Calderdale MBC

Wards Affected **All**

9

Cabinet **12th February 2018**

Low Emissions Strategy and Action Plan

Joint Report of the Director, Regeneration and Strategy and Director, Public Health

1. Purpose of Report

1.1 The purpose of this report is to agree the Low Emission Strategy 2018-2023, attached as Appendix 1 and agree the Air Quality Action Plan, attached as Appendix 2, for consultation.

2. Need for a decision

2.1 Members are asked to agree drafts of the *Calderdale Low Emission Strategy* and high level outcomes and to agree the *Air Quality Action Plan* for public consultation.

2.1.1 This is a new strategy for Calderdale Council and seeks to provide a policy framework and action plan to address the air quality issues in the borough.

2.1.2 These documents have policy and financial implications and require Cabinet approval. The Air Quality Action Plan is a legal requirement.

2.1.3 The Strategy will enable the Council to fulfil its responsibility to support reduction in air pollution and compliance with both EU and UK Directives and to protect public health.

3. Recommendation

It is recommended:

3.1 That Cabinet approves the Calderdale Low Emissions Strategy and Air Quality Action Plan for consultation.

3.2 That Cabinet receive a further report on the results of consultation prior to final approval of the documents.

4. Background

4.1 Most of the UK's current air quality requirements under the law come from the European Union. While the government has indicated that it would continue with current air quality standards after Brexit, the UK, alongside a number of other EU countries, has not met current standards since 2010. The government continues to face sanction from the EU and legal action from organisations such as Client Earth.

4.2 A consistent approach from central government has been to emphasise the role of Local Authorities in delivering on air quality objectives, and indeed their potential culpability if targets are not met. Whilst major strategic approaches to tackling air pollution from vehicles undoubtedly requires national action, this report introduces potential local measures that can help deliver cleaner air in Calderdale.

4.3 While ambient monitoring in Calderdale indicates that levels of 'particulate matter' are compliant with air quality objectives, the annual mean objective for nitrogen dioxide is currently (2017) being exceeded in seven areas of the Borough. These areas have been declared Air Quality Management Areas (AQMAs) and in each AQMA road traffic is the major contributor to the levels of nitrogen dioxide.

4.4 Calderdale's 5 year Low Emission Strategy's aim is to ensure that we improve the air quality in Calderdale to protect both public health and our environment. The evidence points[i] to vehicle emissions as the most significant contributor to poor air quality in Calderdale. For this reason Calderdale's strategy focuses on reducing the volume of traffic, improving the flow of traffic and reducing transport vehicle emissions at source. This will require:

- a significant investment in public transport and infrastructure to support active travel;
- better use of our highway capacity;
- development of a 'smart system';
- introduction of cleaner technologies and supporting infrastructure;
- and crucially commitment from multiple organisations and the communities of Calderdale.

It will also need continuing complementary action by central government to use policy and spending to accelerate the introduction of cleaner vehicles with less harmful emissions. At the same time individuals and communities will need to make choices to embrace less polluting means of transport.

4.5 The Low Emissions Strategy complements the Calderdale Transport Strategy and ambitions for sustainable growth as set out in the Local Plan. It also addresses the need to comply with EU directives and UK Air Quality objectives.

4.6 The aim of Calderdale's Air Quality Action Plan 2017 is to identify the specific actions required to deliver against the objectives set out in the Strategy. The previous Action Plan (2009) does not cover all the AQMAs and required revision. Calderdale Council will use its existing powers and work together with other agencies, organisations and the local communities in pursuit of the achievement of

air quality objectives in the declared Air Quality Management Areas (AQMAs) within the district.

4.7 Together, the Low Emission Strategy and the Air Quality Action Plan sit within a wider strategic context which will support delivery of the objectives.

4.8 The success of this strategy will depend on good governance and a firm commitment across the Council to adhere to the policy whenever practical. Officers are working to understand the detailed implications of delivering against the objectives outlined in these reports. Progress will be monitored by the Air Quality Steering Group and there is clearly a role for Scrutiny Panels.

5. Options considered

5.1 In 2009, Calderdale had three declared AQMAs. There are now seven. Not acting now will lead to levels of pollution in the Borough remaining above the air quality objectives. This may result in adverse economic, environmental and public health consequences. Supporting and monitoring the delivery of this strategy and action plan will ensure that we are using the available knowledge and technology available to us to reduce the impact of vehicle emissions and protect public health and our environment.

5.2 To not act, may result in the problems in the AQMAs being exacerbated and non-compliance with EU and UK Directives.

6. Financial implications

6.1 The introduction of the measures as outlined in the attached reports will have a capital and revenue implication. Officers are working to understand the deliverability and affordability of these measures. Many of the measures are an adaptation of practices and a re-focusing of resources rather than new investment. Funding for any significant expenditure will be sought from 3rd party investment or if necessary, brought back to Cabinet for further consideration. The Council has access to very significant capital spending opportunities through the West Yorkshire Transport Fund and it is essential that these funds are used, inter alia, to take forward the proposals in the attached documents.

6.2 Whilst planning and engineering budgets and outcomes can adapt to support this strategy additional resources are likely to be needed to engage residents and the business community to ensure that there is a high level of awareness and ownership of the issue leading to a change in travel behaviour. Without this additional resource, policies and interventions can align with the strategy but the necessary improvements to air quality will likely be delayed. No additional resources are sought however at this stage and this issue will be addressed further in the report back to Cabinet after consultation.

7. Legal Implications

7.1 Since the subject matter relates to statutory requirements, it is not only important that those requirements be fulfilled, but also that the process of achieving this is compliant. This means that the Council has to do the appropriate consultations.

8. Consultation

8.1 The 1995 Act provides the statutory basis for consultation and liaison in respect of Local Air Quality Management (LAQM). Defra (for England authorities, outside of London) is the key statutory consultee under LAQM. Schedule 11 of the 1995 Act also requires local authorities to consult the following:

- Environment Agency;
- Highways England;
- All local authorities neighbouring the local authority in question;
- Any National Park authority as appropriate;
- Other public authorities as appropriate; and
- Bodies representing local business interests and other organisations as appropriate.

8.2 Much of the reporting process under the Environment Act has now been superseded by changes implemented via the Deregulation Act 2015 (e.g. removal of Further Assessments) and the LAQM review. As such, local authorities in England are required to consult on the following:

- Annual Status Report (ASR) - including review and assessment of air quality, progress on Action Plan measures and decisions to declare, revoke or amend (subject to the degree of amendment) AQMAs; and
- Preparation or revision of an Air Quality Action Plan;

8.3 Local Authorities are encouraged to consult widely and consider innovative approaches to engage with their local area. In determining how to consult, local authorities are likely to have regard to the Consultation Principles15 issued by the Cabinet Office.

9. Environment, Health and Economic Implications

9.1 The implications are discussed in detail in Appendix 1: the Calderdale Low Emission Strategy;

10. Equality and Diversity

10.1 The outcomes of this work will not discriminate against any one individual or group but will improve the air quality for all residents and visitors to Calderdale.

11. Summary and Recommendations

11.1 Calderdale Council has a statutory obligation to develop a process for reducing air pollution. The Council has a robust policy framework which sits well within a National Framework for delivering against the objectives in this strategy. The challenges are significant but must not be shied away from if we are to reduce emissions and protect the health and well-being of our communities. The context within which we are delivering against these objectives is favourable.

11.1.1 We are undertaking massive capital expenditure on our highway network and this provides a unique opportunity to act, and act now to deliver against some of the objectives in the Strategy.

11.1.2 Government is introducing measures to support our transition to a low emissions future with financial support for innovation in this area, legislation on diesel and petrol engines, for example.

11.1.3 Our Digital Strategy supports the creation of a smart system for parking, traffic light management and the creation of platforms for future mobility.

11.2 The way to a low emission future is an evolving process and will take a degree of cultural change for both the way we operate and manage our networks, for how we choose to travel and the vehicles we drive.

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The documents used in the preparation of this report are:

1.Local Air Quality Management Technical Guidance (TG16) April 2016 (DEFRA)

2. Local Air Quality Management Policy Guidance (PG16) April 2016 (DEFRA)

and the website https://laqm.defra.gov.uk/review-and-assessment/review-and-assessment.html

The documents are available for inspection at: Princess Buildings, Halifax

[i] See Air Quality Action Plan 2017

Calderdale Low Emissions Strategy 2018-2023

Policy Context

Calderdale's 5 year Low Emission Strategy's aim is to ensure that we improve the air quality for residents and visitors to Calderdale and protect our sensitive environment. The evidence points to vehicle emissions as the most significant contributor to poor air quality in Calderdale. For this reason our strategy focuses on reducing transport vehicle emissions.

The Low Emissions Strategy (LES) complements the Calderdale Transport Strategy and ambitions for sustainable growth as set out in the Local Plan. It also addresses the exigent need to comply with EU directives and UK Air Quality objectives.

Calderdale's LES sits within the framework of the West Yorkshire Low Emissions Strategy 2016-2021 (WYLES). This 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.

WYLES has 3 strategic aims:

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.

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.

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

The aim of Calderdale's Air Quality Action Plan 2009 is to identify how Calderdale Council will use its existing powers and work together with other agencies, organisations and the local communities in pursuit of the achievement of air quality objectives in the declared Air Quality Management Areas (AQMAs) within the district.

The programme of actions are categorised as: specific measures in each AQMA; general district wide measures; and proposed measures.

Calderdale's Energy Future Strategy sets out how the Council and our partners can support a resilient low carbon economy to achieve a 40% reduction in carbon emissions by 2020 from a 2005 baseline.

Key deliverables include: an enhanced building stock, upgraded appliances and energy systems in both homes and buildings, large scale renewable infrastructure, an enhanced transport system which provides less carbon intensive alternatives to current modes and reduces the need to travel, skills provision to provide access for jobs within a low carbon economy, space for children to grow

food, aligned policy and financial agendas, a finance mechanism to support these developments and a plan to deliver an 80% reduction in carbon emissions by 2050.

The Calderdale Transport Strategy 2016-2031 focuses on sustainable growth, enhancing connectivity and enhancing the environment and peoples quality of life by providing an environment conducive to walking and cycling. The Transport Strategy, if delivered, will support a shift away from high emissions and towards improved air quality.

The Local Plan 2017-2032 adheres to the principals in this strategy:

- Siting new buildings and estates so that the need for motorised travel is minimised.
- Minimising the exposure of vulnerable groups to air pollution,
- Providing infrastructure to support low- and zero-emission travel
- Planting of appropriate trees and vegetation in open spaces.
- All proposals that have the potential to increase local air pollution either individually or cumulatively must be accompanied by proportionate evidence

Collectively these strategies and policies have created a robust policy context to enable the reduction in emissions across the Borough.

However some policies currently do not support the reduction in emissions as set out here and in the Air Quality Action Plan. These will have to be addressed as work progresses.

These include

- **our approach to parking, and parking policy is now being developed**
- **workplace practices on car use**
- **procurement policies**

In addition certain proactive measures will need to be taken to ensure we deliver against our objectives such as the introduction of both workplace and school travel plans.

Monitoring air pollution across the Borough is an on-going process. The pollutant of most concern in Calderdale is nitrogen dioxide[i] and particulates, both mainly associated with road traffic. Calderdale's Environmental Health service publishes an Annual Status Report (ASR). It gives a summary of all the work the council has been doing to improve air quality. It discusses

- The background and the association of air pollution and poor air quality with adverse health impacts.
- Levels of air pollution and how we measure them
- What we are trying to do about air pollution
- How the public can get involved in the issue.

While ambient monitoring in Calderdale indicates that levels of particulate matter are below the air quality objectives, the annual mean objective for nitrogen dioxide is currently (2017) being exceeded in seven areas of the Borough. These areas have been declared Air Quality Management Areas (AQMAs) and in each AQMA road traffic is the major contributor to the levels of nitrogen dioxide.

Low Emission Strategy

The Low Emissions strategy outlines the strategic direction and policy approach to reducing high levels of pollution associated with vehicle emissions, particularly aimed at nitrogen dioxide and particulate matter.

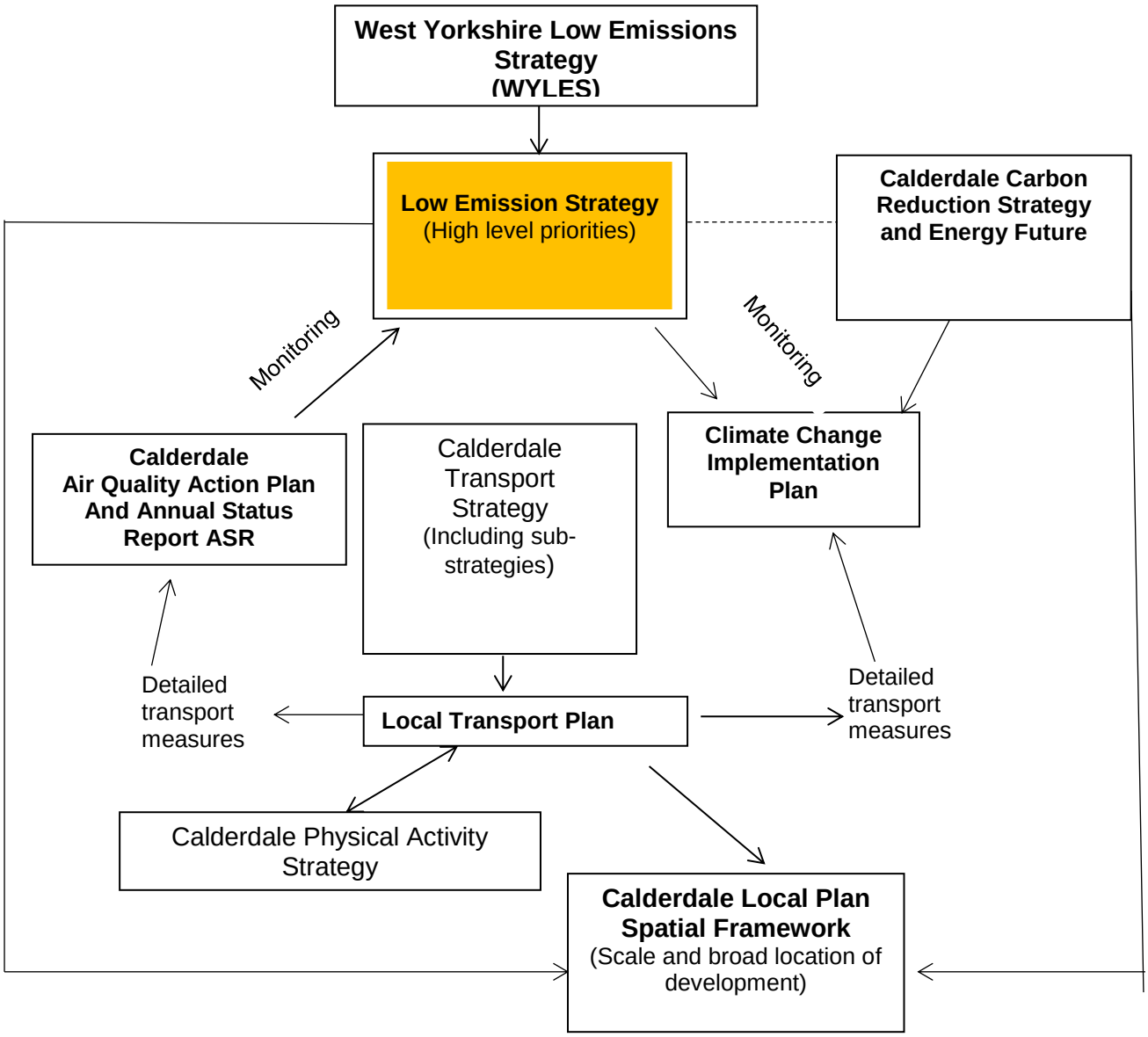
VISION

Calderdale Council's vision for the future of transport emissions:

'To be fully compliant with all its air quality legal obligations and significantly reduce the health and economic impacts of roadside air pollution.'

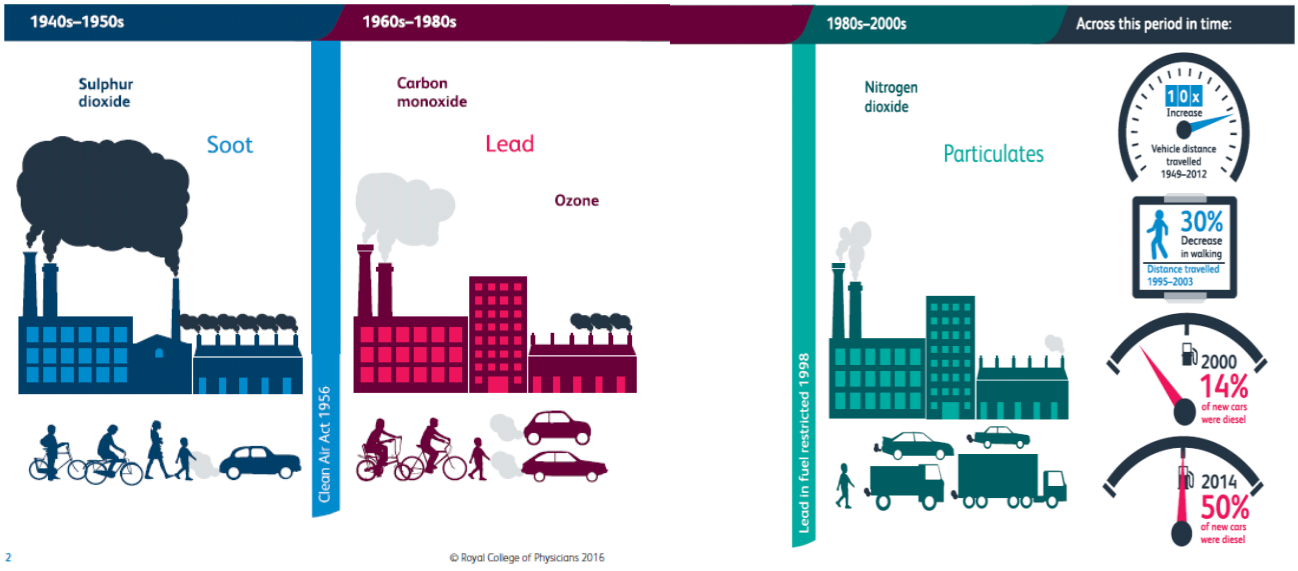
Relationships with other strategies

To have an impact on air quality the Council needs to take a holistic approach; there are many areas across the council that can impact air quality from transport to planning. Therefore air quality will need to be a consideration in many different strategies and policies throughout Calderdale Council



Background

Although there have always been many sources of air pollution, including natural sources such as volcanoes and natural fires, air pollution in towns and cities is seen as a detrimental side effect of modern life. Where once industrial emissions from burning coal and oil were the predominant source of air pollution; now road transport produces the bulk of harmful emissions. The evidence from our Annual Status Report demonstrates that this is true also for Calderdale.



