Calderdale Council

Air Quality Action Plan (2024 – 2029)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

June 2024

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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 actions we will take to improve air quality in Calderdale between 2024 and 2029, with a focus on current Air Quality Management Areas (AQMA).

This AQAP replaces the previous Action Plan which ran from 2019-2024. Projects delivered through the past AQAP include:

- Improvements to Calderdale's Air Quality web pages.
- Highway improvements at A629 Calder and Hebble Junction (Phase 1b)
- Borough-wide improvements to cycling and walking networks.
- Active Calderdale campaign
- Creation and development of the Council's Air Quality Strategy with the six key objectives.

Additionally, since the AQAP of 2019, the Council has declared a Climate Emergency in Calderdale.

Context

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[i,ii].

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

Calderdale Council has adopted an ambitious strategy to become net zero by 2038. This strategy includes measures relating to rail, roads and energy policy in Calderdale and the wider region and many of the planned measures that will reduce carbon emissions will also improve air quality (e.g. reducing car journeys, getting

more people cycling and walking). Additional measures developed through this AQAP will also likely have co-benefits for Calderdale's ambition to be net zero by 2038.

By considering existing strategies and policies within Calderdale and the wider West Yorkshire Combined Authority, we have developed and identified actions that can be considered under the broad topics:

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

As the Climate Action Plan and Local Transport Plan have already identified several flagship measures to reduce carbon emissions in Calderdale, and hence air pollutant emissions, the AQAP doesn't solely focus on measures to reduce emissions, but also measures that will reduce the exposure of members of the public to existing pollution and promote behaviour change.

Our priorities are to improve our understanding of air pollution, promote air quality as a consideration in decision making, raise awareness of the understanding of air pollution in Calderdale, and its links to Climate Change, design the physical and natural environment to reduce congestion, reduce pollution from vehicle journeys and protect the health of those that are most vulnerable to the harmful effects of pollution (children, the long term sick and the elderly).

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 policy areas that are outside of our influence (such as vehicle emissions standards agreed in Europe, or large-scale projects such as HS2), 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. Where appropriate, the impact of these measures on air quality are predicted, particularly in the context of the existing Air Quality Management Areas (AQMA).

Responsibilities and Commitment

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

- Public Health
- Highways and Transport
- Planning Services
- The West Yorkshire Low Emission Strategy Partnership

Greenavon Ltd, a specialist air quality consultancy, also assisted with the development of the evidence base and technical aspects of the AQAP.

This AQAP has been approved by Neighbourhoods and Communities Directorate and Public Health.

This AQAP has been signed off by the Director of Public Health and will be subject to an annual review. 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:

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1 Introduction

This report outlines the actions that Calderdale Council will deliver between 2024 and 2029 to reduce concentrations of air pollutants and exposure to air pollution; thereby positively impacting the health and the quality of life of residents and visitors to Calderdale.

It has been developed in recognition of the legal requirement on the local authority to work towards Air Quality Strategy (AQS) objectives under Part IV of the Environment Act 1995 and relevant regulations made under that part and to meet the requirements of the Local Air Quality Management (LAQM) statutory process.

This Plan will be reviewed every five years at the latest and progress on measures set out within this Plan will be reported on annually within Calderdale Council's air quality ASR.

The AQAP aims to prove that there are sufficient actions taking place in Calderdale to reach compliance with the national AQSs and as such, measures being carried out by partner organisations, local business and the NHS are discussed. However, the AQAP places greater focus on the actions directly under the control of Calderdale Council, as well as the local partnerships that are in place, or need to be strengthened.

2 Summary of Current Air Quality in Calderdale Council

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 technical reports and the most recent of these Annual Status Reports (ASR) are available on the Council's website.

Currently the council monitors concentrations of NO_2 and fine particulate matter (PM_{10} and $PM_{2.5}$). Particulate matter is everything in the air that is not a gas (e.g. pollen, smoke, and aerosols).

At the time of drafting this AQAP, historic and current monitoring has led the council to designate eight AQMAs. Each of these AQMAs has been declared due to an exceedance of the annual mean objective for NO_2, principally associated with emissions from cars and other road vehicles. Two AQMAs (AQMA Nº.4 at Luddendenfoot and AQMA Nº.5 at Stump Cross) are however in the process of being revoked and are not currently considered in this AQAP. The remaining AQMAs can be found at:

- The A629 Salterhebble, Halifax (AQMA Nº. 1)
- The A58 Sowerby Bridge (AQMA Nº. 2)
- the A646 in Hebden Bridge, commencing adjacent to Bankfoot Terrace and ending adjacent to Station Road (AQMA Nº. 3)
- the centre of Brighouse (AQMA Nº. 6)
- Halifax Road/Leeds Road crossroads, Hipperholme (AQMA Nº. 7)
- A58 at New Bank and Godley Road Halifax (AQMA Nº. 8)

Maps of the individual areas are featured in the latest ASR and on Defra's website. Please refer to the latest ASR from Calderdale Council, for further information on the air quality within these AQMAs.

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.

The Public Health Outcomes Framework data tool compiled by Public Health England quantifies the mortality burden of $PM_{2.5}$ within England on a county and local authority scale. The latest available data shows that the 2022 fraction of mortality attributable to $PM_{2.5}$ pollution in Calderdale is 5.3% which is slightly above Yorkshire and the Humber's fraction (5.1%) and below the England average of 5.8%.

The most recent figures from Public Health England (2023) show that the directly standardised death rate in under 75s from respiratory disease (Public Health Outcomes Framework indicator (PHOF indicator 93963) was 116.5 per 100,000 in Calderdale, compared to 106.9 per 100,000 in England. This figure recognises smoking and all forms of air pollution as contributory factors.

This statistic only considers one type of pollutant, $PM_{2.5}$, due to the robust scientific evidence linking it to mortality. It does not include NO_2, which is the basis for declaring Calderdale's AQMAs, implying that the actual mortality burden could be significantly higher. Moreover, the Committee on the Medical Effects of Air Pollutants (COMEAP) is currently examining the possibility of attributing deaths to specific pollutants, following a review of research on the mortality burden associated with the mixture of air pollutants, rather than individual pollutants acting separately. Regardless, it is anticipated that the measures to decrease NO_2 levels outlined in this AQAP will also reduce PM_{10} and $PM_{2.5}$ concentrations.

Calderdale Council are taking action to reduce health inequality and poverty in the borough. Table 3.1 provides a selection of statistics describing the populations living in, and around, Calderdale's AQMAs. These population statistics have been provided so that the Council can best direct resource to reduce health inequalities and build a fairer Calderdale, where all can thrive.

The statistics are provided at Lower Super Output Area (LSOA) level. LSOA are the smallest areas for which population level statistics are available and as the AQMAs do not cover the entire area of any LSOA, the populations living within, or immediately adjacent to the AQMAs will be slightly different. For an idea of the scale of LSOA, there are between 304 and 506 households in the LSOAs with AQMAs in Calderdale. The Calderdale local authority level statistics are also provided for comparison.

Table 3:1: Population Statistics for Lower Super Output Areas with AQMAs

AQMA	LSOA	Index of Multiple Deprivation Decile (Where 1 is most deprived 10% of LSOAs)[iv]	Not Deprived in Any dimension[v](%)	Deprived in two dimensions [v]	% White: English, Welsh, Scottish, Northern Irish or British [v]	Reported Health (Bad and Very Bad) [v]	Child Population (%) [v]
No. 1 (Salterhebble)	Calderdale 021B	8	61.1	8.7	84.3	2.7	14%
	Calderdale 021C	7	55.6	9.9	**78.3**	3.5	**20%**
	Calderdale 018D	4	**45.6**	12.8	89.0	4.9	16%
	Calderdale 018E	2	**42.0**	**18.4**	87.4	**6.4**	**22%**
No. 2 (Sowerby Bridge)	Calderdale 017A	6	**44.6**	14.3	91.4	5.3	17%
	Calderdale 017D	2	**40.2**	**18.5**	92.6	**9.4**	12%
	Calderdale 017F	3	50.5	12.2	91.1	5.6	15%
No. 3 (Hebden Bridge)	Calderdale 004B	5	48.6	14.9	89.6	**7.4**	16%
	Calderdale 004E	5	52.1	13.1	86.4	**6.2**	14%
	Calderdale 004F	4	54.0	11.2	88.7	5.3	14%

No.6 (Brighouse)	**Calderdale 015A**	4	**41.8**	**15.5**	92.0	**6.4**	14%
	Calderdale 019E	3	**41.4**	**16.6**	90.4	**7.2**	15%
	Calderdale 023C	3	**43.9**	**17.0**	92.4	**6.4**	18%
No. 7 (Hipperholme)	Calderdale 011B	10	61.8	8.0	93.3	2.7	17%
	Calderdale 011C	8	60.2	8.3	92.6	3.1	15%
	Calderdale 011D	6	55.5	11.1	90.7	4.9	15%
No. 8 (New Bank)	**Calderdale 008A**	5	50.0	13.5	92.8	5.2	14%
Calderdale Average	NA	NA	47.1	15.2	83.2	5.8	18%

Note: **Bold** denotes a significant part of the AQMA within the LSOA.

Red denotes higher than Calderdale average deprivation, non-white population, self-reported bad health and child population.

3.2 Planning and Policy Context

There are many local, regional and national policies and strategies that directly align with the goals of the AQAP. As road traffic is the predominant source of pollution in the borough and the principal cause of non-compliance with the national AQS, many of these policies relate to transportation. However, climate-related policies are equally vital as they address other emissions, including domestic, natural, and industrial sources.

