Bath's Clean Air Zone Annual report summary 2024



This report can be made available in a range of languages, large print, on tape, electronic and other accessible formats from the Clean Air Zone Team.

Call 01225 396189

(Option 3 - Monday to Thursday, 9:00 am - 5 pm;

Friday 9:00 am – 4:30 pm)

Contents

Introduction Summary of findings	Pg. 3 Pg. 4
Air pollution in Bath	Pg. 6
How air pollution affects our health	Pg. 7
Why we need a charging zone Why we don't charge private cars	Pg. 8 Pg. 8
The zone boundary	Pg. 9
How Bath's CAZ works Exemptions	Pg. 10 Pg. 10
Financial assistance to upgrade or replace vehicles	Pg. 11
How revenue from the zone is spent	Pg. 12
Findings How we monitor air quality The impact of Covid-19 and Cleveland Bridge Air quality results Traffic volume and flow results Vehicle compliance results	Pg. 13 Pg. 13 Pg. 13 Pg. 14 Pg. 15 Pg. 16
Next steps How you can help	Pg. 17 Pa. 17



Introduction

In 2017, the Government directed Bath & North East Somerset Council (B&NES) to reduce nitrogen dioxide (NO₂) pollution in Bath to within the legal limits of an annual average limit of **40 micrograms per cubic metre (µg/m³)** and to do so in the shortest possible time.

In response to this, on 15 March 2021 the Council launched a charging class C Clean Air Zone (CAZ) in Bath's city centre to drive down NO₂ pollution at several locations which regularly exceeded these NO₂ limits, risking children's and vulnerable resident's health.

CAZs work by deterring certain high emission vehicles from entering areas of high pollution by levying a daily charge, encouraging a more rapid replacement of polluting vehicles for cleaner, compliant ones that would otherwise naturally occur. Within Bath, NO₂ pollution is chiefly caused by road traffic emissions, and extensive technical work showed that a charging CAZ, coupled with the introduction of a traffic management scheme at Queen Square would be the only way to achieve success in the required time frame (at the end of 2021 by the latest).

In launching the CAZ, significant financial support has been made available to individuals and businesses to replace non-compliant, chargeable vehicles regularly driving into the zone. A Financial Assistance Scheme (FAS) and Bus Retrofit Scheme were launched using Government funds to support the upgrade or retrofit of almost 950 vehicles. Additionally, there has been an ongoing behaviour change campaign aimed at helping people travel more actively and sustainably across B&NES, also supporting the aims of the CAZ.

Following the launch of the CAZ, the Council has been monitoring air quality and traffic flows outside of the zone to determine whether traffic has been displaced, and associated emissions have increased. Findings show that traffic outside of the zone does not appear to have increased, and air quality continues to improve, however, the composition of traffic may have changed. The Covid-19 pandemic greatly affected working habits and travel patterns, with there still being a national increase in light commercial vehicles¹.

It is also important to note that private cars are not charged within Bath as the CAZ is a class C zone. Therefore, whilst these vehicles have no reason to avoid the zone, there may be temporary road closures or road works affecting their journeys.

B&NES thank the public for supporting the Council to implement the zone which is helping to improve air quality and public health.

¹Department for Transport, 2024. Domestic Transport Usage by Mode. Available at: https://www.gov.uk/government/statistics/transport-use-during-the-coronavirus-covid-19-pandemic/domestic-transport-usage-by-mode



caused by vehicle emissions



Government directs council to act in 'shortest possible time'



Summary of findings

Air quality results from within the CAZ (CAZ_Only):

2019 is used as the baseline year for analysis as it is the most recent year with pre-CAZ data that has not been impacted by the Covid-19 pandemic.

- Average 2024 annual nitrogen dioxide (NO₂) concentrations within the CAZ are 40% lower than in 2019, representing a reduction of 13.0 µg/m³. This is the average reading from a total of 65 monitoring sites that recorded data in both 2019 and 2024. Note sites with less than 25% data capture have been discounted from this analysis. Sites with 25-75% data capture have been annualised, and sites with over 75% data capture have been averaged.
- In 2024, no sites recorded an annual average NO₂ concentration greater than 36 μg/m³. This is a reduction of 21 sites when compared to 2019.
- None of the 65 sites were found to have increased in NO₂ concentrations since 2019.
- Concentrations within the CAZ have decreased a further 12% in 2024 when compared to 2023.