The way we use transport has a significant effect on our health and the local economy

The combustion process results in significant production of nitrogen oxides and fine particulate matter. Small particles can penetrate deeply into sensitive lung tissue and damage it, causing premature death in extreme cases. Inhalation of such particles may cause or worsen respiratory diseases and aggravate heart diseases. [ii]

It has been estimated that 40,000 excess premature deaths in the UK in 2016 were attributable to long-term exposure to air pollution[iii]. Calderdale had the equivalent of 86 deaths a year or 4.5% mortality (WYLES).

Poor air quality has effects on the local economy. Although there are no Calderdale specific figures the National Air Quality Strategy (DEFRA 2007) stated that poor air quality costs society between £8.5 billion and 20.2 billion a year nationally.

Areas with low car dominance tend to thrive and Calderdale's Transport Strategy supports 'walkable, cycle-able district centres' as a key objective with multiple positive outcomes. Successful places whether they are town centres, neighbourhoods or single spaces such as public squares all share a number of key characteristics. The most successful places, the ones that flourish socially and economically, tend to have certain qualities in common.

- They have a distinct identity.
- Their spaces are safe and pleasant.
- They are easy to move around, especially on foot.
- And visitors feel a sense of welcome.

Particulate matter

Local Authorities have been given flexibility to set their own approaches to reducing $PM_{2.5}$ emissions [Local Air Quality Management Technical Guidance TG16 (DEFRA April 2016)]. The objective for this pollutant is phrased in terms of working towards reducing emissions and concentrations. A numerical limit has been set for Scotland (annual mean 10□gm^{-3}) but this does not apply to England. No safe lower exposure level has been identified for fine particulate matter, although there is a European Air Quality Standard for fine particles ($PM_{2.5}$) of 25□gm^{-3}. [Fine Particulate Matter (PM2.5) in the United Kingdom, Air Quality Expert Group 2012]

Nitrogen Dioxide

Studies have shown associations with Nitrogen Dioxide in outdoor air with adverse effects on health, including reduced life expectancy.[iv] The UK is currently subject to legal proceedings for failing to meet European Limit Values for NO2, as discussed below. Calderdale persistently exceeds these limits in certain heavily trafficked areas of the Borough.

Legal Requirements

Another reason that we must look to improve air quality in Calderdale is that there is currently a legal requirement through European law (Air Quality Directive 2008/50/EC) and then written into domestic law to do so (Air Quality (England) Regulations 2000, as amended by the Air Quality (England) (Amendment) Regulations 2002). If we do not achieve the limit values by the target dates set out in Table 1a and b below Calderdale Council could face financial penalties.

European – Limit values

Table 1: 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 (NO2)k		40 µg/m^{3v}	1st January 2010
PM10		40 µg/m^3	1st January 2005
PM2.5	**Stage 1**	25 µg/m^3	1st January 2015
	Stage 2	20 µg/m^3	1st January 2020

We are currently in compliance on PM but persistently exceed the NO2 limits in seven areas. These are all associated with high traffic levels.

UK – Air Quality Objectives

Pollutant	**Table 1: Air Quality Objective[vi][1]**	
	Concentration	**Measured as**
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean

Air quality monitoring has been carried out in Calderdale for many years and the latest monitoring is evaluated in the Air Quality Annual Status Report 2016 (ASR)

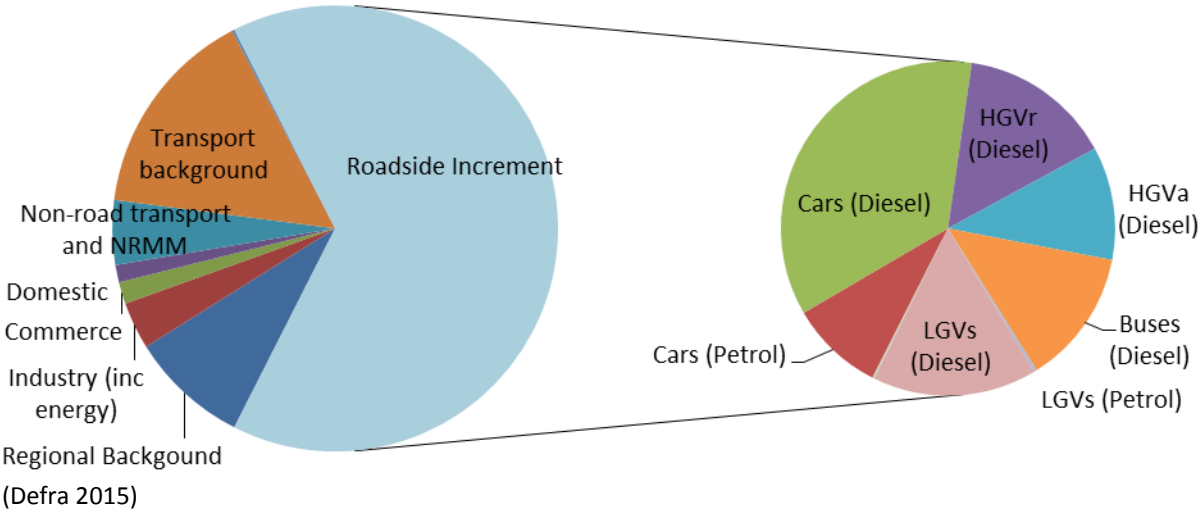
There are seven Air Quality Management Areas (AQMA's) in Calderdale **all** related to road traffic emissions. An AQMA is a geographical area where monitored concentrations exceed the limits set out in Table 1b above. The AQMA's in Calderdale are outlined in Table 2 below:

Table 2: air quality management areas declared for Nitrogen Dioxide 2016

AQMA Name	Area	Brief Description
Calderdale No.1	Salterhebble, Halifax	A629 corridor, Salterhebble and Skircoat
Calderdale No.2	Sowerby Bridge	A58 corridor through Sowerby Bridge and Bolton Brow
Calderdale No.3	Hebden Bridge	A646 through Hebden Bridge centre
Calderdale No.4	Luddendenfoot	Residential properties along A646 in Luddendenfoot centre
Calderdale No.5	Stump Cross, Halifax	Small group of residential properties at Junction A58/A6036, Stump Cross
Calderdale No.6	Brighouse, Town Centre	Town Centre properties along A641, A643, A644 and A6025 in Brighouse
Calderdale No.7	Hipperholme	Properties alongside A58 and A644/649.

Specific measures to reduce the emissions in each AQMA are outlined in Calderdale's developing Air Quality Action Plan; this document will outline the process for improving air quality across all areas.

Transport emissions represent over 70% of air pollution in Calderdale



(Defra 2015)

Creating a low emissions future

Calderdale must be a place where lower emissions vehicles are used commonly, we have a modern bus and freight fleet, public transport and active travel are used much more often as a travel choice and our network is operating much more efficiently.

Act now, think long term. As a community, we must act now, and with urgency, to protect the health, wellbeing and economic sustainability of our communities and future generations.

In order to create a low emission future in Calderdale we need to concentrate our efforts on the measures that will be most effective. As the evidence on the previous pages have suggested and what national research tells us (DEFRA) the main contributing factor to poor air quality in the borough is due to transport emissions.

There are 3 things we propose do to reduce the air pollution from transport emissions:

1. **Reduce Traffic** – *reduce the number of cars on the road*
2. **Improve flow** – *introduce systemic strategies to keep traffic moving*
3. **Reduce emissions** – i*mprove vehicles on the road so fewer emissions are released.*

Reduce Traffic

These measures could include:

Active travel

In order to reduce traffic we need to make a modal shift from travelling by car to public transport or active travel. To do this, the roads must both feel safe and become safer for vulnerable road users. The infrastructure must be coherent. We must do everything we can to make active travel a first choice for those who can be more active.

Research suggests that when the walking environment is pleasant, people will walk further. We must identify and protect areas that could be used to create segregated paths (greenways), ensure traffic speeds are appropriate and that planning tools are used to ensure new developments create access to amenities and contribute overall to a network which supports active travel.

Public Transport

In Calderdale use of public transport is integral to daily life. The percentage of people who own cars has reduced among the younger generation. Rail use has increased significantly with a doubling and tripling of passenger numbers in many areas. Bus patronage is in decline but is still the only option for many people and represents over 10% of all journeys made in the Borough.

However, travel by public transport must be seamless. Services need to go where people want to travel at the times they want to go. The cycling and walking routes must integrate with public transport networks. Ticketing should respond to the demand for 'mobility as a service', with one type of payment for parking, Electric Vehicle car hire, cycle hire, bus and rail tickets. Public transport

travel needs to be more affordable to compete in price with the family car. Information presented must be intuitive and accessible.
These are huge barriers to overcome and can only be achieved through sustained work with public transport operators, Government departments and reallocation of the road space to improve network efficiency.

Highways and Transportation have secured significant funding to improve the highway network to make journey times for all modes more reliable especially buses which are currently caught in traffic congestion. Evidence shows that to achieve a modal shift away from the car, public transport journey times should be 25% faster than the same car journey. For example the journey time from Halifax to Manchester should be 25% faster by train than the route for a car journey. To achieve this type of express service for key destinations by bus is a significant challenge, but the prize is big, as this, combined with other initiatives as described above, and could result in many people choosing public transport as a viable option. This in turn can contribute to reduced traffic on our highway and improved air quality.

Demand Management

In transport, managing demand can be a cost-effective alternative to increasing highway capacity with the potential to deliver better environmental outcomes, improved public health, stronger and more prosperous places.

Transport Demand Management (TDM) is often used as a 'stick' to reducing car use and smoothing out peak crowding on public transport, and has proven to be very effective. For example, high parking charges, tolls, peak pricing all have a strong influence on when we travel and our choice of mode.

The use of TDM will need to be an important consideration if we are to reduce traffic and resulting emissions. We will need to give buses priority (hold the green time at signals for buses), enforce bus lane infringements and ensure parking charges are high enough to deter unnecessary car use. We need to explore other ways of TDM such as providing real time traffic information and introducing a 'smart highway' with active speed management to smooth flow similar to the 'smart motorway'.

Pedestrianisation, crossing facilities, and end-to-end cycle infrastructure (including parking and showers) are demand management techniques and are integral to sustainable transport practice.

Public Awareness and Engagement

Poor air quality is an issue which affects everyone and in order to make real lasting changes in Calderdale we need to engage with the residents of Calderdale to make them aware of the issues and the possible solutions. By doing this we can empower people to take personal ownership over the decisions they make that affect air quality.

Our requirements for travelling are irregular and using a car eases this burden and can improve our quality of life. But some journeys can be made easily by leaving the car at home and can benefit us in a number of ways, for example, by giving us time (rail and bus) or improving our mental well-being (bike or walk).

We must find imaginative ways to engage the public. In April 2017 Calderdale launched a new **one in five campaign**. Outdoor advertising is aimed at regular commuters as well as bus adverts to try and encourage people to leave their car at home one day in a (commuting) week. By replacing one day's car travel with a sustainable mode, traffic would reduce by up to 20%.

'Swap one car journey a week to help us reduce pollution in Calderdale'

Improve Flow

These measures could include:

Active Network Management

The stop-start nature of traffic flow causes significant transport emissions. High emissions are also related to varying speed. Vehicles idling spew excessive fumes into the air. In 2015 there were 22 road closures on the M62 affecting our local highway. Our district centres are generally car dominated and this creates a real and perceived danger to pedestrians and cyclists.

Our utilities are generally located in the roads or in the pavement and access to maintain these utilities are essential as is regular highway repairs and maintenance. Best efforts are used to manage and regulate the network to ensure it operates efficiently. A new West Yorkshire Urban Traffic Management Control Centre and a well-managed Key Rote Network are key outcomes required to support better traffic management.

However more can be done to improve the flow of traffic, including the increased application of systemic strategies.

> A *systemic strategy* to influence transportation emissions focuses neither on the technology of the vehicles using the transport network, nor on the choice of individuals using that technology, rather, it addresses the network itself in order to change the conditions of traffic flow so that vehicles can operate at their technical optima in terms of both pollutant emissions and energy efficiency.

A good example of this is the 'smart motorway'. This systemic intervention acts to increase or decrease the capacity of the transport network. Changes made to the capacity of a network can help to increase average speeds of vehicles running along the network, as well as reduce the amount of stop-and-go traffic. Both of these changes are associated with increased operating efficiency of vehicles –that is, a reduction in energy intensity–as well as a reduction in pollutant emission rates.

A systemic strategy must be linked to other strategies. Increasing capacity can lead to induced demand for travel, that is, an increase in overall levels of activity and, in some cases, shifts to modes benefiting from a capacity increase.

Intelligent Traffic Management

Intelligent transport systems vary in technologies applied, from basic management systems such as car navigation; traffic signal control systems; container management systems; variable message signs; automatic number plate recognition or more advanced applications that integrate live data and feedback from a number of other sources, such as parking guidance and information systems; weather information; bridge de-icing systems; and the like. Additionally, predictive techniques are being developed to allow advanced modeling and comparison with historical baseline data.

Connected and autonomous vehicles are in the near future and will bring both challenges and opportunities for traffic management. A **connected vehicle** is a vehicle with technology that enables it to communicate and exchange information wirelessly with other vehicles, infrastructure, other devices outside the vehicle and external networks. An **autonomous vehicle** is a vehicle that is, in the broadest sense, capable of driving itself without human intervention.

These technologies will deliver

- Cleaner mobility and reduced emissions;
- Improved traffic flow and efficiency and reduced fuel consumption

Taking further advantage of these technological opportunities is vital if we are to rapidly move to a low emissions future.

Speed and Freight Management

A comprehensive review of speeds along our entire network is needed to ensure that speeds are appropriate to the surrounding environment. Vehicle speed is the most important contributor to road casualties and may deter people from walking and cycling. We have to deepen our understanding of the effects of speed on the environment and our economy.

Freight vehicles, such as Heavy Goods Vehicles (HGV's) and Light Goods Vehicles (LGV) are the greatest contributor to road side emissions in Calderdale.

The Local Authority can help limit the effects of freight movements by developing a better understanding of freight movements and signing freight traffic appropriately. This means developing a better working relationship with Highways England and our neighbouring authorities on traffic management.

Reduce Emissions

These measures could include:

Clean Air Zone or Low Emission Zone

A Clean Air Zone (CAZ) or Low Emission Zone (LEZ) is a designated area where certain restrictions are placed on certain types of vehicles. They are designed to place penalties on higher polluting vehicles to encourage individuals or companies to upgrade to vehicles with lower emissions.

The introduction of a non-charging Clean Air Zone or LEZ in Calderdale could have a high impact on reducing emissions and fits with our overall objectives. The declaration of a CAZ would also open funding opportunities. Consideration for a non-charging CAZ would be taken forward pending Cabinet approval.

Retro fitting Buses and Taxis

Buses have a disproportionate impact on vehicle emissions compared to cars. There is a particular issue in Calderdale as the fleet of buses used are relatively old and therefore more polluting. Even though buses alongside other public transport can be part of the solution to reducing air pollution they are also significantly contributing factors to poor air quality in Calderdale. There are two main reasons for this:

1. The fleet of vehicles used by local bus operators are relatively old and therefore more polluting
2. Buses are quite often on the busy routes and therefore are stopping often and idling increasing the amount of pollution they emit.

Diesel-hauled trains also contribute to emissions overall although do not specifically effect any AQMA's in Calderdale.

Taxis are a very important mode of transport for residents of Calderdale and improvements in the emissions from taxis will have a positive impact on air quality. As the licencing authority we can set emissions standards as part of licencing requirements.

Our overall aim is to ensure that all buses and taxis in Calderdale will be compliant with the requirements of a Clean Air Zone. Specifically this may involve:

- Restricting the age of licenced vehicles
- Being complaint with specific emissions standards (e.g. euro 5 petrol and euro 6 diesel)
- Having no minimum engine size

Passenger Cars

In order to reduce the emissions from passenger cars we must encourage the uptake of vehicles with lower emissions such as electric, hydrogen and hybrid vehicles.

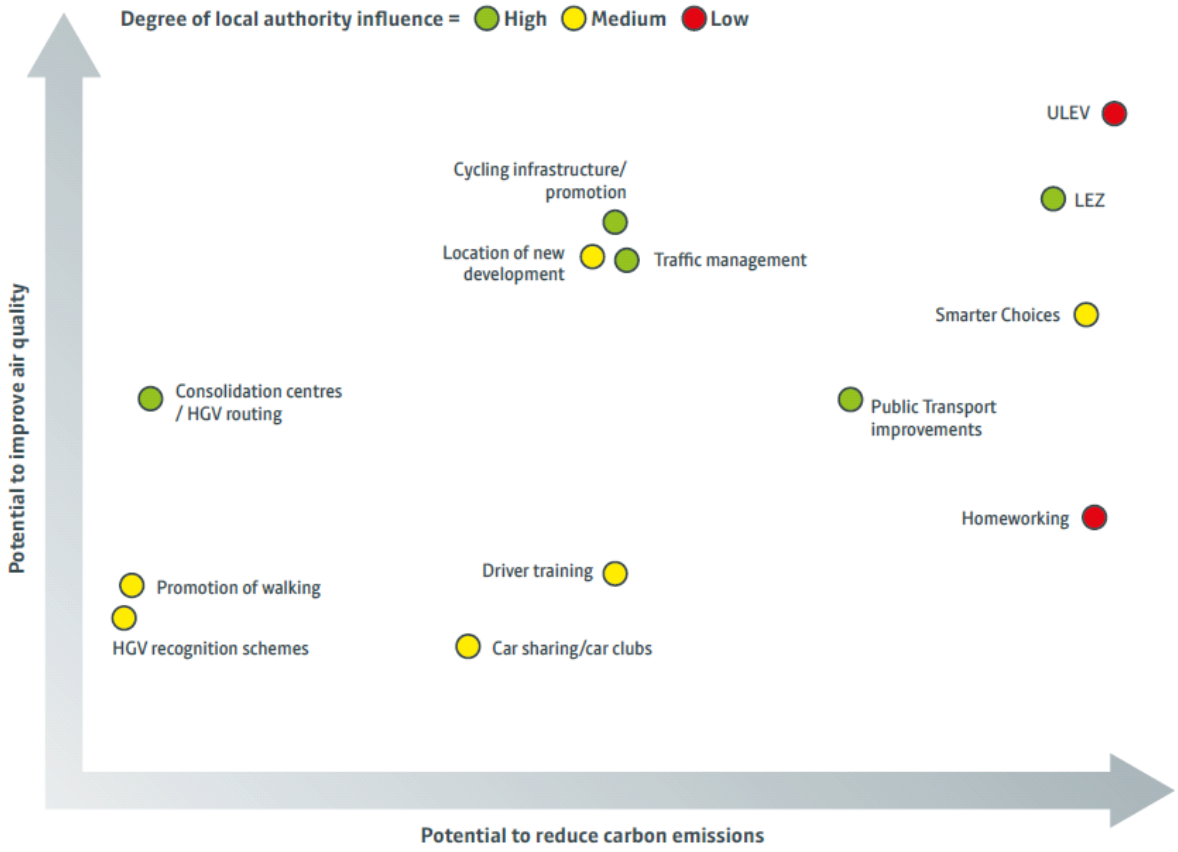
Low emission vehicles such as electric cars emit no Nitrogen Dioxide, no Particulate Matter and no Carbon Dioxide at source.