Reviewing these other policies is essential to prevent a duplication of work within the AQAP, as well as identifying emission sources that have not been fully considered in existing policy. This integrated approach aims to improve air quality and protect public health, in an efficient way, while aligning with broader environmental goals.

3.2.1 Clean Air Strategy

The Clean Air Strategy 2019[vi], which addresses air pollution at the national level in the UK, identifies various pollution sources, including road transportation (relevant to AQMAs in Calderdale). It outlines actions necessary to mitigate the impact on air quality from these sources. Developed alongside the Industrial Strategy, Clean Growth Strategy, and 25 Year Environment Plan, the strategy focuses on transportation-related emissions:

- Road to Zero: A plan to phase out new conventional petrol and diesel cars and vans by 2040.
- Legislation for Vehicle Recalls: Compelling manufacturers to recall vehicles and non-road mobile machinery with emission control system failures and combat tampering.
- Tyre and Brake Standards: Developing new standards to reduce toxic non-exhaust particulate emissions.
- Promoting Clean Transport Modes: Encouraging cleaner freight and passenger transport.
- Non-Road Mobile Machinery: Exploring emission reduction approaches, especially in urban areas.

3.2.2 Local Plan

The Calderdale Local Plan[vii] directs planning decisions in the borough and is therefore 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 the National Planning Policy Framework (NPPF) paragraph 192, allows a strategic approach to reducing emissions and promoting alternatives to private vehicle use.

The Local Plan contains policies of relevance to the AQAP, including:

> *"Policy EN2 Air Quality*
>
> *I. To ensure that the effect of development on air quality is minimised so far as practicable, residual impacts are mitigated, compliance with legal Air Quality objectives is achieved as soon as possible, and to support the Council's overall strategy set out in the reasoned justification above, all proposals that have the potential to increase local air pollution either individually or cumulatively must be accompanied by proportionate evidence to show that the impact of the development has been assessed. Assessments must be in accordance with the guidance contained in the West Yorkshire Low Emissions Strategy and Air Quality & Emissions Technical Planning Guidance (or equivalent guidance) where relevant to the proposal. In cases where industrial emissions may be introduced or increased, an appropriate assessment must be submitted. Proposals that are not accompanied by that evidence, or which do not incorporate adequate mitigation measures as indicated by the guidance to secure and maintain compliance with air quality objectives to protect human health, will not be permitted.[…]*
>
> *Where there is assessed to be an adverse effect on air quality applicants must provide an assessment of damage cost of the development to secure additional mitigation measures. The mitigation measures will be secured through Planning Conditions or a Legal Agreement.*
>
> *IV. New development in Air Quality Management Areas must be consistent with the Council's Air Quality Action Plan. In these areas, development should not materially worsen air quality or undermine strategies and actions to achieve compliance with the air quality objectives in the shortest time possible.*

V. Where the development introduces new sensitive receptors into Air Quality Management Areas, the development must incorporate sustainable mitigation measures that protect the new receptors from air pollution as defined in national air quality objectives. Where sustainable mitigation measures cannot be introduced to prevent receptors from being exposed to such risks, development will not be permitted."

And:

"Policy EN1 Pollution Control

I. The Council will seek to reduce the amount of new development that may reasonably be expected to cause pollution or be exposed to pollution. When determining planning applications, consideration will be given to the following issues:

a. The likelihood of light, noise, smell, vibration or other emissions that pose an unacceptable risk to the amenity of the local area […]

c. Whether there are reasonable grounds to believe that human health may be affected by the proposal

d. The potential for pollution (including noise, light, water and air pollution) to affect biodiversity and sites of biological and geological importance […]

g. The potential impact on designated Air Quality Management Areas (AQMAs) or areas at risk of exceeding air quality objectives."

3.2.1 West Yorkshire Low Emission Strategy

The five West Yorkshire Authorities have been working for several years to bring about improvements in air quality. Calderdale Council also formally adopted the West Yorkshire Low Emissions Strategy (WYLES) in December 2016[viii] and is working towards implementing it through planning policy. The West Yorkshire Low Emissions Strategy is formed from:

- West Yorkshire low emissions strategy document[ix]
- Air quality and emissions technical planning guidance[x]
- Bus emissions strategy[xi]
- Low emission procurement guide[xii]

The WYLES focuses on reducing emissions of NO_2 and fine particulate matter, from principally road transport across the five west Yorkshire Authorities and is, in part, designed to guide the production of this AQAP. Although the strategy was adopted in 2016 and was intended to run until 2021, the strategy is still active.

The WYLES provides comprehensive detail on how emissions from vehicles and other sources can be reduced. The West Yorkshire Low Emission Procurement Guide provides guidance on public sector procurement in the region, and the required standards. These standards are reproduced below in Table 3.2.

Table 3:2 WYLES Vehicle Emissions Standards

Vehicle Type	Minimum standard	Best practise	Other considerations
Cars	CO_2- 130g/km Or less Emissions- Euro 5	CO_2- 100g/km Or less Emissions- Euro 6 or better (e.g zero emission)	use of renewable fuels, e.g bio fuels, renewable electricity, Telematics to support fuel efficient driving
Vans	CO_2- 170g/km Or less Emissions- Euro 5	CO_2- 150g/km Or less Emissions- Euro 6 or better (e.g zero emission)	use of renewable fuels, e.g bio fuels, renewable electricity, Telematics to support fuel efficient driving
Heavy Duty vehicles	Emissions- Euro V	Emissions- Euro IV or better	use of renewable fuels, e.g bio fuels, renewable electricity, Telematics to support fuel efficient driving
Waste collection Vehicles	Emissions- Euro IV Or Equivalent retrofit	Emissions- Euro IV or better (e.g zero emission) Or Equivalent retrofit	use of renewable fuels, e.g bio fuels, renewable electricity, Telematics to support fuel efficient driving, monitoring and targets CO_2 NO_X and PM Emission
Bus service	Emissions- Euro IV Or Equivalent retrofit	Emissions- Euro IV or better (e.g zero emission) Or Equivalent retrofit	use of renewable fuels, e.g bio fuels, renewable electricity, Telematics to support fuel efficient driving, monitoring and targets CO_2 NO_X and PM Emission

The West Yorkshire Combined Authority (WYCA) Bus Strategy (2040) Environment Policy aims to *"create a modern, low carbon bus system which contributes to improved air quality".* It aims to achieve this by:

- Providing a bus fleet that has a positive impact on health and environment, with consistent year on year improvement.

- Meeting the legal health standards for air quality by ensuring older buses are modernised or replaced through investment to reduce local emissions
- Requiring all vehicles new to West Yorkshire to meet the latest environmental standard as a minimum. The current standard is Euro VI.
- Encouraging new vehicle technologies which move towards near to zero vehicle emissions;
- Providing support to establish clean air zones across West Yorkshire
- Raising public awareness around bus emissions standards.

The current estimate from March 2023 for the bus fleet in Calderdale is provided in Table 3.3. This info was provided by the WYCA.

Table 3:3 Calderdale Bus Fleet, by Euro Class (March 2023)

Euro Class	Number of Buses	Percentage of Buses (%)
2	0	0%
3	7	5%
4	8	5%
5	43	28%
6 or Zero Emission Vehicle (ZEV)	97	63%
Total	155	-

The WYLES is a high-level strategy document which is designed to reduce emissions and concentrations of pollutants across all sectors, as well as raise awareness of the impact of poor air quality.

Whilst it is important that this AQAP provides evidence that sufficient measures are being carried out to improve air quality in the borough, care has been taken to ensure that elements of the WYLES (an existing strategy) have not been duplicated.

3.2.1 Climate Action Plan

The Calderdale Climate Action Plan[xiii] is a comprehensive strategy developed by Calderdale Council to combat climate change and achieve a net zero carbon emissions target by 2038[1]. The plan outlines the council's commitment to taking climate change seriously, acknowledging its major threat to our way of life[1].

To achieve net zero across West Yorkshire by 2038, the following will need to occur:

- reduce car trips by 21%
- increase cycling trips by 2000%
- increase walking trips by 78%
- increase bus trips by 39%
- increase rail trips by 53% [xiv]

While the plan itself primarily focuses on reducing carbon emissions to combat climate change, many of the actions it proposes also contribute to improving air quality.

The three-year plan (2023-26) covers the following six key themes:

1. **Working together to influence decisions**: Collaborating with various stakeholders to make climate action part of everything we do.
2. **Support community action**: Encouraging community involvement through initiatives like Green Community Advice Hubs and Neighbourhood Climate Action Plans.
3. **Create warm and resilient buildings**: Retrofitting buildings to make them more energy-efficient, reducing the burning of fossils fuels for heating.
4. **Grow a green economy**: Promoting sustainable business practices.
5. **Transform transport and how we get around**: Encouraging the use of sustainable modes of transport. By promoting the use of sustainable modes of transport, the plan aims to reduce the emissions from vehicles, which is a significant source of air pollution.
6. **Work with land and nature to protect us in the long-term**: Implementing strategies to protect and enhance the natural environment. Measures to

increase tree cover in Calderdale will help minimise pollutant concentrations, and measures to protect and restore peatland will reduce fire risk.

The Calderdale Climate Action Plan is closely related to air quality, and one of its commitments is to *"work in line with the AQ strategy to reduce congestion"*.

