





Lancaster City Council

Lancaster Air Quality Action Plan

October 2024

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Lancaster City Council

Air Quality Action Plan

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

December 2024

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Date	December 2024

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 Lancaster City Council between 2024 and 2029.

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 billion³. Lancaster City Council is committed to reducing the exposure of people in Lancaster to poor air quality in order to improve health.

Where an exceedance of the UK Air Quality objective⁴ is recorded at a relevant exposure, local authorities are required to declare an Air Quality Management Area (AQMA) to focus efforts into reducing pollutant concentrations. To the date of this report, Lancaster City Council has one declared AQMA:

- **Lancaster City AQMA** – covering the gyratory in Lancaster city centre. Declared in 2004 for exceedances in the NO₂ annual mean, and amended in 2017 to include exceedances in the hourly mean NO₂ objective.

Two AQMAs were revoked in June 2024 due to year-on-year improvements in nitrogen dioxide concentrations:

- **Galgate AQMA** – covering the main crossroad area in Galgate. Declared in 2009 for exceedances in the annual mean NO₂ objective.

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

⁴ UK Air. UK Air Quality Limits. Available at: <https://uk-air.defra.gov.uk/air-pollution/uk-limits.php> (Accessed: March, 2024)

- **Carnforth AQMA** – covering the main crossroad area in Carnforth. Declared in 2007 for exceedances in the annual mean NO₂ objective.

Both the Carnforth AQMA and Galgate AQMAs were compliant with the annual mean objective for over 6 years⁵. As per the LAQM TG(22)⁶ there should not be any declared AQMAs for which compliance with the relevant objective has been achieved for a consecutive five-year period. Lancaster City Council therefore revoked Carnforth and Galgate AQMAs in June 2024. Additionally, the City of Lancaster AQMA has been compliant of the NO₂ 1-Hour Mean objective for the past consecutive six years and the Council will amend the AQMA to revoke the 1-Hour Mean objective.

This action plan focuses only on the Lancaster City AQMA.

Action Plan measures have been developed that can be considered under a number of broad topics:

- Traffic Management
- Promoting Travel Alternatives
- Transport Planning and Infrastructure
- Alternatives to private vehicle use
- Policy Guidance and Development Control
- Vehicle Fleet Efficiency
- Public Information
- Promoting Low Emission Transport

The priorities within this action plan intend to target transport emissions within the Lancaster AQMA by targeting key sources of emissions which have been identified through the source apportionment exercise. Targeted measures to reduce emissions from buses and older vehicles have been prioritised and are to be brought forward.

Concentrations will also seek to be managed through working with local communities and businesses to aid a behavioural shift within the population to promote more sustainable and less polluting methods of transport. This should help to reduce

⁵ Lancaster City Council Annual Status Report 2023, 2023.

⁶ Defra. LAQM Technical Guidance (22), 2022.

dangerous pollutant concentrations and reduce the risk of detrimental impact on health and wellbeing within the city. The city council intends to implement measures which set a positive example for others through implementing measures to control emissions from their own fleet.

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 Lancaster City Council's direct influence.

Responsibilities and Commitment

This AQAP was prepared by Bureau Veritas and the Environmental Health Department of Lancaster City Council with the support and agreement of the following officers and departments:

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Lancaster City Council

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Signature	
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Signature	
Approved by the Director of Public Health	Dr Sakthi Karunanithi
Signature	

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

If you have any comments on this AQAP, please send them to Environmental Health at environmentalhealth@lancaster.gov.uk.

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1 Introduction

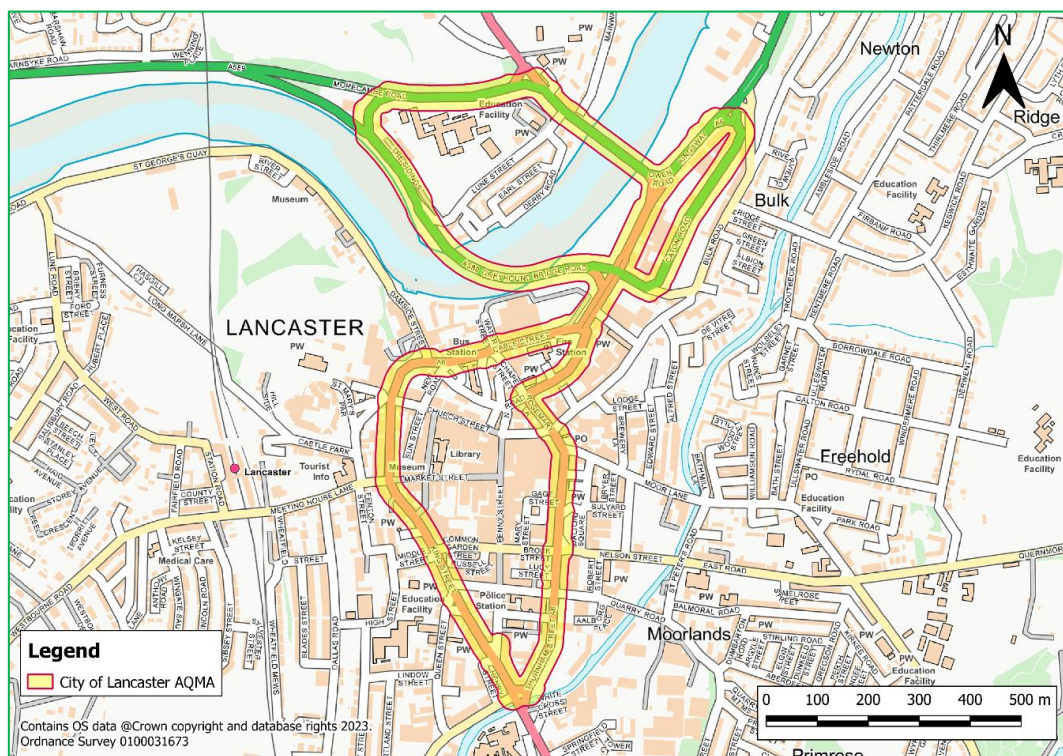
This plan outlines the actions that Lancaster City Council will deliver between 2024 and 2029 in order to reduce concentrations of pollutants and exposure to air pollution; thereby positively impacting on the health and quality of life of residents and visitors to the Lancaster City area.

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 Lancaster City Council’s air quality ASR.

This action plan focuses on actions to improve air quality across the entire borough, with a specific focus on Lancaster City AQMA. Figure 1 shows the AQMA extent.

Figure 1 Extent of the City of Lancaster AQMA



2 Summary of Current Air Quality in Lancaster City Council

Lancaster City Council is situated in north Lancashire. There are approximately 60,000 residents currently residing within the Lancaster City Council's boundary⁷. The main pollutant of concern within the Council is Nitrogen Dioxide (NO₂), which largely originates from vehicle emissions.

Air quality monitoring is carried out within Lancaster via a network of air quality monitors in a variety of locations (kerbside, roadside, and background). During the latest available reporting year of 2022, the Council monitoring network included 48 diffusion tubes sites, which measure the concentrations of NO₂, two NO₂ automatic monitoring stations and one automatic monitoring station to measure particulate matter (PM₁₀ and PM_{2.5})⁵. The automatic monitoring stations and 21 of the 48 diffusion tube monitoring sites are located within the City of Lancaster AQMA. Due to the nature of 2020, 2021 and the impact of the COVID-19 pandemic restrictions on traffic volumes, and air quality, there is uncertainty about whether 2020 and 2021 monitoring data will be considered an outlier when compared to the normal pollution trends until the long-term impacts are better understood. Please refer to the latest 2023 ASR⁵ (at the time of writing this report) from Lancaster City Council for a detailed assessment of the air quality and pollution levels across the Council during 2022.

At the time of this report, Lancaster City Council has one declared AQMA and two recently revoked AQMAs:

- **Lancaster City AQMA** – covering the gyratory in Lancaster city centre. Declared in 2004 for exceedances in the NO₂ annual mean (75 µg/m³), and amended in 2017 to include exceedances in the hourly mean NO₂ objective;

⁷ Office for National Statistics: Population and household estimates, England and Wales: Census 2021. Available at: <https://www.ons.gov.uk/>

- **Carnforth AQMA** (revoked) – covering the main crossroad area in Carnforth. Declared in 2007 for exceedances ($42 \mu\text{g}/\text{m}^3$) in the annual mean NO_2 objective; and
- **Galgate AQMA** (revoked) – covering the main crossroad area in Galgate. Declared in 2009 for exceedances ($43 \mu\text{g}/\text{m}^3$) in the annual mean NO_2 objective.

Both the Carnforth and Galgate AQMAs have been compliant with the annual mean objective for over 5 years⁸. As per the LAQM TG(22)⁹ there should not be any declared AQMAs for which compliance with the relevant objective has been achieved for a consecutive five-year period. As a consequence, Lancaster City Council revoked both Carnforth and Galgate AQMAs in June 2024. The City of Lancaster AQMA has been compliant of the NO_2 1-Hour Mean objective for the past consecutive five years and the Council will amend the AQMA to revoke the 1-Hour Mean objective in the near future.

This action plan therefore focuses only on Lancaster City AQMA.

An assessment of air quality has been undertaken through dispersion modelling to predict the levels of NO_2 across the City of Lancaster AQMA using 2022 as a base year. Dispersion modelling provides a means by which estimates of the levels of NO_2 can be made across a wider area than monitoring and is supported by verifying against the monitored levels to provide an assessment of uncertainty in predictions.

2.1 City of Lancaster AQMA

Lancaster City Council declared the City of Lancaster AQMA in 2004 for the exceedance of the NO_2 annual mean UK AQS objective of $40 \mu\text{g}/\text{m}^3$. The level of exceedance for declaration was $75 \mu\text{g}/\text{m}^3$. The AQMA, as shown in Figure 1

⁸ Lancaster City Council Annual Status Report 2023, 2023.

⁹ Defra. LAQM Technical Guidance (22), 2022.

covers the gyratory in Lancaster City centre. In 2017, it was amended to include exceedances of the hourly mean NO₂ objective. The AQMA details can be obtained here: https://uk-air.defra.gov.uk/aqma/details?aqma_ref=230.

As of 2022, there were 21 diffusion tube monitoring sites located within the boundary of the AQMA and two automatic monitoring stations. The locations are shown in Figure 2 with those areas which monitored higher concentrations in 'amber' and 'red' respectively. The annual mean NO₂ concentrations reported at all monitoring sites carried out within this AQMA over the past 5 years are presented in

Table 1. Furthermore, the number of 1-Hour Means bigger than 200µg/m³ recorded at the automatic monitoring stations are presented in Table 2.

Monitored exceedances of the annual mean NO₂ AQS objective have been reported over the past 5 years at LC8, LC10, I, LC20 and LC15. This is in line with the modelling exercise carried out for the base year 2022 where a concentration above 40µg/m³ was predicted at 4 receptors within the AQMA. The City of Lancaster AQMA is not compliant for annual mean NO₂.

According to the LAQM TG(22)⁶, exceedances of the NO₂ 1-hour mean are unlikely to occur where the annual mean is below 60 µg/m³ at roadside and kerbside monitoring sites where road traffic is the primary source of emissions. During the past 5 years and considering the concentrations at relevant exposure, all the concentrations within the City of Lancaster AQMA were below 60µg/m³, with the highest recorded concentration being 55.0 µg/m³ at LC10 in 2018. Additionally, at the automatic monitoring stations, AN1 – Cable Street and AN2 - Dalton Square, no exceedances of the 1-Hour Mean were recorded in the past five years. This is in line with the modelling exercise carried out for the base year 2022 where all the NO₂ predicted concentrations at the receptors within and near the City of Lancaster AQMA were below 60 µg/m³, with the highest predicted concentration being 50.6 µg/m³ at receptor R33. The City of Lancaster AQMA has been compliant with the NO₂ 1-Hour Mean objective for the past five consecutive years.

Figure 2 – Monitoring Locations within the City of Lancaster AQMA

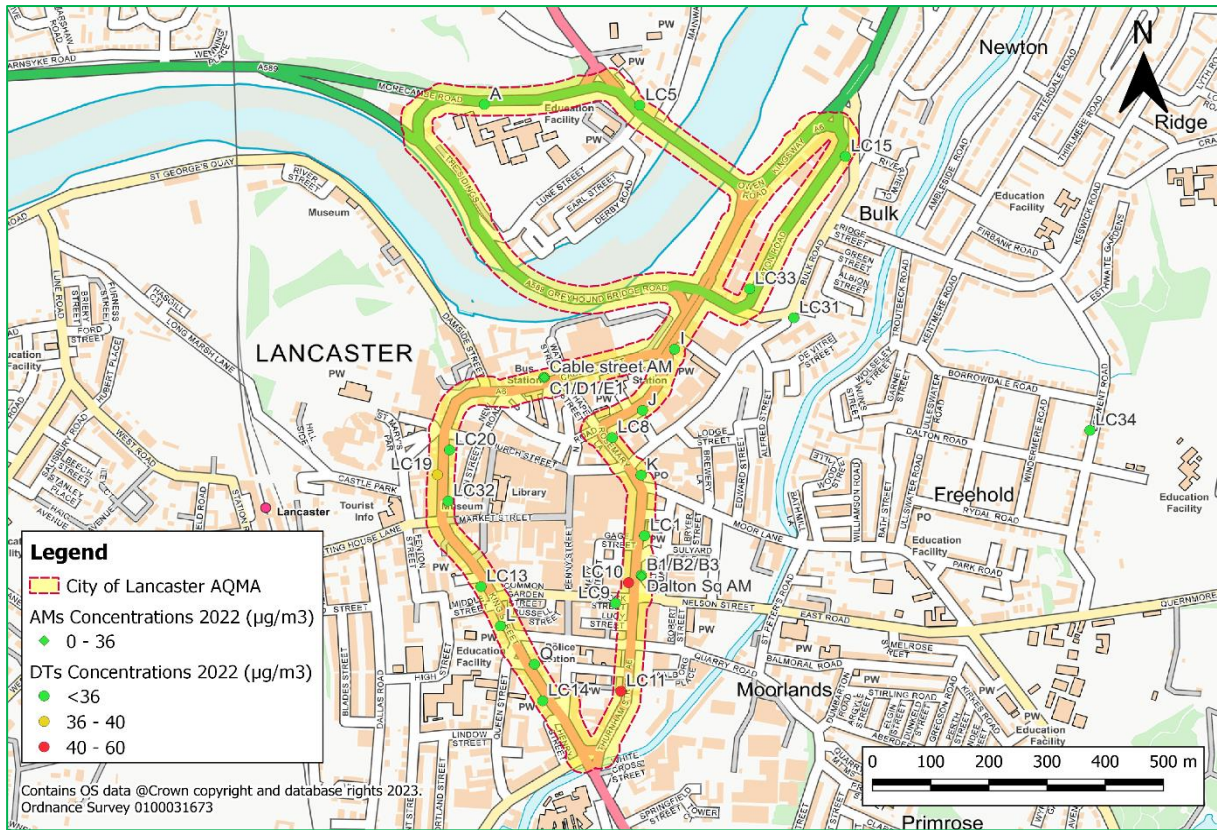


Table 1 City of Lancaster AQMA Monitoring results 2018-2022

Site ID	Site Type	OS Grid Ref X	OS Grid Ref Y	Height (m)	Distance to Relevant Exposure (m)	Annual Mean NO ₂ Concentration (µg/m ³)				
						2018	2019	2020	2021	2022
LC1	R	347852	461682	3.5	2.5	30.0	29.0	23.0	29.0	24.0
LC5	R	347846	462448	3.0	0.2	25.0	29.0	20.0	24.0	22.0
LC8	R	347796	461853	3.5	0.2	55.0	53.0	42.0	48.0	47.0
LC10	R	347834	461596	3.0	0.2	48.0	48.0	37.0	43.0	41.0
LC11	R	347821	461404	3.0	0.2	34.0	32.0	26.0	27.0	27.0
LC13	R	347580	461593	3.0	0.2	28.0	27.0	25.0	29.0	25.0
LC14	R	347685	461389	3.0	0.2	26.0	23.0	19.0	22.0	19.0
A	K	347582	462451	3.0	N/A	28.0	27.0	21.0	23.0	23.0
B1, B2, B3	R	347852	461611	2.0	N/A	36.0	36.0	27.0	32.0	28.0
C1, D1, E1	R	347685	461963	2.0	0.4	33.0	32.0	23.0	27.0	25.0
I	R	347909	462015	3.0	0.2	40.0	40.0	28.0	35.0	33.0
J	R	347852	461909	3.0	0.2	35.0	34.0	27.0	31.0	29.0
K	R	347850	461791	3.0	0.2	37.0	34.0	22.0	29.0	27.0
L	R	347613	461523	2.5	0.2	28.0	26.0	21.0	23.0	24.0
Q	R	347664	461449	3.0	0.2	27.0	27.0	-	-	22.0
LC15	R	348199	462361	5.0	0.2	43.0	45.0	40.0	42.0	39.0
LC19	R	347502	461841	3.0	0.4	39.0	38.0	29.0	33.0	31.0

Site ID	Site Type	OS Grid Ref X	OS Grid Ref Y	Height (m)	Distance to Relevant Exposure (m)	Annual Mean NO ₂ Concentration (µg/m ³)				
						2018	2019	2020	2021	2022
LC20	R	347515	461835	3.0	0.4	44.0	37.0	-	-	29.0
LC32	R	347511	461744	3.5	0.3	35.0	34.0	23.0	26.0	25.0
LC33	R	348045	462120	3.0	3.5	32.0	30.0	22.0	24.0	23.0
LC9	R	347808	461564	3.0	0.2	39.6	34.0	28.0	32.0	27.0
AN1* – Cable St	R	347684	461963	2.0	0.4	32.0	34.0	21.0	26.0	23.0
AN2* – Dalton Sq	R	347852	461610	2.0	N/A	30.0	29.0	23.0	29.0	24.0