We must work with National Government to influence policies that will encourage the update of these vehicles. Locally, through planning policy we can ensure all new developments provide infrastructure which begins to support a wider national connected system supporting these cleaner technologies.

Procurement and Contracts

Any procurement of council owned fleets or those services outsourced by the Council should wherever practical; stipulate the use of Electric Vehicles or hybrids to support the objectives of this strategy.

Relative Impact of all Measures



Monitoring and Review

The Council has a programme of monitoring air quality and the results of this monitoring are published annually in the ASR. The council will continue to do this to have an understanding of air quality in Calderdale and whether actions to tackle it need to be changed.

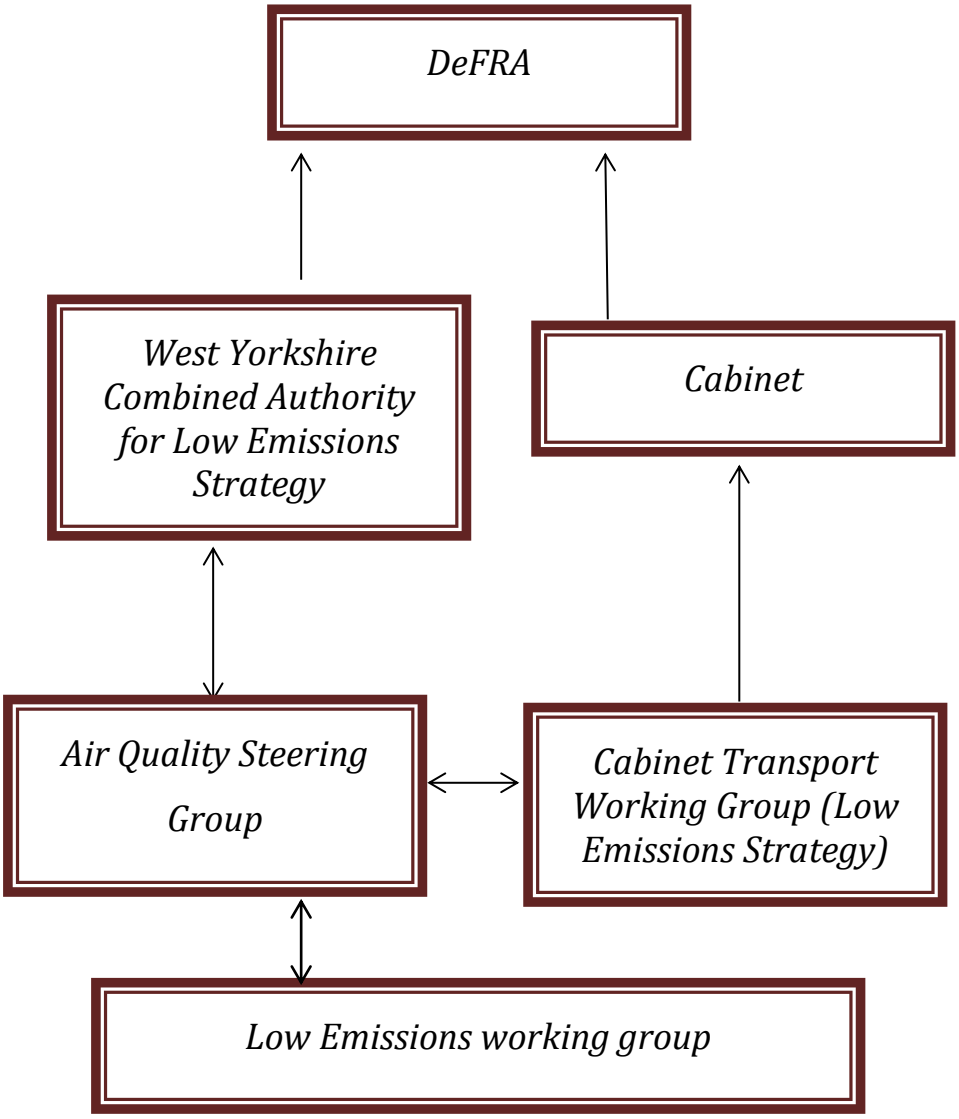
The actions identified in this strategy will be monitored through the Air Quality Action Plan 2017

Governance and Resources

Currently a cross-directorate steering group has ownership of this Low Emissions Strategy with the Director of Economy and Environment as the Senior Responsible Officer. Councillor Dan Sutherland holds the portfolio.

It is recommended that the monitoring and evaluation of the Low Emissions Strategy in Calderdale is overseen by the Cabinet Transport Working Group.

Suggested Governance and reporting structure



There are currently no additional resources allocated to delivering on this agenda. In order to make sure that we capitalise on any funding opportunities that are available, the council has created a working group with the aim of pursuing the aims of this strategy. The working group is cross directorate and will look to capitalise on any available funding and share resources where necessary.

Next Steps

1. Establish Low Emissions Working Group
2. Identify a budget and funding opportunities to deliver against these objectives
3. Seek opportunities across the organisation to deliver against these objectives

Conclusion

Calderdale Council has a robust framework established for delivering against the objectives in this strategy. The challenges are significant but must not be shied away from if we are to reduce emissions and protect the health and well-being of our communities.

The way to a low emission future is an evolving process and will take a degree of cultural change for both the way we operate and manage our networks, for how we choose to travel and the vehicles we drive.

But the prize is huge and it is our duty and responsibility to do our best in achieving this future.

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[i] These were linked to PM 2.5 probably much more attributable if we factor in NOx
[ii] Statement on the Evidence for the Effects of Nitrogen Dioxide on Health, COMEAP 2015
[iii] Every breath we take: the lifelong impact of air pollution; 2016 Royal College of Physicians
[iviv] COMEAP
[v] The units are micrograms of pollutant per cubic metre of air (µg/m^3).
[vi] http://www.eea.europa.eu/publications/air-quality-in-europe-2016

DRAFT

Calderdale Air Quality Action Plan 2017

In fulfilment of the council's duty under Section 84(2) of the Environment Act 1995 in respect of local air quality management

Consultation draft

This draft is presented for consultation. The approach, detailed measures and conclusions are set out so that residents, businesses and other interested parties can consider and respond to them.

The Council invites comments on the draft. Comments may be submitted in writing (including email) to

Environmental Health
c/o Town Hall
Crossley Street
Halifax
HX1 1UJ

Email: environmental.health@calderdale.gov.uk

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Department	Economy and Environment
Address	Town Hall, Crossley Street, Halifax. HX1 1UJ
Telephone	01422 288001
E-mail	environmental.health@calderdale.gov.uk
Date	2017

Executive Summary

This Air Quality Action Plan (AQAP) has been produced as part of our statutory duties required by the Local Air Quality Management framework. It outlines the action we will take to improve air quality in Calderdale between 2017 and 2030.

This action plan replaces the previous action plan which ran from 2009 [AQAP09]. Projects delivered through the past action plan include:

- Provision of bus lay-by at Salterhebble to improve traffic flows up this heavily trafficked incline through an AQMA;
- Adoption of West Yorkshire Low Emissions Strategy (December 2016);
- Junction improvements at Tuel Lane Sowerby Bridge to reduce congestion;
- Borough-wide improvements to cycling and walking networks, including resurfacing cycle paths along the Calder Valley;
- Campaigns to promote car share scheme and encourage use of public transport

Further consideration of the previous action plan will be presented.

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3]. Calderdale Council is committed to reducing the exposure of people in Calderdale to poor air quality in order to improve health.

We have developed actions that can be considered under the following broad topics:

- Alternatives to private vehicle use
- Environmental permits
- Freight and delivery management
- Policy guidance and development control
- Promoting low emission plants;
- Promoting low emission transport
- Promoting travel alternatives
- Public information
- Transport planning and infrastructure
- Traffic management
- Vehicle fleet efficiency

Our priorities are to improve the uptake of ultra low emissions vehicles and active travel, including the promotion of public transport, walking and cycling, and lobby for

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

the cleaning up of the public transport fleet. This will involve building public engagement into policy decisions that impact upon travel and showing leadership with bold decisions about planning, infrastructure and the transport network.
It is worth setting out the objectives set by WYLES, and these are in Appendix D.

In this AQAP we outline how we plan to effectively tackle air quality issues within our control. However, we recognise that there are a large number of air quality policy areas that are outside of our influence (such as vehicle emissions standards agreed in Europe), but for which we may have useful evidence, and so we will continue to work with regional and central government on policies and issues beyond Calderdale Council's direct influence.

Responsibilities and Commitment

This AQAP was prepared by the Environmental Protection Team of Calderdale Council with the support and agreement of the following officers and departments:

- Public Health
- Highways and Transport
- Planning Services

This AQAP has been approved by:

Department	**Representative (signature)**
Public Health	
Transport	
Sustainability	
Environmental Protection	

This AQAP will be subject to an annual review, appraisal of progress and reporting to the relevant Council Committee (to be confirmed). Progress each year will be reported in the Annual Status Reports (ASRs) produced by Calderdale Council, as part of our statutory Local Air Quality Management duties.

If you have any comments on this AQAP please send them to Tommy Moorhouse at:
Environmental Protection c/o Town Hall, Crossley Street, Halifax1 1UJ
Telephone 01422 288001, Email environmental.health@calderdale.gov.uk

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1 Introduction

Part IV of The Environment Act 1995 sets out the duties of Calderdale Council with respect to local air quality management.

The Air Quality (England) Regulations 2000 (amended 2002) set out objectives for 7 pollutants, including two objectives for nitrogen dioxide (NO_2)

- A level of no more than 200 micrograms per cubic metre, when expressed as an hourly mean, not to be exceeded more than 18 times a year
- A level of no more than 40 micrograms per cubic metre, when expressed as an annual mean

The regulations apply to the air outside of buildings or other natural or man-made structures above or below ground, and where members of the public are regularly present. The objectives were to be reached by 31st December 2005.

Sections 82 and 83 of the Act required the council to assess whether the objectives were met or were likely to be met by December 2005. Where they were not being met etc such areas were to be designated as Air Quality Management Areas (AQMAs). By December 2016 Calderdale had declared 7 AQMAs, each due to an exceedence of the annual mean objective for nitrogen dioxide.

Section 84 required Calderdale to assess the current and likely future air quality in those AQMAs and the reasons why the air quality objectives were not being met. Further assessments were published between 2007 and 2011 and can be viewed http://www.calderdale.gov.uk/v2/businesses/pollution/air-quality/air-quality-management-areas-aqma

Section 84 then required Calderdale to prepare an Air Quality Action Plan (AQAP) *"in pursuit of the achievement of air quality standards and objectives in the designated area, of any powers exercisable by the authority"*. In doing so it must have regard to guidance issued by the Secretary of State. The current statutory guidance is

- 'Local Air Quality Management Technical Guidance (TG16)' [Defra April 2016]
- 'Local Air Quality Management Policy Guidance (PG16)' [Defra April 2016]

and it recommends a structure and content of an AQAP. The current AQAP was written in 2009. The guidance suggests AQAPs are reviewed at least 5-yearly. It is therefore appropriate for Calderdale to review and revise its current air action plan.

The Calderdale 2017 AQAP outlines the council's proposals to reduce concentrations of air pollutants and exposure to air pollution; thereby positively impacting on the health and quality of life of residents.

Progress on measures set out within this Plan will be reported on annually within Calderdale's air quality Annual Status Report (ASR).

2 Summary of Current Air Quality in Calderdale

Calderdale has been monitoring local air quality for many years and in respect of nitrogen dioxide (NO_2) since the 1990's. Monitoring results are published in a series of reports and more recent reports are available on the Council's website http://www.calderdale.gov.uk/v2/businesses/pollution/air-quality/air-quality-reports. Currently the council monitors concentrations of nitrogen dioxide and fine particles PM_{10} and $PM_{2.5}$.

The reporting format changed in June 2016 in accordance with statutory guidance. The Annual Status Report (ASR) now summarises the council's activity in local air quality management in the previous year. The most recent ASR can be viewed via the above link.

At the time of drafting this AQAP historic and current monitoring has lead the council to designating seven AQMAs. Each of these AQMAs has been declared due to an exceedence of the annual mean objective for nitrogen dioxide. They are at

- A629 Salterhebble, Halifax (Calderdale No. 1)
- A58 Sowerby Bridge (Calderdale No. 2)
- Hebden Bridge (Calderdale No. 3)
- Luddendenfoot (Calderdale No. 4)
- Stump Cross, Halifax (Calderdale No. 5)
- Brighouse (Calderdale No. 6)
- Hipperholme (Calderdale No. 7)

Preliminary investigation suggests that the annual mean objective may be exceeded in 8th area around the A58 at New Bank and Godley Lane, Halifax, and the Council is gathering further evidence to decide whether an AQMA (Calderdale No. 8) should be declared.

Maps of the individual areas are featured in Appendix A of this plan (as well as in the ASR and reports on the individual AQMAs).

Based on real-time and passive monitoring the range of measured levels in each of the areas is summarised in Table 1 below

AQMA	Monitor reference	Measured level (μg/m^3) in 2016
A629 Salterhebble, Halifax	AQS2	**46** continuous monitor
A58 Sowerby Bridge	AQS4	**41** continuous monitor
A646 Hebden Bridge	AQS3	**42** continuous monitor
A646 Luddendenfoot	LF1	**46** diffusion tube
A58 Stump Cross, Halifax	SC5	**43** diffusion tube
Brighouse Town Centre	HXR1	**53** diffusion tube
A58 Hipperholme, Halifax	HH-LT	**58** diffusion tube (relocated along Linden terrace 2016)

Table 1: Summary of level of NO_2 for Calderdale's AQMAs, 2016

3 Calderdale Council's Air Quality Priorities

3.1 Public Health Context

Poor air quality is known to be a factor in the development of respiratory and cardiovascular disease, and represents a real health cost to society. Understanding of the health effects of air pollution is developing rapidly (see, for example [LCPH]).

The most recent figures from Public Health England (2013-2015) show that the directly standardised death rate in under 75s from respiratory conditions (Public Health Outcomes Framework indicator (PHOF) indicator 4.07) was 43.7 per 100,000 in Calderdale, compared to 33.1 per 100,000 in England, significantly higher in Calderdale compared with the national picture. This figure recognises smoking and all forms of air pollution as contributory factors.

3.2 Planning and Policy Context

The Local Plan is a key component of local planning policy and as such is an appropriate tool for putting in place elements of the Council's Action Plan. Integration of air quality considerations into the planning process, in line with NPPF paragraph 124 allows a strategic approach to reducing emissions and promoting alternatives to private vehicle use. Calderdale Council formally adopted the West Yorkshire Low Emissions Strategy (WYLES) in December 2016 and is working towards implementing it through planning policy.

The Council has also published its Transport Strategy [CMBC17], which includes a commitment to leadership and innovative thinking in travel policy. This strategy is central to addressing vehicle emissions and exposure to traffic pollution.

This Action Plan has been produced in close association with the Low Emissions Strategy, which sets out the Council's broader air quality strategic ambitions.

3.3 Source Apportionment

The AQAP measures presented in this report are intended to be targeted towards the predominant sources of emissions within Calderdale Council's area. Road traffic is the main source of emissions in all seven air quality management areas, and a simple review of traffic census data gives some insight into the vehicle types that are responsible.

Two AQMAs in particular include street canyons, quite narrow stretches of road lined with tall buildings. This is believed to lead to higher average concentrations of pollutants in these areas compared with open areas due to restricted dispersion.

A source apportionment exercise was carried out by Calderdale Council in 2017 using traffic counts from 2016. This identified that within the AQMAs the percentage source contributions were similar across the Borough. The pie chart below shows the breakdown at Salterhebble.

The Emissions Factor Toolkit v 7.0 was used for the calculation of NOx emissions.

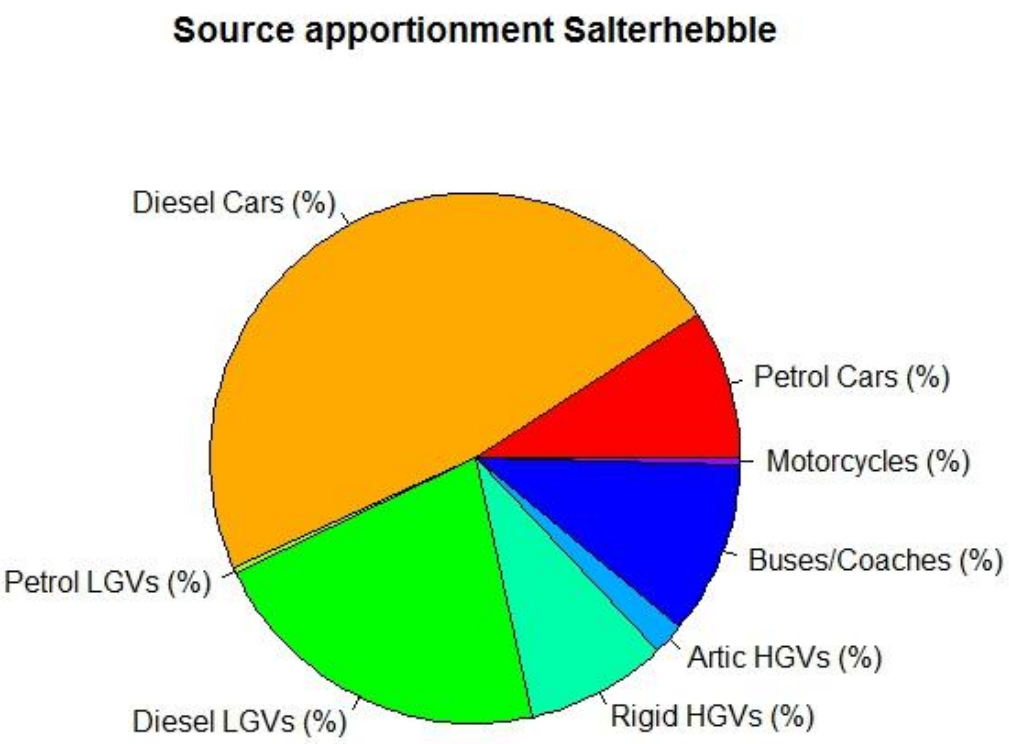


Figure 1: Pie chart - source apportionment by vehicle type

Diesel cars and diesel LGVs dominate the emissions, and this is typical of the picture across the AQMAs, and indeed across the UK (see Figure 3 of [DEFRA 17]). Similar charts can be drawn for each AQMA, but it is difficult to visually compare pie charts and the following bar chart may be more helpful.