Air quality results from within the wider Bath urban area (CAZ_Boundary):

- Average 2024 annual nitrogen dioxide (NO₂) concentrations within the CAZ_Boundary are 41% lower than in 2019, representing a reduction of 10.4 μg/m³. This is the average reading from a total of 56 monitoring sites that recorded data in both 2019 and 2024. Note sites with less than 25% data capture have been discounted from this analysis. Sites with 25-75% data capture have been annualised, and sites with over 75% data capture have been averaged.
- In 2024, no sites within the CAZ_Boundary recorded greater than 36 μg/m³. This is α reduction of 7 sites when compared to 2019.
- None of the 56 sites were found to have increased in NO₂ concentration compared with 2019.
- Concentrations within the CAZ_Boundary have decreased a further 10% in 2024 when compared to 2023.



Vehicle compliance results

- An average of 1,742 non-compliant vehicles were seen in the zone each day during the launch week of the CAZ, this compared to 275 during 2024, a decrease of 84%.
- Owners of over 1,500 vehicles applied for financial support to upgrade or retrofit their non-compliant vehicles through the FAS.
- The Council's FAS, now closed, has supported the upgrade of 949 vehicles from higher emission to clean, compliant ones.
- The percentage of chargeable noncompliant vehicles (as a percentage of total traffic) entering the zone each week reduced from 6% in launch week to an average of 0.9% by the end of 2024.

Multiple lockdowns in response to the Covid-19 pandemic had a significant effect on transport and travel behaviour, locally and nationally. Whilst Cleveland Bridge fully reopened on 02 October 2022 (subject to an 18-tonne weight restriction), it is possible the effects of the closure may have been seen at the start of 2023 as traffic volumes recovered.

Despite this and following the submissions of official 2022 air quality data to the Government for an independent review, the Joint Air Quality Unit (JAQU) confirmed that B&NES had passed the State 3 Assessment. The report confirmed that there were reductions in the annual mean NO₂ target between 2019 and 2022, and there were no observations of increased concentrations at any of the diffusion tube sites. The summary report can be viewed at the following: https://beta.bathnes.gov.uk/sites/default/files/BaNES-2022-State-3-Summary.pdf



Cleaner air

Air pollution in Bath

Air pollution is the leading environmental health risk to the UK public, with an estimated 29,000 to 43,000 deaths annually attributed to it in the UK alone². There are different causes and sources of air pollution, but a major source in the UK contributing to nitrogen dioxide (NO₂) pollution and particulate matter (PM) pollution, is road traffic.

Particulate matter pollution, referred to as PM₁₀ or PM_{2.5}, is made up of tiny bits of material from many sources including smoke from fires, exhaust fumes, smoking or the dust from brake pads on vehicles. These particles are too small to see, and can be breathed in without being noticed

Nitrogen dioxide (NO₂) comes from burning fuels or other materials, so concentrations are especially high around roads. But they are also produced from home gas boilers, bonfires, and other sources as well. You cannot see or smell nitrogen oxides, but they mix with the air and are absorbed into our bodies. Vehicle exhaust emissions contribute to 35% of all UK nitrogen oxide emissions (NO_v) which is the single greatest source³.

Particulate matter in Bath was not found to exceed legal limits for either PM₁₀ (particulate matter less than 10 micrometres in diameter) or PM_{2.5} (particulate matter less than 2.5 micrometres in diameter), except at times when there were meteorological or other events that caused spikes in these pollutants. However, in Bath, annual average NO_a levels had previously exceeded the legal limit of 40 µg/m³ at several locations within the city, chiefly caused by vehicle emissions.

The problem is exacerbated by Bath's topography. The city sits in the bottom of a valley surrounded by hills, and its central roads are flanked by tall buildings, which means that in certain conditions, vehicle emissions can get trapped in the atmosphere causing high levels of NO₂ in certain locations.

²UK Health Security Agency, 2022. Chemical Hazards and Poisons Report.

³DEFRA, 2019. Air quality: explaining air pollution – at a glance. Available at: https://www.gov.uk/government/publications/ air-quality-explaining-air-pollution/air-quality-explaining-airpollution-at-a-glance

You cannot see or smell nitrogen oxides, but they mix with the air we breathe and are absorbed into our bodies.



trap emissions



Cleaner air

















How air pollution affects our health

Air pollution particles and gases enter our bodies and can damage our cells in different ways. They usually get into our lungs first and can then move into our bloodstream to reach organs such as our heart and brain.