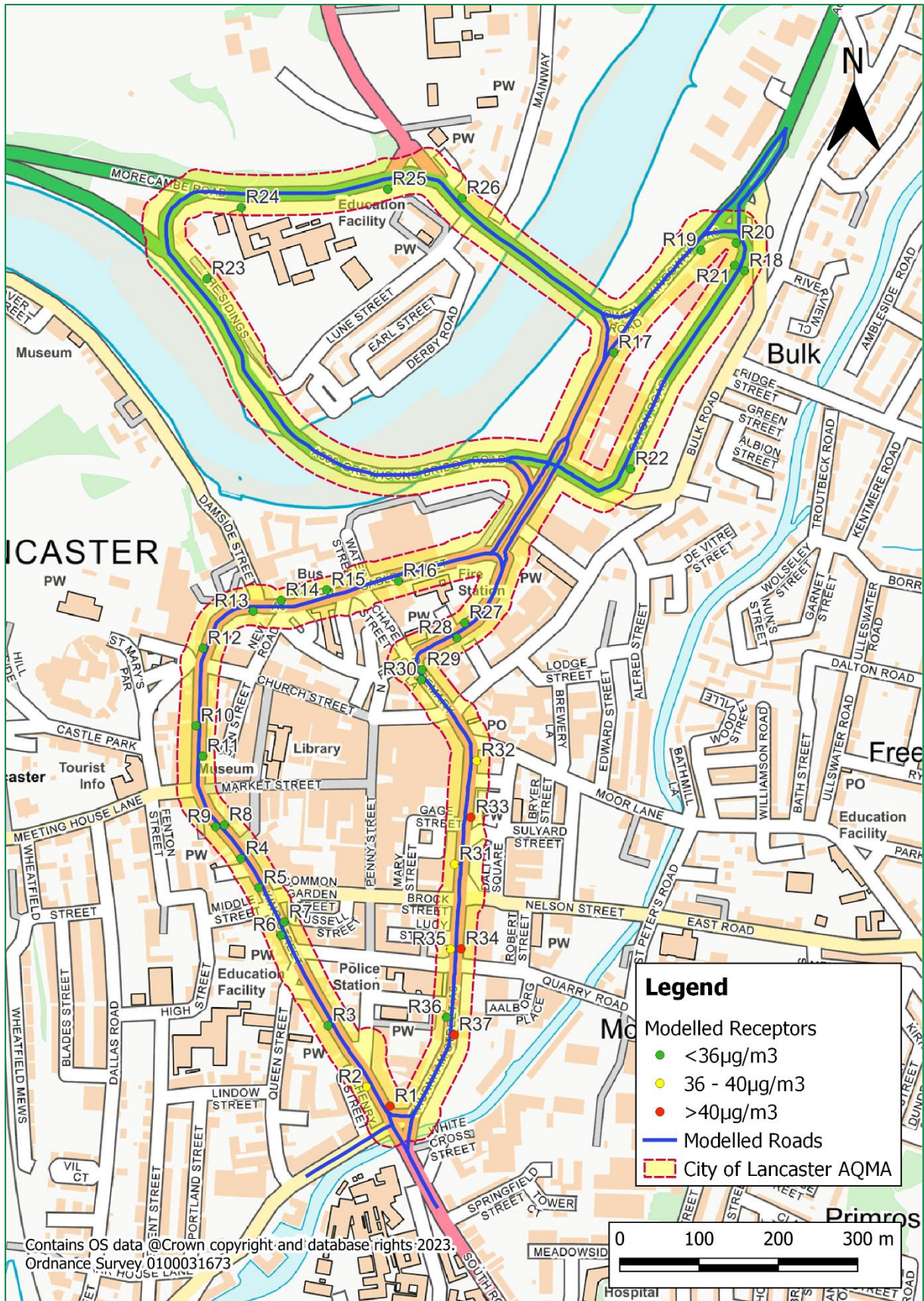
In *italics*, annual mean NO₂ concentration is within 10% of the AQS objective of 40µg/m³ (i.e., 36.0 - 40.0µg/m³)
 In **bold**, exceedance of the annual mean NO₂ AQS objective of 40µg/m³.
 When **underlined**, NO₂ annual mean exceeds 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective.
 R= Roadside UB = Urban Background
 *Automatic Monitoring Station

Table 2 City of Lancaster AQMA 1-Hour Mean NO₂ Monitoring results 2018-2022

Site ID	Site Type	OS Grid Ref X	OS Grid Ref Y	Height (m)	Distance to Relevant Exposure (m)	Number of 1-Hour Means > 200µg/m ³				
						2018	2019	2020	2021	2022
AN1 – Cable St	R	347684	461963	2	0.4	0	0	0	0	0
AN2 – Dalton Sq	R	347852	461610	2	N/A	0	0	0	0	0

For the modelling exercise carried out for the base year of 2022, modelled receptors were positioned at existing residential receptor locations within the AQMA. Figure 3 displays the modelled receptors and the predicted annual mean NO₂ concentrations. Exceedances of the annual mean NO₂ AQS objective were predicted within the AQMA within Great John St, Dalton Square and Thurnham Street and at Penny Street, where congestions are likely to occur. This is in line with the monitoring network’s reported concentrations within this area. The highest annual mean NO₂ concentration was recorded at Receptor R33 with a concentration of 50.6 µg/m³. Receptor 33 is located along a façade of a residential property (13 Great John St) which immediately fronts onto 13 Great John Street (A6).

Figure 3 Map of the City of Lancaster AQMA and Modelled Receptors



2.2 Public Exposure

Lancaster City Council is situated north of Lancashire. There are approximately 60,000 residents currently residing within the City¹⁰. Based on the 2020 Lower Layer Super Output Area Population Estimates¹¹, there are approximately 1,901 residents within the City of Lancaster AQMA. Information from the Indices of Multiple Deprivation (IMD), which are based on deciles of multiple factors of deprivation, and the median age are also included in Table 3. The IMD varies from 1 to 10, and the lower the score, the more deprived the area. The median age for the City of Lancaster AQMA is lower than the median age for England (42).

Table 3 Population Exposure within City of Lancaster AQMA

Estimated Population	Average IMD	Median Age
1,901	4	29.1

¹⁰ Office for National Statistics: Population and household estimates, England and Wales: Census 2021. Available at: <https://www.ons.gov.uk/>

¹¹ Office for National Statistics: Mid-2020 Population Estimates for Lower Layer Super Output Areas in England and Wales. Available at: <https://www.ons.gov.uk/>

3 Lancaster City Council's Air Quality Priorities

This chapter presents the main drivers and the approach taken by Lancaster City Council for the development and subsequent selection of measures that have been included within this AQAP. Included within this section of the AQAP are descriptions of the existing strategies and policies that relate to air quality within the Council.

A source apportionment study has been completed within the City of Lancaster AQMA as part of the detailed assessment. The source apportionment study has allowed the most significant sources of oxides of Nitrogen (NO_x) vehicle contributors to be identified. NO_x is predominantly emitted into the atmosphere in the form of nitric oxide (NO) which is then converted to nitrogen dioxide (NO₂) through chemical processes in the atmosphere. Under most atmospheric conditions, the dominant pathway for NO₂ formation is via the reaction of NO with ozone (O₃).

In conjunction, with the strategies and policies that are currently in place, the conclusions of this apportionment exercise have been used to identify and prioritise the action measures presented within Section 5.

3.1 Public Health Context

Poor air quality represents the largest environmental risk to public health in the UK, long-term exposure to air pollution can cause chronic conditions such as cardiovascular and respiratory diseases as well as lung cancer, leading to reduced life expectancy¹². Pollutants including Nitrogen Dioxide (NO₂) and particulate matter (PM₁₀, PM_{2.5}) are still responsible for 40,000 premature deaths each year nationally according to study by Royal College of Physicians¹³.

There is an increasing focus on fine particulate matter. PM_{2.5} is a pollutant of concern

¹² Public Health England. Health matters: air pollution. 2018. Available at: <https://www.gov.uk/government/publications/health-matters-air-pollution/health-matters-air-pollution>

¹³ Royal College of Physicians. 2022. Clean Air Day 2022. Available at: <https://www.rcplondon.ac.uk/guidelines-policy/clean-air-day-2022#:~:text=Prescribing%20clean%20air%20is%20central,every%20year%20in%20the%20UK>

meaning particulate matter which is 2.5 microns or less in diameter. No AQMA within the Lancaster City Council has been declared for PM_{2.5}.

About 4.5% of all deaths across Lancaster City Council were attributable to 'fine' particulate matter (PM_{2.5}) in 2021 (Public Health England)¹⁴, which is below the national average of 5.5%. It should be noted that this figure only accounts for one pollutant (PM_{2.5}) for which stronger scientific evidence on links with mortality exist, and not NO₂ for which the AQMAs are declared.

Furthermore, it is estimated that between 2017 and 2025 the total cost to the NHS and social care system of air pollutants (fine particulate matter and nitrogen dioxide), for which there is more robust evidence for an association, will be £1.6 billion.

There is increasing interest and pressure from members of public for local authorities to actively tackle and reduce air pollution in their areas. Previously, there had been no deaths officially linked to air pollution, however in 2020 the first person in the UK had 'air pollution' listed as a cause of death. Although currently there are no legislative outcomes as a result of this, this further increases the pressure and duty of care that local authorities have in order to protect their residents.

Air pollution tends to affect 'hotspots' (such as roads and traffic intersections), and although there may be many contributory causes, diesel engines are particularly recognised as a causal factor. Generally, more air pollution sources, and higher pollutant concentrations are found in more socially disadvantaged areas, consequently air pollution tends to cause most harm to people in socially deprived groups. Air pollution also negatively impacts upon the health of protected ecosystems, and agricultural productivity.

It is expected that some of the measures implemented within this action plan for the achievement of reductions in NO₂ will have co-benefits in additionally reducing concentrations of PM₁₀ and PM_{2.5}.

¹⁴ Public Health Outcomes Framework. Available at: <https://fingertips.phe.org.uk/profile/public-health-outcomes-framework>

3.2 Planning and Policy Context

There are several related policies and strategies at the local and regional level that can be tied in directly with the aims of the AQAP. The majority of these policies and strategies are focused on transportation issues and are therefore likely to help contribute to overall improvements in air quality across Lancaster City Council. The review of these strategies and policies also assists in not duplicating the work within this AQAP, but instead focus on measures outside those considered within these strategies and policies, but that still contribute towards their overall aims. This section outlines the strategies and policies that have the most significant potential to impact on pollutant concentrations within the Council.

This plan is not proposed to be integrated with a Local Transport Plan.

3.2.1 Environmental Improvement Plan

The Environmental Improvement Plan¹⁵ had its first revision in 2023 since being published as the 25 Year Environment Plan in 2018. The document sets out the UKs vision of action for the natural world for the next quarter century. To achieve this the document sets 10 goals to help direct and measure progress. Goal 2: Clean air is relevant to this AQAP.

The following text has been pulled from the document and highlights the targets the UK has proposed for achieving reduced emissions and subsequently 'clean' air:

...”A legal target to reduce population exposure to PM_{2.5} by 35% in 2040 compared to 2018 levels, with a new interim target to reduce by 22% by the end of January 2028.

- Legal concentration limits for a number of other key pollutants. We already meet the majority of these limits including for sulphur dioxide and coarse particulate matter. We are working towards meeting compliance with a 40 µg/m³ limit for nitrogen dioxide.*

¹⁵ <https://assets.publishing.service.gov.uk/media/64a6d9c1c531eb00c64ffa/environmental-improvement-plan-2023.pdf>

- *A legal target to require a maximum annual mean concentration of 10 micrograms of PM_{2.5} per cubic metre (µg/m³) by 2040, with a new interim target of 12 µg/m³ by the end of January 2028.*
- *Legal emission reduction targets for five damaging pollutants by 2030 relative to 2005 levels:*
- *Reduce emissions of nitrogen oxides by 73%. • Reduce emissions of sulphur dioxide by 88%.*
 - *Reduce emission of PM_{2.5} by 46%.*
 - *Reduce emissions of ammonia by 16%.*
 - *Reduce emissions of non-methane volatile organic compounds by 39%.”...*

3.2.2 Clean Air Strategy 2019

The Clean Air Strategy¹⁶ has been published to set out the case for action at a national level, identifying a number of sources of air pollution within the UK including road transportation (relevant in terms of the City of Lancaster AQMA) and sets out the actions required to reduce the impact upon air quality from these sources. It has been developed in conjunction with three other UK Government Strategies; the Industrial Strategy, the Clean Growth Strategy, and the 25 Year Environment Plan.

Key actions that are detailed within the strategy aimed at reducing emissions from transportation sources include the following:

- The publication of the Road to Zero strategy, which sets out plans to end the sale of new conventional petrol and diesel cars and vans by 2040;
- New legislation to compel vehicle manufacturers to recall vehicles and non-road mobile machinery for any failures in emission control systems, and to take effective action against tampering with vehicle emissions control systems;

¹⁶ Department for Environment, Food and Rural Affairs (2019), Clean Air Strategy.

- Develop new standards for tyres and brakes to reduce toxic non-exhaust particulate emissions from vehicles. This action would not necessarily target reductions in NO₂ for which the AQMAs within Lancaster has been declared;
- The encouragement of the cleanest modes of transport for freight and passengers; and
- Permitting approaches for the reduction of emissions from non-road mobile machinery, especially in urban areas.

3.2.3 Air Quality Strategy 2023

In August 2023, the Air Quality Strategy¹⁷ superseded the previous Air Quality Strategy (2008).

The strategy plans to set out a framework to enable local authorities to deliver for their communities and contribute to the governments long term air quality goals, this includes the new targets for PM_{2.5}.

The Air Quality Strategy is designed for local authorities in England with the focus on three main pollutants, PM_{2.5}, NO_x and NH₃.

Section 3 of the strategy identifies clear requirements for local authorities to accompany declared AQMA's with an AQAP to provide measures and dates by which they will be carried out. The Air Quality Strategy looks to implement this as air quality is a significant environmental threat to public health. Directors of Public Health are expected to be involved and collaborate with action plans and strategies with other departments and strategies such as climate change. The expectation is that local authorities and their partners deliver air quality improvements within reasonable timeframes. Local authorities should consider prevention and reduction of polluting activities in preference to only taking steps to improve air quality once exceedances have been identified.

¹⁷ <https://www.gov.uk/government/publications/the-air-quality-strategy-for-england/air-quality-strategy-framework-for-local-authority-delivery>

3.2.4 UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations

Published in July 2017, the UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations (Detailed Plan)¹⁸ is the UK governments plan for bringing concentrations of NO₂ within statutory limits within the shortest possible time. It is identified that the most immediate air quality challenge within the UK is tackling the issue of NO₂ concentrations close to roads, especially within towns and cities. The plan identifies a number of local authorities that were required to complete feasibility studies to define NO₂ concentrations on road links identified by the national Pollutant Climate Mapping (PCM) model as being in exceedance of the NO₂ annual mean objective as set out within the Ambient Air Quality Directive 2008/50/EC.

The UK Plan provides a high level of detail on possible solutions, and their implementation, to reduce NO_x emissions from vehicles, and therefore lower NO₂ concentrations. The actions detailed within the UK Plan include the following:

- Implementation of Clean Air Zones (CAZs);
- New real world driving emissions requirements for light passenger and commercial vehicles;
- Additional funding to accelerate the uptake of low emissions buses and also for the retrofitting of older buses;
- Additional funding to accelerate the uptake of hydrogen vehicles and associated infrastructure;
- New mandatory emissions standards for non-road mobile machinery; and
- Local cycling and walking investment plans.

¹⁸ Department for Environment, Food and Rural Affairs, Department for Transport (2017), UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations (Detailed Plan)

3.2.5 Local Plan (2011-2031)

The Local Plan adopted by the Council on the 29 July 2020 is composed of two parts: Part One: Strategic Policies & Land Allocations Development Plan Document¹⁹ (DPD) and Part Two: Development Management DPD²⁰. The Part One directs where homes, employment land, services and future investment will go in the city over the next 15 years, while Part Two sets out a series of generic planning policies to determine planning applications. Upon adoption the documents superseded the previous Local Plan which was formed of the residual elements of the 2004 Lancaster District Local Plan, the 2008 Lancaster District Core Strategy and 2014 Development Management DPD, these three documents have now been formally withdrawn. Several of the previous policies have been updated to reflect a need to improve the environment including air quality.

The key policies from Part One are:

- Policy SP10: Improving transport connectivity. The core elements of this policy are to address existing issues with the local and strategic transport network and to identify future improvements necessary to facilitate strategic development growth within the district, expecting greater promotion of a variety of sustainable methods of transport rather than over reliance on the private car to make local journeys. New development will be expected to be sited in sustainable locations that ensure a range of transport options and seek to reduce the need to travel.
- Policy EN7: Environmentally Important Areas on the protection of open spaces (for nature conservation value).
- Policy EN9: Air Quality Management Areas. Until June 2024, the Council had designated three Air Quality Management Areas (AQMAs) within the district in order to improve levels of air quality. Two AQMAs (Carnforth and Galgate) were

¹⁹ Lancaster Local Plan Part One: Strategic Policies & Land Allocations DPD. Available at: <https://www.lancaster.gov.uk/planning/planning-policy/land-allocations-dpd>

²⁰ Lancaster Local Plan Part Two: Development Management DPD. Available at: <https://www.lancaster.gov.uk/planning/planning-policy/development-management-dpd>

revoked in June 2024 and the City of Lancaster AQMA will be amended to revoke the NO₂ 1-Hour Mean objective. Developments that are located within or adjacent to the AQMA will be expected to ensure that they do not contribute to increasing levels of air pollutants within the locality and adequately protect their users from the effects of poor air quality. Any development proposals will be expected to have regard to all relevant policies contained within the Local Plan, in particular Policy DM31 of the Development Management DPD20 which relates to development and air quality.

- Policy T2: Cycling and Walking Network. The Council are committed to supporting and promoting the role of cycling and walking in the district, building on previous successes of Lancaster's role as a Cycling Demonstration Town providing safe and secure facilities.
- Policy T3: Lancaster Canal. Development proposals which are adjacent to, or adjoining, the Lancaster Canal will be expected to improve access to, along and from the waterway for all users (where appropriate) and enhance / improve the environmental quality and green infrastructure of the waterway corridor in that area, providing a net gain in biodiversity.
- Policy T4. Public Transport Corridors. Frequent and regular public transport services will be promoted in the following key public transport corridors:
 - The Caton Road Gateway between M6 junction 34 and Lancaster city centre;
 - The A6 Corridor between Lancaster University and Lancaster city centre; and
 - Lancaster Road / Morecambe Road between Lancaster city centre and Morecambe town centre.