The horizontal bars show the percentage contributions of each vehicle type, with the entire bars representing 100% of the emissions. It is easier to get a picture of the relative importance of each source at each site, and again it is clear that diesel vehicles contribute most. The Regional and Local contributions are background contributions derived from Defra's maps and the calculations in TG16.

It is important to note that calculations of this type are necessarily approximate. They represent a combination of different estimates (vehicle speeds, fleet composition snapshots, emission factors etc) and should be considered with this in mind.

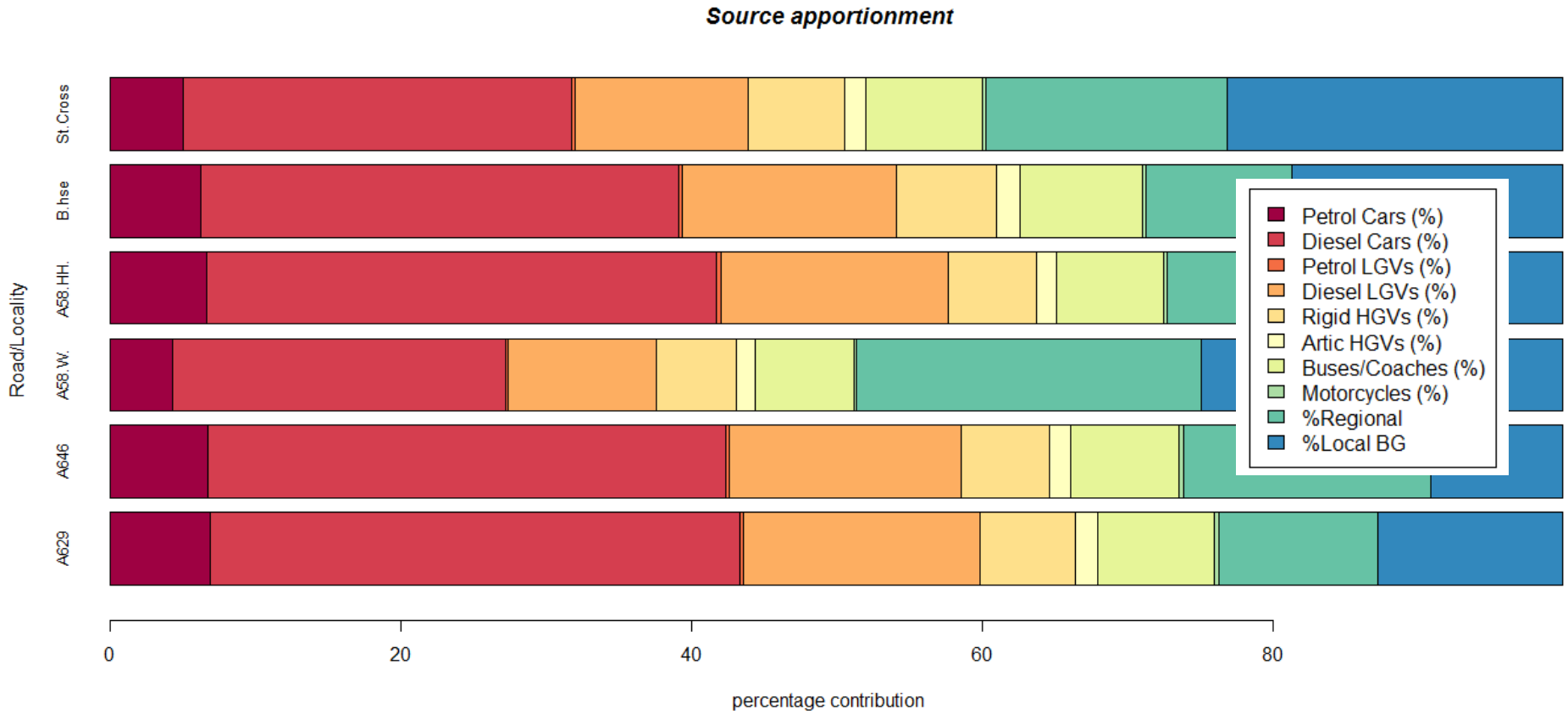


Figure 2: source apportionment at various sites

In Figure 2 the listed sites are: A629 – Huddersfield Rd, Salterhebble; A646 – Market Street, Hebden Bridge; A58(W) – Wharf Street, Sowerby Bridge; A58(HH) Leeds Road, Hipperholme; B.hse – Halifax Road Brighouse and St.Cross – Stump Cross.

3.4 Required Reduction in Emissions

The required reduction has been calculated in line with Technical Guidance LAQM.TG16 Chapter 7, where the terms are defined.

Count point	Road	Tube	Regional background (%)	Local background (%)	All LDVs (%)	All HDVs (%)	Road increment NOx	Target road NOx	Reduction needed (NOx)	% eduction needed
7728	A629	AQS2	10.92172	12.70034	59.28142	17.09652	84	65	19	22.6
77715	A646	AQS3	17.01113	9.039386	58.93254	15.01695	70	65	5	7.1
17357	A643	CL1	13.81588	23.94094	54.32187	7.921314	62	53	9	14.5
47406	A629	CRH1	13.1651	18.35223	50.17525	18.30743	91	52	39	42.9
17360	A646	AQS3	25.27876	14.0603	47.83696	12.82398	60	53	7	11.7
6577	A58	HH-LB	15.5539	19.69924	44.28075	20.46611	68	54	14	20.6
17358	A644	HH-LT	12.11607	15.03979	59.17027	13.67387	105	54	51	48.6
28683	A641	HXR1	10.03038	18.56047	52.48015	18.92901	92	56	36	39.1
77654	A58	AQS4	23.64762	24.89214	39.23825	12.22199	49	44	5	10.2
7729	A6026	SB1	18.9934	21.78	47.2001	12.0265	71	44	27	38.0
76051	A58	SC5	16.55844	23.08256	41.27986	19.07913	59	51	8	13.6
56867	A644	WR2	16.94799	31.36098	27.66959	24.02144	48	45	3	6.3

Table 2: calculation of required reduction

Tube	T-NO2	TB-NO2	Road Nox	TB-Nox	RB-Nox	LB-Nox	RB-NO2	LB-NO2	L-NO2
AQS2	47	11.10237	66.83	22.72636	10.50759	12.21877	5.133208	5.96916	35.89763
AQS3	42	10.94122	67.11	15.00012	9.79516	5.204959	7.144674	3.796542	31.05878
CL1	43	16.23543	53.19	29.14229	10.66367	18.47862	5.940827	10.29461	26.76457
CRH1	54	17.01936	61.42	24.67213	10.30579	14.36634	7.109154	9.910202	36.98064
AQS3	42	16.52241	65.08	15.24333	9.79516	5.448168	10.61708	5.905327	25.47759
HH-LB	45	15.86391	69.14	23.35824	10.30579	13.05244	6.999253	8.864659	29.13609
HH-LT	58	15.7504	51.81	23.90059	10.66367	13.23692	7.027318	8.72308	42.2496
HXR1	53	15.15315	58	30.39599	10.66367	19.73232	5.316101	9.837047	37.84685
AQS4	42	20.3867	56.47	21.56817	10.50759	11.06058	9.932002	10.4547	21.6133
SB1	50	20.3867	46.61	22.55679	10.50759	12.0492	9.496702	10.89	29.6133
SC5	43	17.04563	74.37	24.67213	10.30579	14.36634	7.120129	9.925503	25.95437
WR2	41	19.80668	45.46	30.39599	10.66367	19.73232	6.948675	12.858	21.19332

Table 3: calculation for TG16 parameters

The figures for the percentage reduction needed show quite a large variation between sites, but some variation is to be expected due to the nature of the information and estimates used. For example, AQS3 in Hebden Bridge lies between two count points, and the actual composition of the traffic passing AQS3 is related to the respective counts in a way that cannot be simply deduced. The two count points suggest that the required reduction is between 7% and 12%, indicating the range of uncertainty to be expected.

The diffusion tubes at Hipperholme (HH-LB and HH-LT) show different annual means and therefore, since the traffic composition is similar, different values for the reduction required. HH-LT is very close to the major junction while HH-LB is set further back from the carriageway. It is clear that allowing a smoother flow around the junction would have a beneficial impact on concentrations of nitrogen dioxide, but it isn't possible using the models available to realistically quantify the reduction that would be achieved.

3.4.1 A note on source apportionment and speed

It is of interest to examine how the relative contributions of different vehicle types vary with speed. This is of relevance for Calderdale's AQMAs as these are centred on stretches of road where speeds are generally low. The figure below shows the relative contributions of vehicle types at speeds ranging from 10km/h (the bottom bar) to 70km/h (top bar) in 10km/h steps. This was calculated using the Emissions Factor Toolkit v7.0 using a standard fleet breakdown with 5% HGV. At low speeds the contribution from buses and HGVs is greater than at higher speeds.

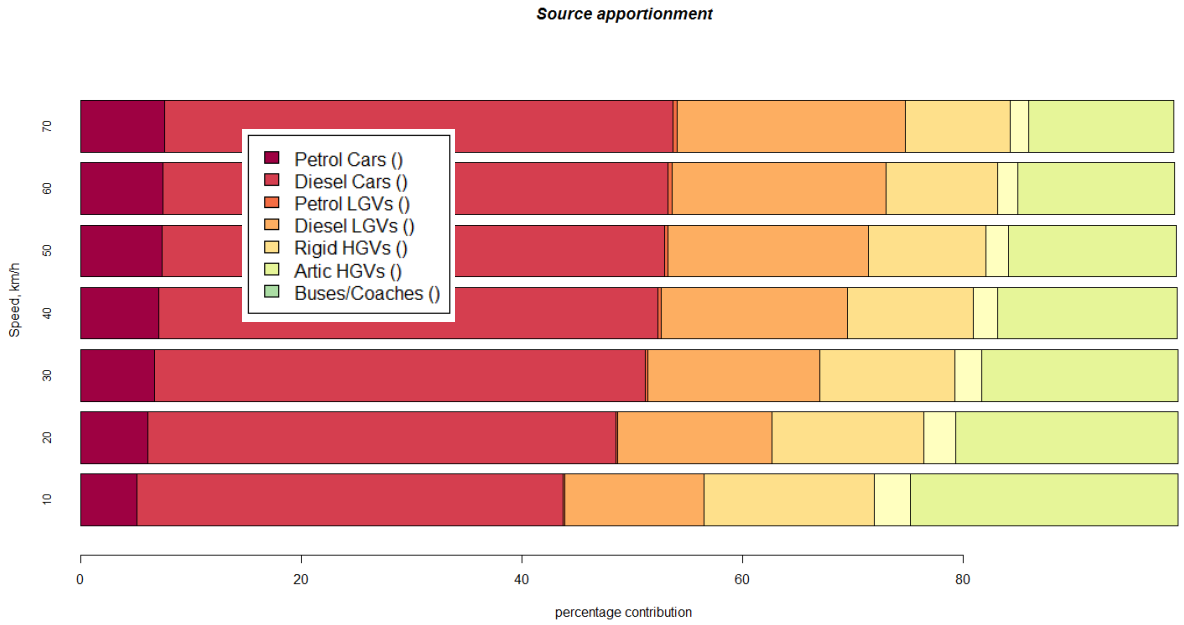


Figure 3: the influence of speed on relative emissions

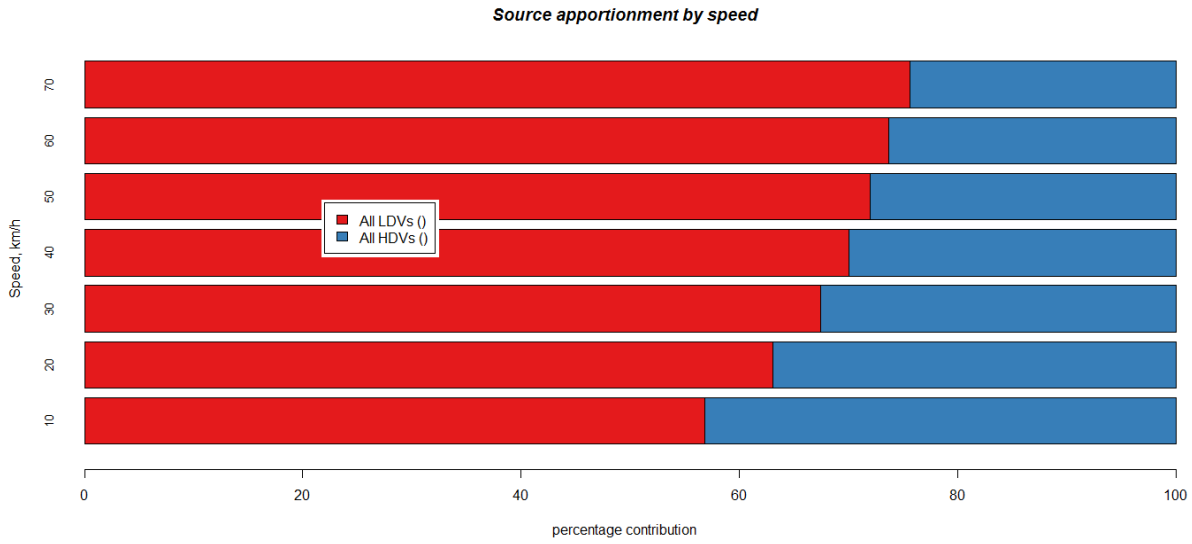


Figure 4: LDV vs HDV emissions by speed

Traffic management that allows vehicles, particularly HDVs, to move at a better pace will generally reduce the emissions. Allowing buses to proceed through junctions, for example, may have an impact on the overall emissions profile in that location.

3.5 Key Priorities

The Council envisages that implementation of the Transport Strategy, Low Emissions Strategy and Local Plan will play a key role in tackling air quality issues. These elements therefore underpin many of the key priorities identified below.

- Priority 1 - promoting alternatives to private vehicle use, recognising the contribution of diesel vehicles and bidding for ULEV funding whenever possible
- Priority 2 – improving the transport network infrastructure, as set out in the Council's Transport Strategy and Local Plan
- Priority 3 –developing awareness of impacts and remedies, and integrating the priorities of other strategies and frameworks, such as public health (active travel), sustainability (carbon reduction strategy) and local planning (sustainable development)
- Prority 4 - encouraging public engagement and interest through improved communication and community involvement.

4 Development and Implementation of Calderdale Council AQAP

4.1 Consultation and Stakeholder Engagement

In developing/updating this AQAP, we have worked with other local authorities, agencies, businesses and the local community to identify measures to improve local air quality. Schedule 11 of the Environment Act 1995 requires local authorities to consult the bodies listed in paragraph 6.1 of [PG16] In addition, we have undertaken the following stakeholder engagement:

- Website improvement
- Publication of air quality monitoring data on the Council's Dataworks site
- Survey of residents' views on air quality and the Council's work in this area

The response to our consultation stakeholder engagement is given in Appendix B.

Yes/No	Consultee
Yes	the Secretary of State
Yes	the Environment Agency
Yes	the highways authority
No	all neighbouring local authorities
No	other public authorities as appropriate, such as Public Health officials
Yes	bodies representing local business interests and other organisations as appropriate

Table 4: Consultation Undertaken

4.2 Steering Group

Although no formal Steering Group has been formed, the Council has set up an air quality strategy group consisting of Council officers and an elected Councillor with the Environmental portfolio. The Council officers include representatives of Public Health, Planning, Highways and Environmental Protection. The group meets approximately monthly and sets actions aimed at furthering the Council's priorities in air quality. Progress is reviewed and expertise shared, and ideas for relevant projects are reviewed and consolidated.

The group has prioritised the development of the Council's Air Quality Strategy and Action Plan, and these projects have developed together. Air quality monitoring and the response to results that may indicate the need for further action have also been considered.

The group will continue to explore ways to make sure that the Council's policies and strategies feature improving air quality as a central consideration.

5 AQAP Measures

Table 5 shows the Calderdale Council AQAP measures. It contains:

- a list of the actions that form part of the plan
- the responsible individual and departments/organisations who will deliver this action
- estimated cost of implementing each action (overall cost and cost to the local authority)
- expected benefit in terms of pollutant emission and/or concentration reduction
- the timescale for implementation
- how progress will be monitored

NB: Please see future Annual Status Reports for annual updates on implementation of these measures

Table 5: Air Quality Action Plan Measures

Measure No.	Measure	EU Category	EU Classification	Planning Phase	Implementation Phase	Key Performance Indicator	Progress to Date	Estimated Completion Date	Comments
AQAP1	Achieve better understanding of local air quality	Transport Planning and Infrastructure	Other	2009-2014	2009-2020	(1) Traffic flow and travel demand through and within the AQMAs. Traffic queue lengths in AQMAs. And Traffic volumes and modal split	(1) Three surveys carried out of traffic fleet at AQMAs by Leeds ITS (2009-11). MOVA installed at Hipperholme and Stump Cross junctions 2013.	Traffic queue length surveys completed 2011. MOVA completion due 2017. (1) A 629 corridor proposals- work scheduled to start July 2016. Some delay but initial work completed. A 641 / A644 Brighouse corridor to progress to early concept stage 2016. Traffic impact study in Sowerby Bridge final report due April 2016 including feasibility for Ryburn Valley Greenway (2) Centralised UTMC for WY working with HE to introduce better traffic management	'Actual' emissions are markedly different to 'expected'. Policy implications. Evidence base needed for the kinds of interventions that could reduce vehicle emissions. A richer understanding of the traffic implication due to the M62 is required.