Any amount of pollution can be damaging to our health, but the more that you are exposed to, the bigger the risk and the larger the effect on you and your family. Some people are more vulnerable to the impacts of air pollution than others.

The more at risk from the negative effects of air pollution include children, pregnant and older people; and people with lung conditions such as asthma, chronic obstructive pulmonary disease (COPD) and lung cancer. People with heart conditions such as coronary artery disease, heart failure and high blood pressure are also at risk.

Long-term exposure to air pollution is linked to premature death associated with lung, heart, and circulatory conditions, while short-term exposure exacerbates asthma and increases hospital admissions.

Clean air is important for everyone. It will alleviate stress on our health system, improve people's lives and make our society more equitable.



Worsens heart and lung conditions



in the UK per year





Why we need a charging zone

In 2017, following a successful ruling by the Supreme Court in a case brought against the Government by Client Earth, the Government directed B&NES to reduce the annual average NO₂ levels in Bath to within legal limits in 'the shortest possible time'.

Since 2017, the Council has undertaken significant technical work to understand what's required to comply with air quality limits, establishing that a charging CAZ together with the introduction of a traffic management scheme at Queen Square would be the only measures capable of delivering the necessary air quality improvements.

The purpose of the CAZ is to speed up the natural replacement of older, more polluting vehicles with cleaner, compliant ones that meet the city's minimum emission standards. It does this by levying charges on owners of non-compliant vehicles that don't meet emission standards, so that they are incentivised to upgrade or replace their vehicle sooner than they might otherwise do (to avoid paying a daily charge).

As excessive pollution in Bath was mostly caused by vehicle emissions, encouraging cleaner, less polluting vehicles is an effective way to quickly drive down pollution without restricting vehicle use in the city centre.

The Euro 6 emission standard came into force in 2015 and has significantly reduced emissions, particularly for buses and coaches with larger diesel engines. A separate fund has supported bus companies to upgrade scheduled, higher emission buses to Euro 6 standard.



Why we don't charge private cars

The options for Bath to achieve success were a Class D charging CAZ, charging all higher emission vehicles including cars and motorbikes or a class C charging CAZ charging all higher emission vehicles except private cars and motorbikes but including some additional traffic management

The Council engaged extensively with the public throughout 2018/19 before reaching a decision on a class C charging CAZ. The overwhelming opinion was that while pollution needed to be tackled, a class C charging CAZ would strike a better balance between tackling pollution and protecting central businesses and vulnerable residents that might be disproportionally affected by charging higher emission private cars.

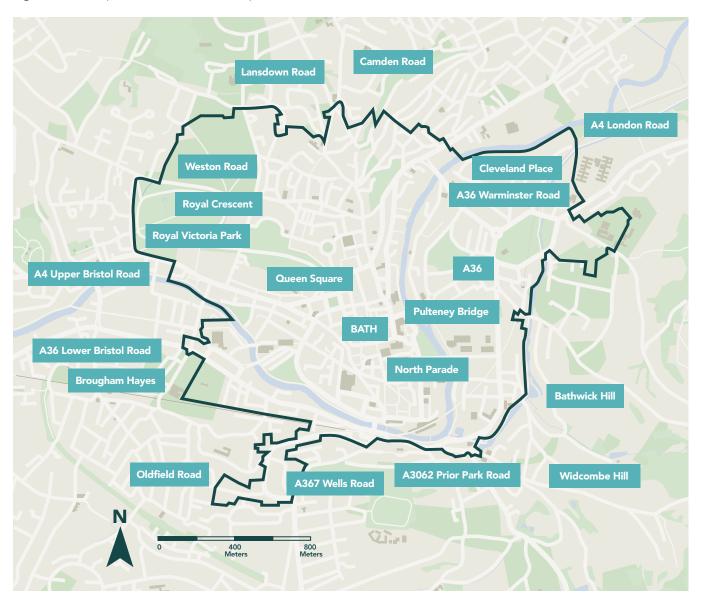
Technical modelling suggested that the Council could achieve success with a class C CAZ provided additional traffic measures at Queen Square were introduced to address a particular NO₂ hotspot on Gay Street.

In addition, it was agreed that significant financial support would be given to local individuals and businesses to help them replace higher polluting vehicles regularly entering the zone with cleaner, compliant ones. This mitigation would reduce the impact of charges on affected businesses and individuals, while also further reducing emissions to support better air quality.

