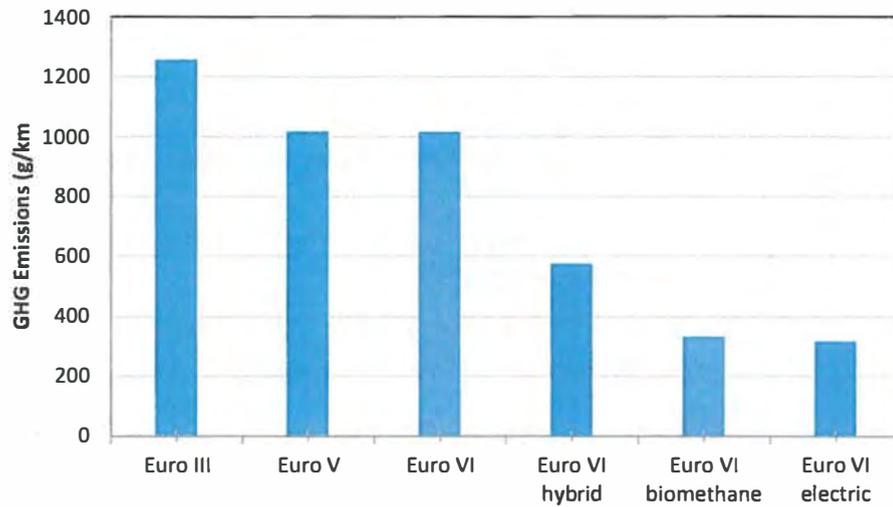


**Figure 20 – PM emissions of buses by Euro Standard and fuel type (at 18km/hr)**



<sup>64</sup> Includes hybrid buses

**Figure 21 – Green House Gas (Well to Wheel) emissions of buses by Euro Standard and fuel type**



There has been considerable activity in West Yorkshire to improve bus emissions, including:

- “Yellow” school buses go green by fitting NOx and Particulate abatement technology to reduce exhaust emissions – resulting in older buses now achieving EEV<sup>65</sup> emission standards and protecting the health of children. The West Yorkshire school bus fleet is now one of the cleanest in the country<sup>66</sup>.
- Arriva has introduced 12 hybrid buses and FirstGroup introduced 22 hybrid buses in the region, with further hybrid buses being introduced in Bradford and Calderdale.
- Bradford Council has worked with FirstGroup and Transdev to fit NOx and Particulate exhaust abatement technology on 25 buses operating on urban routes resulting in at least 90% of buses going to the Bradford interchange being Euro IV or better by 2016<sup>15</sup>.
- Leeds City Council has secured Government funding to introduce 10 low emission buses on park & ride sites.

As part of the West Yorkshire Transport Strategy we will develop and implement a **West Yorkshire Bus Strategy**, including the following environmental policies:

- A bus fleet that has a positive impact on health and environment, with consistent year-on-year emission improvements.
- To meet the legal health standards for air quality by ensuring older buses are modernised or replaced through investment to reduce local emissions.
- All vehicles new to West Yorkshire would be required to meet at least the latest environmental standard as a minimum.

<sup>65</sup> Environmentally Enhanced Vehicle

<sup>66</sup> Based on PEMS testing in Bradford and Leicester on Euro III retrofitted buses a NOx emission improvement of 70% to 96% may be expected. Particulate matter reductions of 40% to 60% were also reported

- New vehicle technologies which move towards near to zero vehicle emissions will also be encouraged.
- Support to establish and comply with Clean Air Zones across West Yorkshire.
- Raising public awareness around bus emission standards.

The Bus Strategy includes the **Bus 18** project aimed at providing a step change in bus services by 2018, including the following initiatives to reduce emissions:

- Commercial bus services operating in pollution hotspots across West Yorkshire will be required to retrofit all pre-Euro IV buses with NOx and Particulate abatement equipment by 2018.
- Bus operators will introduce benchmarking, including emission performance, through the Eco Stars scheme by 2018.

Further emission improvements will be required by 2020 or sooner when CAZ standards will be introduced in Leeds and in other locations where needed.

While we will continue to work with bus operators to progressively reduce harmful emissions from buses we will also seek to promote the greenhouse gas benefits of moving away from diesel to alternatively fuelled buses such as bio-methane and electric technologies.