The key policies from Part Two are:

- Policy DM7: Purpose Built Accommodation For Students
- Policy DM29: Key design principles. The Council expects new developments to:
 - Ensure there is no significant detrimental impact to amenity in relation to overshadowing, visual amenity, privacy, overlooking, massing and

pollution; Deliver net gains in green infrastructure, retaining and enhancing, where possible, appropriate amounts of garden / outdoor space for occupiers of both proposed and neighbouring uses;

- Minimise impacts on air quality (including odour), noise and light pollution;
 - Locate new development sensitive to pollution in locations where existing sources of noise, light or air pollution can be satisfactorily mitigated;
 - Incorporate electric vehicle charging points in line with the guidance contained within Policy DM31 and the forthcoming Supplementary Planning Document on this matter.
- **Policy DM31: Air Quality Management and Pollution.** All development proposals must demonstrate that they have sought to minimise the levels of air polluting emissions generated and adequately protect their new users, and existing users, from the effects of poor air quality. A development, which is located within an AQMA, or any development which has the potential to, individually or cumulatively, contribute to increasing levels of air pollution, will be required to demonstrate how either on-site or off-site mitigation measures will be put in place to reduce the air quality impact. Any proposal must not significantly worsen any emissions or air pollutants in areas where pollution levels are close to objective / limit value levels. Proposals should contribute towards delivering the actions detailed within the Lancaster District Air Quality Action Plan, once in place. Any proposal must not worsen any emissions or air pollutants in areas that could result in a breach of or worsen site-level critical loads for ecosystems within relevant Internationally designated nature conservation sites during both construction and operational phases. Air Quality Assessments must be submitted for relevant development proposals, as outlined in the Council's Validation Guide. All development proposals will be expected to take account of the Council's forthcoming SPD on Low Emissions and Air Quality.

3.2.6 National Planning Policy Framework

All development within Lancaster must align with this national framework. The relevant

tests of asking for s.106 monies are set out in paragraph 57 of this document and need to be met in order for money to be secured from new development to fund some proposed measures such as EV charging etc.

3.2.7 Neighbourhood Plans

Information on the district's Neighbourhood Plans can be found at this link: <https://www.lancaster.gov.uk/planning/planning-policy/neighbourhood-planning> .

3.2.8 Climate Emergency Local Plan Review

Information related to the Climate Emergency can be found here: [What we are doing - Lancaster City Council](#) and Climate Emergency Local Plan Review [Climate Emergency Local Plan Review Examination - Lancaster City Council](#)

3.2.9 Electric Vehicle Charge Infrastructure SPD

While not yet adopted the draft version of this Supplementary Planning Document (SPD) can be found here: [PC draft Provision of Electric Vehicle Charging Infrastructure Supplementary Planning Document \(SPD\) Consultation | KeepConnected \(lancaster.gov.uk\)](#)

3.2.10 Planning Advisory Note – PAN 11 – Air Quality

This Planning Advisory Note (PAN) provides guidance and encouragement to developers to support action through the planning system to improve air quality and lower transport emissions. It provides guidelines for the treatment of development sites through a planning appraisal. It is anticipated that this PAN will in time be formalised into a Supplementary Planning Document (SPD) via the emerging Local Plan. The full note can be found here:

<https://planningdocs.lancaster.gov.uk/NorthgatePublicDocs/00979413.pdf>

3.3 Source Apportionment

The AQAP measures presented in this report are intended to be targeted towards the predominant sources of emissions within the City of Lancaster AQMA. This has

involved a review of both background regional sources and specific local sources with the key focus on different sources of emissions from road vehicles. Full details of the traffic data used and model verification are available in the technical report in the Appendix C.

A source apportionment exercise was carried out using ADMS-Roads air dispersion modelling to assess the overall emission profiles of the vehicles present within the AQMA. It should be noted that emission sources of NO₂ are dominated by a combination of direct NO₂ (f-NO₂) and oxides of nitrogen (NO_x), the latter of which is chemically unstable and rapidly oxidised upon release to form NO₂. Reducing levels of NO_x emissions therefore reduces levels of NO₂.

The following sections describe the source apportionment results. A breakdown of NO_x is given according to vehicle class within the AQMA and based on the following criteria:

- Contributions based on average NO_x levels across all monitored locations;
- Contributions based on NO_x levels across all modelled locations where NO₂ concentrations exceed 40 µg/m³ (where applicable); and
- Contributions based on NO_x levels at the highest NO₂ concentration receptor in the AQMA.

Table 4 provides a breakdown in NO_x emissions according to vehicle class within the AQMA and Figure 6 displays the average NO_x emissions across all modelled receptors within the AQMA and at the receptor with maximum NO_x road concentration.

The findings of the source apportionment study show that the primary contributors to total NO_x are road emissions (68%). Within the City of Lancaster AQMA, diesel cars (33%) and diesel LGV (27%) contribute the highest to NO_x emissions. At the receptor with maximum NO_x concentration, Buses (32%) and Diesel Cars (27%) are the highest contributors to NO_x emissions. As such, measures which target emissions from these sources will be prioritised.

Emissions from Petrol Cars (5%), petrol LGVs (0.2%) and Motorcycles (0.1%) contribute less to concentrations within the AQMA. As such, measures could be brought forward to switch away from diesel cars and to these modes of transport, especially newer petrol, hybrid or electric cars.

Background concentrations, which account for 33% of the total NO_x within the AQMA, show that domestic sources (7%) and rural sources (8%) contribute to total concentrations within the AQMA. Measures as part of the Action Plan should also prioritise managing emissions from these sources where it is within the Local Authorities ability to do so.

Figure 4 Average NO_x Background Split

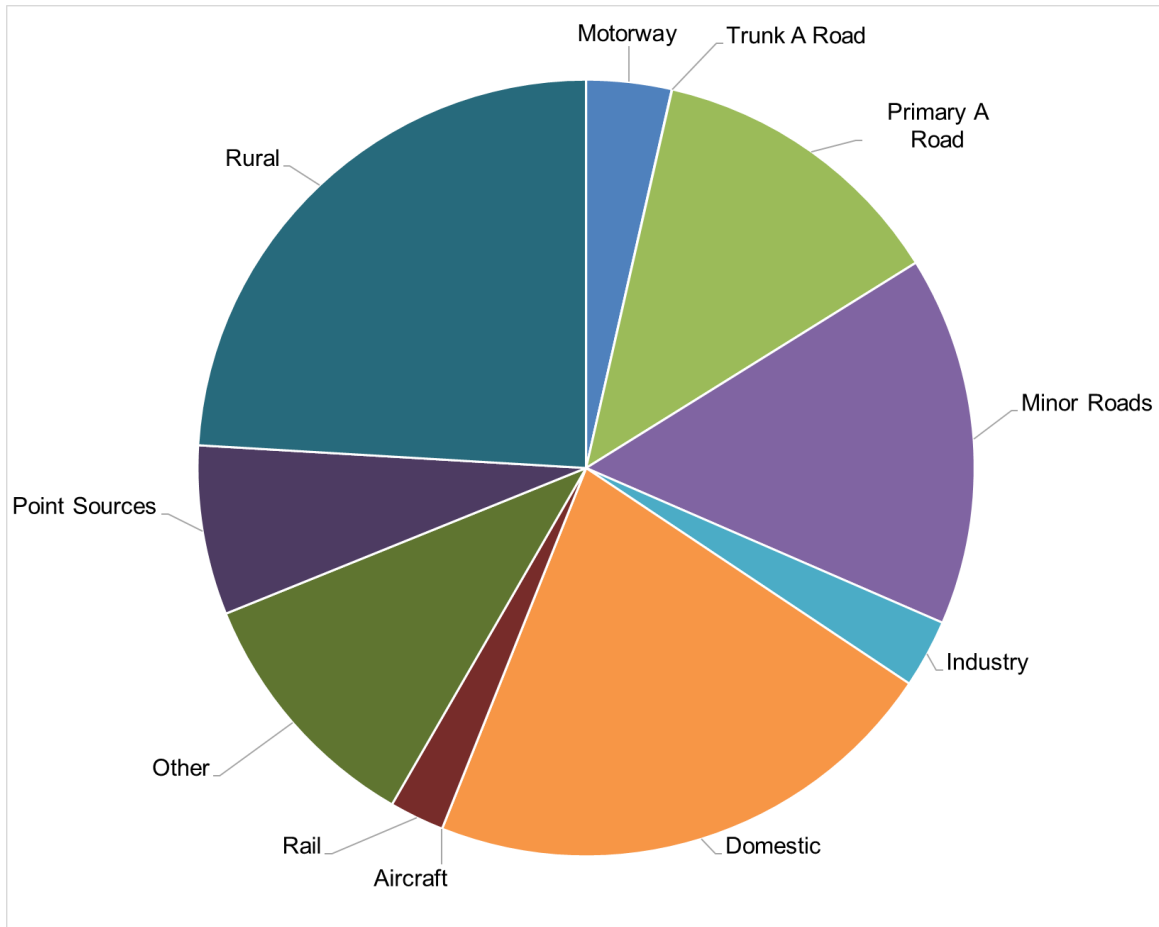


Figure 5 Detailed Source Apportionment of Background + Road NO_x Concentrations

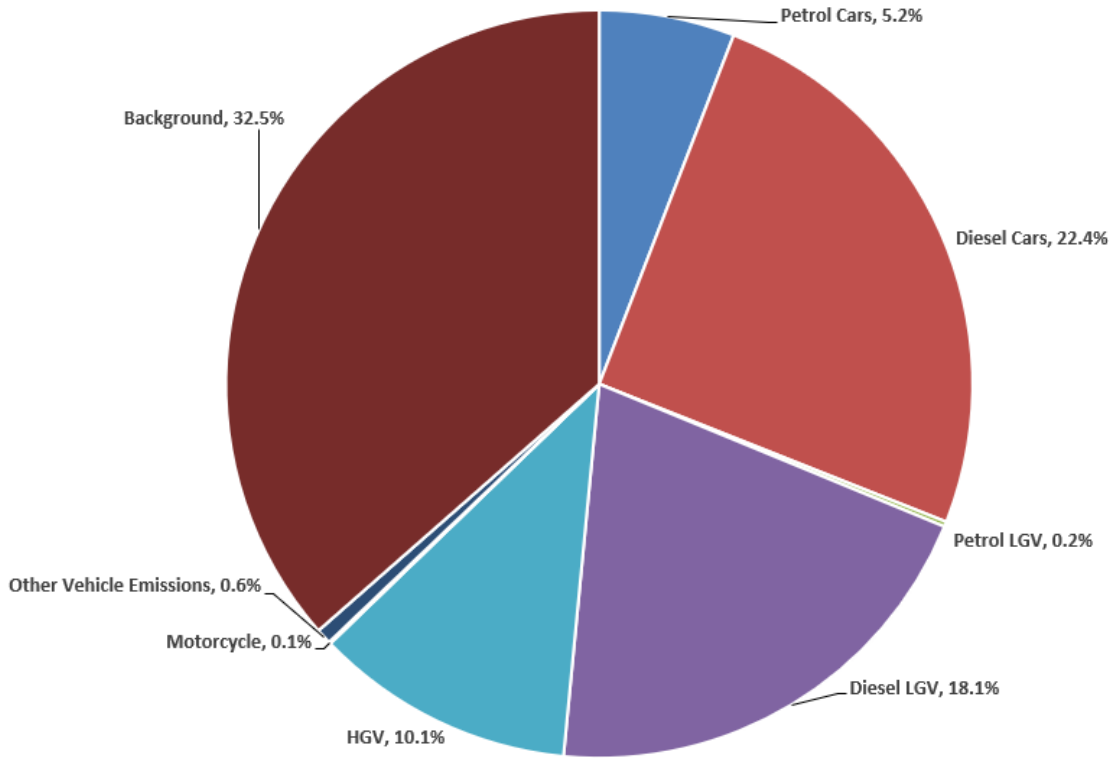


Figure 6 Detailed Source Apportionment of All NOx Concentrations

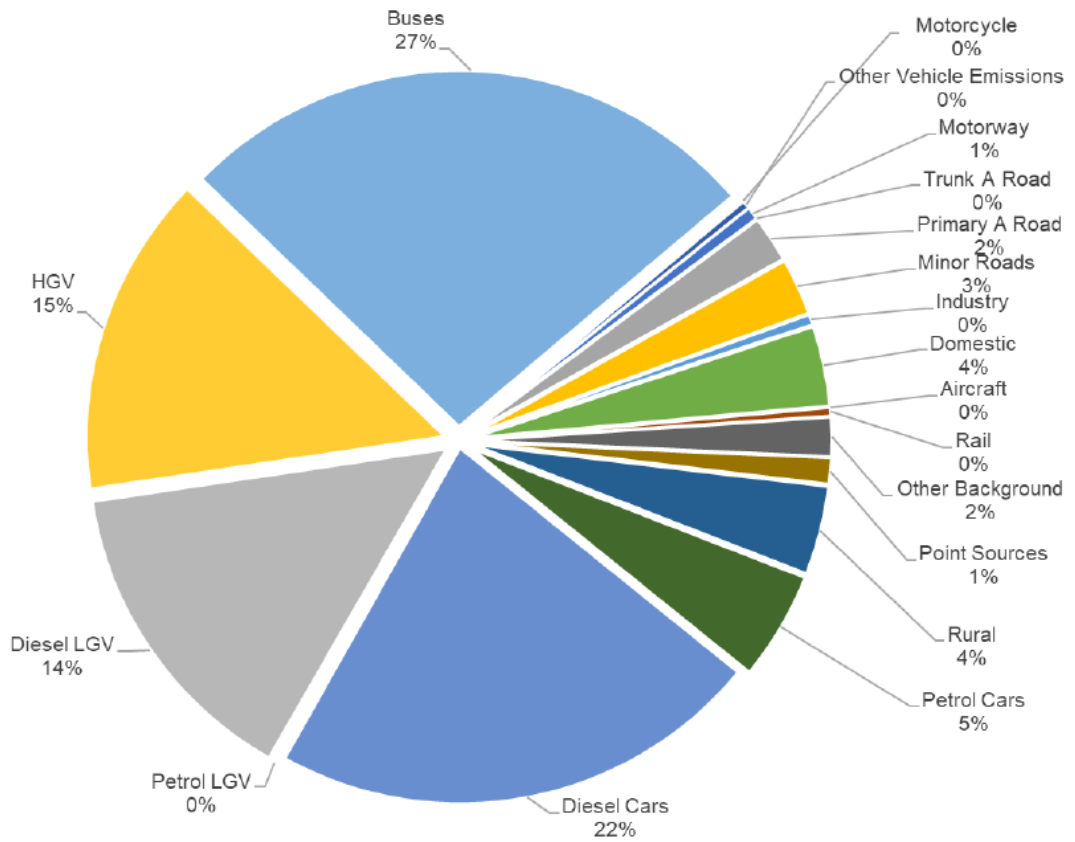


Table 4 Detailed Source Apportionment of Road NO_x Concentrations

Metric	All Vehicles	Petrol Cars	Diesel Cars	Petrol LGV	Diesel LGV	HGV	Buses	Motorcycle	Other	Background
Average Across All Modelled Receptors										
NO _x Concentration (µg/m ³)	32.3	2.5	10.7	0.1	8.7	4.8	5.2	0	0.3	15.6
Percentage of Total NO _x	68%	5%	22%	0%	18%	10%	11%	0%	1%	33%
Percentage Contribution to Road NO _x	100%	8%	33%	0%	27%	15%	16%	0%	1%	-
At Receptor With Maximum Road NO_x Concentration										
NO _x Concentration (µg/m ³)	82.1	4.9	22	0.1	14.2	14.4	26.2	0	0.4	16.5
Percentage of Total NO _x	83%	5%	22%	0%	14%	15%	27%	0%	0%	17%
Percentage Contribution to Road NO _x	100%	6%	27%	0%	17%	18%	32%	0%	0%	-

NO₂ Source apportionment has also been completed for the worse case receptor. The calculations are summarised in Table 5 and Table 6 below.

Table 5 – NO₂ Source Apportionment Calculations

Calculation	Concentration (µg/m ³)
Total Background NO ₂ [TB-NO ₂]	12.33
Total Background NO _x [TB-NO _x]	16.53
Regional Background NO _x [RB-NO _x]	3.98
Local Background NO _x [LB-NO _x]	12.55
Regional Background NO ₂ [RB-NO ₂]	2.97
Local Background NO ₂ [LB-NO ₂]	9.36
Total Max Modelled NO ₂ [T-NO ₂]	50.64
Local NO ₂ Contribution [L-NO ₂]	38.31

Table 6 – NO₂ Source Apportionment from Vehicles at Max Receptor

Calculation	NO ₂ Contribution (µg/m ³)
Petrol Cars	2.27
Diesel Cars	10.25
Petrol LGV	0.06
Diesel LGV	6.62
HGV	6.72
Buses	12.22
Motorcycle	<0.01
Other	0.17

3.4 Required Reduction in Emissions

In line with the methodology presented in Box 7.6 of LAQM.TG(22)⁶, calculations have been carried out to determine the necessary reduction in road NO_x required to bring the City of Lancaster AQMA to compliance. The reduction required at the worst-case location within the AQMA is presented, under the assumption that an equal reduction across the entirety of the AQMAs would ensure that all receptors are compliant. In addition, the average reduction required at all receptors predicted to be exceeding within the AQMA is also presented.

Table 7 below also illustrates the required reduction in NO_x emissions for annual mean NO₂ concentrations to fall below the air quality objective (AQO) of 40 µg/m³. As shown, a 27.8% reduction in road NO_x is required to meet the AQO for annual mean NO₂ at the worst-case receptor.

Table 7 – Required Reduction in NO_x emissions to meet AQO for Annual Mean NO₂

Metric	Value (Concentrations as µg/m ³)
Worst-Case Relevant Exposure NO ₂ Concentration	50.6
Equivalent NO _x Concentration	85.4
Background NO _x	16.5
Background NO ₂	12.3
Road NO _x - Current	82.1
Road NO _x - Required (to achieve NO ₂ concentration of 39.9µg/m ³)	59.3
Required Road NO _x Reduction	22.8
Required % Reduction	27.8%

Estimated Year of Compliance

Following the identification of exceedances of the AQS objectives, it is useful to provide an estimate of the year by which concentrations at the identified locations of exceedances will become compliant with the relevant AQS objective. This is initially provided below assuming only the trends for future air quality, as currently predicted by Defra, are realised. The implementation of specific intervention measures to mitigate the local air quality issues, as are currently being developed by the Council within a revised AQAP, would then be considered most likely to bring forwards the estimated date of compliance.