The full business case for the CAZ was approved by Central Government in January 2020 and can be read here: https://baths-clean-air-zone

The zone boundary

Figure 1- A map of the CAZ boundary



The CAZ covers the very centre of the city (see Figure 1, below), but its boundary is designed to complement improvements to air quality across bath. An interactive map can be viewed online at: https://beta.bathnes.gov.uk/view-map-baths-clean-air-zone

The CAZ is as small as possible to minimise the social, economic, and distributional impact of the scheme, whilst at the same time capturing as many non-compliant vehicle movements as possible in and around the city.



How Bath's CAZ works

Daily charges apply to the following higher emission vehicles used within the zone that do not comply with Euro 6 (diesel), or Euro 4 (petrol) emissions standards:

- Taxis, private hire vehicles (PHVs), vans (including pick-ups and N1 campervans), minibuses, and light goods vehicles (LGVs) - £9 per day
- Buses, coaches, and heavy goods vehicles (HGVs) - £100 per day
- A discounted charge of £9 per day is also available for private HGVs, such as larger motorhomes and horse transporters, once registered with the Council.

Cars (except for taxis and PHVs) and motorbikes are not charged regardless of their emissions standards. This includes campervans classed as M1 on their V5C (Vehicle Registration Certificate) issued by the DVLA.

Motorists can use their registration number to check if charges apply in any charging CAZ within England by visiting www.qov.uk/clean-air-zones

Exemptions

National exemptions apply permanently for ultralow emission vehicles, hybrid (within Bath) and alternatively fuelled vehicles, disabled passenger tax class vehicles, disabled tax class vehicles, military vehicles, historic vehicles, and vehicles with retrofit technology accredited by the Clean Vehicle Retrofit Accreditation Scheme (CVRAS).

Local exemptions from daily charges applied temporarily from launch for two years for certain vulnerable groups, and hard-to-replace vehicles. Exemptions were also introduced to encourage applications to the now closed Financial Assistance Scheme to upgrade or replace noncompliant vehicles. Exemptions were developed in response to feedback from public consultations and to mitigate the impact of charges on certain groups. For more information on local exemptions see https://beta.bathnes.gov.uk/get-exemption-or-discount-baths-clean-air-zone



Financial assistance to upgrade or replace vehicles

To mitigate the impact of charges and further support air quality improvements, the Council invested £9.4 million of Government funds in a Financial Assistance Scheme (FAS) that offered grants and interest-free loans to businesses and individuals wishing to replace non-compliant, chargeable vehicles with cleaner, compliant ones.

Businesses and individuals could apply for funding to upgrade or retrofit their vehicle if they passed a basic eligibility test, proving that they travel at least two days per week on average in the zone over a 60-day period. Those passing the test could then apply for grants and/or interest free loans via the Council's approved FAS administrators.

The scheme launched in November 2020 and by the end of the scheme it had helped replace 949 polluting vehicles with cleaner compliant ones, with approximately £8 million spent on upgrading and retrofitting vehicles (including the Bus Retrofit Programme).

has raised our environmental profile – helping us win new work.

Retrofitting our coaches through the scheme was a really cost effective way of increasing our fleet compliance - we are pleased our coaches can be used and not made redundant.

Cleaner air



How revenue from the zone is spent

Non-compliant vehicles contribute the most towards a worsening of air quality and daily charges for their use are designed to encourage drivers to consider an economic decision whether to use their vehicle within the zone or not. Charges are set at such a level to also encourage vehicle owners to consider upgrading, replacing, or switching travel mode entirely to maximise the air quality improvements and health benefits of the zone. Charges are designed to influence behaviours and disincentivise non-compliant vehicle use rather than generate income for the council.

Revenue from daily charges and penalty charges is used to fund the running of the scheme. Any surplus revenue must be used for the purposes set out in the <u>CAZ Charging Order</u> with benefits towards sustainable transport projects or schemes which compliment wider air quality improvements.

In its third year of operation, the zone generated a net income of £4.57 million. To support our commitments to reinvestment of CAZ proceeds we have allocated these funds to provisionally support a range of programmes. These include £2 million to fund delivery of the western section of Scholars Way, £1.7 million to support the Council's Local Highways Improvement Capital Programme, and £500k to support future transport strategy development.

A full summary of programmes the reinvestment reserve has supported, as well as financial overview for 2024, can be found in Appendix 3.

£3.1m net income generated in 2024

£4.3m

has already been paid out to support sustainable transport and air quality improvement projects





Findings

The following sections highlight the main findings of the Annual Report looking at the zone's impact on air quality, traffic flow and vehicle compliance.