We will build on the experience of other towns and cities in supporting diesel alternatives. Biomethane buses have been successfully rolled out in Sunderland, Darlington, Reading, Beccles, Runcorn and Bristol and both Bristol and Nottingham, 2 of the 4 Ultra Low Emission Cities in the UK have plans for significant growth in bio-methane buses. Cities such as London, Nottingham, Milton Keynes and Coventry have successfully introduced electric buses. While the capital cost of these buses is higher than standard diesel buses, there can be significant fuel and maintenance savings that can provide overall savings to operators. The benefits of both these technologies are highlighted below:

#### **Biomethane Buses**

- Runs on compressed gas, tanks on roof.
- Spark ignition engine
- Very high GHG savings
- No range limitation
- Filling station required, economies of scale favour larger projects
- Significant operational savings



### Electric Buses

- All electric operation
- Zero tailpipe emissions
- Limited range – more suited to urban routes
- Operational savings
- Choice of infrastructure – overnight charging to inductive and/or rapid charging (more expensive)



### 6.6.2. Trains

Diesel trains emit high levels of particulates and NO<sub>x</sub>, however, when considered on the basis of pollution per passenger per kilometre travelled, emissions are much less than other forms of transport including diesel cars and buses. Trains are therefore part of the solution to reducing transport related emissions. This is not to say that trains do not produce emissions, such as NO<sub>x</sub>, particulates, CO<sub>2</sub> and noise, with emissions from trains being most significant at train stations in urban locations such as Leeds and Bradford train stations. Therefore, any action to reduce emissions from trains will benefit air quality and the quality of our environment.

The impact of trains on local air quality varies according to the type of rail vehicle in use. Older trains emit more pollution so renewing train fleets will help reduce emissions. Electric vehicles impose minimal impact on local air quality compared to diesel trains and therefore the most effective way to ensure that trains do not contribute to local air quality problems and reduce passenger exposure is to support calls for electrification of the regional rail network. Electric trains are also able to have more seats than a diesel equivalent, increasing much needed capacity on the railway network.



The procurement and deployment of rail rolling stock is generally determined at a national level as part of the rail franchising process. As with bus operations, WYCA is the lead organisation at a regional level which engages with train operating companies and Network Rail. Acting through Rail North, WYCA is seeking to influence decisions regarding rail rolling stock and to advance the process of replacing older, more polluting trains with newer, cleaner rolling stock.

Whilst electric trains operate between Leeds and Wakefield, and connect Leeds and Bradford with Shipley, Keighley, Skipton and Ilkley, the remainder of the West Yorkshire rail

network is operated by diesel trains. Many of the diesel rail vehicles in use in West Yorkshire are over 30 years old and do not benefit from modern engine technologies. Incremental improvements in emissions can therefore be obtained by replacing older diesel vehicles with electric trains or cleaner, newer diesels.

Electrification of the trans-Pennine rail route between York, Leeds, Huddersfield and Manchester planned for 2019/20 will replace diesel vehicles with electric providing a commensurate benefit to air quality. Further electrification is subject to funding however the Leeds – Harrogate and Leeds, Bradford, Halifax lines are high in the regional priority for electrification in the early 2020s<sup>67</sup>.

In addition to the plan to electrify more of the rail network, plans to replace older diesel trains are included in the revised Northern and trans-Pennine rail franchises which will start in 2016. These plans involve the replacement of the older “Pacer” trains with brand new diesel vehicles with improved emission control. It is anticipated that the new rolling stock will be in service from 2019 onwards.

In addition to the work to rolling stock and increased electrification of routes, improvements will also be undertaken to integrate the use of trains as part of wider journey planning, including:

- Increased capacity for Park & Rail.
- EV charging points at railway station car parks.
- Improved cycle facilities.



This modernisation of the regional rail network will improve capacity and will help more journeys to be made by public transport and bring commensurate benefits to air quality.

<sup>67</sup> [https://www.networkrail.co.uk/North\\_West\\_electrification.aspx](https://www.networkrail.co.uk/North_West_electrification.aspx)

## 6.7. Freight

The key features of the WYVeP to reduce emissions from freight are:

- **Clean Air Zone standard in Leeds & other areas where appropriate.**
- **Introduction of Eco Stars Fleet Recognition Scheme**
- **Procurement practice to support low emission fleets.**
- **Minimum Euro emissions standards for new commercial developments.**
- **Alternative fueling facilities such as gas, bio-methane and hydrogen.**
- **Integration with electric vehicle strategy including ULEV demonstration schemes.**
- **Consolidation centres to remove HGVs from towns and cities.**

Freight represents a low proportion of traffic flows at around 8% of traffic in the West Yorkshire region<sup>68</sup>, but produces a disproportionate amount of emissions. Road freight is not just about Heavy Goods Vehicles (HGVs), Light Goods Vehicles (LGVs) such as vans have seen significant growth, rising by 46% between 2000 and 2009.