3.2.1 Transport Strategies

As road transport is the principal cause of non-compliance with the UK AQS in Calderdale, the regional and district level strategies play a key-role in the delivery of air quality improvements. The Calderdale Transport Strategy[xv] aims to enhance the environment and people's quality of life by:

- *"improving air quality in the Borough by initiating a programme of measures to reduce air pollution in key problem locations"*

The WYCA Transport Strategy[xvi] has the following high-level objectives:

- *"Economy: Create a more reliable, less congested, better connected transport network, increasing business productivity and ,access to wider labour markets*
- *Environment: "have a positive impact on our built and natural environment and increase resilience against climate change.*
- *People and Place: Put people first to create a strong sense of place - increasing access in a safe, inclusive way and encouraging walking and cycling for health and other benefits"*

By targeting these high-level objectives, air quality across West Yorkshire will improve.

The Calderdale Next Chapter webpage provides details of many of the major road/ infrastructure developments in the borough that are planned to reduce congestion and improve air quality. This AQAP has, where appropriate, highlighted specific projects and measures that will, or could potentially have, significant beneficial impacts on air quality in the AQMAs (See Appendix C).

3.2.2 Rail Strategy

The Calder Valley Rail Line runs through Hebden Bridge, Sowerby Bridge, Halifax, and Brighouse, and within 100m of all active AQMA, except for the AQMA No.8 (New

Bank). The WYCA Rail Strategy[xvii] categorises the Calder Line as being in Tier 1, reflecting the highest priority for electrification. Regarding the Calder Valley Line it states:

"The Calder Valley Line: As one of the busiest routes in the region, high numbers of diesel vehicles could be removed, and full electrification would maximise the benefits of Leeds-Bradford electrification; there is also significant freight traffic"

The electrification of the Calder Line is also a strategic objective of both local and regional Transport Plans. The electrification of the Calder line could bring about reduced direct NOx/NO_2 emissions, as well as increased ridership and reduced car journeys, with evident benefits across Calderdale. An improved rail network could also, importantly, reduce the number of heavy goods vehicles on Calderdale's roads by moving a larger proportion of freight onto the railway.

3.2.3 Calderdale and Huddersfield Foundation Trust (CHFT) Green Plan

The Calderdale and Huddersfield Foundation Trust (CHFT) Green Plan is a comprehensive strategy that outlines the Local NHS Trust's commitment to sustainable development from February 2021 to February 2026. Whilst it primarily focuses on achieving Net Zero, the plan also addresses air pollution and has the following aims relating to air quality:

- The Trust will convert 90% of their fleet to low, ultra-low and zero-emission vehicles by 2028.
- The Trust will cut air pollution emissions from business mileage and their fleet by 20% by March 2024.

Calderdale Royal Hospital is located adjacent to AQMA No.1 (Salterhebble) and traffic associated with the hospital will influence pollution concentrations within the AQMA.

3.2.4 White Rose Forest Action Plan

Calderdale Council has aligned its tree planting initiatives with the White Rose Forest Action Plan[xviii]. The council plans to increase local tree canopy cover by more than a third, in line with the White Rose Forest Action Plan targets (18.73% tree cover by

2050). This will not only contribute to achieving carbon neutral targets but also support positive wellbeing and form a key part of natural flood management work.

The latest estimate from Friends of the Earth[xix] suggests that tree cover in Calderdale currently stands at 6.9%. As such, by 2050, forest cover in Calderdale is predicted to increase from 2,528 Ha to 6724.3 Ha. An additional 4,296.3 Ha of woodland cover could remove an additional 11.5 tonnes of $PM_{2.5}$ and 23.7 tonnes of NO_2, per year[xx]. For NO_2, this is equivalent to, at least, a reduction of 39,400 car trips of 10 km in length (assuming a 2024 vehicle fleet)[xxi].

Planting the right trees, in the right places, can also lead to local benefits in pollution by deflecting pollutants away from where people live, move and work.

3.3 Source Apportionment

The Local Transport Plan included detailed queue length analysis which identified that almost all Calderdale's AQMAs are in congestion hotspots. Reducing congestion and stop and start behaviour can have non-linear benefits on air quality, with small improvements in congestion and the flow of vehicles in the AQMAs, causing significant improvements. These non-linear type effects are not easily accounted for in dispersion models such as ADMS-Roads, which rely on *average* speeds and *average* vehicle numbers.

In addition, no automatic number plate recognition (ANPR) studies were carried out to support this AQAP, and as such, Calderdale Council has not developed a detailed profile of the local vehicle fleet, in terms of age and emissions.

All AQMAs, except for AQMA No.8, are located within 100m of the Calder Valley Railway Line. The Calder Line has been identified as being a source of heavy freight traffic and diesel trains, which could influence local concentrations. The council lacks detail on the type of trains, their emissions and schedule to accurately carry out dispersion modelling.

Parts of Calderdale are also hilly, with gradients exceeding 6% in many cases. Terrain can influence air quality by making engines (and brakes) work harder to overcome gravity, which increases emissions, particularly from heavy duty vehicles. Unfortunately, Defra's Emission Factor Toolkit caps the potential effect of gradient at

6%, which could underestimate the potential impact of buses and heavy goods vehicles on steep road links.

For these reasons, no dispersion model has been developed for this source apportionment study. It was considered that the use of ADMS-Roads or other dispersion models could give a false sense of certainty in predictions, for significant additional effort.

As such, for each monitor either in exceedance of the annual mean AQS for NO_2 (>40 µg/m^3) or at risk of exceeding (>36 µg/m^3), the relative contribution of different sources of NO_X, making up total NO_X has been estimated. The relative contribution of background NOx levels was derived from Defra's UK-AIR background maps[xxii], with the vehicle-type contribution derived from a combination of traffic data (from 2022) from the DFT[xxiii], Defra's Emission Factor Toolkit[xxi] and the Defra's NO_x to NO_2 Calculator (V8)[xxiv]. The bus fleet profile in Table 3.3 was used to adjust the EFT, creating a local bus profile. We have also provided a discussion of how the limitations above could influence our predictions, and what effect that may have on the priorities of the AQAP.

Calderdale Council has estimated the relative contribution of different road vehicles, at different speeds (at assessed free-flowing speed, and 10 km/h) in Figures 3.1 and 3.2, respectively. An assessment at two speeds was provided in an attempt to consider the potential effect that congestion could have on estimates.

Figure 3.3 includes the estimated relative contribution, considering both background sources and vehicle movements (at free-flowing speed only).

Figure 3.1 NOx relative contribution by vehicle type (%), at assessed road speeds

Table shows NOx relative contribution by vehicle type at each measurement point by type vehicle.

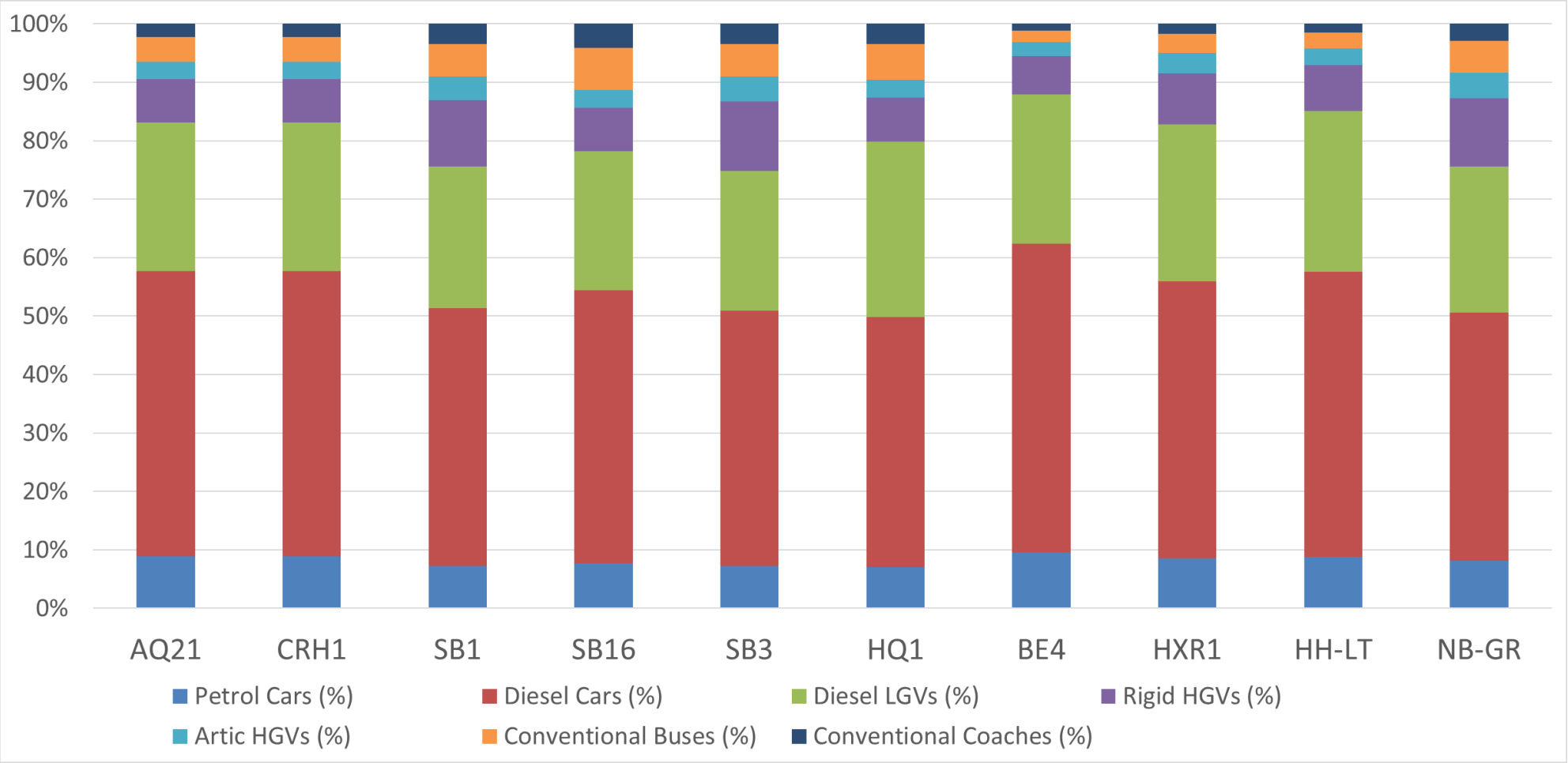


Figure 3.2 NOx relative contribution by vehicle type (%), at 10 km/h

Table shows NOx relative contribution by vehicle type at 10 km/h at different measuring points