Given the unprecedented conditions brought about by the Covid-19 pandemic in 2020 (including significant changes in transport and travel), 2020 figures have been discounted for comparative purposes. Therefore, baseline data from 2019 has been used to compare air quality monitoring results, and baseline data from 2017/2018 has been used to compare traffic flows (this is the latest year with sufficient comparable data).

For more information on how data is measured and presented, pleases see the full report via the following link: https://www.bathnes.gov.uk/policy-and-documents-library/baths-clean-air-zone-monitoring-reports

How we monitor air quality

B&NES has been monitoring air pollution for many years, frequently reviewing the monitoring sites to ensure coverage both within and outside of the CAZ. Three pollutants are measured around the district: NO_2 , PM_{10} and $PM_{2.5}$.

There are currently over 150 locations where NO_2 is measured, including over 20 key sites with higher levels of pollution where three diffusion tubes are located at each location to improve data confidence.

65 diffusion tubes are within the CAZ, 56 in the city's urban area outside of the zone, and a further 18 in the wider district.

More information about air quality across B&NES can be viewed online at: https://beta.bathnes.gov.uk/air-quality

The impact of Covid-19 and Cleveland Bridge

Multiple lockdowns in response to the Covid-19 pandemic had a significant effect on transport and travel behaviour, both locally and nationally. Locally, there have been significant changes to traffic composition, including reduced peak time traffic in the mornings, a greater spread of traffic throughout the city across the day, and a sharp increase in e-commence and home deliveries.

Additionally, Cleveland Bridge was closed to all traffic on 28 June 2021 for emergency repairs. The bridge usually carries around 17.000 vehicles per day. and so the closure affected traffic flows throughout Bath. The bridge fully reopened on 02 October 2022, subject to an 18-tonne weight restriction to protect the bridge structure from further deterioration and damage, this was in place throughout 2024. Whilst the closure of the bridge impacted traffic flows in and around Bath throughout much of 2022, it is possible these effects may have been seen at the start of 2023 as traffic volumes recovered.



Air quality results

There are clear indications that the CAZ is working to improve air quality across the area and not just within the zone.

- All monitoring sites within and outside the zone saw an overall decreasing trend, with annual average NO₂ concentrations lower than in 2019.
- Overall, the annual mean NO₂ concentrations for 2024 in the zone are 40% lower than in 2019. This is an average reduction of 13.0 µg/m³.
- The annual mean NO₂ concentration for 2024 in the urban area outside the zone is 41% lower than in 2019. This is an average reduction of $10.4 \, \mu g/m^3$.
- Additionally, NO₂ concentrations have continued to decrease when compared to 2022. Concentrations within the CAZ have decreased a further 12% in 2024 when compared to 2023, with reductions also being seen in the CAZ Boundary (10%).
- In 2024, no monitoring sites within the CAZ recorded an annual mean NO. concentrations above 36 µg/m³.
- In 2024, no monitoring sites in the urban area outside of the zone recorded an annual mean NO₂ concentrations above 36 µg/m³.

Some sites showed higher NO₂ concentrations as a quarterly average, but not as an annual average. Meteorological conditions (the weather) and local transport issues, such as diversions, influence pollution concentrations. Therefore, to determine trends and measure improvement, an annual mean average concentration is always used.



recorded an annual average NO, concentration greater than 36 µg/m³.



















Traffic volume and flow results

Looking at traffic trends helps us understand the impact of the zone on traffic displacement and air quality.

The zone inevitably creates some traffic displacement because motorists with non-compliant vehicles will seek to avoid it until they can upgrade or replace their vehicle. However, the Council monitors areas of concern to ensure that any displacement does not contribute to deteriorating air quality, safety, or amenity.

Data from 2016/17/18 is used for comparing traffic flows, because there is insufficient data for periods in 2019. You can find out more about the locations of monitors within our full report.

- Nationally, traffic volumes were 0.7% lower than the 2019 pre-pandemic baseline, with LGVs, motorcycles and scooters exceeding prepandemic levels. Overall traffic volumes have increased to just less than 2019 levels, public transport has increased at a slower rate and remains below pre-pandemic volumes⁴.
- Average 2024 traffic flows within Bath were generally slightly below pre-pandemic levels.
- Within the CAZ, data availability from the Council's permanent automatic traffic count (ATC) network has some variation due to network trials and upgrades. During 2022, the network, particularly within the CAZ, was being upgraded with new, more reliable technology to replace the older, faulty counters that were no longer maintained. As a result, there are some inconsistencies with data availability, and individual sites do not hold a full data set from 2016 through to 2024.