West Yorkshire is a prime location for the distribution of goods, having an excellent strategic road network from North to South (M1 and A1) and East to West (M62). It is not surprising that many distribution centres and logistics operators are located within the region, with the freight sector contributing about 25% of the region's economy. Road freight is the most used mode for freight movements in West Yorkshire, moving around 1,900 million tonnes of freight in West Yorkshire (2008 data). Motorways account for the majority of freight trips by length of journey, specifically the M1, M621 and M62. Freight can account for up to 16% of traffic flows by mode on the motorway network<sup>69</sup>.

The West Yorkshire Transport Strategy recognises the importance of the freight sector to the West Yorkshire economy and also recognises the disproportionate contribution that road freight has in terms of emissions compared with non-road freight. The WYLES supports the Transport Strategy by promoting actions to reduce emissions from freight and commercial vehicles.

Freight and commercial activity is potentially one of the most difficult for local authorities to directly influence, given that decisions in relation to the procurement of fleet vehicles is entirely a commercial decision. However, commercial organisations are required to report on CO<sub>2</sub> emissions through Corporate Social Responsibility (CSR) requirements and are encouraged to reduce their emissions and we will seek to support commercial operators in reducing transport emissions.

Examples of what can be done include:

- **Restricting access to older, high emission HGVs and LGV in Leeds and other areas where necessary through the introduction of Clean Air Zones.**

<sup>68</sup> West Yorkshire Freight Study 2010

<sup>69</sup> West Yorkshire LTP Freight Strategy 2012

- Seeking opportunities to increase the take-up of alternative fuels and technologies by HGV and LGV operators, for example a recent Gas Infrastructure Feasibility Study commissioned by Wakefield Council found that three strategic LNG/CNG gas refueling stations could be supported at key locations near to the M1 (j41), M62 (j30) and the A1 (Barnsdale Bar) highway networks. Both Leeds and Bradford are looking at plans for gas refueling facilities.
- Promote electric vehicle infrastructure through the WY Electric Vehicle Strategy.
- Promote Sustainable Emission Criteria in public sector and Corporate Social Responsibility (CSR) purchasing decisions.
- Minimising emissions in urban areas from HGVs and LGVs – the so-called “last mile” of deliveries – for example through the use of freight consolidation centres.
- Using the West Yorkshire Air Quality & Planning Technical Guide to ensure new commercial developments incorporate facilities for ultra-low emission vehicles, such as electric charging points and minimum Euro emission standards for fleet vehicles.
- Introduce the Eco Stars fleet emission recognition scheme<sup>70</sup> across West Yorkshire, supporting fleet operators to reduce emissions through upgrading to new vehicle technology, improved driver training and fuel management.
- Working with commercial fleet operators to use whole-life costing during vehicle procurement to promote the economic as well as environmental and health benefits from low emission HGVs and LGVs.
- Encourage more freight to be transported by rail for long-haul journeys.
- Exploring the potential for the regions’ canals and waterways for the transport of goods.



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<sup>70</sup> <http://www.ecostars-uk.com/>

## 6.8. Taxis

The key features of the WYVeP to reduce emissions from taxis are:

- **Clean Air Zone standard in Leeds & other areas where appropriate.**
- **Raise awareness of cost & emission benefits of low emission / electric taxis.**
- **Integration with electric vehicle strategy including ULEV demonstration schemes.**
- **Using taxi licensing to raise emission standards.**
- **Dedicated taxi charge points / ranks for electric / hybrid taxis.**
- **Recognition scheme for clean air taxis**
- **Public sector procurement of transport / taxi services to raise emissions standards.**
- **Support for taxi industry to transfer to low emission alternatives.**

The majority of taxis in West Yorkshire, both Hackney Carriages and private hire vehicles (PHV) are diesel cars, however, there has been a significant rise in the use of petrol hybrid models in the PHV fleet. West Yorkshire was awarded funding by OLEV<sup>71</sup> to undertake an Ultra-Low Emission Taxi feasibility Study through the Energy Savings Trust (EST).

The Study highlighted the need for raising awareness of the emission and cost benefits of ultra-low emission taxis and reinforced the need for taxi licensing authorities to set emission standards as part of licensing requirements. Taxis accessing the Leeds CAZ will be required to meet a Euro 6 diesel or Euro 4 petrol standard by 2020 or sooner.