Measure No.	Measure	EU Category	EU Classification	Planning Phase	Implementation Phase	Key Performance Indicator	Progress to Date	Estimated Completion Date	Comments
						(2) Monitoring and modelling of traffic flows and air quality. Traffic queue lengths at junctions. Journey times through junctions.	(2) Trial areas implemented in Stainland and Elland 2010/11. Phase 1 Halifax area complete. Feasibility and design on A629 north Halifax corridor. A629 corridor works underway (Phase 1)		
						(3) Emissions characteristics of different vehicle types and under different driving conditions.	(3) RCVs driver training. Roadside emissions testing discounted due to poor overall benefit. Failure to implement a Bus Quality Partnership Agreement. Traffic Regulation Control adopted - no Euro I and II buses permitted through the AQMAs from 2014 onwards.		(3) West Yorkshire Eco-stars scheme initially discounted but may be reconsidered in 2017.
AQAP2	Awareness campaign	Public Information	via the Internet	2009-2014	2009-2020	(1) Investigate feasibility of Local Air Quality Partnership.	Not pursued		Disseminate this information to the public as part of a wider behavioural change programme
						(2) Disseminate air quality information via Council website. Reports published on website	(2) All reports are published. There has been progress with the understanding of public preferences for the presentation of air quality information (2017).		(2) working in partnership with Leeds CC to derive modelled NO2 roadside concentrations based on measured road speeds
						(3) Investigate establishment of Freight Quality Partnership.			Consideration of Virtual Emissions' Monitoring and the introduction of in-cab technology. Funding needs to be secured.

Measure No.	Measure	EU Category	EU Classification	Planning Phase	Implementation Phase	Key Performance Indicator	Progress to Date	Estimated Completion Date	Comments
									Kirklees is piloting this.
						(4) Respiratory conditions highlighted in the Joint Strategic Needs Assessment			
AQAP3	Traffic and Highways management	Traffic Management	UTC, Congestion management, traffic reduction	2009-2014	2009-2024	(1) High occupancy routes. Promote high occupancy vehicles. Modal split surveys. Improve traffic flow on AQMA corridors.	(1) Traffic queue lengths at Salterhebble inbound. DfT Access for all funding secured. ERDF funding secured in respect of traffic through Sowerby Bridge. Design being finalised, estimated completion date 2017. Phase 1a Salterhebble-Shaw Hill Gateway 1 submission. CCTV monitoring of queue lengths and remote signal timing adjustment at Salterhebble and Hebden Bridge complete 2011. Variable message signs at decision points on Calder Valley highway network complete 2011. Installation of traffic signal control at major junctions to improve flow, estimated completion 2013-17. Corridor reports complete. Findings input into West Yorkshire Plus Transport Fund programme. Proposed creation of new motorway junction (M62) and proposed Brighouse town centre bypass schemes included in WY+TF outline programme. Bus layby to smooth uphill traffic flow and reduce stop-start on Huddersfield Road (AQMA No. 1) completed 2011. Encourage and facilitate home working by provision of fast broadband,	(1) WY+TF Traffic queue works complete at A629 / Shaw Hill junction May 17 A629 corridor Phase 1a Dryclough/ Dudwell/Salterhebble to commence Aug17, completion Aug18. A629 Phase 1b Calder & Hebble interchange to commence Nov 18, complete April 20. 95% superfast broadband coverage scheduled for completion 2015. Design guides for developers in place and on website .	(1) Low emissions Zones a possibility but not currently being pursued. Road user charging discounted on cost grounds. Smoothed traffic flows and reduction in uphill stop-start. Specific benefits to AQMA No. 1. Sowerby Bridge bypass scheme not suitable for large vehicles and some destinations. To include introduction of bus lane and bus gate civil enforcement. Demand management strategy should be developed

Measure No.	Measure	EU Category	EU Classification	Planning Phase	Implementation Phase	Key Performance Indicator	Progress to Date	Estimated Completion Date	Comments
							including coverage of rural areas.		
						(2) Promote cycling and walking, including improving safety for cyclists and Improving infrastructure for cyclists and pedestrians.	(2) Promotion of active travel amongst medical at-risk groups. Developed walking and cycling routes in Salterhebble, Sowerby Bridge and Hebden Bridge. Developed Hebble Trail between Halifax and Elland. 'Bike and Go' integrated rail/ cycle scheme, cycle hire facilities operative 2014. Developed Calder Valley Cycle Route. Cycle training provided by West Yorkshire Go Cycle. 'Walk it' initiative footfall counts completed on promoted routes (2010). Ryburn Valley Cycle Route. Cycle City Ambition Grant 2 (CCAG2) currently in development. Promoted in clinics targeted at maternity, mental health, anti-smoking, CHD and weight management. CCAG2 bid submitted. Facilities for cycles established at Northgate House. Secure lockers provided at railway stations in Todmorden, Hebden Bridge and Sowerby Bridge and in Hebden Bridge town centre. Ramped underpass constructed at Salterhebble (southern end) avoiding A629 crossing. Elland Wood Bottom and West Vale Viaduct routes complete and opened.	(2) (CCAG2) 2015-17. Ryburn Valley cycle scheme for completion 2020. Northern extension into town centre stalled due to landowner issues - revised completion 2017. City Connect 2 construction expected to start 2018.	(2) Bikeability targets constantly exceeded. Cycle Strategy included in Infrastructure Plan under development in 2016. 'City Connect 2' development of high quality off-road cycle route between Upper Calder Valley-Halifax-Elland-Brighouse in design stage Electric bicycle scheme for employees rolled out 2017.

Measure No.	Measure	EU Category	EU Classification	Planning Phase	Implementation Phase	Key Performance Indicator	Progress to Date	Estimated Completion Date	Comments
						(3) Public transport patronage. Promotion of company discounted Metro Cards + First Bus and Northern Rail Season tickets. Increase provision of Metro poll cards for Council travel.	(3) Pool Metro Cards. 78 new applicants for discounted travel cards. Increased availability of pool metro cards for Council staff travel purposes. Bus transport - improved punctuality and reliability, simplified ticketing, quality corridors (2009-14). Brighouse bus station improvements completed 2009. Real-time bus information system complete 2008-13. Rail - improving capacity, access and integration. Proposed new rail station at Elland, estimated completion 2024. Network Rail GRIP at Stage 1, completion 2024 onwards. Background studies undertaken and promotional campaign developed. Scheme included in WY+TF outline programme. Covered stands in Halifax town centre and King Cross. School travel plans reduced distance travelled by 10%. Improved access to Hebden Bridge railway station, estimated completion 2016, DfT access funding secured. Works to improve Calder Valley line and rolling stock 2024 onwards.	(3) Rail patronage data by 2016. Bus punctuality scheme development superseded by West Yorkshire Plus Transport Fund programme (estimated completion date 2019).	(3) Park-and-ride discounted due to cost.
						(4) Car clubs.	(4) Car club bid tendered.	(4) 'Enterprise' Car club launched July 2015	

Measure No.	Measure	EU Category	EU Classification	Planning Phase	Implementation Phase	Key Performance Indicator	Progress to Date	Estimated Completion Date	Comments
						(5) Car parking strategy.			(5) Local public car parking charges reviewed but unlikely to use as a measure to improve air quality.
						(6) 20 mph areas.	(6) 20 mph areas to be implemented across Borough in 3-year implementation plan. Trial areas implemented in Stainland and Elland 2010/11. Phase 1 Halifax area complete, Hebden Bridge, Sowerby Bridge complete.	(6) 20 mph areas completion date 2017. Progressive introduction throughout 2015/16.	
						(7) increase car share modal proportion			(7) Additional shared cars possible but dependant on usage picking up
AQAP4	Promote LEV technologies	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2009-2014	2009-2020	(1) Where possible and practical procure ULEVs within fleet profile. Pilot use of EV to evaluate suitability as pool car. .	(1) Replace 175 vehicles to EURO 6 emissions standards. Council Handyperson Service equipped with 2 EV vans in 2015. Retrofit school bus fleet with carbon capture. Uptake of sustainable travel initiatives. Elimination of Euro I and II buses by 2014.	(1) Council fleet points installed 2014. Tourist points completed by 01/03/2015. EV trials across directorates 2017. Handyperson vehicles delivered 2015. Regional recharging rapid network due 2015.	(1) Gas powered RCVs considered but discounted.

Measure No.	Measure	EU Category	EU Classification	Planning Phase	Implementation Phase	Key Performance Indicator	Progress to Date	Estimated Completion Date	Comments
						(2) Introduce Council staff salary sacrifice car scheme for LEVs	(2) Salary sacrifice scheme introduced 2014.		(2) Go Ultra Low City Bid for procurement of new EV's to replace ageing public sector diesel fleet and fund charging infrastructure submitted to Dft.
						(3) Promote EV recharge point installation.	(3) 504 dwellings subject to planning conditions requiring EV points; another 125 under consideration; 5 large commercial developments conditioned with recharge points; 3 commercial developments under consideration. Promote EV recharge point installation in tourist accommodation. Installation of regional rapid charge network.	(3) Technical feasibility study for public charge point network ongoing. Report due Q3 2016/17	(3) combined WYLA Gul City Challenge bid lodged 2015-determined unsuccessful early 2016
AQAP5	Planning policy	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2009-2014	2009-2020	(1) Require travel plans and transport assessments in association with major new developments.	(1) Major developments since 2006 have included sustainable travel measures. Sustainable travel plans - promote business uptake. Also an element of WYLES (see (3))	.	Publication of Local Plan, consultation 2017/18 (1) HIA's should form part of new policy in Local Plan
						(2) School travel plan.	(2) School travel plans in existence by March 2010.		

Measure No.	Measure	EU Category	EU Classification	Planning Phase	Implementation Phase	Key Performance Indicator	Progress to Date	Estimated Completion Date	Comments
						(3) Ensure full account taken of air quality in connection with new developments.	(3) Development of the West Yorkshire Low Emissions Strategy incorporating planning guidance (2014 onwards). Large commercial and residential developments being recommended or required by planning condition to include EV charging points within car parks as part of planning permission. Major developments encouraged to submit Health Impact Assessments as part of planning application.	(3) WYLES adopted 2017. Council involved in ongoing work.	(3) Adoption of WYLES informing development policy and planning consultations. Formally adopted 2017.
						(4) Mass scale uptake and usage of electric vehicles	(4) West Yorkshire Electric Vehicle Strategy in development.	(4) Adoption expected Q3 2017/18	
AQAP6	Compatibility with other programmes			2009-2019	2009-2024	(1) Compatibility with West Yorkshire Local Transport Plan and development of WYLES.	(1) Community renewable energy scheme promotion in place. Halifax Master Plan background studies commissioned.	(1) Halifax Master Plan 2024 onwards.	
						(2) Increase in uptake of locally grown food.	(2) Increase in uptake of allotments. Incredible Edible Todmorden locally grown food network.		
						(3)Carbon savings and improved energy performance of homes and business dwellings the Halifax district heat network	(3) First stage feasibility study ongoing		

Transport and infrastructure projects feature prominently in the table. The improvement of key routes into Calderdale has begun with a major project on the A629 between Halifax and Huddersfield. This road passes through Calderdale AQMA No. 1 at Salterhebble, and work is in progress to explore some innovative ideas about incorporating live air quality monitoring data into the traffic management system here.

5.1 Progress with previous Action Plan

The 2009 Action Plan was written to cover three AQMAs: Salterhebble, Hebden Bridge and Sowerby Bridge. It summarised the air quality data then available and included actions specific to the AQMAs as well as more strategic action. The links between Calderdale's roles and those of other agencies and bodies were described.

Some of the actions formed part of the Local Transport Plan (LTP), or involved collaboration with other bodies. Table 6 shows measures identified as ongoing in [AQAP09].

Lead partner	Action	Progress	notes
CMBC	Traffic monitoring and modelling	Ongoing, see below	See Section 5.1.1
CMBC	Air quality monitoring and modelling	Three monitoring stations, around 60 diffusion tubes	Ongoing
CMBC/ partners	Congestion target delivery plan		See Section 5.2
WY Metro/ WYCA	West Yorkshire Bus Partnership		Ongoing
WY Metro/ WYCA	Rail Strategy	Halifax rail station refurbished, Elland rail station feasibility study completed	See Section 5.1.3
CMBC/ partners	Walking and cycling strategies	Strategies approved, improvements carried out to cycleways & footpaths	LTP superceded, cycling strategy developed (Section 5.3.3)
CMBC/ schools/ partners	Sustainable travel plans	Plans submitted as part of planning process	WYLES also covers travel plans
CMBC/ Partners	Car share	Scheme in place, promoted.	Uptake has been variable.
CMBC	Car parking strategy		New strategy for Halifax including promotion of EVs and cycle parking

Table 6: ongoing measures

Table 7 indicates progress with measures identified as general district-wide measures in [AQAP09].

Table 7: district-wide measures

Lead authority	Action	Description	progress
CMBC and partners	Local air quality partnership	Seek joint approach to addressing emissions and exposure	Not currently pursued
CMBC and partners	Information, education and travel awareness	Updates on air quality in AQMAs	'live' updates being investigated – otherwise reported as part of LAQM.
		General advice on causes/ effects of poor air quality	Some information on website, not extensive
		Advice for motorists on cutting pollution	Some information on website, not extensive
		Promotion of alternative fuels	EV promotion developing
		Voluntary vehicle emissions tests	Not pursued
		Initiatives such as 'bike week', 'walk to work week'	Initiatives tried and ongoing
		Active lifestyle promotion	Ongoing
		Personalised journey planning	Not pursued yet, but still a possibility
EU and UK law, CMBC	Cleaner fuel technology	Council to show leadership in fleet procurement and management	
		Partnership work on EV infrastructure	Some success, ongoing work
		Incentives such as discounted parking charges for EVs	EV provision included in Halifax Town Centre car parking strategy
		Setting emissions standards in contracts	
CMBC/ partners	Freight quality partnership		Under investigation
CMBC	Planning controls	Include air quality-related planning	Policies EP1 and EP2 were adopted.

		controls	Currently only EP1 survives, but Local Plan should include air quality. WYLES adopted.

5.1.1 Traffic modelling, monitoring and managing

Traffic counts are undertaken across the Borough's road network. Modelling and innovative monitoring have been used in the A629 corridor improvement programme in order to optimise the road design and traffic controls.

Monitoring travel times along the A629 using Bluetooth (and possibly WiFi) connected to drivers' phones is helping to optimise traffic flows during disruption due to road improvements.

The Urban Traffic Management Control programme is a West Yorkshire wide programme to replace all the traffic signals on the Key Route Network with dynamic signalling utilising Blue Tooth detection for better traffic management. Benefits include improved journey times and reduced emissions. Calderdale now needs to further develop its signal strategy.

Work is also underway to explore innovative technology to map traffic flows and emissions along key routes, including routes through AQMAs. The aims include quantifying the impacts of interventions such as changes to traffic controls both on congestion and air quality.

5.1.2 Bus partnership

Improvements to ticketing and fares are being lead by Transport for the North and WYCA. Digital tickets and contactless payments are being developed along with mobile apps to simplify ticket purchases and deliver travel information.

The Council, through WYLES and WYCA, is also engaged in a bid for finances from the Clean Bus Technology Fund. This will support the introduction of cleaner buses on routes through Calderdale's AQMAs.

5.1.3 Rail strategy

Shifting commuter and leisure travel from the roads to rail could make a significant change to the volumes of traffic, and consequent air pollution, across the Borough.

Funding has been secured both for the Halifax Station Gateway and for a new Elland Rail Station. The former is a scheme intended to improve links between the existing rail station and the town centre, and is closely linked with major improvements to the transport system and infrastructure within the town.

Elland rail station offers the opportunity for residents to choose rail travel instead of driving into Halifax, Brighouse or Huddersfield, which would ease congestion on the A629 in particular.

The Calder Valley Line is covered by the Northern Hub. Track and signal improvements are underway as part of the Calder Valley Line upgrade driven by the Northern Programme. Other aspects of the programme include direct links to Manchester Oxford Road and Manchester Airport, and faster and more frequent services between Leeds and Manchester. "The Northern Programme is a series of targeted upgrades to the railway in the north of England. It will allow hundreds more trains to run each day and provide space for millions more passengers a year."

The new franchisee for the Calder Valley Line intends to put new rolling stock on the line. The rolling stock is currently being built.

In 2016 the Todmorden Curve, a short stretch of railway line abandoned in the mid 20th century, was reopened. This introduced additional direct services between Manchester and Burnley, calling at Todmorden and improving service frequency to Lancashire and Greater Manchester.

Taken together these developments will help make rail travel a more attractive option for commuters and leisure travellers.

5.1.4 Sustainable Travel Plans

Some progress has been made in this area, but there remains work to be done. The WYLES planning technical guidance requires developers of some schemes to put in place travel plans where the development could adversely impact upon air quality, and travel plans are being submitted with many applications.

5.1.5 Car parking strategy

Although a politically sensitive subject, car parking needs to be properly managed to encourage the use of other forms and transport and to move private vehicles away from town centres.

The Halifax Town Centre parking strategy has been adopted as part of the wider Transport Strategy: an extract from the Council minute states:

> The Halifax Car Parking Strategy [has] been developed as part of the ambition to maintain and grow the vibrancy and vitality of Calderdale as a whole. It [outlines] an approach to parking that reflect[s] the ambitions to minimise the impact on sensitive environments, support the local economy and respond with agility to technological change and customer expectations. The strategy support[s] the creation of a positive 'sense of place' where the enjoyment of spending time in Halifax – to look, to linger, to shop and to soak up the culture [is] at the heart of decision-making. This [is] an integral part of a wider Transport Strategy. The Strategy [is] focused on Halifax in order to tie in with the current major infrastructure investment, but wider consideration [is] now being given to parking management in other parts of Calderdale through the

Town Boards. Lessons learned would be used to inform on-going policy in the other District Centres. The goal to get drivers off of the highway network at easily accessible locations on the periphery of town would facilitate better traffic management, improve overall air quality and reduce dominance of the car in the core of the town.