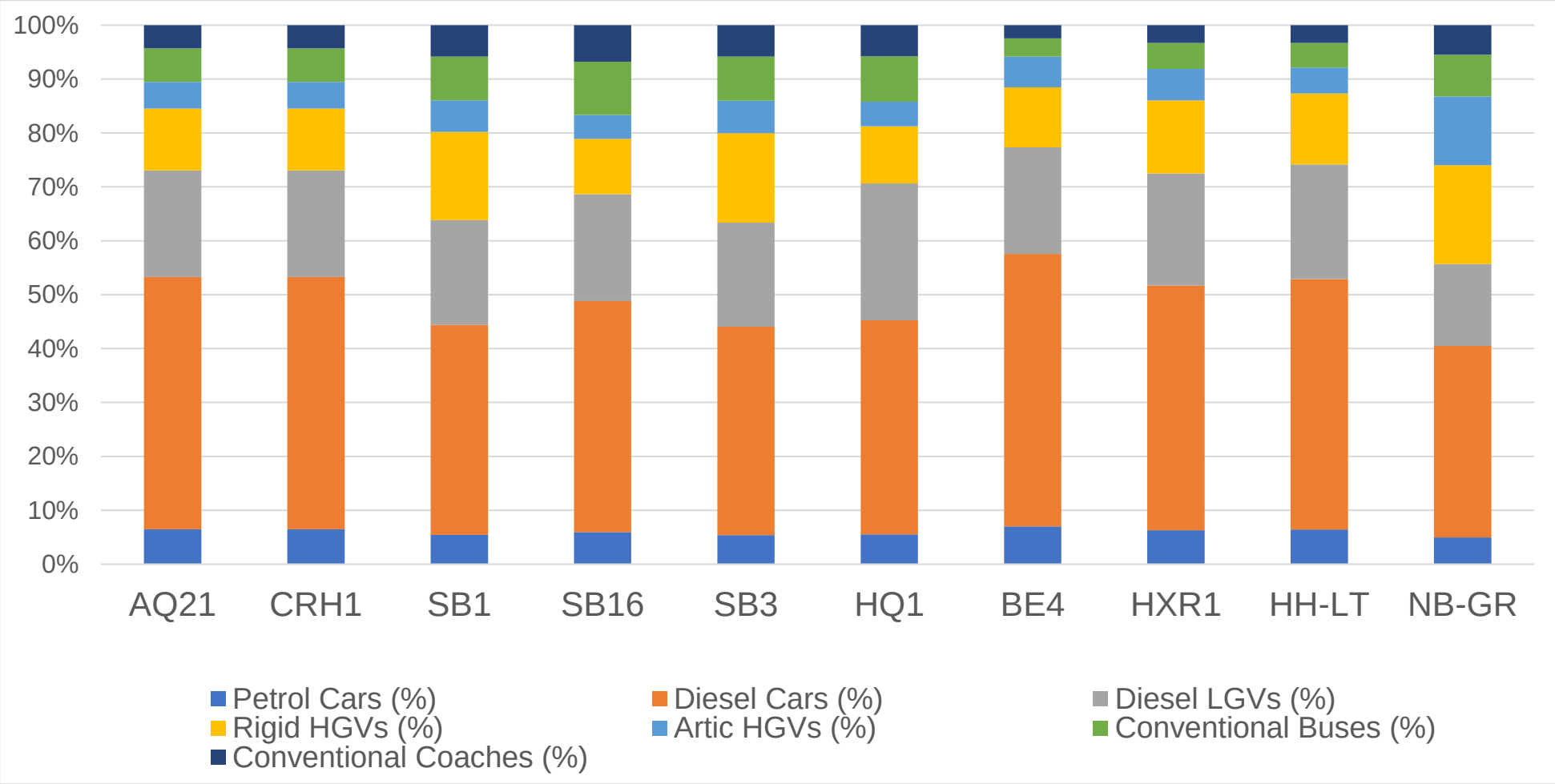
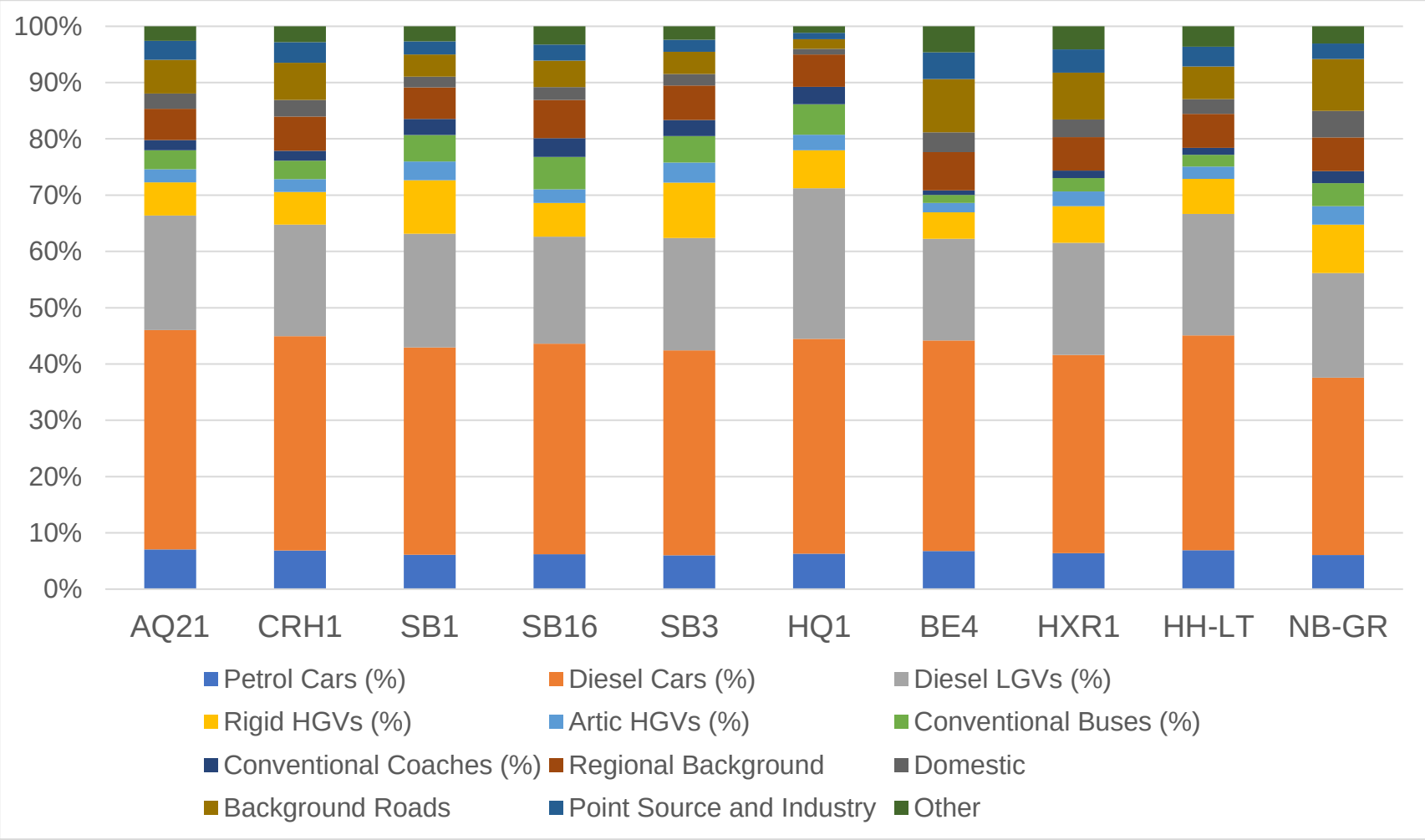


Figure 3.3: Relative NOx Contribution (All major sources)

Table shows NOx Contribution at each measuring point of different sources of NOx



The relative contribution of the different sources to total NO_X are summarised again in Table 3.4 below. Table 3.4 also includes commentary on how, and if, the council can target emission reductions for each source, as well as any potential over or underprediction caused by the methods.