We will pursue funding opportunities to support taxi drivers and operators to switch to ultra-low emission vehicles through measures in the West Yorkshire Electric Vehicle Strategy, including increased provision of dedicated fast and rapid charging facilities for taxis. We will also investigate the potential for converting petrol taxis to run on liquid petroleum gas (LPG), natural gas or biomethane.

We will investigate the potential to encourage low and ultra-low emission taxi take-up by introducing Clean Air Taxi Ranks and a Clean Air Taxi Recognition Scheme.

We will introduce emission criteria as part of public sector procurement of taxi services.

We will engage with taxi App providers such as UBER to require emission standards.

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<sup>71</sup> Office for Low Emission Vehicles

### 6.9. Public Sector Fleets

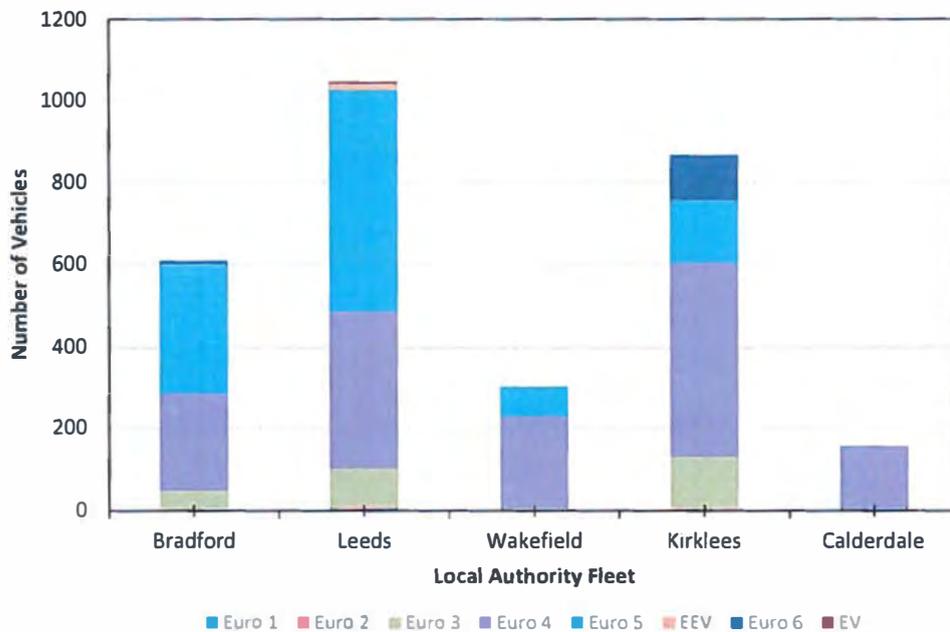
The key features of the WYVeP to reduce emissions from public sector fleet vehicles are:

- **Compliance with Clean Air Zone standards.**
- **Aim for 80% of local authority fleet vehicles to be minimum Euro VI by 2020.**
- **Demonstrate / use alternatives to diesel, such as electric, CNG, bio-methane and hydrogen.**
- **Procurement Guide to consider Whole Life Costs and support low emission alternatives.**
- **Integration with electric vehicle strategy including ULEV demonstration schemes.**
- **Early adoption of the Eco Stars fleet recognition scheme**
- **CAZ standards in hotspots**

Local authority fleet operations are an ideal opportunity to ‘lead by example’ and influence public vehicle purchasing decisions.

West Yorkshire local authorities currently operate approximately 3,000 fleet vehicles of which the overwhelming majority are diesel vehicles of varying Euro Standard (see Figure 22).

**Figure 22 - West Yorkshire Local Authority Fleet – vehicles by Euro Standard<sup>72</sup>**



<sup>72</sup> Note – data for Kirklees is 6 months ahead of the data provision by other councils

The fleet emission profile of purchased vehicles tends to be below that of leased fleet vehicles. Based on fleet replacement programmes it is anticipated that around 80% of local authority fleets will achieve a Euro 6/VI Standard in 2020.

All West Yorkshire Authorities have demonstrated low emission vehicle alternatives and some are beginning to look at more intensive fleet transformation to use cleaner fuels and technologies.

The Cleaner Road Transport Vehicles Regulations 2011 require public sector organisations to consider the energy use and environmental impact of vehicles they buy or lease. A key concept of the Regulations is the consideration of whole-life costs whereby the operational costs over a vehicle life, including pollution damage costs, are taken into account rather than just the purchase price. This helps to redress the issue of low emission vehicles costing more than conventional vehicles, while potentially having lower operating costs that outweigh the purchase increment.