5.1.6 Cleaner fuel technology

The Council is promoting and encouraging the uptake of electric vehicle technology. This technology has moved on since the 2009 Action Plan and the Council has successfully applied for funding to install and support the installation of EV recharge facilties.

EV recharging features in the Transport and Parking Strategies, and the Council is working with the licensed trade to promote the uptake of cleaner vehicles as they come up for renewal.

5.1.7 Freight Quality Partnership

Although no partnership has yet been formed the Council is looking into taking on a commercial partner to trial in-cab technology for reducing the impact of heavy vehicles on air quality, for example by routing HGVs away from areas where air quality is a real-time concern.

A signing strategy is also being investigated with the aim of reducing HDV traffic through areas of poor air quality. This goes hand in hand with the collaborative traffic management scheme operated in partnership with the Highways Agency. This scheme would alert the partners to incidents, adverse conditions and road closures (mainly on the M62) to allow diverted traffic to be routed and managed.

5.1.8 Planning Controls and WYLES

The main development in this area is the formal adoption in December 2017 of the West Yorkshire Low Emissions Strategy and associated technical guidance. Proposed developments must take into account air quality from the outset. Developments are categorised according to their scale and potential air quality impacts, and mitigation costs are calculated. The developer must put in place mitigation proportional to the impact. This could include providing EV recharging points at an appropriate rate, drawing up a travel plan or contributing to infrastructure such as road improvements and cycleways.

WYLES is also working on the following projects:

1. **Ecostars** – this scheme, promoting cleaner fleet technology, is being lead by Kirklees Council
2. **Clean Bus Technology Fund bid** – a joint bid is being submitted, lead by WYCA, which aims to see the West Yorkshire bus fleet upgraded to reduce emissions, particularly in AQMAs.

3. **Publicity** – aiming to roll out an air quality publicity campaign based on one run in Leeds.

The draft Local Plan includes several environment-specific policies relating to air quality, and air quality is a consideration in other policies. This will help put air quality at the heart of the local decision-making process for development.

5.2 Transport infrastructure measures covering AQMAs

There are several projects underway or at an advanced stage of study that will have an impact upon air quality in the AQMAs. These are considered below.

5.2.1 Salterhebble (AQMA No. 1)

Major work has started to improve the road link between Halifax and Huddersfield along the A629. This scheme will incorporate technological interventions to monitor and optimise traffic flows, and consequently reduce emissions of nitrogen dioxide and particulates within the AQMA. Real time emissions monitoring should allow the effects of the changes to be quantified.

5.2.2 Sowerby Bridge (AQMA No. 2)

The CIP scheme for the A58/A672 involves a package of measures to improve highway efficiency for the benefit of all road users on the A58/A672 between Halifax and the Calderdale boundary via Sowerby Bridge, Ripponden and Rishworth. It is divided into two phases.

Phase 1 works are to include upgrade works to the following junctions:

A58 Bolton Brow/A6142 Pye Nest Road;
A58 Bolton Brow/A6026 Wakefield Road;
A58 Wharf Street/A6139 Tuel Lane; and
A58 West Street /Sowerby Street/Station Road.

In addition, the relocation of on-street car parking along the A58 and modifications to bus stop locations/facilities are proposed linked to urban realm changes that will improve network operation and enhance the quality of environment for pedestrians in Sowerby Bridge town centre and contribute to improving the economic vitality of the district. This will be aided by the reduced car dominance.

The planned reallocation of road space also provides an opportunity for introduction of on-street cycling infrastructure through the town, linking the City Connect 2 route being developed along the Rochdale Canal to National Route 66 and the proposed Ryburn Valley Greenway.

Phase 2 involves a package of measures along the wider A58/A672 corridor to complement the advanced works developed as part of Phase 1. Whilst the indicative scope of Phase 2 interventions is yet to be defined, key locations where improvements are likely to be necessary include:

A58 Rochdale Road/A672 Oldham Road/B6113 Elland Road junction in Ripponden;
And A58/A646 junction at King Cross.
Measures to reduce capacity constraints posed by on-street car parking and bus stop locations in Ripponden and Rishworth will also be explored in order to improve network efficiency for all modes.

5.2.3 Hebden Bridge and Luddendenfoot (AQMAs No. 3 and No. 4)

A Corridor Improvement Programme scheme has been approved involving a package of measures to improve highway efficiency for the benefit of all road users on the A646/A6033 between Halifax, Todmorden and the Calderdale boundary with Lancashire and Greater Manchester. This route forms a key route through western Calderdale and a principal cross-boundary link between West Yorkshire, Lancashire and Greater Manchester. The whole length of the A646, which passes through both AQMAs, will be covered by the scheme, with opportunities to upgrade walking and cycling routes as well as improving traffic flows and reducing congestion.
To encourage a shift from private cars to bus use issues of bus reliability need to be addressed.

The Bus Hot Spots Fund is part of the Local Transport Fund, a funding pot used for small scale interventions intended to improve bus reliability across West Yorkshire. While not specifically targeted at air quality reduction, improved bus reliability can increase patronage hence reducing car use. Improved bus reliability can also result in less time spent stationary in traffic, hence further reductions in emissions.

The Hotspots Scheme in Calderdale represents a sum of £20,000 to be spent in Hebden Bridge by March 2019. The main aim is to reduce parking on sections of the A646 by rail commuters on the eastern approaches to Hebden Bridge. This would be carried out in conjunction with proposed car parking improvements at Hebden Bridge and Mytholmroyd rail stations. At present excessive parking on this section of the A646 causes traffic congestion and delays buses causing reliability problems. Elimination of this problem would make bus services more reliable and reduce emissions. In turn this should help improve the air quality in the AQMA. Further work is in progress on the feasibility and effectiveness of this scheme.

5.2.4 Stump Cross and Hipperholme (AQMAs No. 5 and No. 7)

The area North and East of Calderdale from Halifax along the A58 to Leeds and A6036 to Bradford is part of Calderdale's Key Route Network (KRN). It currently is a bottleneck for traffic at peak and shoulder peak periods. The village of Hipperholme includes an AQMA centred on the junction of the A58 and Brighouse Road, and at Stump Cross there is a small AQMA at the Leeds Rd/Bradford Rd junction. The traffic has been a long-standing problem for Calderdale and a politically acceptable solution has not been yet found. The traffic issues are restraining growth to business and housing growth in the area as well as contributing to the poor air quality.

Previously, plans to address the issues were solely focussed on the A58 at Hipperholme and Stump Cross. The Council is now looking to take a more holistic

approach and look at a multi-modal package of measures across the entire area with the objective of *preserving* and *enhancing* the village of Hipperholme. Taking a transport planning approach instead of an engineering one, the scheme would look at the A58, A6036, A641 and the wider network of minor roads. The Council intends to build on the existing strong business case for a new rail station at Hipperhome and the creation of a high-frequency bus corridor. Potential for highway improvements will be included in the works.

5.2.5 Brighouse (AQMA No. 6)

The A641 Bradford-Brighouse-Huddersfield, including the A644 between Brighouse – M62 Junction 25, corridor forms part of West Yorkshire's Key Route Network (KRN) and was identified as a multi-modal corridor in the West Yorkshire Plus Transport Fund's (WY+TF) initial scheme pipeline with delivery by 2023.

The A641 project is located across Bradford, Calderdale and Kirklees districts and the A641 corridor has issues in all locations, including at key junctions - most significantly in Brighouse, which has an AQMA due to road traffic emissions.

Initial pre-feasibility work on the A641 project established that there is significant complexity to the transport issues in Brighouse, and that significant opportunity exists to use A641 WY+TF investment to resolve these and to enable the realisation of Brighouse's economic growth potential and Local Plan site development in Calderdale, Kirklees and Bradford. Thus the vision for the A641 Project is:

"To improve efficiency and connectivity for all modes travelling along the corridor between Bradford,Brighouse and Huddersfield; enhancing accessibility to key growth sites, and facilitating economic development across Calderdale, Kirklees and Bradford."

The A641 project will identify interventions across all travel modes for the A641 between Odsal Top in Bradford and Huddersfield Ring Road, and the A644 between Brighouse and M62 Junction 25. Potential phasing of interventions will be considered to establish if opportunities for early delivery exist; potential interventions deliverable via other projects will also be identified, such as reviewing Brighouse rail station parking.

Halifax is the most important employment destination for Brighouse residents beyond Brighouse itself. Brighouse – Halifax public transport movements and the A6025 corridor between Brighouse and Elland have been added to the scope of the project.

The A641 Project seeks to unlock development and facilitate employment growth. This goal is not incompatible with improvements to air quality, especially as improved traffic flows around the town centre ring and between the town and the M62 may lead to reduced emissions. The project aims to reduce congestion and improve journey time reliability on the A641/A644/A6025 for all travel modes to facilitate economic development, to unlock land for employment and housing growth and to increase the availability and use of sustainable transport modes. Aspects of the project include improved walking and cycling routes, improved public transport reliability and hence an incentive to shift from private vehicle use to sustainable modes of travel.

5.3 Other schemes with potential air quality benefits

5.3.1 District heating

Although district heating is primarily aimed at improving energy efficiency it can have benefits in terms of reduced emissions from domestic and commercial fuel burning.

Calderdale Council is working to implement a district heating scheme close to Halifax town centre using natural gas to provide heat to homes and commercial premises in that area. It is hoped that many small heating systems will be replaced by this single, more efficient system, with the consequent efficiency and air quality benefits.

5.3.2 In-house incentives to travel sustainably

The Council runs several schemes aimed at encouraging staff to use their private vehicles less. Some of these schemes have other benefits such as keeping staff active and healthy. The main schemes operating at the moment are:

- Pool Metro cards – free public transport for work related business such as meetings e.g. in Leeds. The uptake has been excellent.
- Pool electric bicycles – staff can book electric bikes for work related trips, instead of taking their cars.
- Discounted annual metro card – staff can apply for a metro card (public transport ticket) at company discount rates.
- Car sharing scheme – staff can register to offer or request lifts to and from work

5.3.3 Cycling strategy

The Council has developed a cycling strategy, from which the following extract is taken.

Our vision is to make Calderdale a nationally recognised centre of cycling excellence where residents, visitors and tourists of all ages and abilities can safely cycle for utility, commuting, leisure and sporting pursuits.

Everyone is able to use an intuitive and integrated network of high-quality on-road, greenway and off-road routes, connecting communities, activities and destinations, whilst improving their health, wellbeing, and contributing to economic growth.

This vision for the future is underpinned by a simple principle to connect people to places and activities. To support our vision we have developed a set of high-level objectives to inform the individual elements of our strategy;

- To make cycling safe, attractive, accessible, achievable and inclusive for all, particularly for those who presently don't ride
- To make cycling a part of Calderdale residents' day-to-day travel choices to improve health, wellbeing and productivity

- To improve cycle facilities both on- and off-road, as well as links between the two, including improving the size, legibility, connectivity and accessibility of the network
- To enhance cycling within the active leisure and tourism offer to increase its contribution to the local economy
- To make Calderdale a nationally recognised cycling centre for locals, visitors and tourists alike.

While air quality improvements are not explicitly set out in these objectives, the overall approach to promoting active travel does carry this additional benefit, when people are able to switch easily from private vehicles to active travel.

Improvements to the cycling network will be sought whenever the opportunity arises, for example when major developments and road schemes are proposed.

5.3.4 Air quality data for the public

The Council is a sponsor of the ODI Leeds and has taken part in events aimed at improving access to, and adding value to, open data. This includes data published on the Calderdale Dataworks website. The Council is working to improve the presentation and accessibility of its air quality monitoring data. In future this is hoped to include the dissemination of live air quality data and advice, and work is progressing on this aspect.

6 Conclusions and future vision

The Council recognises that there are steps it can take to tackle air pollution in its Borough. The main cause of that pollution is road traffic, and all seven AQMAs have been declared on the basis of elevated levels of traffic-related pollution. The Council has very little influence over vehicle standards and emissions, and must seek to influence other aspects of the road transport system. Therefore this Action Plan is focused on transport and on projects that will reduce congestion, improve flow or encourage people travelling to, from and within the Borough to use public transport, walk or cycle.

The ambitious road schemes currently underway or at an advanced stage of planning are central to the Plan, but the improvements to the rail network will also play a pivotal role. Active travel and the development of walking and cycling routes also have a key role to play.

Other pollution sources are not being neglected, and the Council is seeking to reduce emissions, for example through the environmental permitting system and the development of district heating.

The Council's aim is to integrate air quality considerations into its policies on all aspects of development and wider change from the outset rather than to see it as an add-on. By implementing this action plan in association with its other strategies we hope to make a significant improvement to air quality in the AQMAs and across the Borough

Appendix A: Maps of Calderdale's AQMAs

Key to each map:

Boundary of AQMA

Location of discontinued monitoring location. Monitoring by passive diffusion tube.

Location of current monitoring location. Monitoring by passive diffusion tube.

AQ4 Monitoring location reference.

7728 Department for Transport traffic census point number.

Figure A1a: Salterhebble, Halifax (Calderdale No 1 AQMA)

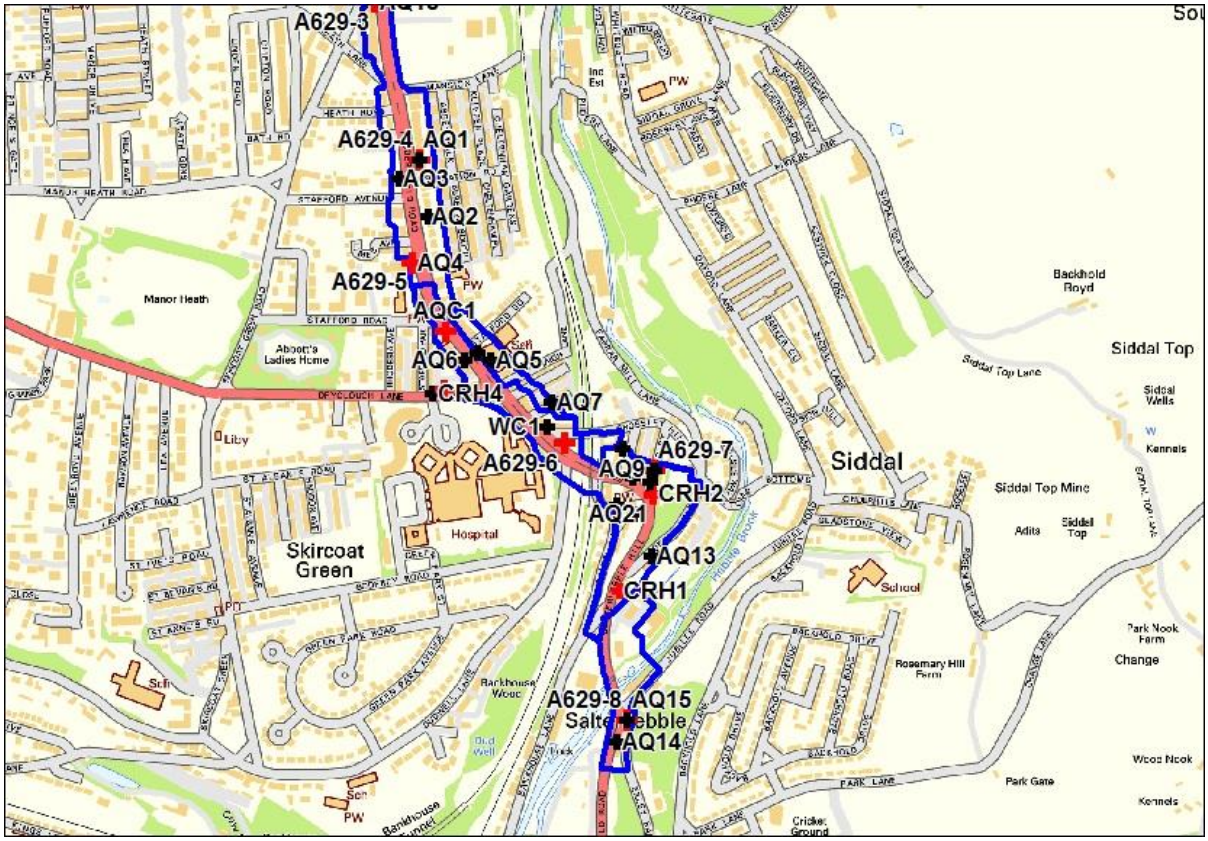


Figure A1b: Salterhebble traffic census points

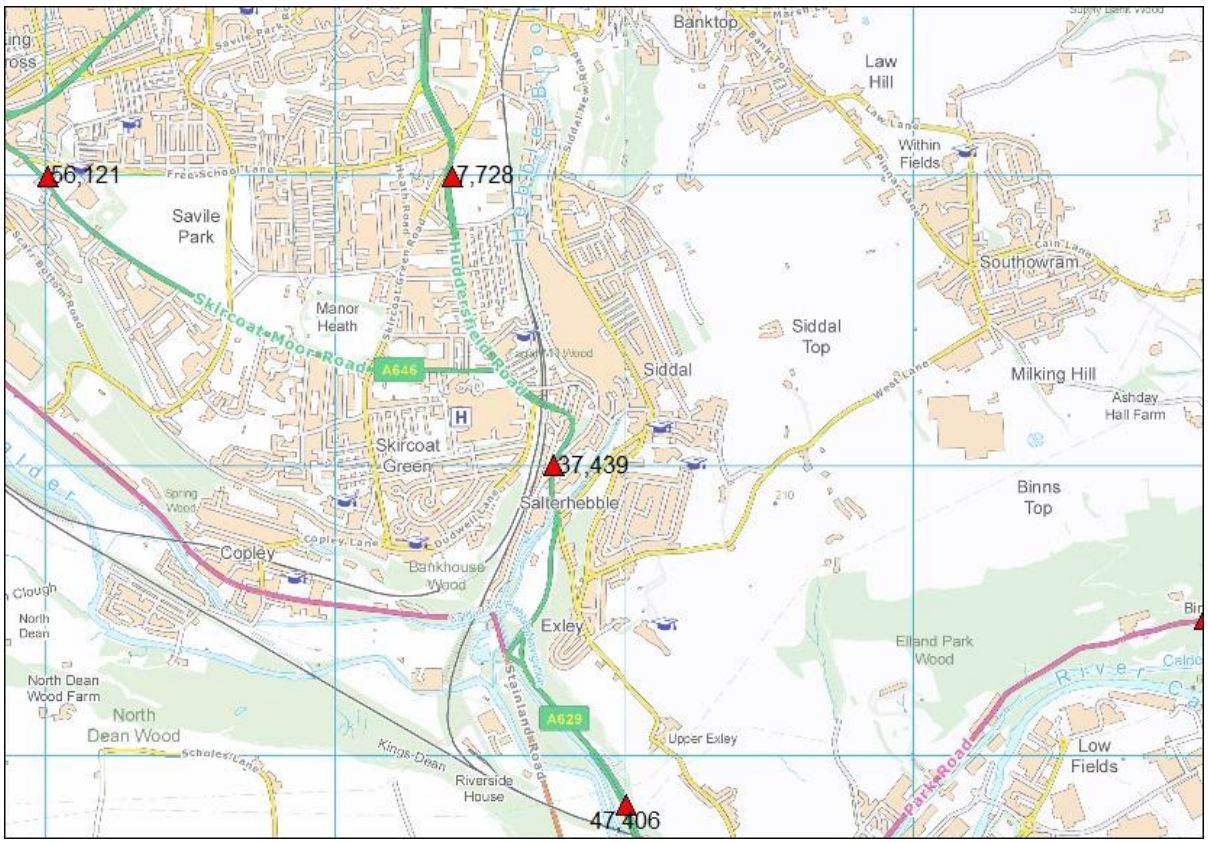


Figure A2a: Sowerby Bridge (Calderdale No 2 AQMA)