Table 3:4: Relative Contribution of Emission Sources to NOx at non-compliant monitoring locations

Source	NOx Contribution (%) minimum	NOx Contribution (%) maximum	Commentary
Petrol Cars (%)	6.0%	7.1%	The Council has little control over private car purchases, and so measures to reduce the number and duration of car journeys will have greatest impact on this source. There are a significant number of measures in both the transport and climate action plans that will minimise emissions from cars.
Diesel Cars (%)	31.5%	39.0%	
Diesel LGVs (%)	18.1%	26.8%	These are a significant contributor to local NO_2 concentrations. The council could support micro-consolidation and last-mile delivery services, as well as promote fleet recognition schemes.
Rigid HGVs (%)	4.7%	9.9%	The council has little direct control over this source. The analysis, however, shows that the fraction of NO_2 from this source increases with

Artic HGVs (%)	1.7%	3.5%	slower speeds/ more congestion. As such, measures to reduce congestion, as well as get freight onto rail, could reduce emissions from this source.
Conventional Buses (%)	1.4%	5.8%	Buses in Calderdale are currently run by First Bus. The West Yorkshire Bus Strategy is managed by the WYCA and there is no programme yet on the rollout of electric buses in Calderdale. The Council could, however, advise on which routes can first benefit from zero and low emission buses. Unfortunately, there is no detailed breakdown between coaches and buses in the traffic data used in the assessment. As such, these estimates should be treated with caution. Emissions from buses and coaches are also likely more significant than estimated in congested conditions, and when travelling on steep hills.
Conventional Coaches (%)	0.8%	3.3%	
Rural Background	5.5%	6.8%	This represents the regional background, and therefore supporting the regional WYLES and the White Rose Forest Action Plan can help minimise this contribution.
Domestic	1.0%	4.7%	The contribution from this source will be reduced because of the domestic retrofit programme (see climate action plan). The relative contribution of

			this source may also be under-estimated locally as estimates are only available at low resolution (1km^2 grid).
Background Roads	1.7%	9.5%	Measures to promote active travel and encourage modal shift will help reduce NOx levels in urban areas.
Point Source and Industry	1.1%	4.7%	The relative contribution of this source may also be under-estimated locally as estimates are only available at low resolution (1km^2 grid).
Other	1.1%	4.6%	This source includes rail, aircraft and shipping/ boat emissions. The council has little direct control over these sources but can support changes through lobbying. Rail lines take a comparatively small area of land, and as such, any contribution averaged over a 1km^2 can have significant local effects, likely of greater significance at some locations of non-compliance.

The source apportionment study confirms that roads are the principal cause of non-compliance with the annual mean AQS for NO_2 and that cars, light goods vehicles (LGVs) and heavy goods vehicles (HGVs) are generally the most significant contributors to measured NOx levels. There are, however, uncertainties associated with the estimates, principally related to how congestion would influence each source differently. As such, emissions associated with HGVs and buses are likely to have been under-estimated in Table 3.6.

3.4 Required Reduction in Emissions

LAQM TG (22) guidance requires a calculation of the required reduction in NOx and NO_2 to achieve compliance with the national AQS, to understand what level of intervention is required to achieve compliance in the shortest possible time. It is, however, important to note that emissions from road vehicles in Calderdale and across the UK are reducing year on year due to the turnover of the fleet. As such, it is important to have an estimation of when NO_2 levels are likely to become compliant, without significant additional intervention.

Baseline (2023)

The source apportionment study and the baseline assessment within this AQAP has focused on the locations of relevant exposure that were identified in the 2024 Annual Status Report as exceeding or being at risk of exceeding the annual mean AQS for NO_2, i.e. annual mean concentrations greater than 36µg/m^3. These locations are identified in Table 3.5, below.

Table 3:5: Measured Concentrations at Non-Compliant Monitoring Stations (at locations of relevant exposure)

Monitor	AQMA	Annual Mean NO_2 concentration (µg/m^3)				
		2019	2020	2021	2022	2023
AQ21	Yes: AQMA No.1 (Salterhebble)	-	38.5	46.6	40.7	44.6
CRH1	Yes: AQMA No.1 (Salterhebble)	42.0	38.4	38.9	40.5	41.3

SB1	Yes: AQMA No.2 (Sowerby Bridge)	42.0	40.2	37.0	39.4	41.8
SB16	Yes: AQMA No.2 (Sowerby Bridge)	36.0	31.2	25.4	30.7	36.6
SB3	Yes: AQMA No.2 (Sowerby Bridge)	35.0	35.9	37.0	37.4	39.5
HQ1	Yes: AQMA No.3 (Hebden Bridge)	44.0	38.4	42.6	31.3	41.1
BE4	Yes: AQMA No.6 (Brighouse)	42.0	33.6	43.2	36.6	37.7
HXR1	Yes: AQMA No.6 (Brighouse)	42.0	43.0	43.6	39.3	41.9
HH-LT	Yes: AQMA No.7 (Hipperholme)	41.0	40.7	42.3	39.0	39.2
NB-GR	Yes: AQMA No.8 (New Bank)	46.9	42.4	43.9	39.3	40.6

Uncertainty in 2023 Measurements

Due to periods of over and under-exposure, the was a greater level of uncertainty in the 2023 diffusion tube data, with the choice of adjustment factor (local vs national) determining the compliance/ noncompliance of monitoring locations. The monitoring data for 2022 was compliant with all air quality standards at all but AQMA No.1 and AQMA No.6, and this followed the long-term trend, and should a ‘national bias adjustment factor’ have been chosen to adjust the diffusion tube data for 2023, all sites would have been compliant. To ensure that the AQAP was adequate in reducing NO_2 levels to below the national AQS, the upper boundary of NO_2 possible measurements were reported, and the local adjustment factor was chosen.

Future Baseline (2024-2029)

Even in the absence of additional interventions in Calderdale, there will likely be an improvement in the Calderdale vehicle fleet as older vehicles are replaced by newer vehicles, including electric vehicles. As explained in DEFRA’s emission factor toolkit, which provides predictions of how emissions from the UK vehicle fleet will evolve in the future, NO_X emissions from the ‘average vehicle’ in Calderdale will reduce by a few per cent each year, as people buy newer cars and electric vehicles. As cars are the dominant source of NO_2 within the AQMAs, the improvements to the fleet will

likely mean that the AQMAs will become compliant, without significant additional interventions by 2029.

This is demonstrated by the data in Table 3.6. Measured data in 2023 has been adjusted by DEFRA's Roadside Adjustment factors, to predict future pollutant concentrations.

The factors have been calculated as the average of modelled concentrations across approximately 1,900 road links in London, and 7,000 links elsewhere, taking into account the changes in traffic activity, and emission factors for NOx and primary NO_2. The factors consider the inputs of the EFT, which assumes improvements in buses, and other vehicle emissions. Table 3.6 applies adjustment factors appropriate for use outside London where Heavy Duty Vehicles (HDVs) make up less than 10% of the traffic

Table 3:6: Future Baseline at non-compliant monitoring stations, using Defra's Roadside Adjustment Factors

Monitor	AQMA	Annual Mean NO_2 concentration ($\mu g/m^3$)					
		2024	2025	2026	2027	2028	2029
AQ21	Yes: AQMA No.1 (Salterhebble)	42.2	40.0	38.1	36.3	34.7	33.3
CRH1	Yes: AQMA No.1 (Salterhebble)	39.0	37.0	35.2	33.5	32.1	30.8
SB1	Yes: AQMA No.2 (Sowerby Bridge)	39.6	37.5	35.7	34.0	32.5	31.2
SB16	Yes: AQMA No.2 (Sowerby Bridge)	34.6	32.8	31.2	29.7	28.4	27.3
SB3	Yes: AQMA No.2 (Sowerby Bridge)	37.4	35.4	33.7	32.1	30.7	29.5
HQ1	Yes: AQMA No.3 (Hebden Bridge)	38.9	36.9	35.1	33.4	32.0	30.7
BE4	Yes: AQMA No.6 (Brighouse)	35.7	33.8	32.2	30.7	29.3	28.2
HXR1	Yes: AQMA No.6 (Brighouse)	39.6	37.5	35.7	34.0	32.6	31.3

HH-LT	Yes: AQMA No.7 (Hipperholme)	37.1	35.1	33.4	31.8	30.5	29.2
NB-GR	Yes: AQMA No.8 (New Bank)	38.4	36.4	34.7	33.0	31.6	30.3

As shown in the source apportionment section (specifically Figure 3.1 and 3.2), emissions from cars and LGVs are the dominant local emission source of traffic. These are the sources over which Calderdale Council has limited control; however, the gradual renewal of these vehicle types will likely cause significant improvements in local air quality, regardless of additional AQAP interventions.

Based on the above, albeit simple analysis, it is considered likely that all AQMAs will be compliant with the national AQS within the lifetime of this AQAP (by 2026), without significant intervention. As there are “no safe levels” for air pollution, this AQAP provides the necessary details to minimise pollution levels beyond the national AQS, and to bring pollution levels down in as short-time as possible.

Furthermore, the EFT (v12) assumes improvements in emissions from buses and other vehicles, and as of 2023, Calderdale’s bus fleet was found to be behind national predictions. As such, the use of the roadside projection factors may over-estimate the decline in Calderdale.

Required Reduction

In line with the requirements of LAQM.TG (22), the necessary reduction in Road NOx at both non-compliant and locations at risk of being non-compliant, is calculated below. Before any AQMA in Calderdale is revoked, the location must be below 10% of the AQS for NO_2 (i.e., < 36 µg/m^{-3}) for three years. As such, an annual mean concentration of 36 µg/m^{-3} has been the basis of the reduction calculation. A summary of the calculation is provided in Table 3.7, below.