Following the methodology outlined in LAQM.TG(22) paragraph 7.70 onward, the year by which concentrations at the identified locations of exceedances will become compliant with the NO₂ annual mean AQS objective has been estimated. This has been completed using the predicted modelled NO₂ concentrations from the 2022 Base scenario.

As a worst-case approach, the projection is based upon the receptor predicted as having the maximum annual mean NO₂ concentration, which in this case is Receptor R33. The appropriate roadside NO₂ projection factors, as provided on the LAQM

Support website²¹, are then applied to this concentration value to ascertain the estimated NO₂ annual mean reduction per annum, and hence the anticipated year of compliance. In this case, roadside projection factors for 'Rest of UK (HDV <10%)' have been applied, consistent with the worst-case receptor location.

The projected NO₂ annual mean concentrations following the above approach are presented in Table 8.

Table 8 – Projected Annual Mean NO₂ Concentrations

Receptor R33								
2022 Annual Mean Concentration (µg/m ³)	Predicted Annual Mean Concentration (µg/m ³)							
	2023	2024	2025	2026	2027	2028	2029	2030
50.6	48.0	45.4	43.0	40.9	39.0	37.3	35.8	34.5
In bold , exceedance of the NO ₂ annual mean AQS objective of 40µg/m ³ Vehicle Adjustment Factor = Rest of UK (HDV <10%)								

Table 8 indicates that the first year by which Receptor R33 will be exposed to a concentration below the annual mean NO₂ AQS objective will be 2027. Additionally, it is expected that concentrations are expected to drop below 10% of the annual mean NO₂ AQS objective by 2029. 2027 is therefore considered the predicted year of compliance for those receptors used within the model, which are believed to represent worst case exposure within the City of Lancaster AQMA, in the absence of the implementation of any specific intervention measures to further bring forward local air quality improvements in the area.

²¹ <https://laqm.defra.gov.uk/tools-monitoring-data/roadside-no2-projection-factor.html>

3.5 Key Priorities

3.5.1 Priority 1 – Reducing Transport Emissions

The main source of air pollution leading to the declaration of the AQMA is road transport emissions. Therefore, reducing transport emissions are the key priority. Our approach focuses on two main areas:

Areas where Lancaster has direct control:

- modernising the Council fleet to reduce emissions from diesel cars;
- promoting alternatives to private motor vehicles;
- encouraging the use of, and facilitating the use of low/zero emissions transport;
- safeguarding and expanding sustainable transport services and routes (such as bus and rail facilities);
- reducing the need to travel by supporting sustainable development and initiatives that help support the local economy, services and facilities;
- provide proactive facilities and measures to support sustainable transport modes including on-site features to encourage sustainable travel methods e.g. cycle path links, cycle storage facilities, bus stops, electric vehicle charging points etc.; and

Areas where measures can be implemented via a partnership:

- work with Lancashire County Council and other partner organisations to improve the road network, make strategic highways improvements and promoting and improving public travel alternatives.

As the roads contributing to pollutant concentrations which result in exceedance of the annual average NO₂ objective are not managed by National Highways, this Relevant Public Authority has not been engaged with for the purpose of preparing this AQAP.

3.5.2 Priority 2 – Improving Vehicle Efficiency

Across the local authority, there are multiple efforts in place to improve uptake in cleaner vehicles. This includes provision of additional electrical vehicles, increasing parking space for low emission vehicles, incentives for taxis to use electric vehicles and procurement of low emission buses and coaches within the city.

3.5.3 Priority 3 - Planning and Infrastructure

The Local Plan and its policies set out the considerations that will be applied by Lancaster for all development proposals. The Council will work with developers and partner organisations to ensure the delivery of infrastructure, services and community facilities necessary to develop and maintain sustainable communities. This will not only apply to air quality but all relevant environmental aspects.

3.5.4 Priority 4 - Policy Guidance

Existing strategies and policies adopted by Lancaster area are key mechanisms for reducing emissions across the borough. Transport is the main source of NO_x emissions, and therefore NO₂ concentrations, within the AQMAs.

3.5.5 Priority 5 - Public Health and Wellbeing Behavioural Change

The Council has a strong role in facilitating and encouraging behavioural changes by setting examples and developing infrastructure to support this. An effective way to achieve a reduction in vehicle numbers is to change the attitudes and behaviour of the population towards travel. Lancaster City Council will encourage and facilitate these changes through implementing a suite of interventions that have been informed by insights into the key factors affecting travel behaviour.

Measures will include education and awareness raising alongside schemes which incentivise change. Improving air quality to protect public health requires a wide-reaching perspective which is not specific to the AQMAs but instead aims to have a wider impact across the borough.

Overview of Lancashire County Council's Air Quality Activity

In Lancashire, the strongest evidence we have on the population health impacts of air

pollution is provided by the Office for Health Improvement and Disparities within their Public Health Outcomes Framework. The most recently published data estimates that the overall mortality rate from particulate air pollution in Lancashire-12 is 5.1% (2022).

Working with district councils, Lancashire County Council (LCC) has an important role to play in taking action to reduce the health impacts of air pollution, and improving air quality is a key objective in the County Council's Environment and Climate Strategy 2023-2025. Responsible for transport planning, network management, highway maintenance, public health and procuring local vehicle fleets, there are a number of ways LCC support local and county-wide efforts to improve air quality:

1. Encouraging the use of sustainable forms of travel

Lancashire's cycling and walking strategy, *Actively Moving Forward*, sets out an ambitious plan for increasing the number of people walking and cycling in the county by 2028. By improving and increasing access to cycling and walking infrastructure, alongside training and promotional activities, it aims to significantly increase the amount of cycling and walking people do across the county. Information on the County Council's ongoing activities in this area can be found on the *Active Travel in Lancashire* website.

As part of Lancashire's cycling and walking strategy, there are seven supplementary documents: Local Cycling and Walking Infrastructure Plans (LCWIPs). These are:

- Lancaster
- Central Lancashire
- West Lancashire
- Fylde Coast
- Ribble Valley
- Burnley and Pendle
- Rossendale and Hyndburn

As part of the LCWIP process, extensive public and stakeholder engagement was carried out. The LCWIPs were signed off by LCC cabinet in May 2024. They include a network plan for cycling and walking infrastructure and an aspirational list of schemes

for delivery over short, medium, and long-term timeframes. They will be used to support future infrastructure decisions and to access new funding schemes as they become available.

The Road Safety Team work with schools, workplaces and the community to encourage safe and sustainable modes of travel. Initiatives for schools are promoted through the Safer Travel Moodle and include: a series of cycling and walking safety training programmes; guidance and resources for teachers to encourage safe and active travel; and support for creating travel plans.

Bus services across Lancashire operate in a deregulated market, meaning the County Council doesn't control the bus network, franchise routes or control fares. Buses in Lancashire are the most popular and well used form of public transport in the county so it's vital we ensure everyone can maintain connections with their friends and family, reach essential services, and access opportunities for education and employment.

As part of our Bus Service Improvement Plan, the county council will continue to work more closely with bus operators, alongside local communities, to create a network that people want and will use. The council has published a ten-year Enhanced Partnership Plan and Scheme alongside its Bus Service Improvement Plan which together will deliver measures to restore confidence and grow patronage across Lancashire.

2. Supporting the transition to electric vehicles

Lancashire County Council has already installed 150 fast and rapid charge points around Lancashire, either on LCC car parks or kerbside on our highways. These can typically allow vehicles to charge in less than an hour and are operated on our behalf by BP Pulse. The types of charge points installed will depend on the specific location, power supply and demand.

The Lancashire and Blackburn with Darwen EV Infrastructure Strategy was approved in July 2023 and sets out our plan to provide more EV charge points across the county. It considers the future demand for charging infrastructure and identifies broad locations for different types of charging need, whilst it is modelled data it helps us to understand the size and type of public infrastructure that will be required.

This strategy supports LCC's application to the government's Local Electric Vehicle Infrastructure (LEVI) capital fund. The aim of the funding is predominately to deliver

local, low power, on-street charging infrastructure, primarily benefiting residents who do not have access to off-street parking at home. An indicative £10.1m has been allocated to Lancashire, subject to the submission and approval of a full business case and application in the 2024/25 funding round. This will help us to scale up the deployment of local charge points and deliver our strategy aims. We will be working closely with district councils and other partners to ensure there is county-wide provision which is suitable for the needs of the local area.

In addition to preparing an application to the LEVI capital fund, LCC is one of 16 councils to secure funding from the LEVI extended pilot fund. This is to trial solutions that will help people who do not have access to off-street parking, including testing charging points integrated into street lighting columns and pavement cable channels. The cable channels provide a low cost and practical solution to support residents without off street parking charge at home.

The county council's Parking Services Team fleet vehicles are now fully electric, with charging infrastructure installed at the offices and depots where the vehicles are based, and regularly visit. LCC's Fleet Services team is committed to switching to electric commercial vehicles, where possible, as set out in the LCC Highways Decarbonisation Strategy.

3. Creating cleaner, healthier road networks

Work to develop the next Local Transport Plan (LTP4) for Lancashire, Blackpool and Blackburn with Darwen is underway. The Public Health team has submitted an evidence base to inform the process, highlighting transport-related health challenges affecting the population of Lancashire and making recommendations about how local transport planning policy can contribute to addressing these. The local Highways and Transport Masterplans will be refreshed to align with the priorities of LTP4. This will provide an opportunity to identify longer-term network solutions that address issues in AQMAs and have a positive impact on air quality generally.

LCC's Highways and Transport Strategy published in early 2023 provides a helpful explanation of the county council's transport priorities and actions in support of public health improvements.

4. Embedding air quality into policy

LCC works with district planners to ensure air quality is a key consideration of Local Plans, alongside wider public health issues. It supports district councils in developing policies that seek to ensure new developments do not contribute to increasing levels of air pollutants and that requirements for appropriate mitigation are in place.

LCC, as part of its highways input into planning applications, actively encourages measures that aim to promote sustainable forms of travel. Working under the direction of the National Planning Policy Framework, the county council seeks measures that facilitate cycling and walking, increase the use of public transport and provide access to electric vehicle charge points. LCC also seeks funding from developers, through Section 106 contributions, to support existing bus services or to provide new bus services suitable to serve development sites once they are built.

5. Raising awareness and increasing engagement

Lancashire Insight provides information on the sources and health impacts of air pollution across the county. Webpages include a Summary of Emissions Data and Monitoring of Air Quality and Health Impacts.

3.5.6 Priority 6 - Air Quality Monitoring

Currently, NO₂ is monitored across Lancaster City Council using passive diffusion tubes and two automatic monitoring stations. Air quality monitoring is a useful way to continually assess the extent of air pollution within the Council. It also helps to measure the impact of implementing measures to reduce emissions, and as an evidence base for AQMAs to be revoked. The Council will continue to monitor focusing on areas where higher concentrations have been previously monitored and modelled in the City of Lancaster AQMA detailed assessment.

4 Development and Implementation of Lancaster City 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 9. In addition, we have undertaken the following stakeholder engagement:

- Updates to the Lancaster City Council Air Quality webpage with information about key air pollutants and measures that can be taken to reduce both individual contribution but also personal exposures.
[About air pollution - Lancaster City Council](#)
- A public survey which aims to understand public perception of local environmental issues with a particular focus on air quality (November 2023 – February 2024).
[Air Quality Survey | KeepConnected \(lancaster.gov.uk\)](#)
- Public consultation regarding the revocation of Carnforth and Galgate Air Quality Management Areas (February – March 2024).
[Carnforth and Galgate Air Quality Management Area Revocation Consultation | KeepConnected \(lancaster.gov.uk\)](#)
- Air quality officers from Lancaster City Council participated in public engagement workshops with Shared Future CIC exploring sustainable travel with local residents (Autumn 2023).
- Prior to the publication of the final draft, the wider public were invited for consultation (November – December 2024). Responses can be found in Appendix D.
www.keepconnected.lancaster.gov.uk/air-quality-action-plan-consultation

Table 9 – Consultation Undertaken

Consultee	Consultation Undertaken
The Secretary of State	Yes
The Environment Agency	Yes
The highways authority	Yes
All neighbouring local authorities	Yes
Other public authorities as appropriate, such as Public Health officials	Yes
Bodies representing local business interests and other organisations as appropriate	Yes

4.2 Steering Group

A steering group was established at the start of the update process to drive forward the development of the new AQAP. The core aim of the steering group was to identify measures for inclusion within the AQAP that would be effective both in terms of reducing NO₂ concentrations and also feasible in terms of implementation and delivery.

Lancaster City Council set up a steering group in Autumn 2023. Membership of the group included representatives from:

- Environment and Place – Lancaster City Council
- Planning and Climate Change – Lancaster City Council
- Planning and Environment Service – Lancashire County Council
- Bureau Veritas UK

Including members from various areas and departments in the steering group enables a collaborative strategy for enhancing air quality and expands the potential for implementing a wider array of measures.

Lancaster City Council

Lancaster City Council maintains virtual communication with involved parties, primarily through e-mail. to clarify aspects of consolidated measures. It is crucial to communicate progress on individual initiatives related to AQAP measures, analyse valuable lessons learned from ongoing implementation, and persist in discussing innovative concepts for future measures and actions within the council.

5 AQAP Measures

Table 10 shows the Lancaster City 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; and
- how progress will be monitored.

NB: Please see future ASRs for regular annual updates on implementation of these measures.

Additional information on some measures is set out below inclusive of how they relate to the source apportionment exercise.

5.1 Active and Sustainable Travel

Lancaster City Council works in line with the Department for Transport's Cycling and walking investment strategy²² and their Technical Guidance for Local Authorities (2017)²³. The Council is currently in the process of finalising the plan for Lancaster City and it will be published soon.

Promoting sustainable travel can have a high impact on the City of Lancaster AQMA air quality as cars contribute 27% (of which 25% are diesel cars) to the emissions within the AQMA. Additionally, a sustainable travel culture will also have positive impacts in

²² Department for transport. Cycling and walking investment strategy. <https://www.gov.uk/government/publications/cycling-and-walking-investment-strategy>

²³ Department for Transport. Local Cycling and Walking Infrastructure Plans. Technical Guidance for Local Authorities. 2017.

human health and help with net zero targets and climate change objectives. This measure helps to obtain compliance and to maintain it.

5.2 Sustainable Travel SPD

While not yet adopted, there is a draft Sustainable Travel Supplementary Planning Document, the measures therein will seek to advance modal shifts and thus reduce pollutant concentrations across the city.

[PC draft Sustainable Travel SPD | KeepConnected \(lancaster.gov.uk\)](#)

5.3 Lancaster Cycling and Walking Infrastructure Plan

This network plan is now complete. The delivery of the measures proposed therein will help enable active travel plan and include suggested interventions for new cycle and pedestrian paths to make this a more appealing and safer option for travelling when compared to private vehicle use.

[Lancashire Cycling and Walking Infrastructure Plans - Lancashire County Council.](#)

5.4 Sustrans Partnership

LCC works with Sustrans to promote active travel. More information on these initiatives can be found here: [Lancashire Cycleway - Sustrans.org.uk](#). (E.g. [Lune Valley Greenway: Caton to Bull Beck Improvements \(arcgis.com\)](#))

Sustrans Greenway Improvements:

- Approximate alignment with LCWIP - [Lancashire Cycling and Walking Infrastructure Plans - Lancashire County Council](#)
- Extension of Lune Valley Greenway – 6 projects to extend up to Hornby, Wray, Kirkby Lonsdale and Ingleton

5.5 Zero emission busses

Lancashire County Council applied for the ZEBRA bid were unsuccessful but intend to rebid in future or find an alternative source of funding to promote this measure. The

bid covered the procurement of 31 new electric buses for Stagecoach for Services 1/1A, 2X and 100. It was likely that these buses would have also appeared on other routes during the evening and Sundays when the requirement on the main services is lower. Additionally, the County Council's Bus Service Improvement Plan includes the ambition for Zero Emission Buses being introduced in Lancashire within the next five years.

Furthermore, operators are encouraged via the Enhanced Partnership to invest in newer vehicles to reduce their vehicle emission levels, however this is not mandatory to avoid it being detrimental to SME operators. Tendered bus services (public not school) have a 10-year age limit on vehicles as part of the contract terms which means that all vehicles on supported services should now be a minimum of Euro V and be all Euro VI within the next few years.

As buses contribute 27% of the total emissions at the receptor with maximum road NO_x concentration, and 11% in average across all modelled receptors, measures that aim to reduce these contributions can have a high impact on the air quality. Introducing electric buses has a long-term impact in the air quality of the AQMA and the whole borough, assisting not only to obtain compliance but also to maintain it.

5.6 Signalling Improvements

Lancashire County Council will be updating the signalling infrastructure over the next year. The project is currently in the early design stage, and it is not yet possible to provide a detailed timescale / programme for delivery. There are three elements to this:

- Linking signals together across the city to improve traffic flow;
- Bus priority element; and
- Linked with bus timetable to allow busses to remain on schedule.

As part of the detailed assessment carried out for the City of Lancaster AQMA, it was identified that congestion is a major contributor to the high levels of NO₂ within the AQMA. This measure also has a long-term impact on the Lancaster City AQMA's air quality, which will aid on retaining the compliance.

5.7 Taxis

Following the declaration of Climate Emergency by Lancaster City Council, the Council's Private Hire and Hackney Carriage licensing policy states that all licenced taxis should be Euro 6 compliant or zero emission by 2025 and zero emission by 2030.

[Private Hire and Hackney Carriage licensing policy - Lancaster City Council](#)

A Defra AQ Grant (£454,576) was received in 2022. The Council is looking to run a 'try before you buy' scheme to encourage taxi drivers to use electric taxi vehicles and provide a discounted electric vehicle leasing scheme. To give the scheme longevity and impact within the Lancaster AQMA, the Council is looking to use monies derived from the capital purchase of electric vehicles to operate a discounted long term electric vehicle leasing scheme to taxi drivers. The project is expected to be delivered from 2025. Reducing vehicles emissions helps to obtain and maintain compliance with air quality objectives.

5.8 Electrification of Lancaster City Council Fleet

From 2021, the Council has plans to electrify the entire LCC fleet in order to meet the Council's ambitious plan to be carbon zero by 2030. 57 EV have already been acquired, which accounts of 31% of the total fleet (182). The remaining 125 vehicles are diesel and plans are in place to change 69 diesel vehicles to EV between 22/23 – 25/26.