Figure A2b: Sowerby Bridge traffic census points

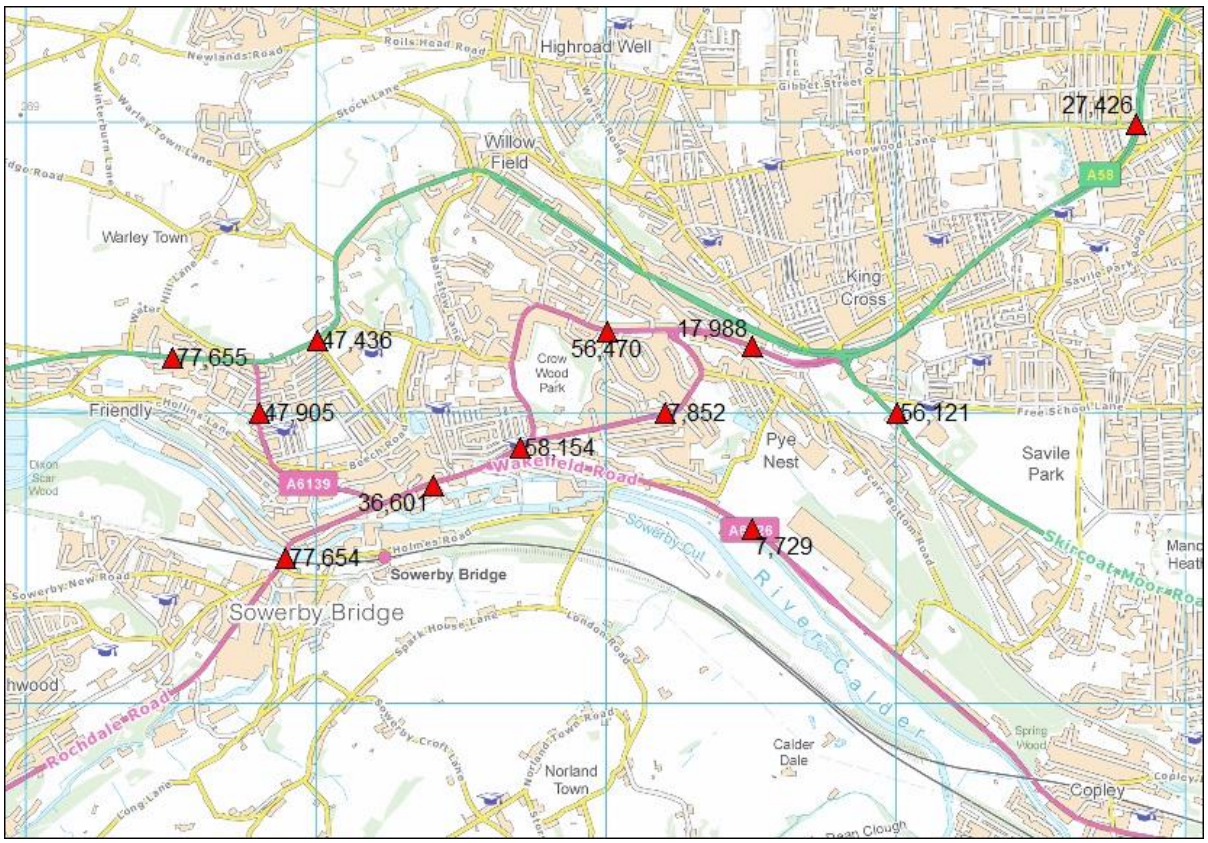


Figure A3a: Hebden Bridge (Calderdale No 3 AQMA)

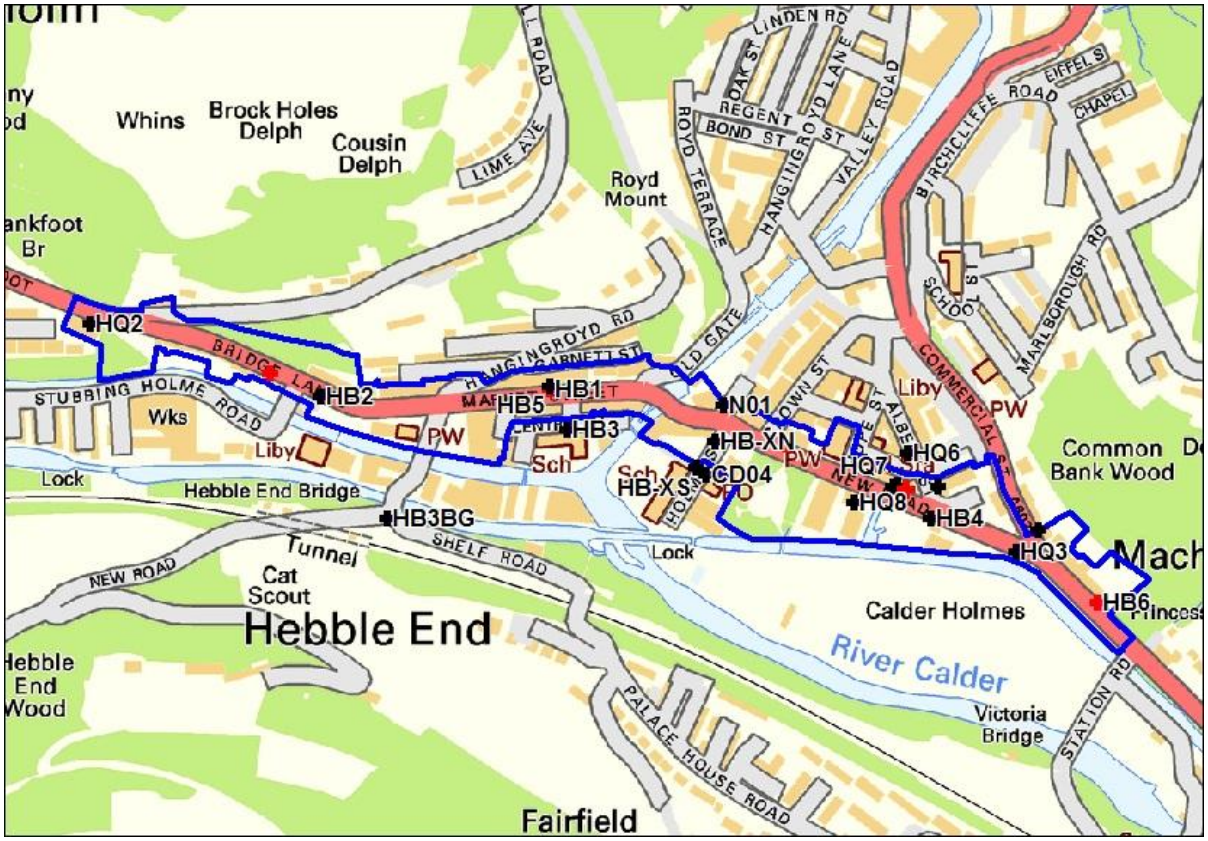


Figure A3b: Hebden Bridge traffic census points

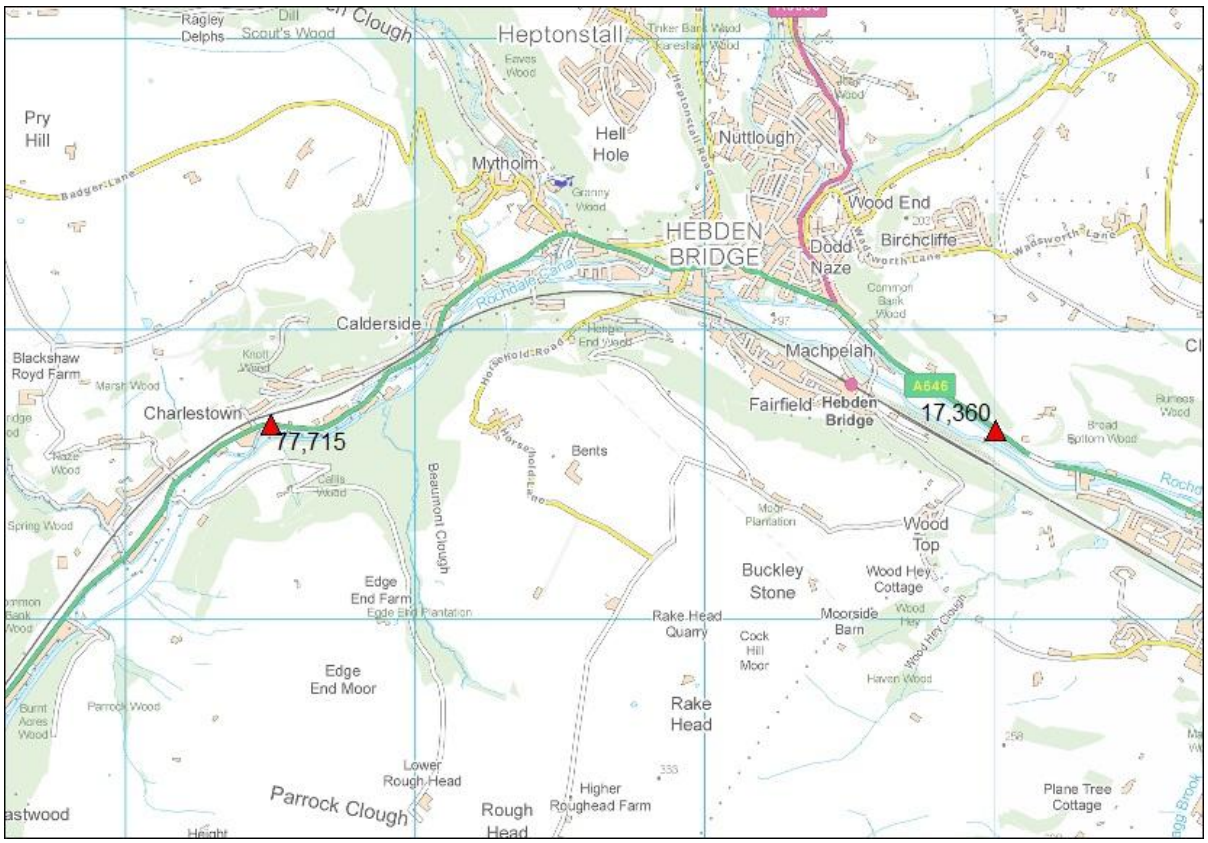


Figure A4a: Luddendenfoot (Calderdale No 4 AQMA)

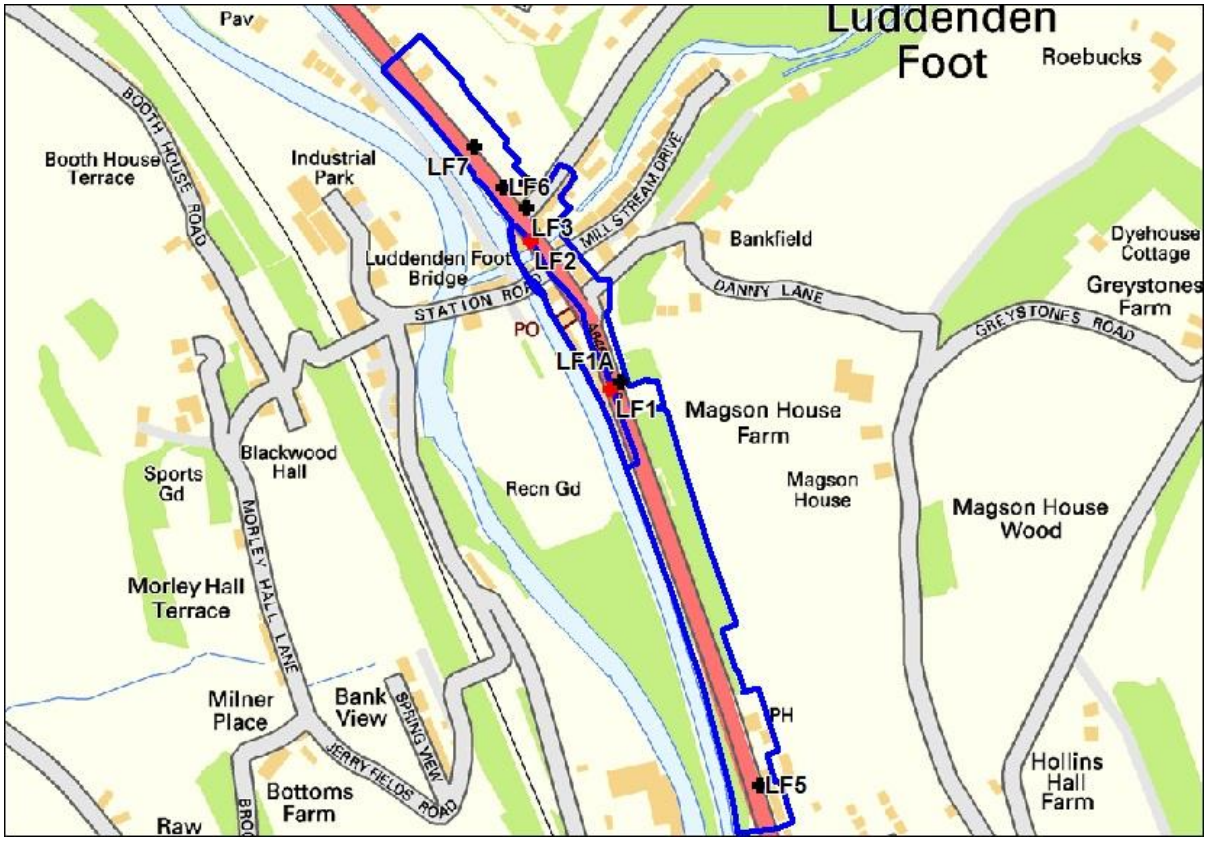


Figure A4b: Luddendenfoot traffic census points

See data for Sowerby Bridge and Hebden Bridge

Figure A5a: Stump Cross, Halifax (Calderdale No 5 AQMA)

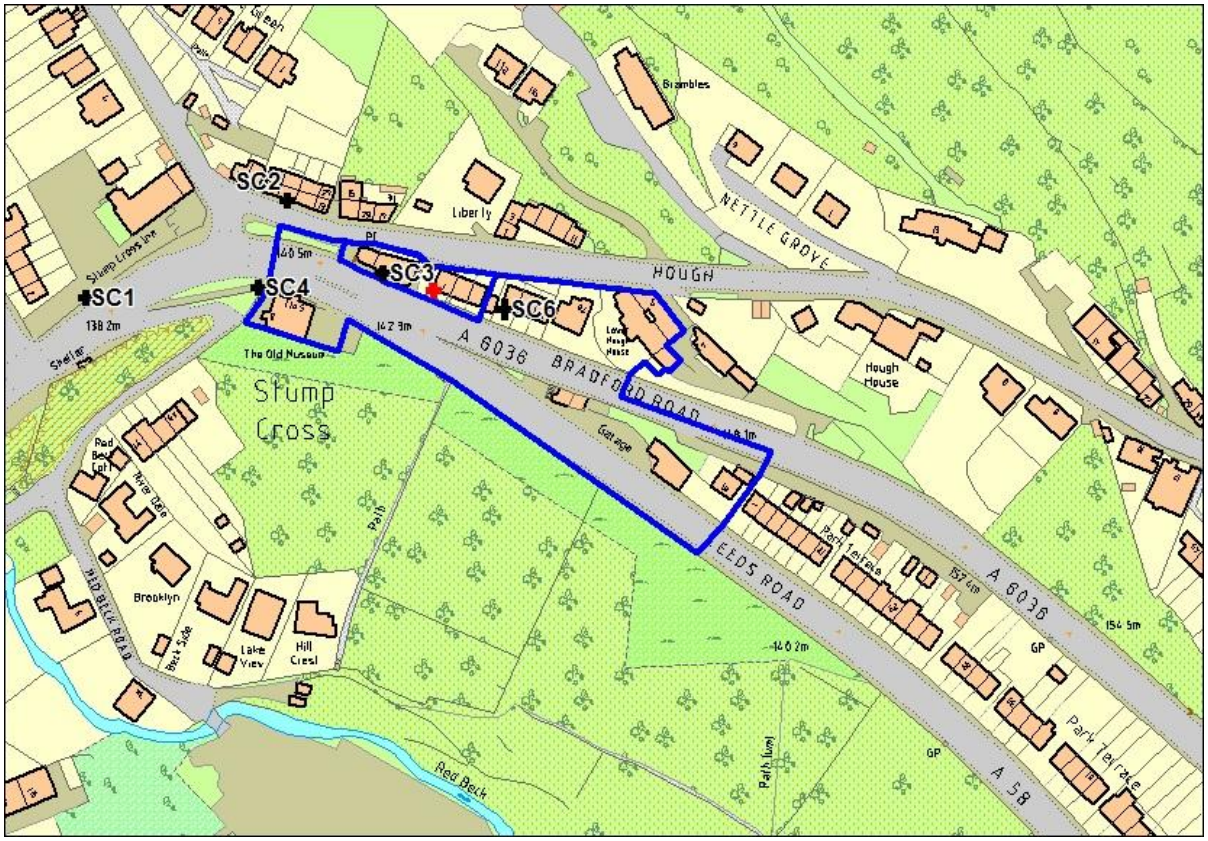


Figure A5b: Stump Cross, Halifax traffic census points

Figure A6a: Brighouse (Calderdale No 6 AQMA)