Table 3:7: Required NOx emission reduction at non-compliant, and 'at risk' of non-compliance locations

Monitor	AQMA	2023 Concentration (µg/m^3)				Required Reduction to 36µg/m^3
		UKAIR Background NO_2	NO_2	Road NOx at measured	Road NOx at 36 µg/m^3	
AQ21	No.1 (Salterhebble)	12.4	44.6	67.7	47.6	20.1
CRH1	No.1 (Salterhebble)	12.4	41.3	59.7	47.6	12.1
SB1	No.2 (Sowerby Bridge)	10.2	41.8	65.6	52.1	13.5
SB16	No.2 (Sowerby Bridge)	10.2	36.6	53.3	52.1	1.3
SB3	No.2 (Sowerby Bridge)	9.5	39.5	61.6	53.4	8.1
HQ1	No.3 (Hebden Bridge)	6.7	41.1	71.3	59.2	12.1
BE4	No.6 (Brighouse)	14.3	37.7	47.5	43.6	3.8

HXR1	No.6 (Brighouse)	14.3	41.9	57.0	43.6	13.4
HH-LT	No.7 (Hipperholme)	12.1	39.2	55.3	48.1	7.2
NB-GR	No.8 (New Bank)	14.4	40.6	54.0	43.6	10.4

The following reductions in road NO_X are, therefore, required in each AQMA to reach a NO_2 concentration of 36.0 µg/m^3:

- A629 Salterhebble, Halifax (AQMA No. 1): 20.1 µg/m^3 reduction
- A58 Sowerby Bridge (AQMA No. 2): 13.5 µg/m^3 reduction
- Hebden Bridge (AQMA No. 3): 12.1 µg/m^3 reduction
- Brighouse (AQMA No. 6): 13.4 µg/m^3 reduction
- Hipperholme (AQMA No. 7): 7.2 µg/m^3 reduction
- New Bank (AQMA No. 8): 10.4 µg/m^3 reduction

Reductions in road NO_X of between 7.2 µg/m^3 and 20.1 µg/m^3 are, therefore, required to ensure compliance with the annual mean AQS in all Calderdale AQMAs, considering a 10% uncertainty in measurements.

3.5 Key Priorities

The Calderdale Joints Needs Assessment section on Air Pollution, in 2023, recognised that a *"lack of coherent policy and, in some cases, a lack of cooperation embracing all council functions and services"* is an issue for the Council, with regard to improving air quality. Efforts are already underway across the council and an Air Quality Operational group has already been set up to make air quality a key consideration in decision making across the council, and to promote joined up thinking, particularly with Public Health and the Climate Action group.

The source apportionment study suggests that private car and light goods vehicles (particularly diesel vehicles) are the dominant local source of air pollution in the

remaining AQMAs, with Rigid and Articulate HGVs, likely playing a significant role when there is heavy congestion and steep gradients. Roads are also the predominant source of background air pollution in the local area, with domestic emissions and the rural background also playing an important role. As Calderdale has little control over the turnover of private vehicles in the borough, measures to reduce congestion and to promote alternatives to car use will be essential to minimise pollution concentrations.

This can be achieved through structural changes in the network, as well as behavioural changes. The AQAP is, therefore, divided into five priorities:

- **Priority 1** – improving the transport network infrastructure, as set out in the Council's Transport Strategy and Local Plan Priority 1.
- **Priority 2** - promoting alternatives to private vehicle use, recognising the contribution of diesel vehicles and bidding for ULEV funding whenever possible.
- **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)
- **Priority 4** - encouraging public engagement and interest through improved communication and community involvement.
- **Priority 5** – work with our partner organisations (WYCA) to support improvements in air quality in Calderdale, and to lobby regional, and national bodies for required changes.

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 improve local air quality. Schedule 11 of the Environment Act 1995 requires local authorities to consult the bodies listed in Table 4:1.

To encourage engagement in the consultation at a local level, the draft AQAP will be:

- Published on Calderdale's website and social media channels.
- Sent to local groups.

The response to our consultation stakeholder engagement will be given in **Error! R eference source not found.**.

Table 4:1 – Consultation Undertaken

Consultee	Consultation Undertaken
The Secretary of State	Not specifically
DEFRA/ LAQM	Yes
The Environment Agency	Yes
The highways authority	Yes – Calderdale Council Strategic Infrastructure
All neighbouring local authorities	West Yorkshire Combined Authority
Other public authorities as appropriate, such as Public Health officials	Yes – Public Health
Bodies representing local business interests and other organisations as appropriate	Yes – Through Council consultation processes including Town boards,

Consultee	Consultation Undertaken
	ward forums and on individual projects around capital development and highways/ network.

4.2 Steering Group

The Council has set up an Air Quality Strategy Group consisting of senior Council officers and Elected Members who hold the relevant links through their portfolios to Environment. The Council officers include representatives of Public Health, Planning, Highways, Environmental Health, and the Community Safety Partnership. The group meets typically every month and set 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 internal Air Quality Strategy and LAQM required AQAP, and these projects have developed together. 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.

Calderdale's air Quality Strategy has the aim of clean air for all. It includes six key objectives:

1. To have a good understanding of air quality issues in Calderdale so that we can take an intelligence-led approach.
2. To ensure air quality is considered in everything we do.
3. To raise awareness and understanding of air quality in Calderdale
4. To design the physical ant natural environment to improve air quality
5. To reduce pollution from vehicle journeys
6. To protect the health of those most vulnerable to the harmful effects of air pollution.

The air quality strategy group works is guided by the following important principles:

- We will provide **leadership**, by advocating for clean air, by influencing and enabling others to lead air quality improvement
- We will work in **partnership** across the Council, with partner organisations and with local communities and residents. No single organisation can improve air quality alone.
- We will **engage with communities** about air quality and empower them to take action to improve air quality
- We will **target** air quality action to areas and groups at greatest risk of harm from air pollution
- We will use our **regulatory and enforcement** powers when necessary to improve air quality

5 AQAP Measures

Table 5:1 shows the Calderdale Council's core AQAP measures, which will improve air quality in the AQMAs, as well as secondary measures related to wider efforts to improve air quality across the borough. Table 5.1 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 ASRs for regular annual updates on the implementation of the core AQAP measures.

The following classification scheme has been used to quantify the effectiveness of measures:

- **Low**: imperceptible (a step in the right direction). Improvements unlikely to be detected within the uncertainties of monitoring and modelling.
- **Medium**: perceptible (a demonstrable improvement in air quality) improvement of up to 2 µg/m^3 NO_2, which could be shown by a modelling.
- **High**: A significant improvement, greater than 2 µg/m^3 NO_2. It can be clearly demonstrated by modelling or monitoring (a significant improvement is likely to be delivered by a package of options rather than by a single intervention).

A secondary classification system has been used to explain whether the impact would impact concentrations at the:

- **Roadside/ Local** , including within the Calderdale Council's AQMAs.
- **Background**, with an impact over a wide area.

- **Exposure reduction,** with the measure acting to reduce peoples contact with air pollution, instead of minimising concentrations.

Table 5:1 – Air Quality Action Plan Measures

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
CORE AQAP MEASURES															
1	Mytholm Meadows & Old Clog Factory Park and Ride	Alternatives to private vehicle use	Bus based Park & Ride	2024	Unknown	Calderdale Council / WYCA	Calderdale Council	No	No	> £1 million	Planning	Low / Roadside	Purchase of site and grant of planning permission		Land Acquisition from Private company
2	Promotion of Yorkshire Lift Share and Metro Travel Card Pool	Alternatives to private vehicle use	Car & lift sharing schemes	2019	Ongoing	West Yorkshire councils and Metro	West Yorkshire councils and Metro	No	Funded	<£10k	Implementation	Low/ Roadside	Ridership stats/ accounts		The website appears to no longer be accepting sign ups.
3	Rail Park and Ride Programmes	Alternatives to private vehicle use	Rail based Park & Ride	2017	2026	National Rail / Calderdale Council / WYCA	UK GOV'T, Northern Powerhouse WYCA plus Transport Fund	No	Partially Funded	>£10 million	Planning	Local / Roadside	Use of Park and Ride Services	Additional Car Parking at Hebden Bridge.	Funding
4	City Car Club	Alternatives to private vehicle use	Car Clubs	2015	Ongoing	Enterprise Car Club and Hour Share >	Private Company	No	Private company	Charge for users	Implementation	Low/ Roadside	Number of Car Club providers/ cars available (with low emission)	Enterprise Car Club in Halifax, and Hour Share to receive car club space in new mobility hub	-
5	Investigate Freight Partnership	Freight and Delivery Management	Freight Partnerships for city centre deliveries	2019	Ongoing	CMBC				<£10k	Implementation	Low / Roadside			
6	Implementation of key Local Plan Policies: EN1 (Pollution Control); IM4	Policy Guidance and Development Guidance	Air Quality Planning and Policy Guidance	Ongoing	2032/2033	Planning Committee / Planning Officers	Developer Contribution	No	Not Funded	Project Dependent	Planning / Implementation	Medium/ Roadside	Air Quality Assessments and development including an	Local Plan and Air Quality Planning	

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
	(Sustainable Travel); and BT1 (High Quality Inclusive Design)												appropriate level of mitigation (EV charge points)	Guidance Adopted	
7	Implementation of The West Yorkshire Low Emission Strategy	Policy Guidance and Development Control	Low Emissions Strategy	2016	Ongoing	WYCA, CMBC	WYCA	No	Funded	NA	Implementation	High / Roadside/ Background	Reduced mortality in region associated with air pollution.	Adoption of technical planning guidance, bus emissions strategy, low emission procurement guide.	This is a very wide-ranging measure.
8	Ensure principles of Green and Healthy Streets strategy are reflected in major capital projects, highway schemes and housing developments	Promoting Low Emission Transport / Policy Guidance and Development Control / Alternatives to private vehicle use	Other	Ongoing	Ongoing	R & S Directorate - Major Projects / Strategic Infrastructure / Planning / Housing	Development	No	Project dependent	<£10k	Planning and implementation	Medium / Local	Number of schemes incorporating healthy streets and Green Walls.	A629 phase 2 Halifax town centre	Resource / changes to national planning policy
9	Retrofit of up to 69,000 homes to make low carbon	Promoting Low Emission Plant	Other Policy	2024	2038	Climate Action Group	Green Homes Grant	No	Funded	>£ 10 million	Planning/ Implementation	Low / Background	Number of homes retrofitted / achieving net zero	900 Homes by September 2023	Households needed to have a total combined income of less than £30,000 or be in receipt of certain government benefits, such as pension credit, child benefit, child