In addition, Lancaster City Council has paired up with national car share scheme Co-Wheels to provide an electric vehicles car share club for Council staff and the public. Ten fully electric vehicles are available for staff (3 are ring fenced for LCC staff) as pool cars and for residents and businesses to use on a pay-as-you-go basis. Car clubs have been shown to reduce car dependence and increase walking, cycling and public transport use, which together contribute to a reduction in CO₂ emissions and improvements in local air quality.

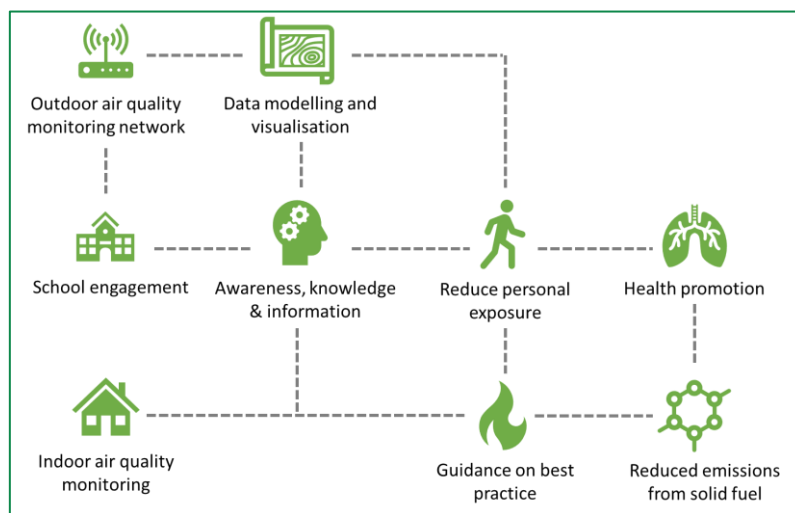
[Lancaster District Car Club | Co Wheels \(co-wheels.org.uk\)](#)

5.9 Public education and awareness

A public awareness project was funded with a Defra AQ Grant (£198,794) received in 2021. The aim of the project is to reduced particulate matter concentrations (improved air quality) across the locality by improving education, knowledge, and awareness of both outdoor and indoor air quality. Additionally, through the project, the public is provided with the knowledge and awareness to reduce their personal exposure to air pollution.

Outdoor concentrations of key pollutants (including, but not limited to, oxides of nitrogen, PM_{2.5} and PM₁₀) are measured throughout the locality. The monitored information is displayed in a publicly accessible user-friendly website increasing public awareness of local AQ including a model that uses source apportionment to gain insight into emissions coming from solid fuel burning in comparison to other sources. The project is currently in the delivery stage until Q3 of 2025. Educating and raising awareness are fundamental components of achieving sustainable results, and the project hopes to aid community engagement, behavioural change, informed decision-making and long-term commitment.

Figure 7 Graphical summary of the air quality education and awareness project.



5.10 Electric Vehicle Charging Infrastructure

Lancaster City Council is committed to facilitating the shift to less polluting vehicles through improved infrastructure for electric vehicles. A draft supplementary planning document for the Provision of Electric Vehicle Charging Infrastructure has been consulted on but has not yet been adopted.

[PC draft Provision of Electric Vehicle Charging Infrastructure Supplementary Planning Document \(SPD\) Consultation | KeepConnected](#)

Lancashire County Council has produced a strategy that aims provide clear direction and transparency to the deployment of electric vehicle infrastructure across Lancashire and Blackburn with Darwen. The strategy sets out recommendations and actions to deliver the following vision:

To deliver appropriate, accessible, and equitable EV charging provision across Lancashire and Blackburn with Darwen, in collaboration with commercial operators, to meet the expected growth in EV usage and demand from residents, businesses and visitors without access to off-street charging.

[Appendix 1 for Electric Vehicle Infrastructure Strategy.pdf](#)

Table 10 – Air Quality Action Plan Measures

Measure Number	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Date	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
1	Education – School Projects	Public Information	Other	2022	Ongoing	Lancaster City Council, schools	Defra, Lancaster City Council	Yes	Funded	< £10k	Active	<0.5µg/m³	Number of schools which have taken part in the project	7 schools	LCC staff time
2	EV Charging points on all new development	Policy Guidance and Development Control	Other policy	2024	2026	Lancaster City Council	Various, developer	No	Funded	< £10k	Ongoing	<0.5µg/m³	Improved EV charging infrastructure across district # of EV charging infrastructure % of EV within the borough	DM29 Policy adopted	Electric grid capacity issues
3	Behaviour Change measures/ incentives (supported by infrastructure changes)	Other	Other	Already introduced	Ongoing	Lancashire County Council, Lancaster City Council, Schools, external organisations (Global Action Plan, Sustrans)	Various	Yes	Funded	£10k - £50k	Active	<0.5µg/m³	Uptake of project by schools	School project piloted and ongoing, public education / awareness campaign ongoing	Staffing resource
4	Bus Idling and Idling enforcement	Traffic Management	Anti-idling enforcement	2025	2030	Lancashire County Council, Lancaster City Council, Stagecoach, other local bus service providers	Lancaster City Council	No	Not known	< £10k	Planning	<0.5µg/m³	Reports/complaints of idling decrease	Not started	LCC staff time
5	Taxi idling/enforcement	Traffic Management	Anti-idling enforcement	2025	2030	Lancaster City Council	Lancaster City Council	No	NA	< £10k	Planning	<0.5µg/m³	Reduction in taxi idling as reported by officers	Planning	Staff resource
6	Anti Idling Signage/Messaging	Traffic Management	Anti-idling enforcement	2024	2029	Lancaster City Council, Lancashire County Council, schools, local businesses	Lancaster City Council	No	Not yet allocated	< £10k	Planning	<0.5µg/m³	Increased awareness around idling, reduction in complaints relating to idling	Planning	Officer time

Measure Number	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Date	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
7	Charging infrastructure where no off-street parking (e.g. charging hubs)	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	Continual	Continual	Lancaster City Council, Lancashire County Council	Various including Lancaster City Council, DfT, Defra, LEVI	Some	Some funded	£100k - £500k	Ongoing	<0.5µg/m³	EV charging provision # of EV charging infrastructure % of EV within the borough	11 EVCs in LCC carparks, plus 3 rapid chargers. Lancaster Area Energy Plan. Project planning for charging hubs.	Grid capacity may lead to unequal distribution of charging provision
8	More charging infrastructure across the district (including off-street)	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	Continual	Continual	Lancaster City Council, Lancashire County Council	LEVI	Yes, plus others	Some funded	£100k - £500k	Active	<0.5µg/m³	Planning policy in relation to EV charging infrastructure implemented. Increase in EV charging infrastructure. # of EV charging infrastructure % of EV within the borough	Draft planning policy	Grid capacity may lead to unequal distribution of charging provision
9	Green walls and barriers near bus station	Other	Other	2025	2030	Lancaster City Council, Lancashire County Council	Various	No	NA	£10k - £50k	Planning	<0.5µg/m³	Installation of green walls and barriers in key locations (e.g. bus station)	Planning stage	Funding and placement, location feasibility
10	Cycling and walking to school initiatives	Promoting Travel Alternatives	Promotion of walking	Continual	Continual	Lancaster City Council, Lancashire County Council, schools	Various	No	Funded	£10k - £50k	Ongoing	<0.5µg/m³	Increased active travel to school	Schemes already ongoing but links could be made to join up the approach	Staff resource, school interest
11	Traffic Light technology to keep traffic moving/improve flow	Traffic Management	Strategic highway improvements, Re-prioritising Road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2024	2025	Lancashire County Council, Lancaster City Council	Bus Services Improvement Plan	No	Funded	Unknown	Design stage	2-3 µg/m³	Reduction of congested areas	High level desktop exercise, BSIP committed, next steps to carry out design work	Relies on BSIP Sponsors

Measure Number	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Date	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
12	More cycle parking	Promoting Travel Alternatives	Promotion of cycling	2025	2030	Lancaster City Council, County Council, Local Cycling and Walking Infrastructure Plan	Various	No	Not yet funded	£10k - £50k	Planning	<0.5µg/m³	Increased number of cycle parking facilities across the district Reduction in the AADT for cars	Planning	Funding
13	Provision of cycle hubs with storage and facilities	Promoting Travel Alternatives	Promotion of cycling	2025	2030	Lancaster City Council	Various avenues are being explored	No	Not yet funded	£10k - £50k	Planning	<0.5µg/m³	Increased provision of cycle hubs and storage across the district Reduction in the AADT for cars	Planning, policy, scoping	Funding
14	Electric taxis	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	2025	2030	Lancaster City Council	Defra AQ grant	Yes	Funded	£100k - £500k	Paused until Q3 2024	<0.5µg/m³	Uptake of electric taxis Percentage of electric taxis	Funding approved but staff resource low so paused until Sept 2024	Staff resource level across LCC, taxi driver appetite, EV charging infrastructure
15	Promoting /Incentivising Electric vehicles/lower emission cars	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2021	Continual	Lancaster City Council, Defra, Lancashire County Council, Co-Wheels	Various	Yes	Funded	£500k - £1m	Active	<0.5µg/m³	Increased EV use across district % EV	Busses - funding application, taxi project - funded and delivery due 2025, EV charging - continuously implemented	EV infrastructure, officer time
16	Increased Walking and Cycling in Lancaster city centre and across district	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2021	2032	Lancashire County Council, Lancaster City Council, Local Cycling Walking Infrastructure Plan	DfT, Active Travel England	No	Planning	>£10m	Development	<0.5µg/m³	Improved local cycling and walking infrastructure, tracked pedestrian, cycling and driving trends	LCWIP network planning finalised. Next stage to design and delivery once funding secured.	Funding
17	Electric low emission buses	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	2025	2029	County Council, City Council, Stagecoach, Department for Transport	DfT ZEBRA 2	No	Awaiting response from DfT	£1m - £10m	Awaiting funding application decision	1-2 µg/m³	Deployment of 31 and regular use of electric busses in Lancaster by Stagecoach	In application stage	If funding application is not successful

Measure Number	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Date	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
18	New schools associated with new housing development	Policy Guidance and Development Control	Other policy	Ongoing	Ongoing	Lancaster City Council, developers	Various including developer and education authority	No	NA	£1m - £10m	Policy	<0.5µg/m³	School provision associated with new development	Policy	
19	All Council Fleets (City and County) Electric Vehicles	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	2021	2030-2035	Lancaster City Council	Lancaster City Council	No	Funded	£1m - £10m	Active	<0.5µg/m³	%electrification of fleet	31% fleet EVs	Increasing capital and electricity prices
20	Extend Lune cycle path to Halton, Wray and Wennington	Promoting Travel Alternatives	Promotion of cycling	2023	Unknown at this stage	Sustrans, Local Cycling Walking Infrastructure Plan, Lancaster City Council	Various	No	Funded improvements to Caton, but extension in planning stage	£1m - £10m	Part-funded	<0.5µg/m³	Greenway extension to Wray, Hornby, Kirkby Lonsdale, Ingleton Reduction in the AADT for cars	Improvements to Caton and Bull Beck completed Jan 2024	Funding and route feasibility main barriers to extension of Greenway. Not delivered directly by the Council.

5.11 Timescales of the AQAP Measures

Ten of the measures set out in Table 10 have already commenced. For example, electrify the entire LCC fleet, has started in 2021 and currently 31% (57 vehicles) of the Council fleet is electric. The other ten measures set out in Table 10 are in planning stage, three are expected to commence in 2024 and seven are expected to commence in 2025. Some of these measures are in their infancy and, while there is every ambition to implement these to achieve reductions in pollutant concentrations within Lancaster City Council, they will require further investigation and planning before a realistic timescale can be set.

5.12 Air Quality Partners

Lancashire County Council is our primary collaborator for air quality initiatives, and we maintain effective collaborative working between the County Council and the City Council. This collaborative effort ensures a unified approach in addressing the air quality challenges.

5.13 Measures to Maintain Safe Air Quality

It is recognised that improving air quality is an ongoing challenge which must be weighed against business interest and political will. There are a number of measures within this AQAP which look to make behavioural changes by improving active travel and moving away from single occupancy vehicles. With these measures, the Council look to make sustainable, long-term changes in patterns of behaviour which will aid in reducing pollution in years and decades to come.

This Action Plan is set to cover the period 2024-2029. The Action Plan will be reviewed and updated as required commencing in 2029 and will be reviewed annual as part of the Annual Status Reporting regime.

6 Quantification of Measures

6.1 Assumptions and Quantification

Many of the measures set out in Table 10 are difficult to quantify. As a result, three measures have been quantitatively assessed to inform the likely effect in terms of change in traffic or fleet composition as a result of the measures. The proposed measures allow for a high-level analysis of reductions in emissions based on professional judgement and literature review of similar measures being undertaken by other local authorities. A summary consideration of the measures and expected change in concentrations is contained in Table 11 below.

Table 11 – Assumptions around Quantification of Measures

Measure Number	Measure	Assumptions for Quantification	Assumed Reduction in AQMA
1	Education – School Projects	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards positive behavioural changes. Reduction based on professional judgement	< 0.5µg/m ³
2	EV Charging points on all new development	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards active and sustainable travel. Reduction based on professional judgement	< 0.5µg/m ³
3	Behaviour Change measures/incentives (supported by infrastructure changes)	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards active and sustainable travel. Reduction based on professional judgement	< 0.5µg/m ³
4	Bus Idling and Idling enforcement	Not possible to quantify given the existing amount of idling is not known for comparison. Reduction based on conservative professional judgement.	< 0.5µg/m ³
5	Taxi idling/enforcement	Not possible to quantify given the existing amount of idling is not known for comparison.	< 0.5µg/m ³

Measure Number	Measure	Assumptions for Quantification	Assumed Reduction in AQMA
		Reduction based on conservative professional judgement.	
6	Anti Idling Signage/Messaging	Not possible to quantify given the existing amount of idling is not known for comparison. Reduction based on conservative professional judgement.	< 0.5µg/m ³
7	Charging infrastructure where no off-street parking	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards active and sustainable travel. Reduction based on professional judgement	< 0.5µg/m ³
8	More charging infrastructure	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards active and sustainable travel. Reduction based on professional judgement	< 0.5µg/m ³
9	Green walls and barriers near bus station	See Section 6.1.2.	< 0.5µg/m ³
10	Cycling and walking to school initiatives	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards active and sustainable travel. Reduction based on professional judgement	< 0.5µg/m ³
11	Traffic Light technology to keep traffic moving/improve flow	See section 6.1.3	2-3 µg/m ³
12	More cycle parking	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards active and sustainable travel. Reduction based on professional judgement	< 0.5µg/m ³
13	Provision of cycle hubs with storage and facilities	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards positive behavioural changes. Reduction based on professional judgement	< 0.5µg/m ³
14	Electric taxis	Insufficient detail to quantify this measure. Reduction based on professional judgement	< 0.5µg/m ³
15	Promoting/Incentivising Electric vehicles/lower emission cars	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards positive behavioural	< 0.5µg/m ³

Measure Number	Measure	Assumptions for Quantification	Assumed Reduction in AQMA
		changes. Reduction based on professional judgement	
16	Increased Walking and Cycling in Lancaster city centre and Carnforth	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards active and sustainable travel. Reduction based on professional judgement	< 0.5µg/m ³
17	Electric / low emission buses	See Section 6.1.1	1-2 µg/m ³
18	New schools associated with new housing development	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards active and sustainable travel. Reduction based on professional judgement	< 0.5µg/m ³
19	All Council Fleets (City and County) Electric Vehicles	See section 6.1.4	< 0.5µg/m ³
20	Extend Lune cycle path to Halton Wray and Wennington	Effectiveness of measure in isolation is likely to be minimal, but it will help to push the drive towards positive behavioural changes. Reduction based on professional judgement	< 0.5µg/m ³

6.1.1 Electric / low emission buses

Lancaster City Council aims to obtain 31 electric busses. Stagecoach have identified services 1/1A and 2X and 100 as high priority routes for introducing electric buses It has been identified that buses are a key contributor to local pollutant concentrations within the AQMA.

A detailed modelling assessment has been carried out to assess the introduction of 31 electric buses which would replace 31 of the current buses at Lancaster for the services 1/1A and 2X and 100. For the detailed assessment, the dispersion modelling in the technical report was updated to account for the replacement of current buses with electrical ones for the aforementioned services. It was considered that for the services 1/1A and 2X and 100, each service has on average 51 daily trips. Services run from 07:00 until 00:00 with a frequency of three (3) buses per hour. Considering the introduction of 31 electric buses, these will replace the whole fleet for the aforementioned routes. Accordingly, 102 AADT for buses were replaced on the

services routes to account for electric buses. New emissions were calculated using the EFT v11 for consistency with the modelled exercise. New concentrations were modelled using ADMS Roads for a 2022 scenario considering the introduction of the 31 electric buses as described above.

The results at the modelled receptors were compared with the 2022 base scenario and are presented in Table 12. The average reduction of NO₂ at receptors is 0.39µg/m³. The maximum change in concentrations observed was 1.6µg/m³ at receptor R31.

Table 12 Comparison of modelled concentrations at receptors

Receptor name	2022 Modelled NO ₂ Annual Mean Concentration (µg/m ³)	2022 Modelled NO ₂ Annual Mean Concentration inclusive of electric buses incorporation (µg/m ³)	Reduction
R1	42.5	41.8	0.7
R2	39.6	39.0	0.6
R3	26.9	26.6	0.3
R4	27.6	27.3	0.3
R5	23.3	23.0	0.3
R6	28.3	27.9	0.4
R7	24.2	23.8	0.4
R8	22.9	22.6	0.3
R9	22.6	22.4	0.2
R10	35.7	35.2	0.5
R11	35.3	34.8	0.5
R12	22.4	22.1	0.2
R13	25.8	25.5	0.4
R14	24.5	24.2	0.3
R15	24.3	24.0	0.3
R16	22.0	21.7	0.3
R17	19.7	19.4	0.3
R18	20.0	19.9	0.0
R19	18.0	17.9	0.0
R20	19.7	19.7	0.0
R21	18.5	18.5	0.0
R22	20.1	20.0	0.1
R23	19.9	19.7	0.3
R24	20.7	20.4	0.3
R25	22.3	22.1	0.3
R26	27.8	27.4	0.3
R27	25.1	24.9	0.2

Receptor name	2022 Modelled NO ₂ Annual Mean Concentration (µg/m ³)	2022 Modelled NO ₂ Annual Mean Concentration inclusive of electric buses incorporation (µg/m ³)	Reduction
R28	24.0	23.8	0.2
R29	27.9	27.6	0.3
R30	26.7	26.6	0.1
R31	39.1	37.5	1.6
R32	37.0	36.3	0.7
R33	50.6	49.3	1.4
R34	40.1	39.5	0.6
R35	38.3	37.8	0.5
R36	33.4	32.8	0.5
R37	44.1	43.3	0.8
Max			1.6

6.1.2 Impacts of Vegetation on Urban Air Pollution

In 2018, the Air Quality Expert Group published a report about impacts of vegetation on Urban Air Pollution. Defra have published a frequently asked question regarding vegetation and Urban air pollution based on this report²⁴. It states the following:

For nitrogen dioxide (NO₂), vegetation is, generally speaking, of little benefit; it is not a very efficient sink. The deposition occurs in daytime, and primarily in the warmer months, when NO₂ is less of a problem. Vegetation is a very poor sink for nitric oxide (NO) and soil is a source of NO, at least partially offsetting any potential benefit of uptake by vegetation.