In order to achieve compliance with the above Regulations and to support local authority procurement teams a ***West Yorkshire Low Emission Procurement Guide*** has been produced as a supporting document to the WYLES.

As part of the WYLES project, a public sector fleet benchmarking exercise was also carried out to identify the barriers and potential opportunities for reducing emissions from local authority fleet operations. Local authorities will continue to share knowledge and seek opportunities to establish best practice by regularly appraising available low emission vehicle alternatives to standard technology, demonstrating suitable low emission vehicles and incorporating whole life cost considerations into procurement processes. This will include:

- Early introduction of the Eco Stars fleet recognition scheme, with a commitment to continuous improvement to raise emission standards.
- Consideration of alternative fuels and technologies including electric, hybrid, CNG, bio-methane and hydrogen vehicles.
- Working with other fleet operators to increase the viability of alternative refuelling infrastructure.
- Linking in with the West Yorkshire Electric Vehicle Strategy to promote EV use within fleet operations.
- Reducing emissions from “grey fleet” vehicle used by local authority staff.

## 7. Funding & Delivery of the West Yorkshire Low Emissions Strategy

The West Yorkshire Low Emissions Strategy will be delivered and funded by making the best possible use of the existing resources that are available and by working across the West Yorkshire area, together with our partners, to tap into new funding streams. Funding to support the WYLES will include:

- West Yorkshire Transport funding.
- Growth Deal funding.
- Public Health funding.
- Development schemes and developer contributions through s106 agreements and Community Infrastructure Levy.
- Grants from Government Departments and other bodies, such as Clean Vehicle Technology Fund; Office for Low Emission Vehicle (OLEV) funding; DfT Cycling and Walking Investment funding etc.
- Joint-working, partnerships with, and investment from other public bodies and private organisations, for example to deliver infrastructure investment.

Delivery of the WYLES will be overseen by the West Yorkshire Transport & Health Board, which has representation from Public Health England, West Yorkshire Combined Authority and West Yorkshire district Environmental Health professionals and will in turn report on progress through the governance arrangements of the West Yorkshire Combined Authority.

The West Yorkshire local authorities will also use this Low Emissions Strategy to help fulfil their obligations to tackle air quality at a local level and develop individual Air Quality Action Plans (AQAP) for Air Quality Management Areas in the region and report on progress through the Annual Status Reports (ASR), which local authorities must provide to central Government and make available to the public.

## List of Abbreviations

ASR	Annual Status Report
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
CAZ	Clean Air Zone
CHP	Combined Heat and Power
CNG	Compressed Natural Gas
COMEAP	Committee on the Medical Effects of Air Pollutants
COPD	Coronary Obstructive Pulmonary Disorder
CSR	Corporate Social Responsibility
CVD	Cardio-vascular Disease
DEFRA	Department for the Environment and Rural Affairs
DfT	Department for Transport
EEV	Enhanced Environmentally friendly Vehicle
EST	Energy Savings Trust
GHG	Greenhouse Gases
ICCT	International Council on Clean Transportation
ICE	Internal Combustion Engine
LAQM	Local Air Quality Management
LEV	Low Emission Vehicle
LEZ	Low Emission Zone
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
LTP	Local Transport Plan
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Oxides of Nitrogen (including Nitric Oxide (NO) and Nitrogen Dioxide (NO <sub>2</sub> ))
NPPG	National Planning Policy Guidance
NPPF	National Planning Policy Framework
OLEV	Office for Low Emission Vehicles
PHE	Public Health England
PHV	Private Hire Vehicle
PM <sub>n</sub>	Particulate Matter with a diameter of “n” (usually in microns) including PM <sub>10</sub> , PM <sub>2.5</sub> and PM <sub>0.1</sub> .
QALY	Quality Adjusted Life Year
SCRT	Selective Catalyst Reduction combined with Continuously Regenerating Trap (exhaust emissions abatement technology)
SEP	Leeds City Region Strategic Economic Plan
STOR	Short Term Operating Reserve
TCO	Total Cost of Ownership
ULEV	Ultra Low Emission Vehicle: vehicles which emit very low emissions (usually referred to in g/km Carbon) and used to determine eligibility for plugged in grants: <a href="https://www.gov.uk/plug-in-car-van-grants/overview">https://www.gov.uk/plug-in-car-van-grants/overview</a>
VED	Vehicle Excise Duty
VOCs	Volatile Organic Compounds
WHO	World Health Organisation
WYCA	West Yorkshire Combined Authority
WYVeP	West Yorkshire Vehicle Emissions Plan