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
															tax credit or universal credit
10	NRMM controls / emission standards for Construction (in AQMAs)	Promoting Low Emission Plant	Other Policy	2025		Transport/ Planning	Contractor/ Developer	No	Not Funded	<£10k	Planning	Medium / Local	NRMM emission controls on Council projects/ Planning conditions	New proposed measure	Existing contracts for work
11	Calderdale and Huddersfield Trust Green Plan	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2021	2026	NHS	NHS	No	Funded	< £1 million	Planning/ Implementation	Low / Roadside (AQMA No.1)	Reduced air pollution from business mileage by 20% by March 2024	Unknown	90% of fleet will be low, ultra-low or zero emission by 2038
12	Calderdale Fleet Decarbonisation	Promoting Low Emission Transport	Public Vehicle Procurement	2024	Ongoing	Transport Services, CAFM, HR, Finance, GSSS, Procurement, Transformation Team, Waste & Insurance.	CMBC	No	Not Funded	> £1 million	Planning/ Implementation	Low / Roadside	Success will be the Council's fleet being 100% carbon free at the tail pipe by 2030 and sufficient infrastructure in place to support the re-charging.	17% of 188 vehicles currently de-carbonised.	Funding and see WYCA Low emission vehicle procurement guide.
13	EV Infrastructure available to all – West Yorkshire Electric Vehicle Strategy	Promoting Low Emission Transport	Prioritising uptake of low emission vehicles	2024	Ongoing	WYCA, Transportation and Public Services	Government funding: LEVI phases 1 and 2, Main Bid	No	Not Funded	< £50K	Planning	Medium/ Background and Local	Production of a strategy		
14	Electric Taxis - Aim to find ways to support	Promoting Low	Taxi Emission Incentives	2023	Ongoing	CMBC	Budget	No	Funded	< £10K	Planning	Medium/ Local	Number of Electric / low emission		Evidence of the current emissions

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
	private hire vehicles to consider electric vehicles options.	Emission Transport											taxis in borough.		profile of the taxi fleet is required.
15	Investigate viability of 'Remote Working Hubs' in the 6 main towns	Promoting Travel Alternatives	Encourage / Facilitate Working from Home	2026 or sooner	2030	CMBC	Unknown	No	Funded	>£1 million	Feasibility	Low/ Local	Construction and use of remote working hubs	Planning	Funding/ Acquiring Land.
16	Active Calderdale	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2020	Ongoing	CMBC, Yorkshire Sport	Grant	No	Funded	>£1 million	Implementation	Medium/ Roadside	Uptake in active travel		
17	Calderdale Rail Strategy	Promoting Travel Alternatives	Promote use of rail and inland waterways	2016	2031	CMBC/ National Rail	Various Sources	No	Partially Funded	>£ 10 million	Implementation	Medium / Local Low / Background	Reduced NOx emissions near Rail lines and increased reliability of train line and freight moving onto rail	Adopted	Funding / Politics / HS2. Calderdale to lobby relevant groups.
18	Electrification of the Calder Valley Line.	Promoting Travel Alternatives	Promote use of rail and inland waterways	Unknown	Unknown	Transportation	NA	No	Not Funded	>£ 10 million	Planning	Medium / Local Low / Background	Reduced NOx emissions near Rail lines and increased reliability of train line and freight moving onto rail	Planning Stage	Funding / Links to HS2 funding. Calderdale to lobby relevant groups.

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
19	Delivery of long-planned direct services from Bradford and Halifax via the Calder Valley to the south side of Manchester and Manchester Airport	Promoting Travel Alternatives	Promote use of rail and inland waterways	2016	2031	CMBC/ National Rail	Various Sources	No	Partially Funded	>£ 10 Million	Planning	Medium / Local Low / Background	Ridership stats		Funding / Politics / HS2
20	Re-open Elland Railway station	Transport Planning and Infrastructure	Other Policy	2017	2026	National Rail Calderdale Council	WYCA, UK GOV'T, Northern Powerhouse West Yorkshire plus Transport Fund	No	Partially Funded	>£ 10 million	Planning	Medium / Local	Ridership stats / Reduced journeys between Halifax and Elland, reduced pollution concentrations in AQMA no. 1 and AQMA no 6 Brighouse	Elland Rail Station and access package is under development	Benefits on the roads between Elland and Halifax, and Brighouse. Funding
21	Trial LTNs	Traffic Management	Strategic highway improvements, Re-prioritising Road space away from cars, inc Access management, Selective vehicle priority, bus priority, high vehicle	2026 or sooner	Ongoing	Transport	CMBC	No	Not Funded	<£ 100K	Planning	Low / Roadside	Number of LTNs, Pollution concentrations and road safety.	A LTN plan will be prepared.	Politics of LTNs,

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
			occupancy lane												
22	Compliance checks for environmental permit	Environmental Permits	Other	Current	Current	CMBC / Environment Agency	CMBC	No	Funded	<£50K	Implementation	Low/ Local	Number of nuisance complaints		Resource
23	West Yorkshire Bus Investment Strategy	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	2021	Ongoing	WYCA/ CMBC/ Bus Franchises	WYCA	No	Funded	>£10 million	Planning/ Implementation	Medium/ Local	Increased use of EV buses in Calderdale, and modal shift		
24	Anti-idling enforcement	Traffic Management	Anti-idling enforcement	Ongoing	Ongoing	Calderdale MBC	Budget	No	Funded	<£50k	Implementation	Low/ Local Impact	Number of Idling vehicles in AQMAs	Progressing Legal Orders	Compliance and resource
25	Local Transport Plan measures for cycling, road improvements etc	Transport Planning and Infrastructure	Other	2016	Ongoing	CMBC/ Transport	Various	No	Funded	>£1million	Planning/ Implementation	Medium/ Local	Length of cycle lane, completed schemes	For further detail on progress see: Calderdale Next Chapter	
26	Bicycle Hire Scheme and Active Calderdale Active Calderdale Bike Library	Transport Planning and Infrastructure	Public cycle hire scheme		Ongoing	CMBC	Budget	No	Funded	<£50k	Implementation	Low/ Local	Increased cycle ridership		
27	Halifax Bus Station Improvements	Transport Planning and Infrastructure	Public transport improvements -interchanges stations and services	2021	2025	WYCA/ CMBC/ Bus Franchises	WYCA	No	Funded	>£1 million	Implementation	Medium/ Local	Increased use of EV buses in Calderdale, and modal shift	The redevelopment of Halifax Bus Station, including electric bus facilities	

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
28	Calderdale ECO Stars Scheme	Vehicle Fleet Efficiency	Driver training and ECO driving aids	2016	Ongoing	Transport/ Private companies	CMBC	No	Funded	<£10k	Implementation	Low/ Local	Number of companies signed up	Number of signups.	
29	Huddersfield and Halifax bus routes (new links)	Transport Planning and Infrastructure	Bus route improvements	2024	2025	West Yorkshire Combined Authority	WYCA	No	Funded	<£ 10 million	Planning/ Implementation	Medium/ Local	Increased bus ridership		
30	Explore feasibility of demand management of parking including a workplace parking levy	Promoting Travel Alternatives	Workplace Travel Planning	2024	2027	Transportation and Public Services	Unknown	No	Not Funded	<£ 100K	Feasibility / Planning	Medium/ Local	Reduced car trips	For future consideration	
31	Traffic Signal Management	Traffic Management	UTC, Congestion management, traffic reduction	Ongoing	Ongoing	Transport	CMBC	No	Funded	<£ 100K	Implementation	High/ Local	Reduced congestion	Implemented on several schemes, including:	
32	Calderdale Local Cycling and Walking Infrastructure Plan	Promoting Travel Alternatives	Promotion of cycling and walking	Ongoing	Ongoing	Planning, Highways and Major projects	Project Dependent	No	Funded	Project Dependent	Planning / Implementation	Low/ Roadside	Reduced congestion		
33	West Yorkshire Travel Plan Network	Promoting Travel Alternatives	Workplace Travel Planning	Ongoing	Ongoing	WYCA	WYCA	No	Funded	< 50K	Implementation	Low/ Roadside	Number of businesses using service		
Additional Measures															
34	Adoption of Placemaking Supplementary Planning Document	Policy Guidance and Development Guidance	Other	2024	2024	Planning Strategy Team, Cabinet and then Full Council+	Developer Contribution + Active Calderdale	No	Funded	<£10k	Implementation	Medium/ Local	Number of Development incorporating good practice / carrying out	New Measure	The SPD has been prepared by consultant urban designers, mainly funded