Locally (tens to hundreds of square metres) tree planting may enhance or reduce dispersion; this redistributes pollution but does not remove it. Where vegetation acts as a barrier close to a source, concentrations immediately behind the barrier owing to that source are reduced typically by a factor of about 2 relative to those which would

²⁴ Defra. FAQ 105 – Vegetation and Urban Air Pollution. Available at:

<https://laqm.defra.gov.uk/faqs/faq105/#:-:text=Vegetation%20can%20increase%20surface%20areas,on%20field%20measurements%20and%20modelling.>

occur without the barrier, whereas on the source side of the barrier concentrations are increased.

Tree planting may also exacerbate the build-up of pollution within street canyons by reducing air flow. The use of trees to improve air quality is not without negative impacts as some tree species are important sources of biogenic volatile organic compounds (BVOCs), notably isoprene. BVOCs can enhance the formation of pollutants including PM and ozone. However, BVOC emissions could be avoided by selecting low emitting species. Similarly, the choice of plant species which are known sources of aeroallergens should be avoided.

The impact of trees on air flow and turbulence can influence the dispersal of pollutants across any area. The planting of trees locally (at a scale of 10 – 100m² area) will influence dispersal characteristics which can lead to redistribution of pollution but does not remove it. Completed studies show that where vegetation acts as a barrier close to a pollution source, e.g. a road link, concentrations immediately downwind of the planted area can be reduced typically by a factor of two, relative to the concentration if the vegetation were not in place. Conversely, however, concentrations can increase on the source side of the vegetation area. The extent to which the vegetation area influences dispersal is dependent on the planting design and specific species being used, with taller trees and shrubs being more effective than ground cover plantings.

Overall, vegetation can contribute to a reduction in air pollution within urban areas, in particular through their ability to influence the dispersal of pollutants across an area. However, they can only be a supporting solution to the air quality problems experienced on a city-wide scale in terms of displacement and redistribution rather than removal of pollutants. Nonetheless, vegetation and green infrastructure in urban areas offers several other benefits, including improvements to biodiversity and wellbeing via improved mental health and recreational areas.

6.1.3 Traffic Light technology to keep traffic moving/improve flow

Improving the traffic light technology to keep traffic moving is expected to have a 4% reduction in road emissions using latest Emissions Factors Toolkit on the assumption that congested roads along this link which had been modelled as queueing traffic (5kph) would speed up to a normal slow down speed approach at a junction (20kph).

This it is expected to have up to a 55% reduction in road emissions at congested intersections where the highest concentrations of NO₂ are observed.

6.1.4 Electric vehicles fleet

The aim of the measure is to replace the whole council fleet for electric vehicles. 125 diesel vehicles will be changed for electric ones. The latest version of the EFT was used to assess the impact of changing 125 diesel vehicles for electric ones within the Lancaster AQMA. Switching 125 diesel cars to electric ones will reduce the emissions 187kg/yr maximum per street within the AQMA.

6.2 Cost Benefit Analysis of Measures

6.2.1 Methodology

Using the above assumptions around the quantitative pollution reduction and assumed costs, each measure was given a score as set out below, which are in line with the latest LAQM TM(22) supplementary guidance to determine the impact of air quality improvement measures²⁵.

Table 13 - Cost Score

Estimated Cost of Measure	Score
< £10k	7
£10k - £50k	6
£50k - £100k	5
£100k - £500k	4
£500k - £1m	3
£1m - £10m	2
> £10m	1

Table 14 - Benefit Score

Estimated Reduction in Pollutant Concentrations	Score
>0.5µg/m ³	1
0.5-1 µg/m ³	2
1-2 µg/m ³	3
2-3 µg/m ³	4
3-4 µg/m ³	5

²⁵ LAQM.TG(22) Supplementary Guidance England excl. London. Determining the impact of air quality improvement measures. Defra (2024)

Estimated Reduction in Pollutant Concentrations	Score
4-5 µg/m ³	6
>5 µg/m ³	7

Using the scores above, the below matrix was implemented to work out the cost-benefit. Higher scores are awarded for those measures which are cheapest with the greatest effect, with the lowest scores awarded for those which will be costly with limited reduction in pollution.

Table 15 - Cost Benefit Scoring Matrix

		Estimated Reduction in Pollutant Concentrations						
		>0.5µg/m ³	0.5-1 µg/m ³	1-2 µg/m ³	1-2 µg/m ³	2-3 µg/m ³	3-4 µg/m ³	>4 µg/m ³
Cost of Measure	< £10k	6	8	10	12	14	16	18
	£10k - £50k	5	6	8	10	12	14	16
	£50k - £100k	4	5	6	8	10	12	14
	£100k - £500k	3	4	5	6	8	10	12
	£500k - £1m	2	3	4	5	6	8	10
	£1m - £10m	1	2	3	4	5	6	8
	> £10m	0	1	2	3	4	5	6

The analysis also accounts for the feasibility of implementing the measures, with those likely to progress given a higher priority than those which are acknowledged to be a challenge to implement. The feasibility score factors in local influences such as political backing, accessibility to funding options and resources available. As such, each measure was assigned a 'Feasibility score based on the table below. The score from the matrix was multiplied by this score.

Table 16 - Feasibility Scores

Feasibility Score	Score
Measure has already been started and just requires progressing	7
Very easy to implement, and political good will towards this, sufficient resources	6
Easy to implement, general political goodwill and available resources	5
Possible to implement but may require some learning/campaigning, moderately time intensive	4
Possible to implement but not straightforward and will require some learning/campaigning, moderately time intensive	3
Challenging to implement, would require some campaigning, time intensive	2
Very Difficult to implement, no political appetite, time and resource intensive	1

6.2.2 Cost-Benefit Analysis

Following the above assessment, it has been possible to rank the measures by cost, benefit and feasibility, this is shown in Table 17. With the feasibility weighting meaning Lancaster City Council Air Quality Action Plan – 2024-2029

that measures which are the easiest to progress are scored higher, these are prioritised.

Following a cost-benefit analysis, two of the measures analysed obtained the highest overall score (42) followed by two measures which obtained similar overall score. The measures that scored the highest are educate and inspire children/ listen to children and reduce/banning petrol and particularly diesel vehicle use for taxis (particularly in city centre). Both measures have low cost and are indirect interventions that focus on individual / group behavioural change and do not involve direct impact on infrastructure. These measures aid behavioural shifts within the wider population and businesses to promote more sustainable and less polluting methods of transport. They are easy to implement at a low cost. Their aim is to promote better practices and behaviours across wider areas specially reducing the use of private cars. The measure that follows is the one that aims to include EV charging points on all new developments, the measure has a broad impact on the air quality within the AQMA and the whole Council increasing the uptake of cleaner technologies.

The measure that scored the lowest was the measure which aims to transform all the Council Fleets into Electric Vehicles. This is the case as it is an expensive measure with low direct air quality effect. Despite this, is important to consider the indirect effect of the measure in the entire population.

Table 17 – Cost Benefit Analysis of Measures

Prioritised Measure	Measure	Cost Score	Air Quality Effect Score	Feasibility Score	Overall Score
1	Education – School Projects	7	1	7	42
2	EV Charging points on all new development	7	1	6	36
3	Behaviour Change measures/incentives (supported by infrastructure changes)	6	1	7	35
4	Bus Idling and Idling enforcement	7	1	5	30
5	Taxi idling/enforcement	7	1	5	30
6	Anti Idling Signage/Messaging	7	1	5	30
7	Charging infrastructure where no off-street parking	4	1	7	21

Prioritised Measure	Measure	Cost Score	Air Quality Effect Score	Feasibility Score	Overall Score
8	More charging infrastructure	4	1	7	21
9	Green walls and barriers near bus station	6	1	4	20
10	Cycling and walking to school initiatives	6	1	4	20
11	Traffic Light technology to keep traffic moving/improve flow	2	4	5	20
12	More cycle parking	6	1	4	20
13	Provision of cycle hubs with storage and facilities	6	1	4	20
14	Electric taxis	4	1	4	12
15	Promoting/Incentivising Electric vehicles/lower emission cars	3	1	6	12
16	Increased Walking and Cycling in Lancaster city centre and Carnforth	2	1	7	7
17	Electric/low emission buses	2	3	3	9
18	New schools associated with new housing development	2	1	7	7
19	All Council Fleets (City and County) Electric Vehicles	2	1	6	6
20	Extend Lune cycle path to Halton, Wray and Wennington	2	1	3	3

6.3 Year of Objective Compliance

The Detailed modelling report has used the assessment methodology within LAQM.TG(22) to provide the following estimated year of compliance, with only national measures being considered will be 2027.

Lancaster City Council aims that the implementation of the outlined measures will result in the relevant objective(s) being attained by 2026 and AQMA revocation by 2029, following three years of continuous compliance,

The implementation of the AQAP is anticipated to enhance and sustain the air quality within the AQMA. Various measures, including improved traffic light technology to keep vehicles moving and reduce congestion and increasing the percentage of electric vehicles within the borough, will be instrumental in swiftly achieving the goal by Lancaster City Council Air Quality Action Plan – 2024-2029

reducing emissions. The plan also encompasses additional measures, which, while indirectly impactful, are designed to encourage a cultural shift towards sustainable transport and low emission vehicles uptake, to ensure the objective is upheld and compliance is maintained.

The Council will ensure regular reviews of the implementation of the measures are being made as these ones are vital for an effective plan tracking. These assessments serve to evaluate performance by checking the key performance indicators detailed in Table 10, ensuring that the planned actions align with objectives and produce the desired outcomes. Additionally, they facilitate adaptability by allowing the identification and correction of deviations from the plan, ensuring responsiveness to dynamic business environments. The aim is to identify challenges early on and proactively address obstacles to successful implementation.

It is expected that the AQMA will be revoked in 2029, and a new AQAP will not be required. If this is not the case, the AQAP will undergo comprehensive evaluations at regular intervals, specifically every five years. These periodic reviews will serve as pivotal moments for assessing the effectiveness of implemented measures, identifying any challenges or deviations from the outlined trajectory, and adjusting strategies accordingly. This iterative approach ensures the adaptability and responsiveness of the plan, aligning it with evolving circumstances and maximizing the potential for sustained success in air quality improvement.

Appendix A: Response to Consultation

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

Consultee	Comment	Comment Response
Members of the Public	Measures set out in the Table in Appendix B were provided during a consultation process in 2019.	Responses are provided within Table B.1
Defra	LCC have discussed the Carnforth and Galgate AQMA as compliant for over five years and have completed the revocation process. A complete summary of monitoring data within all LCCs AQMAs is not provided, however if three consecutive years of annual mean NO ₂ concentrations being lower than 36 µg/m ³ (i.e., within 10% of the annual mean NO ₂ objective) can be evidenced for both AQMAs their revocation is supported. LCCs decision to retain the Lancaster City AQMA until it meets the same threshold is supported.	No response required
Defra	There is a minor discrepancy in reporting of monitoring data. The text on page 4 states exceedances have been reported at LC1, LC10, LC13, J, LC19 and LC32, however this does not align with the results in Table 1. This should be checked and clarified.	This has been amended on Page 4.
Defra	As per section 2.22 of LAQM.TG(22), the AQAP has included the population within the AQMA area. This is welcomed and can be considered an example of good practice. The indices of multiple deprivation have	No response required

Consultee	Comment	Comment Response
	<p>been reported, as well as median age, highlighting the intersectional factors which can impact public health impacts from air quality.</p>	
Defra	<p>Detailed modelling has been undertaken of 2022 concentrations within the AQMA, with a technical report attached as an Appendix. This largely appears to have been conducted to an appropriate methodology.</p>	No response required
Defra	<p>A source apportionment exercise has been undertaken, with details provided in the Appendix. The study identifies road traffic is the predominant source of emissions, of which diesel cars are the largest contributors to road NO_x averaged across all modelled receptors. Source apportionment has also been considered at the receptor with the maximum road NO_x concentration, which shows buses as the predominant contributor here. These findings are largely taken forward into the development of measures, with most measures targeting road transport, and a couple which focus on emissions from buses.</p>	No response required
Defra	<p>It is acknowledged that consultation and stakeholder engagement has not yet been completed. Responses should be provided in Appendix A of the final version. The table summarising responses should include specific responses to the feedback received, which signpost within the</p>	Consultation and response now included in Appendix A

Consultee	Comment	Comment Response
	document where the consultation comments have been enacted, or otherwise, with supporting justification.	
Defra	Details on the steering group which will oversee the development and implementation of the AQAP has been outlined. It would be helpful to discuss details of the frequency of meetings, and how the steering group would push forward the implementation of measures within the action plan.	
Defra	The action plan includes some quantification of measures where feasible, namely for electric / low emission buses, traffic light technology and electric vehicles for LLC fleet. However limited information is provided on the methodology used to determine the estimated reduction in concentrations for these measures. Text in the report indicates modelling was conducted but it does not seem to be related to the dispersion modelling in the technical appendix.	Additional detail on the quantification methodology has been included in Section 6.1.1. This confirms that the dispersion model has been used to quantify the change in concentrations as a result of this measure.
Defra	A cost benefit analysis has been undertaken, considering the cost, estimated reduction and feasibility of the measure. The methodology of this should be checked; Table 13 indicates a higher cost would lead to a higher score, but this is not aligned with the matrix in Table 15.	This has been amended in Table 13.

Consultee	Comment	Comment Response
Defra	LCC could reevaluate their cost benefit analysis to give a greater weighting to air quality impact. The highest ranked measures are likely to bring about minimal direct air quality benefits.	The methodology used aligns with the latest guidance document 'Determining the impact of air quality improvement measures'
Defra	The implementation of measures is predicted to bring forward compliance by one year to 2026. LCC have stated they anticipate revocation of their final AQMA in 2029. However, it should be noted that diffusion tube sites should achieve three consecutive years of annual mean NO ₂ concentrations being lower than 36 µg/m ³ (i.e., within 10% of the annual mean NO ₂ objective) before revocation can be considered, due to the uncertainty and limitations of diffusion tube monitoring data.	This is acknowledged.
Defra	The Council could consider additional measures to bring about compliance more rapidly, particularly measures which target buses specifically.	This is acknowledged.
Defra	Measures not pursued are detailed in Appendix B, with the reason outlined. This is welcomed.	This is acknowledged.
Lancashire County Council	The County Council provided a list of amendments and suggestions including more information around measures relating to EV charging infrastructure and active travel.	The suggestions were taken onboard and the AQAP was amended accordingly.

Consultee	Comment	Comment Response
Resident via public consultation	<p>Summary of feedback:</p> <p>The actions of the AQAP do not seek to directly limit the volume of vehicles in the AQMA.</p> <p>The actions do not provide an alternative to the car-centric system.</p> <p>There is an absence of alternative highway infrastructure.</p>	<p>This is acknowledged.</p> <p>Actions to address the movement of vehicles in Lancaster is planned to be addressed in the Lancaster Transport Masterplan following Lancaster's Local Plan Review.</p>
Public consultation responses	<p>Responses can be found in Appendix D.</p>	<p>Local public concern around air pollution is acknowledged and it is hoped that residents will view this AQAP as Lancaster City Council's commitment to improving air quality across the district and in the City Centre in particular.</p>

Appendix B: 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)
Buses	No Idling Zones	Difficult to quantify effect of emissions from idling vehicles. Already prohibited anti-idling zones with enforcement
Vehicle Transport - General	Improved public transport links and smart ticketing	This measure is captured through proposed improvements in rail and bus travel.
Cycling and Walking	Remove roadside vehicle parking along one side of A6 (South Lancaster)	the parking strategy is being reviewed as part of the action plan
Parking - Cars and Bikes	Hire ebikes/bikes at Park and Rides	Not achievable
Cycling and Walking	Put hard surface on Glasson trail cycle route	outside City of Lancaster AQMA.
Other	Aerial Tramway Mass Transit System J33 - Eden Project	Not achievable
Other	New Bridge from New Quay Road to link to Baygateway	outside City of Lancaster AQMA.
Other	Linking AQ Station data feed to control traffic signalling	Not achievable
Trains	More frequent trains between Lancaster and Morecambe	While this measure would likely to reduce private vehicle use and therefore reduce pollutant concentrations, it is difficult to quantify to what extent
Electric Cars/Vans	Electric car/emobility plan for Lancaster	Not achievable
Cycling and Walking	Improve and widen where possible canal towpath cycle route	outside City of Lancaster AQMA.
Buses	Free bus service from Park and Ride	As the majority of bus services are not managed by the Local Authorities, this measure has not pursued
Buses	Subsidise better bus services	As the majority of bus services are not managed by the Local Authorities, this measure has not pursued
Buses	More Bus Services (no bus to Halton on Sunday)	As the majority of bus services are not managed by the Local Authorities, this measure has not pursued
Buses	Buses to have same emission limits as cars	This measure is not possible to achieve with current technology
Buses	Fit devices to reduce emissions	Between this measure and increasing electric buses, uptake of electric buses has been chosen

Action category	Action description	Reason action is not being pursued (including Stakeholder views)
Buses	Dark smoke from buses - better maintenance and testing	This specific issue is controlled through DVSA
Buses	Use Congestion charge to fund better buses	There is no proposed congestion charge as part of the plan
Buses	Bus Lane around Lancaster City Centre	Assume this has not been brought forward as a result of being costly without the political will to implement
Buses	Air Filtration buses (Southampton)	Technology is still in trial stage, it is unclear at this stage how effective this would be. It should also be noted that the focus of the mitigation is to reduce PM concentrations and the focus of this AQAP is on reducing NO ₂ concentrations for which the Lancaster AQMA has been declared.
Buses	Reduce number of buses	This would likely have a negative impact on pollutant concentrations if not accompanied by other measures like increasing other public transport connections
Buses	Lower fares/current monopoly	See measure 1
Buses	Remove bus lane on Greyhound Bridge (causing other traffic congestion in Lancaster) and other bus lanes	This is likely to cause an increase in pollutant concentrations if public transport were to be a less efficient option than travelling by private vehicle. Should investigate further. Investigate can cost <10k.
Buses	Insufficient bus capacity for students	This is more of a comment than a proposed measure
Buses	Free bus passes	No budget available
Buses	Rapid Public Transit corridor from Galgate to Heysham and to connect J34 (tram or bus)	Outside City of Lancaster AQMA
Buses	Residential Minibus transport circular feeder services to rapid transit service	Measure is too vague to quantify
Trains	Direct Train service from Carnforth to Kendal	While this measure would be likely to reduce private vehicle use and therefore reduce pollutant concentrations, it is difficult to quantify to what extent. Not pursued at this time
Trains	Improve West Cumbrian Rail service (more reliable)	While this measure would be likely to reduce private vehicle use and therefore reduce pollutant concentrations, it is difficult to quantify to what extent
Taxis	Ban most polluting vehicles	To an extent, this measure is being implemented through taxi licensing. Difficult to quantify as 'most polluting vehicles' not defined.