- As a result, 2 temporary surveys from a 7-day period were used to give an indicative view of traffic flows within the CAZ.
- On average, data analysed from the permanent ATC network within the CAZ_Boundary, found a 11% reduction in 7-day average traffic flows when compared to the baseline period. Data analysed within the Wider_B&NES area, found an 8% reduction in 7-day average traffic flows when compared to the baseline.

⁴Department for Transport, 2024. Road traffic estimates in Great Britain, 2024: Headline figures. Available at: https://www.gov.uk/government/statistics/road-traffic-estimates-in-great-britain-2024-traffic-on-englands-road-networks



We continue to monitor air quality and traffic flow



Vehicle compliance results

Charging CAZs are designed to encourage motorists to consider replacing older, polluting vehicles more quickly than they might otherwise.

To support motorists affected by charges and to further improve air quality, a Financial Assistance Scheme worth £9.4 million was introduced to help local businesses and individuals replace polluting vehicles with cleaner, compliant ones.

Cars and motorbikes are not charged, regardless of emissions, and compliance rates are expected to improve naturally over the next few years.

A Bus Retrofit Programme, worth £1.4 million, was also introduced to encourage the upgrade of all scheduled buses in Bath to Euro 6/VI standard.

Compliance, or a compliant vehicle, means a vehicle that meets the minimum emission standards for the zone, which is Euro 6 diesel, a Euro 4 plus petrol vehicle, a compliant hybrid, or an ultra-low emission vehicle.



for financial support to upgrade vehicles



Replaced by the end of 2024

Key findings for fleet compliance as an impact of the zone and our mitigation/support are as follows:

- On average, 1,742 vehicles driven in the zone each day during the launch week of the CAZ were non-compliant. By December 2024, this had decreased 84% to 275 vehicles.
- Owners of over 1,500 vehicles applied for financial support to upgrade or retrofit their vehicle. 949 polluting vehicles were replaced by the end of 2024.
- 783 polluting vans have now been replaced with cleaner, compliant ones via the Council's FAS (with further replacements expected in the coming months).
- 110 polluting taxis/private hire vehicles have now been replaced with cleaner, compliant ones via the Council's scheme.
- HGVs already have a higher compliance rate across the UK and in Bath, therefore, they were not a priority for a FAS. However, 32 HGVs have been replaced as part of the FAS.
- 22 non-scheduled, polluting buses and coaches have now been replaced via the Council's scheme. An additional 2 minibuses have also been replaced.
- Out of a total fleet of 226 scheduled buses, 88 were non-compliant when the Bus Retrofit Programme started. By the end of December 2022, this programme had been complete with the full fleet successfully retrofitted to Euro VI standard.





g in the Driving in the ach day zone by Dec 2024

% improvement in compliance by vehicle type

% compliant in March 2021

% compliant in December 2024





















Next steps

The significant reductions in NO_2 concentrations across the area are heartening, and whilst no sites within the CAZ and CAZ_Boundary recorded over $40 \,\mu g/m^3$, there is still work to do with two sites that recorded over $36 \,\mu g/m^3$. The Council will be focusing efforts on these areas moving forward together with:

- Continuing to follow guidance from JAQU to progress along their roadmap to success
- Continue to operate and enforce a charging class C CAZ and monitor air quality, traffic flow and vehicle compliance.
- Continue to pay particular attention to sites that are within 10% of the national objective limit, considering specific initiatives to help reduce concentrations where necessary.
- Continuing to promote long-term, sustainable habits around transport and private car use in line with the Council's Journey to Net Zero policy.

We would like to thank the public and businesses for their commitment to supporting the Council to improve air quality in the city, especially those who have upgraded their vehicles.

How you can help

There's lots you can do to help us drive down pollution in Bath.

- Walk, wheel, or cycle your short journeys in the city
- Consider taking public transport or using the park and ride
- When you replace your vehicle, consider a new or second-hand Euro 6 or 6d diesel vehicle, a compliant petrol vehicle, or an ultra-low emission vehicle
- · Consider car-clubs and car-shares.
- Consolidate home deliveries into fewer parcels to reduce the frequency of courier journeys.

84% of all vehicles

Travelling each day in the zone are cars

On your next journey

consider if you can

walk, wheel, carpool or take public transport