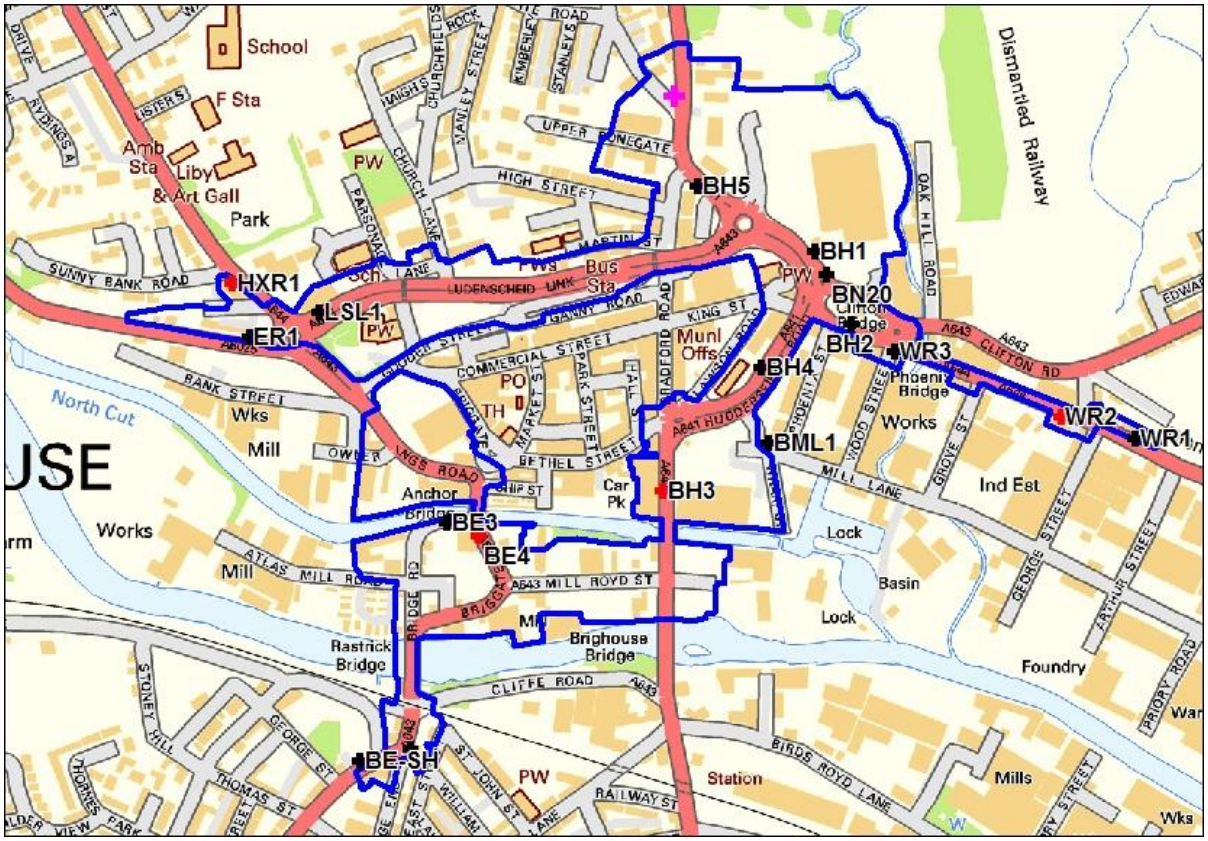


Figure A6b: Brighouse traffic census points

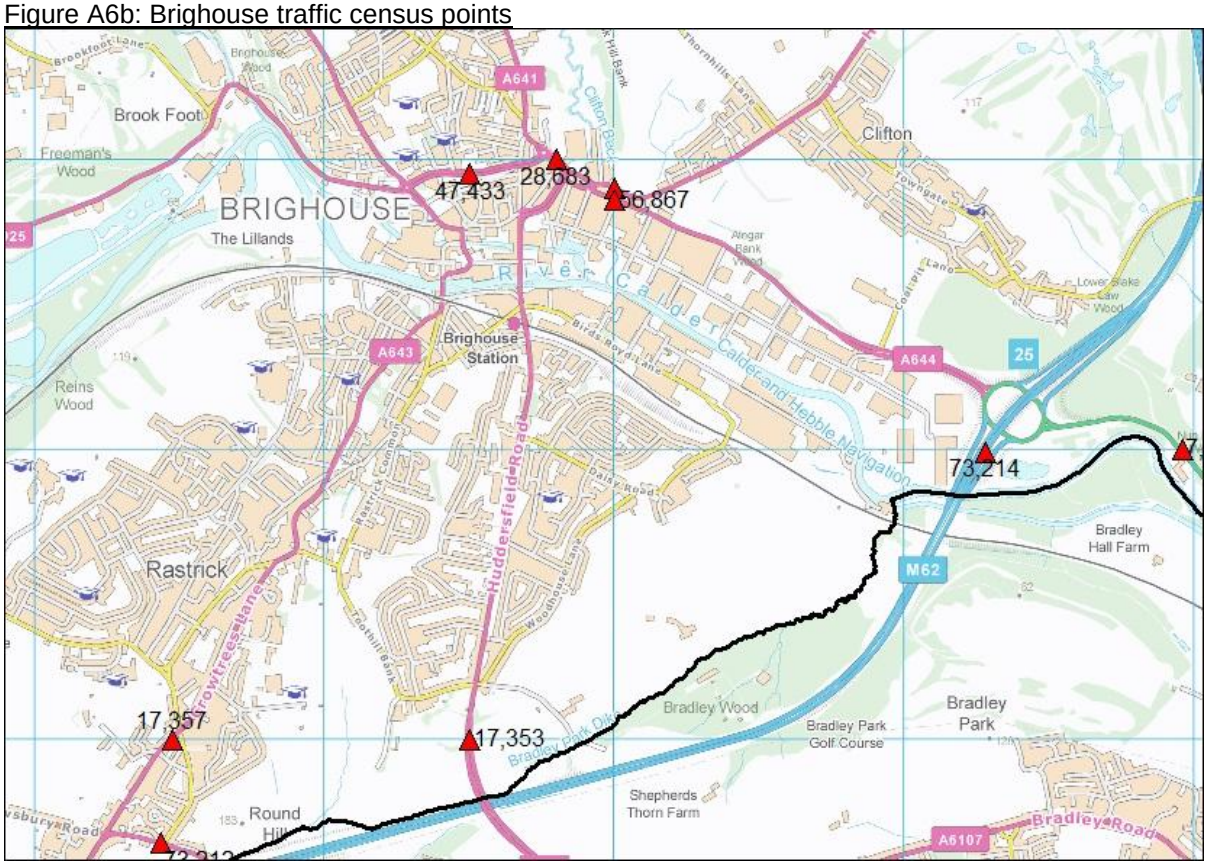


Figure A7a: Hipperholme, Halifax (Calderdale No 6 AQMA)

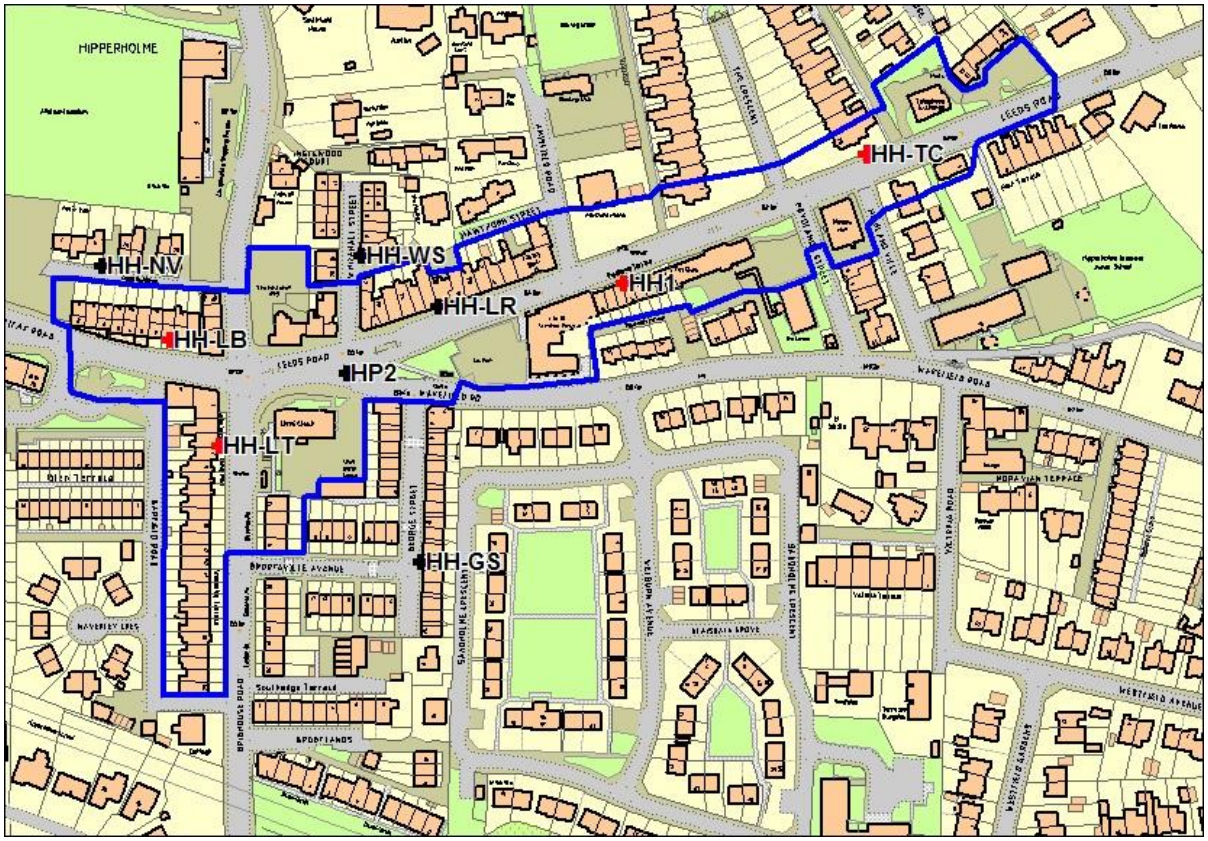
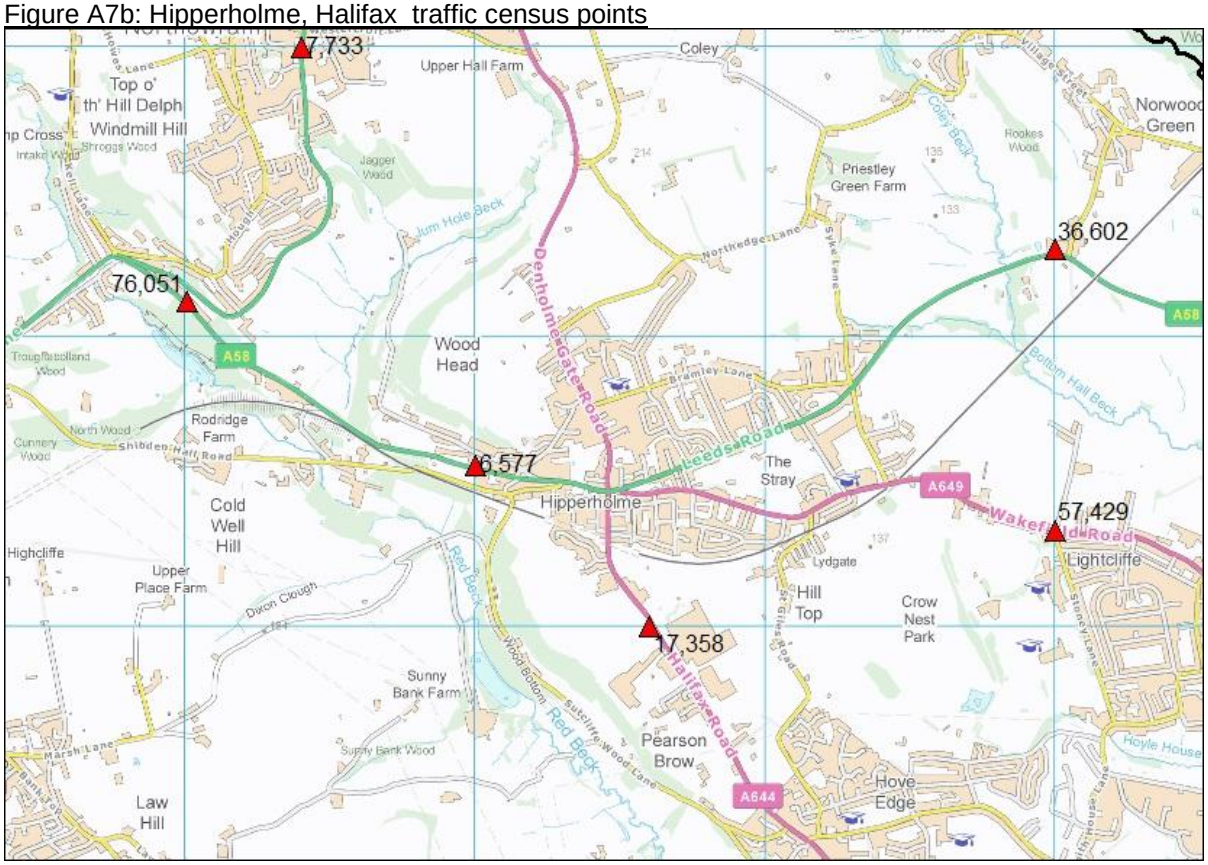


Figure A7b: Hipperholme, Halifax traffic census points



Appendix B: consultation responses

Table A.1 – Summary of Responses to Consultation and Stakeholder Engagement on the AQAP

Consultee	Category	Response
Residents panel (initial consultation on air quality attitudes, June 2017)	Community	Air quality is a significant issue for the majority of respondents. Many were not aware of the Council's monitoring. Suggestions made for better presentation of data, and a clear message that action is more important than monitoring.
Public	Community	
Public Health		
DEFRA		
Environment Agency	Executive agency of Defra	
Kirklees MBC	Local Authority	

Appendix C: Reasons for Not Pursuing Action Plan Measures

Table B.1 – Action Plan Measures Not Pursued and the Reasons for that Decision

Action category	Action description	Reason action is not being pursued (including Stakeholder views)
	Complete table for all measures that will not been pursued.	Add a 2-3 sentence summary for each action
Public transport	Park and ride	High cost and difficulty in identifying land.
Demand management	Road user charging	High cost of infrastructure, unpopular measure with the potential to adversely affect local economy.
Vehicle emissions	Fixed penalty notices	Would not address air quality in AQMAs, where vehicles are less likely to idle. Other measures would be more effective in keeping traffic moving.
Vehicle emissions	Low emissions zone/ CAZ	Not mandatory (see [DE17]), with high infrastructure costs. Could adversely affect local economy, as well as potentially displacing the problem to other areas.

Appendix D: WYLES objectives [WYLES]

Ref	Objective	Notes
001	A Clean Air Zone will be introduced within the Leeds district, and elsewhere were necessary, to control emissions from the most polluting vehicles.	Calderdale is considering the impact that a CAZ may have on its area.
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.	The bus fleet used in Calderdale is old (2000 registration buses on some routes) and this objective is seen as important for reducing emissions.
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.	EV recharge points are now routinely required for new developments, and further implementation of on-street recharging is under investigation.
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.	Limited implementation of this objective, but not abandoned.
005	We will work with our partners to develop infrastructure to support alternative fuels and technology for transport including: natural gas, biomethane, LNG and hydrogen.	Not yet developed in Calderdale.
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.	Licensed trade engagement has already begun. Further progress anticipated as electric recharging infrastructure develops.
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”.	The themes of this objective are central to Calderdale’s air quality strategy.
008	We will use the West Yorkshire Air Quality and Planning Technical Guide to deliver sustainable developments and deliver air quality improvements.	WYLES guidance used.

009	We will use our influence to promote low emission transport through the use of the West Yorkshire Low Emission Procurement Guide in the procurement of vehicles, goods and services and lead by example to reduce emissions from our own fleet operations.	Low emission vehicle trials underway in house.
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.	Improvements to practical public engagement are underway, including campaigns, web page improvements and progress with aim of disseminating live monitoring data.

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
AQS	Air Quality Strategy
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
EU	European Union
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
WYCA	West Yorkshire Combined Authority
WYLES	West Yorkshire Low Emissions Strategy
WY+TF	West Yorkshire Plus Transport Fund

References

[AQAP09] Calderdale Air Quality Action Plan, Calderdale Council 2009

[AQEG12] Fine Particulate Matter (PM2.5) in the United Kingdom, Air Quality Expert Group 2012

[AQPWY] Air Quality Plan for the achievement of EU air quality limit value for nitrogen dioxide (NO_2) in West Yorkshire Urban Area (UK0004)

[AQPYH] Air Quality Plan for the achievement of EU air quality limit value for nitrogen dioxide (NO_2) in Yorkshire and Humberside (UK0034)

[Dataworks] Calderdale Data Works at https://dataworks.calderdale.gov.uk/ - an open data site including air quality data [accessed October 2017]

[CMBC17] Calderdale Council'sTransport Strategy https://www.calderdale.gov.uk/v2/residents/transport-and-streets/transport-improvements-and-initiatives/transport-strategy [last accessed 28th July 2017]

[CMBC17B] Calderdale Council's Cycling Strategy (link tbc)

[CR12] Carslaw D C and Ropkins K, openair --- an R package for air quality data analysis. Environmental Modelling & Software. Volume 27-28, 52-61, 2012

[CR16] Carslaw D C and Ropkins K, openair: Open-source tools for the analysis of air pollution data. R package version 2.0.0, 2016

[DE16] Air Pollution in the UK 2015, DEFRA 2016

[DE17] UK plan for tackling roadside nitrogen dioxide concentrations Detailed plan, July 2017

[LCPH] Lancet Commission on Pollution and Health 2017 at http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(17)32345-0.pdf [accessed October 2017]

[PG16] Local Air Quality management Policy Guidance LAQM.PG(16), DEFRA 2016

[R17] R Core Team (2017). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/

[TG16] Local Air Quality management Technical Guidance LAQM.TG(16), DEFRA 2016

[WYLES] West Yorkshire Low Emissions Strategy https://www.calderdale.gov.uk/v2/businesses/pollution/air-quality/wyles-low-emissions-strategy [accessed October 2017]