Action category	Action description	Reason action is not being pursued (including Stakeholder views)
Electric Cars/Vans	Free parking for Electric Vehicles	While this may result in increased uptake of less polluting vehicles this has not been pursued due to loss of funding associated with parking charges
Vehicle Transport - General	20mph speed limit in built up areas	Already implemented in most residential areas, so not intended to be implemented further
Vehicle Transport - General	10mph speed limit around city centre	Not deemed to be significantly beneficial given the expected public resistance
Vehicle Transport - General	Speed limit in Galgate and Carnforth to deter A6 use (motorway instead)	Galgate and Carnforth AQMAs to be revoked so measure not pursued
Vehicle Transport - General	Technology enforced/policed speed limits	Measure is already enforced so not pursued further
Vehicle Transport - General	Strategy to Reduce vehicle numbers particularly in congested areas	This is an aim for the Action Plan, but the wording of this proposed measure is not possible to quantify and is considered through other measures
Vehicle Transport - General	Deterrents to driving to work	This is an aim for the Action Plan, but the wording of this proposed measure is not possible to quantify and is considered through other measures
Vehicle Transport - General	Emissions based Congestion Charge/Low emission Zone	Measure already being considered as part of the movement strategy.
Vehicle Transport - General	Remove /reconfigure/reduce queuing in the Lancaster gyratory	Measure already being considered as part of the movement strategy.
Vehicle Transport - General	Reconfigure roads around crossroads and train station - form one way system on Market Street, Carnforth	Beyond extent of Lancaster AQMA.
Vehicle Transport - General	Banning through traffic through Lancaster city centre and Carnforth (including heavy lorries)	Already a condition in place as part of post Bay Gateway to assess HGV movements. Pedestrianising Lancaster City Centre not considered viable at this time.
Vehicle Transport - General	New Link Road to Scotland Road Carnforth and road link across Lundsfield Quarry	Measure has been investigated but is not possible due to topography and funding restraints.
Vehicle Transport - General	City Centre Bypass Road	Measure already being considered as part of the movement strategy.
Vehicle Transport - General	Galgate Bypass Road	Measure already being considered as part of the transport masterplan.
Vehicle Transport - General	No new roads	Not a realistic measure should development identify the

Action category	Action description	Reason action is not being pursued (including Stakeholder views)
		requirement for new roads
Vehicle Transport - General	Reduce/banning petrol and particularly diesel vehicle use (particularly in city centre)	This is equivalent to a Clean Air Zone which is not being pursued at this time
Vehicle Transport - General	Incentives from major employers to discourage vehicle use	Measure already being promoted by Lancaster City Council
Vehicle Transport - General	More pedestrian /vehicle shared spaces	Measure already being considered as part of the movement strategy.
Vehicle Transport - General	Council tax relief for those without cars	Measure not being pursued further as cuts to Council tax revenue is likely to impact upon service delivery.
Vehicle Transport - General	More council tax for those with more than 1 car	Measure not being pursued further as rules governing Council tax do not permit such changes.
Vehicle Transport - General	Redirecting Traffic (away from Moor hospital area/Derwent Road/Ullswater Road)	Measure already being considered as part of the movement strategy.
Vehicle Transport - General	Non selective, non- denominational, good schools (reduce need to travel to any school)	Measure is beyond the scope of an air quality action plan to influence.
Vehicle Transport - General	Redirect traffic away from Morecambe Sea front (tram system?)	Measure not being pursued further as there is no exceedance of relevant air quality objective along Morecombe Sea front and this is outside the extent of the City of Lancaster AQMA.
Vehicle Transport - General	Support Car Share Schemes	Measure not being pursued further as schemes already in place (i.e. the car sharing 'Shared Wheels').
Vehicle Transport - General	Working with HGV operators	The council will continue to work with and support local businesses generally to promote good air quality.
Vehicle Transport - General	Study on how to influence individual journey decision making	Not considered further, though this may be captured through Transport Plans
Vehicle Transport - General	Bollards to prevent rat running	Measure already being considered as part of the movement strategy.
Parking - Cars and Bikes	Free parking at park and ride / Free parking for EVs / Differential parking charges for lower emission vehicles / Better/more accessible/cheaper parking to prevent trips looking for parking /	Parking on site at the Caton Road Park and Ride is currently free with fees for the bus transfer into the City. Measure not pursued further.
Parking - Cars and Bikes	Park and Cycle sites	It is possible to drive in with a cycle to existing car park sites. Measure not pursued further

Action category	Action description	Reason action is not being pursued (including Stakeholder views)
Parking - Cars and Bikes	Park and Walk sites	Most Car Parks are park and walk sites. Measure not pursued further
Cycling and Walking	More encouragement to cycle and walk	Measure not being pursued further as the Council already promote cycling/walking through various schemes.
Cycling and Walking	Bike lifts on steeper hills	Measure not being pursued as more practical alternatives (e.g. promotion of ebikes).
Cycling and Walking	Implement County Council vision for walking and cycling	Details within Movement Strategy
Cycling and Walking	Fully integrated and supported cycling network	Details within Movement Strategy
Cycling and Walking	Allocate 15% of County Council transport budget to cycling infrastructure	Beyond scope of Air Quality Action Plan to determine this portion of council budget.
Cycling and Walking	Use Congestion charge to fund better active travel options	Measure already being considered as part of the movement strategy.
Cycling and Walking	Clampdown on motorists parking on cycle lanes/pedestrian areas	Motorists are not currently permitted to park on cycle lanes
Cycling and Walking	Stop closure of Lune Millenium Path and improve route to make more useable	Measure not being pursued as closure only in place temporarily for flood defence works.
Cycling and Walking	Adopt Bike Bus Scheme/Pedal Me	Not achievable
Cycling and Walking	Cycle to work scheme	Measure already promoted by Council to its employees.
Cycling and Walking	Cycling proficiency courses for adults	Several national and local schemes already in place.
Bonfire/Wood/Solid Burning	Nuisance from Bonfires in SCAs / Garden bonfires / Clamp down on illegal burning	Not specific for the city of Lancaster AQMA. Aims to reduce PM while the AQMA is declared for NO ₂ exceedances
Bonfire/Wood/Solid Burning	Better tip access/better and cheaper waste collection services	Not specific for the city of Lancaster AQMA. Aims to reduce PM while the AQMA is declared for NO ₂ exceedances
Bonfire/Wood/Solid Burning	Domestic wood /solid fuel burning (also indoor air quality)	Not specific for the city of Lancaster AQMA. Aims to reduce PM while the AQMA is declared for NO ₂ exceedances
AQ Monitoring	PM2.5 monitoring	Not specific for the city of Lancaster AQMA. Aims to reduce PM while the AQMA is declared for NO ₂ exceedances
AQ Monitoring	AQ monitoring around schools	Measure not being pursued further due to funding constrains / main focus would be on awareness raising.
AQ Monitoring	More AQ monitoring	Measure not being pursued further as has already been considered (subject to funding).

Action category	Action description	Reason action is not being pursued (including Stakeholder views)
AQ Monitoring	Air Quality Improvement Targets	Measure not being pursued further as the Council already has established targets and are looking at new indicators (i.e. tracking of EV numbers etc).
AQ Monitoring	Real time digital displays (AQ info)	Measure is already being considered by Lancaster City Council.
Development Control	Stop building new houses/student accommodation/refuse planning applications	Measure not being pursued further as there is an increasing demand for new houses.
Development Control	Stop building student accommodation in city centre (need to travel to University)	Measure not being pursued as doing so would increase the number of vehicle trips into the city centre (counter productive measure).
Development Control	Limit major building works/duration of building works	Not specific for the city of Lancaster AQMA. Aims to reduce PM while the AQMA is declared for NO ₂ exceedances
Development Control	All new development to have solar roof tiles	Measure already being considered as part of the Local Plan (Policy DM53 / DM37).
Development Control	Don't build car dependant new development	There are a number of policies in place to encourage sustainable transport modes over private vehicular use
Development Control	Move dirtier industries out of towns - animal market and Lune Industrial estate to remove HGV trips through Lancaster City Centre	Measure already being considered as part of the Strategic Policies and Land Allocations (EC3) and the Development Management DPD (DM31).
Development Control	Move Border Aggregates - remove HGV trips/dust Carnforth	HGV traffic already considered under DOS7 / outside City of Lancaster AQMA.
Development Control	Stop B&Q site closing - Build new Aldi on Quay - additional trips to White Lund	Outside City of Lancaster AQMA
Development Control	Work with Eden project to deliver solutions	Production of plan raised at scoping stage of EIA for Eden planning application
Development Control	Business park for creative industries to lead change	Health Innovation Campus at Lancaster University is already under construction.
Development Control	Neighbourhood Plans	Measure already being considered as part of the District-wide Local Plan (DM31).
Development Control	Insulate new houses	Assistance for those on low income already in place to assist with this measure.
Other	Trams (low pollution transport) – University to Lancaster centre	Tram system not currently being considered due to the

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Action category	Action description	Reason action is not being pursued (including Stakeholder views)
	and at Morecambe	significant undertaking.
Other	Railway station at University (trains through to Heysham)	Not considered feasible
Other	Transit system from Eden project to Lancaster	The 1a Bus already goes from the Eden Project to Lancaster City Centre
Other	Slogan to make people more aware of their AQ impacts	Action is already being considered by Lancaster City Council / measure is not AQMA specific (more raises the general profile of air quality).
Other	Carbon emissions-based Council Tax	Not specific for City of Lancaster AQMA. Aims to reduce GHG emissions while the AQMA is declared for NO ₂ exceedances.
Other	Reduce fossil fuel use	Not specific for City of Lancaster AQMA. Aims to reduce GHG emissions while the AQMA is declared for NO ₂ exceedances.
Other	Pioneering Carbon Engineering fuel	Not specific for City of Lancaster AQMA. Aims to reduce GHG emissions while the AQMA is declared for NO ₂ exceedances.
Other	Grow home/local green (food) to reduce transport emissions	Not specific for City of Lancaster AQMA unless the proposal includes growing food within the AQMA or 1 mile away.
Other	Hydro power from Morecambe Bay	Outside City of Lancaster AQMA
Other	Allow Lancaster University to lead /spearhead approach	AQAP is required to be developed by Local Authorities, with Relevant Partner Organisations
Other	Wider region(s) greener	Not a specific measure
Other	Increase nuclear power	Not specific for City of Lancaster AQMA.
Other	AQ not an issue - stop wasting money	Not an air quality measure.
Other	Don't fell trees	Measure already being considered as part of the Development Management DPD (DM45) / not specific to City of Lancaster AQMA.
Other	Ban smoking in city centre	Not within the remit of an Air Quality Action Plan
Other	Ban burger van as smell is foul	Odour beyond extent of AQAP requirements.
Other	Ban cats and dogs (odour from faeces)	Odour beyond extent of AQAP requirements.
Other	Sustainable Drainage System initiatives	Sustainable Drainage beyond extent of AQAP requirements

Action category	Action description	Reason action is not being pursued (including Stakeholder views)
Other	BT kiosks in city centre (green activities)	Not an air quality measure.
Other	Tunnel from University, Lancaster, to Morecambe	Measure not being pursued further due to funding constrains.
Other	Down Grade A6 corridor	Measure already being considered as part of the movement strategy / transport masterplan initiatives.
Other	Park opposite railway station at Carnforth	Outside City of Lancaster AQMA
Other	Passenger Hover craft travel around Morecambe Bay	Not an air quality measure.
Other	No taxes on people entering city centre - wider plan to reduce	Congestion charge to be considered as part of movement strategy. Congestion/low emission type charge only to be considered if other measures do not resolve air quality issues
Other	Better control of quarry dust/linked transport	Not specific for City of Lancaster AQMA. Aims to reduce PM emissions while the AQMA is declared for NO ₂ exceedances.
Other	Actions should not redirect traffic to M6	Measure already being considered as part of the movement strategy.
Other	Take back control of highways from County Council	Measure not being pursued further due to restrictions on the authorities influence on the highways.
Other	Greening can increase pollen air pollution	Not specific for City of Lancaster AQMA
Other	Provide Masks	The option to wear a mask to protect against pollution is open to individual choice but is not considered to be a suitable solution overall as it is not pragmatic or desirable to wear masks at all times e.g. if you live close to a main road. For this reason, this will not form part of the plan
Other	Stay indoors	Staying indoors during episodes of higher outside air pollution can be a means of reducing exposure. However for many this is not possible given other commitments.
Other	Insulate houses	Assistance for those on low income already in place to assist with this measure.
Other	Hierarchy (Pedestrian, Cycles, Buses, Taxis, Private Vehicles for selecting measures	Measures to be selected through cost-benefit analysis with measures which will reduce concentrations in the easiest and most cost effective way being prioritised

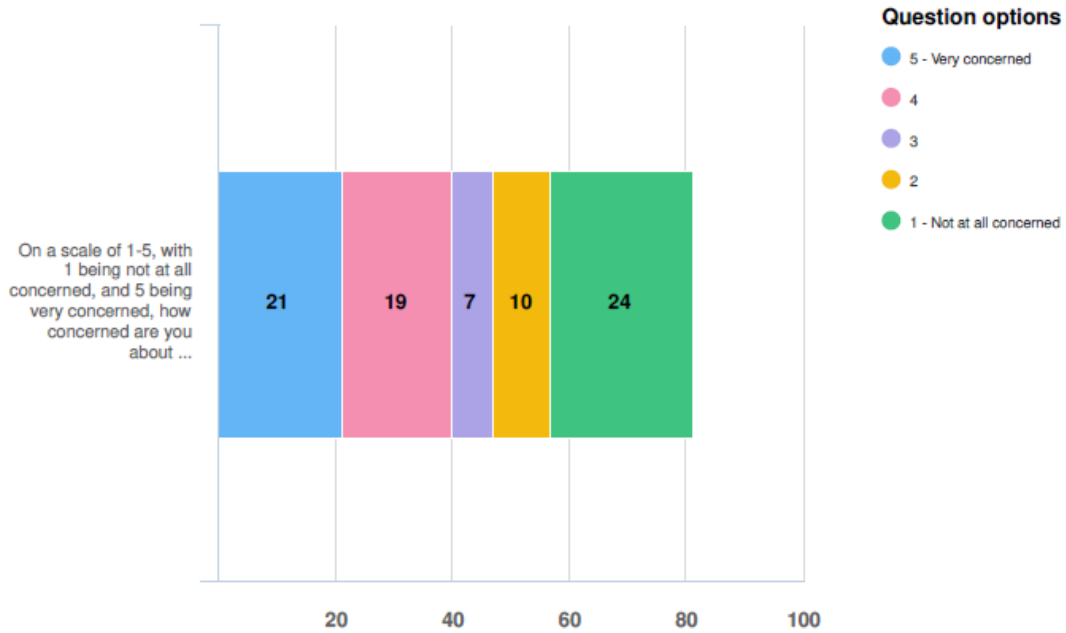
Action category	Action description	Reason action is not being pursued (including Stakeholder views)
Other	Become national exemplar/world leader to achieve local buy in	Measure not being pursued further as covered by the Council's recent declaration of a Climate Emergency / bidding for funding.
Other	Home/Agile Working	This is encouraged by Lancaster City Council where appropriate already
Other	Procurement	This measure is not specific
National Clean Air Strategy	Agricultural emissions (Ammonia)	Not specific for City of Lancaster AQMA. Aims to reduce NH3 emissions while the AQMA is declared for NO ₂ exceedances. NH3 does not react to form NO ₂
National Clean Air Strategy	Indoor air quality / PM2.5/Wood burning	Not specific for City of Lancaster AQMA. Aims to reduce PM and indoor AQ while the AQMA is declared for NO ₂ exceedances in outdoor AQ.
National Clean Air Strategy	Solvents/VOCs	Not specific for City of Lancaster AQMA. Aims to reduce VOC emissions while the AQMA is declared for NO ₂ exceedances. VOC does not react to form NO ₂

Appendix C: Technical Assessment Report for City of Lancaster AQMA

Appendix D: Public Consultation Responses

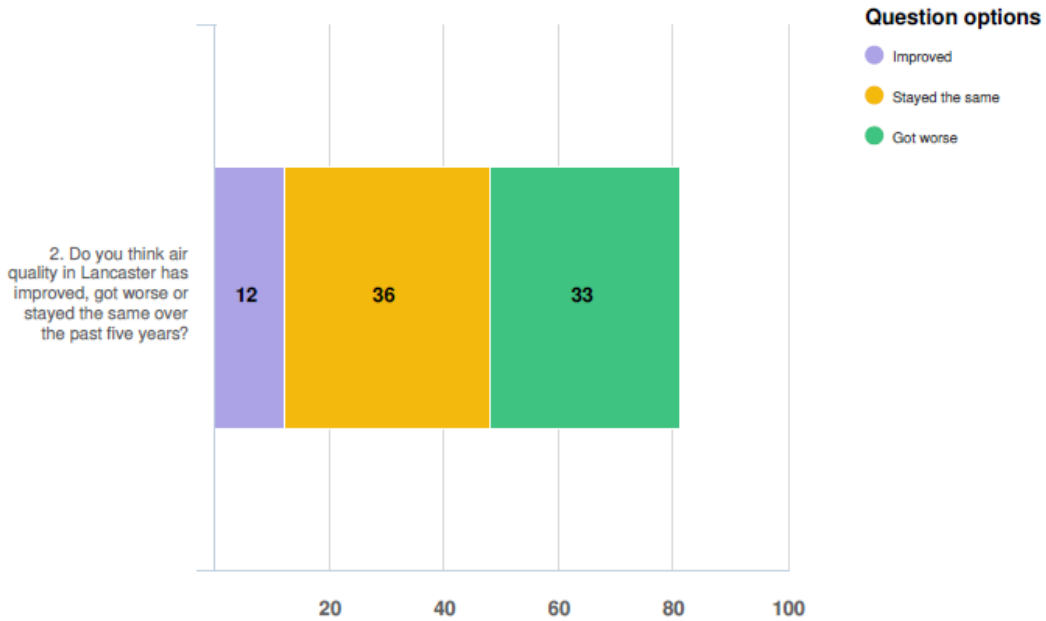
AQAP Consultation : Survey Report for 10 November 2024 to 09 December 2024

Q1 | How concerned are you about air quality in Lancaster?