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						Active Calderdale							air quality assessment		by Active Calderdale
35	Increased land based renewable energy generation in the Borough.	Promoting Low Emission Plant	Other Policy	2024	2038	Climate Action Group	Various	No	Partially Funded	>£ 10 million	Planning / Implementation	Low / Local	Reduction in use of fossil fuels/ combustion for energy	See Climate Action Plan	The Climate Action Partnership will support appropriate land based renewable energy projects which offer benefits to local communities and businesses. We will publish a Local Area Energy Plan for Calderdale which will help us to further explore technologies and how these can benefit local people
36	Public Info on EV charge points	Promoting Low Emission Transport	Prioritising uptake of low emission vehicles	Ongoing	Ongoing	CMBC	Budget	No	Funded	< 10K	Implementation	Low/ Roadside	Uptake in use of existing network	Electric Vehicle (EV) Charging Information webpage	Not updated frequently enough
37	Northern Powerhouse railway and upgrades to network	Promoting Travel Alternatives	Promote use of rail and inland waterways	Unknown	Unknown	UK GOV't	NA	No	Not Funded	>50 Million	Planning	Medium / Local Low / Background	Freight Services taken off the road, increased use of rail	Planning Stage	Will free up demand, improve the amount of rail freight
38	Promote cycle to work schemes	Promoting Travel Alternatives	Promotion of Cycling	2023	Ongoing	Climate Action Group/ Transport		No	Funded	< 50K	Planning/ Implementation	Low/ Roadside	Number of users of scheme	Plans in place	

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
39	Restore Peatlands	Other	Other	2021	Ongoing	CMBC	NA	No	No	>100K	Planning	Fewer pollution events	Number of Moor fires		
40	Delivery of School Streets and Active Travel Neighbourhoods	Promoting Travel Alternatives	School Travel Plans	2019	Ongoing	Highways & Transportation and Public Health	Project Dependent	No	Funded	< 50K	Planning/ Implementation	Low/ Local	Increased number of children walking and cycling to school		Continued collaboration between Members, Officers and schools. Delivery of Moving Traffic Reinforcement TMA part 6 ensures the sustainability of the programme.
41	The Council's Corporate Travel Plan	Promoting Travel Alternatives	Workplace Travel Planning	2015	2020	CMBC	CMBC	No	Funded	< 50K	Implementation	Low/ Roadside	Results of Staff survey		
42	Develop a page on CMBC intranet dedicated to AQ issues - advice and guidance, how people can get involved, what's happening already.	Public Information	Via the Internet	2024	2024	Environmental Health Team + Web Team	Budget	No	Funded	<£10k	Planning	Low/ background	Behaviour changes for 3,000 Calderdale staff members. Greater levels of WFH	New measure	Unplanned demands on officer time.
43	Link with Business and Economy to develop ways to promote ways of working that reduce harmful	Public Information	Other	2024	2024	Green economy theme group of the climate action partnership (Chaired by	Grants/ Budget	No	Partially Funded (related to Climate Action Plan)	<£10k	Planning/ Implementation	Low/ Background	Increased understanding of local businesses about the action they can take to reduce	New measure	Unplanned demands on officer time/ Funding

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
	emissions, including availability of grants/other assistance.					Cllr Martin Hay)							pollution E.g. number of businesses doing pollution accounting		
44	Clean Air Campaign	Public Information	Via Internet/ social media	2019	Ongoing	Environmental Protection	Budget	No	Funded	<£10k	Implementation	Low / Background	Social Media Analytics	Yearly campaign	Officer time
45	Liaise with Community Foundation for Calderdale to explore potential for a small grants programme to support community initiative for clean air, aligned to the £1 million climate action fund	Public Information	Via other mechanisms	2024	2024	Community Foundation for Calderdale	Climate Action Fund	No	Not Funded	<£50k	Planning	Low / Background/ Local	Communities are taking action take to address air pollution	New Measure	Funding
46	Embed air quality into pre-existing campaigns	Public Information	Via the Internet, Via social media and Via Newsletters	Ongoing	Ongoing	Comms Team, Press Team and Next Chapter	Budget	No	Funded	<£10k	Planning/ Implementation	Exposure reduction	Click through rate / views and readership and PRs that include AQ messages.	New Measure	
47	Messages about air quality - raising awareness	Public Information	Via the Internet, Via social media and Via Newsletters	2024	Ongoing	Comms Team, Press Team and Next Chapter	Budget	No	Funded	<£10k	Planning	Exposure reduction	Click through rate / views and readership and PRs that include AQ messages	Clean Air Night Tweets x2. 24.01.24 Impression 1,647 Engagement 62	

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
48	Work with NHS partners to identify people at risk from poor air quality using disease registers	Public Information	Via other mechanisms	2024	Ongoing	NHS / CMBC	Budget	No	Partially Funded	<£50k	Planning	Exposure reduction			
49	Develop and promote an alert system for those most vulnerable to harmful effects of poor air quality.	Public Information	Via other mechanisms	2024	Ongoing	CMBC	Budget	No	Funded	<£10k	Planning	Exposure reduction	Sign-ups to air Alert service	New Measure	Similar systems such as air Alert exist
50	Increase canopy cover across the borough in line with White Rose Forest targets, including more street trees on a 'right tree, right place' principle	Other	Other	Ongoing	Ongoing	Countryside and Woodlands Manager	White Rose Forest	No	Funded	10 million	Implementation	Low/ Background 23.7 tonnes of NO_2 per year, reducing background + up to large improvements due to deflections.	Number of trees planted/ monitoring in vicinity of tree projects and hectares of additional forestry in Calderdale	See White Rose Forest Plan	Tree planting can have negative impacts on air quality and so essential right tree/ right place guidance followed

Appendix A: Predicted Reductions in AQAP measures

The purpose of the quantification section is to ‘prove’ that there are sufficient measures to achieve compliance with the AQS within the lifetime of the AQAP.

The strategies outlined in Table 5.1 represent an ambitious intervention program led by the council and its partners. However, the effectiveness of these measures’ hinges on the behaviour changes of residents, workers, and commuters within the borough. Quantifying the impact of these proposed actions in terms of NO_2 reduction is challenging due to inherent uncertainties about real-world reactions, and a lack of information. As congestion is one of the principal reasons of non-compliance in the district, linear changes in modal-shift could have non-linear impacts on pollution concentrations (as a removal of car journeys will reduce direct’ emissions and improve journey times of all other vehicles)

Several measures in the Table 5.1 are at feasibility/ investigation stage and as such, no detailed quantification of some measures (e.g. potential workplace exposure levy) is available. The council does not currently hold data regarding Taxi licensing/ fuel type, and the collation and management of this type of data is a priority going forward. Where required, further quantification of potential interventions can be provided in the Air Quality Annual Status Report, or in separate Air Quality Assessments.

A summary of the major redevelopment works that are taking place near/ within the AQMAs, expanding on measure 25 (Local Transport Plan measures for cycling, road improvements etc) is listed below:

- A629 Calder and Hebble Junction (Phase 1b) – including the widening of the A629 to two continuous lanes in each direction from Elland Wood Bottom to the completed work at Salterhebble Hill (near AQMA No.1).

- A58/A672 and A646/A6033 improvements
    - AQMA No.2 (Sowerby Bridge) - On Wharf Street, we're changing the layout of the road, relocating the bus layby, adding disabled parking spaces, adding a new loading bay, adding a parallel crossing for pedestrians and cyclists, widening the footpath, and removing on-street parking.
    - AQMA No.3 (Hebden Bridge) - We're working on the A646 through Hebden Bridge to make travel safer for people walking and cycling. The new layout will also help to make sure local bus services can run on time.
- A641 Improvement Scheme
    - AQMA No. 6 (Brighouse)
        - Including a new river crossing
        - New routes for walking, wheeling, and cycling to connect the Garden villages of Woodhouse and Thornhill to Brighouse, removing barriers to movement caused by busy roads.

Based on the number of measures being implemented across Calderdale, the predicted improvements in air quality due to the renewal of the UK fleet with vehicles with cleaner engines, as well as the AQMA concentrations almost being compliant, it is considered highly likely that within the lifetime of this AQAP, all AQMAs in Calderdale will be compliant with the 40 µg/m^3 AQS by the end of the AQAP period (2029).

Whilst predictions are difficult to make due to synergies which may develop, as is required by LAQM.TG (22), an estimate of the impact of AQAP on measured NO_2 has been made. It has not been possible to make predictions for all measures due to a lack of available information (e.g. taxi-licensing info). Table 5.2 includes a quantification of some of the proposed measures.

Table 5:1: Quantification of AQAP Measures

Number	Measure	Assumptions for Quantification	Estimated Reduction (NO_2) at non-compliant locations
23	West Yorkshire Bus Investment Strategy	Assumption that 100% of buses are zero-emission. There is the potential for the estimated reduction to be under-estimated as the source apportionment exercise does not fully account for the impact of stop-start traffic conditions, and terrain.	0.3 - 2.8 µg/m^3
18	Electrification of the Calder Valley Line.	UKAIR Background NO_X values were used to derive NO_X contributions in grid squares containing AQMAs.	0.1-0.3 µg/m^3 reduction in background NO_2, with more significant reductions near the railway.
All measures which could promote alternatives to car use	No specific measure (2.5% reduction in car trips)	Assumed reduction in NOx contribution from car trips by 2.5%	0.3-0.4 µg/m^3 reduction in NO_2. The potential reduction could be greater in congestion hotspots

All measures which could promote alternatives to car use	All Climate Strategy Measures	An aim of the climate action plan is to reduce the number of car trips in the borough by 21%. This would have two-fold benefits for congestion and direct emissions from vehicles. This is, however, difficult to quantify.	A 21% reduction in vehicle flows would cause a decrease of circa 2.6 to 3.4 µg/m^3 in the AQMAs, extrapolating the calculation above. In real terms however, a 21% reduction in vehicle trips, and even a smaller reduction, could alleviate congestion and improve emissions from the average vehicle in Calderdale.

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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

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