Optional question (81 response(s), 1 skipped)
Question type: Likert Question

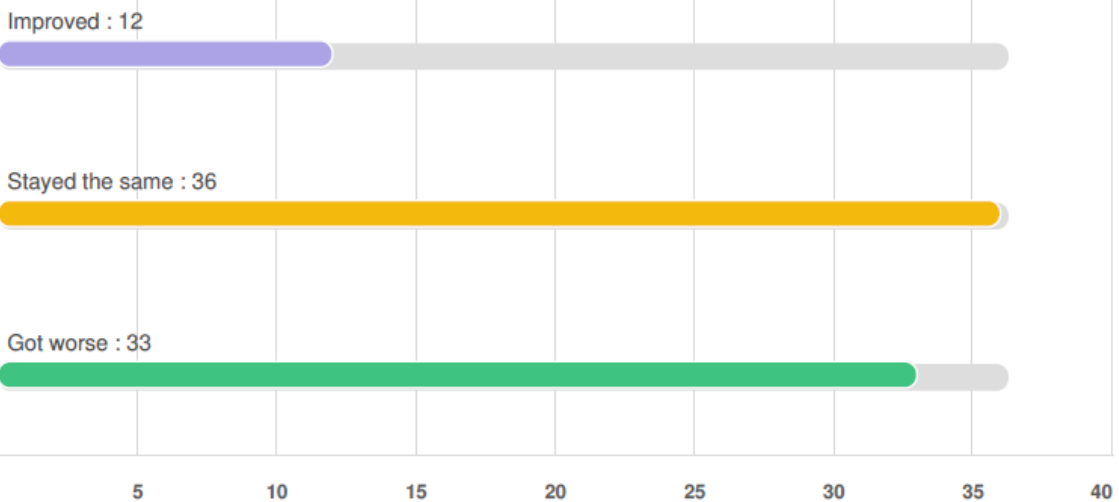
Q2 | Do you think air quality in Lancaster has improved, got worse or stayed the same over the past five years?



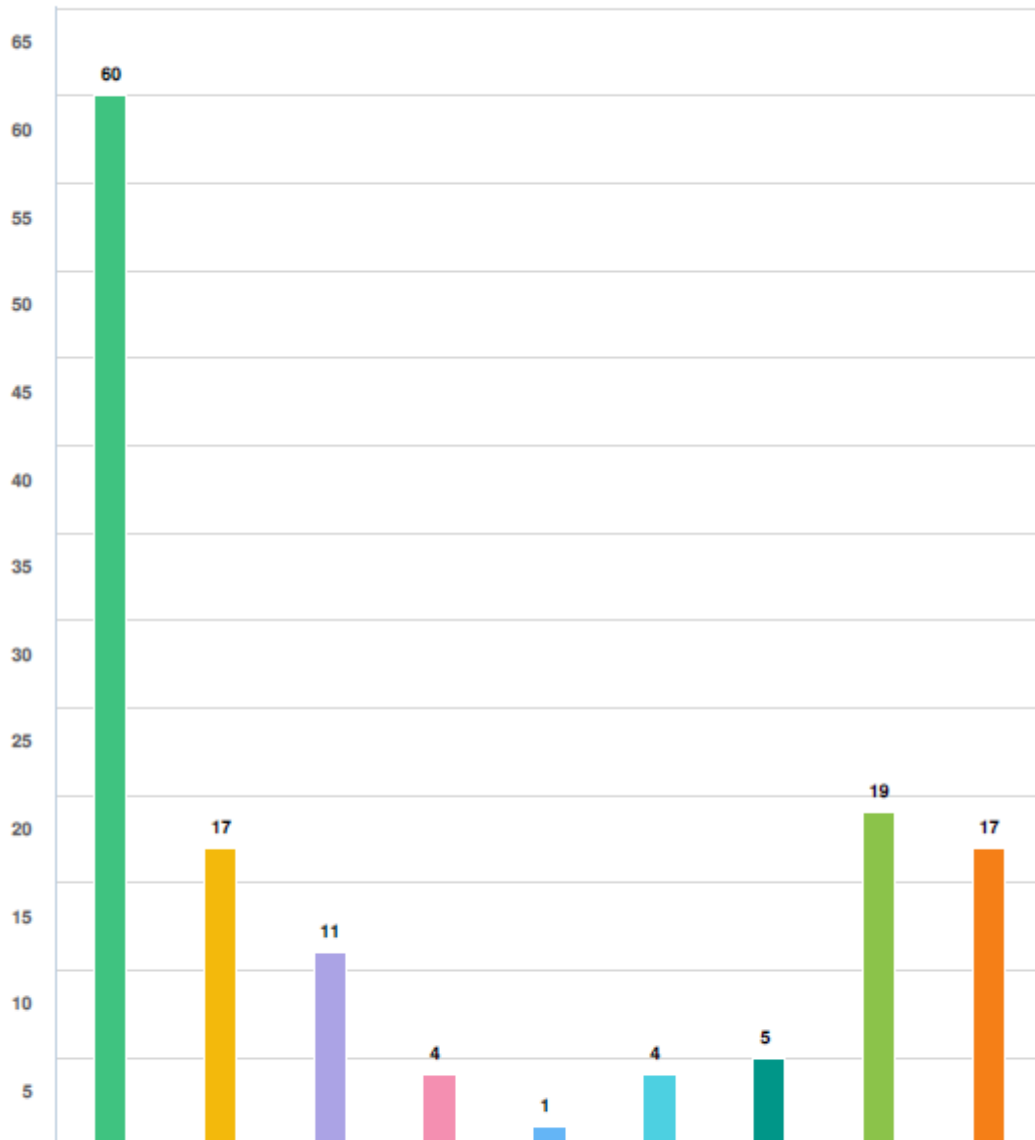
Optional question (81 response(s), 1 skipped)
Question type: Likert Question

Q2 | Do you think air quality in Lancaster has improved, got worse or stayed the same over the past five years?

2. Do you think air quality in Lancaster has improved, got worse or stayed the same over the past five years?



Q3 What are the main sources of air pollution, locally, in your view?



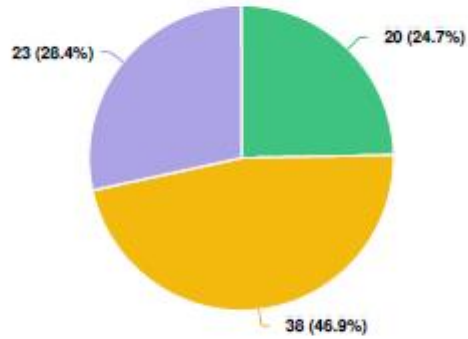
Question options

- Other (please specify)
- Industrial processes
- Commercial buildings
- Restaurants and cafes
- Trains
- Chimney smoke from businesses
- Chimney smoke from houses
- Construction work
- Road traffic

Optional question (81 response(s), 1 skipped)

Question type: Checkbox Question

Q4 | Do you feel air quality locally has impacted the health of yourself or somebody in your household



Question options

Not sure No Yes

Optional question (81 response(s), 1 skipped)
Question type: Radio Button Question

Q5 | If you answered 'yes' to the question 4, would you like to add more information about how you believe air quality has impacted the health of yourself or somebody in your household?

Anonymous
11/19/2024 11:42 AM

Asthma

Anonymous
11/21/2024 10:37 AM

The impacts of poor air quality are very well documented and known. The fact the Lancaster's gyratory has 2 AQMAs that continue to be in exceedance is a damning indictment.

Anonymous
11/21/2024 11:22 AM

I have asthma and the stationary traffic around the one-way system can be a big issue in certain weather conditions.

Anonymous
11/22/2024 08:57 PM

Affects children with asthma

Anonymous
11/23/2024 02:34 PM

I'm not sure as yet, but I am sure it'll become evident in the coming years. We all know the air quality is harmful to everyone

Anonymous
11/23/2024 11:39 PM

Heysham power station is polluting the environment with radio activity and the area has a higher than normal radioactivity

Anonymous
11/25/2024 08:25 PM

Unprovoked road works congestion in the town Lancaster struggles to cope with volume

Anonymous
11/25/2024 08:35 PM

Breathing difficulties in specific modified weather conditions

Anonymous
11/25/2024 09:25 PM

Chest infections as a result of super skip fire in Lancaster.

Anonymous
11/25/2024 10:16 PM

On days when the motorway is closed and traffic is diverted through the centre of Lancaster, I am noticeably wheezier.

Anonymous
11/25/2024 10:51 PM

Neighbour using log burner causes cough and wheeze, and also makes us reluctant to ventilate house.

Anonymous
11/25/2024 11:35 PM

Makes the city centre traffic free. The road system we have is not fit for purpose. There are traffic jams on most days which means traffic is static and send out vehicle fumes which is not healthy or good for the city. It has a bad reputation for bad traffic management.

Anonymous
11/26/2024 08:25 AM

I am asthmatic - there are some days I walk into town when I wish I hadn't , I usually use the canal path to avoid but can't once in town , I could never live in a larger city and I'm not considered to be a severe asthmatic

Anonymous
11/26/2024 11:19 AM

Working in the centre of town in the storey near a busy road junction feels like a lit of care fumes go out in the air round here especially with large haulage trucks. There should be better cycle lanes and pedestrianised areas.

Anonymous
11/26/2024 11:23 AM

Asthma is worse due to traffic in lancaster

Anonymous
11/26/2024 09:48 PM

Nope

Anonymous
11/27/2024 10:44 AM

Living near the castle, several times a week I have to cross or walk up the A6 to get into the city centre or to visit the GP further along the road at Queens Square. At 77 with limited mobility I struggle to breath.

Anonymous
11/28/2024 08:47 AM

We live close to the A6 and our road is used as a rat run. Many wood burning stoves used in our area. At certain times there is a very strong odour from slurry spreading, indicating nitrogen deposition. All the above are known to have an adverse impact on health.

Anonymous
11/28/2024 09:58 AM

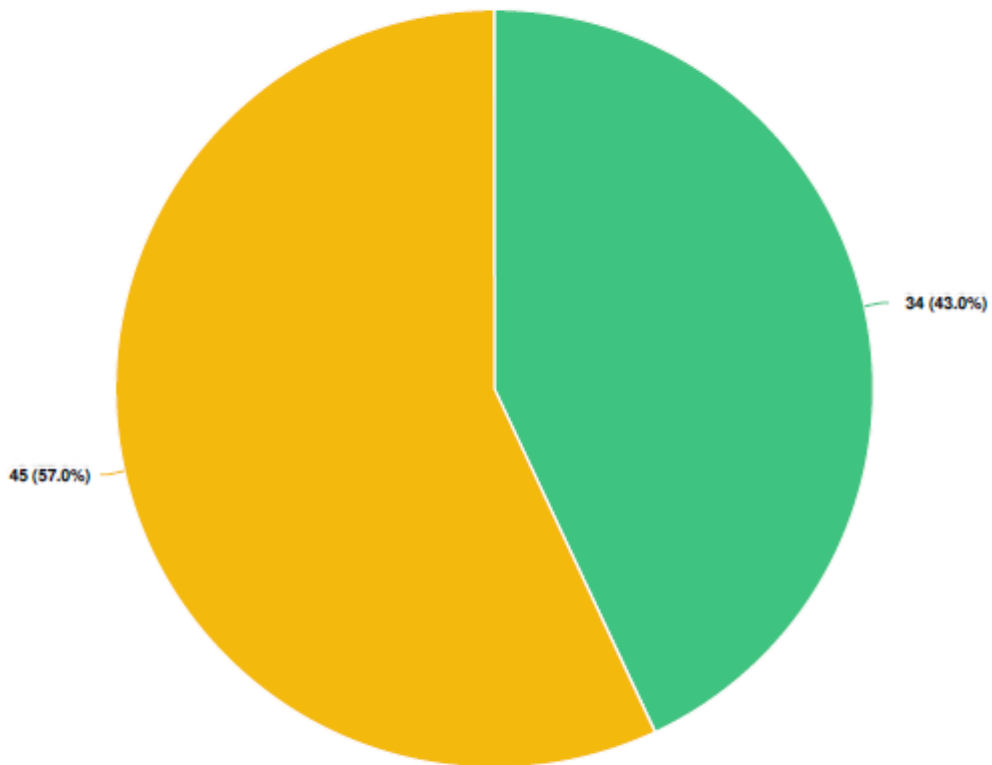
Breathing issues due to choking on air pollution

Anonymous
12/02/2024 04:28 PM

Poor air quality impacts om everyone. Our neighbours have chimneys that come out at street level. So people walking along the street are hit with their fumes. Lots of neighbours round us engaged in burning habits - it needs to stop.

Optional question (20 response(s), 62 skipped)

Q6 | Have you read the draft Air Quality Action Plan (AQAP)

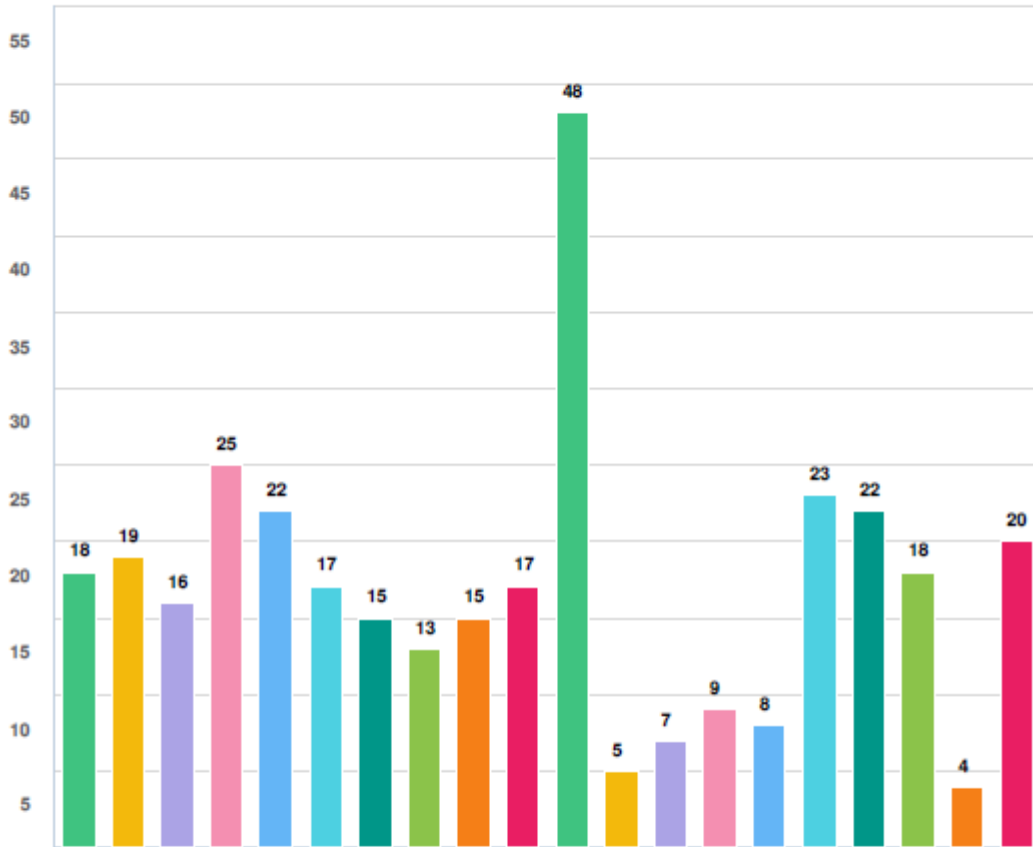


Question options

- No
- Yes

Optional question (79 response(s), 3 skipped)
Question type: Radio Button Question

Q7 Below is a list of the proposed measures in the Air Quality Action Plan. More information on these measures can be found in the AQAP document (pages 40-43). Please choose the top five measures you would be most in support of:



Question options

- 20. Extension of the Lune cycle path (to Halton, Wray, and Wennington)
- 19. All Council fleets (City and County) to be electric vehicles ● 18. New schools associated with new housing development
- 17. Electric low emission buses ● 16. Increased walking, cycling, and wheeling infrastructure across district
- 15. Promoting and incentivising electric vehicles and lower emission cars ● 14. Electric taxi initiatives
- 13. Provision of cycle hubs and facilities ● 12. More cycle parking
- 11. Traffic light technology to improve traffic flow around Lancaster City centre ● 10. Cycling and walking to school initiatives
- 9. Green walls and barriers (e.g. near bus station) ● 8. More charging infrastructure across the district
- 7. Charging infrastructure where there is no off-street parking ● 6. Anti-idling signage and messaging
- 5. Taxi idling and enforcement ● 4. Bus idling and enforcement
- 3. Initiatives that support behaviour change towards sustainable living
- 2. Electric vehicle charging points on all new development
- 1. Education and school projects for improving education around air quality

Optional question (78 response(s), 4 skipped)

Question type: Checkbox Question

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
BVOCs	Biogenic Volatile Organic Compounds
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DPD	Development Plan Document
EU	European Union
EV	Electric vehicle
HGV	Heavy Goods Vehicles
IMD	Indices of Multiple Deprivation
LAQM	Local Air Quality Management
LCC	Lancaster City Council
LGV	Light Goods Vehicles
NO	Nitrogen Oxide
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
O ₃	Ozone
PCM	Pollutant Climate Mapping
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