



Bath Clean Air Plan

Bath and North East Somerset Council

Clean Air Zone Signage Strategy

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Acronyms and Abbreviations

| | |
|-----------------|--|
| ANPR | Automatic Number Plate Recognition |
| B&NES | Bath and North East Somerset Council |
| CAP | Clean Air Plan |
| CAZ | Clean Air Zone |
| Defra | Department for the Environment, Food and Rural Affairs |
| DfT | Department for Transport |
| HE | Highways England |
| JAQU | Joint Air Quality Unit |
| NO ₂ | Nitrogen Dioxide |
| OBC | Outline Business Case |
| TSRGD | Traffic Signs Regulations and General Directions |
| SGC | South Gloucestershire Council |
| SRN | Strategic Road Network |

1. Introduction

Poor air quality is the largest known environmental risk to public health in the UK¹. Investing in cleaner air and doing more to tackle air pollution are priorities for the EU and UK governments, as well as for Bath and North East Somerset Council (B&NES). B&NES has monitored and endeavoured to address air quality in Bath, and wider B&NES, since 2002. Despite this, Bath has ongoing exceedances of the legal limits for Nitrogen Dioxide (NO₂) and these are predicted to continue until 2025 without intervention.

In 2017 the government published a UK Air Quality Plan for Nitrogen Dioxide² setting out how compliance with the EU Limit Value for annual mean NO₂ will be reached across the UK in the shortest possible time. Due to forecast air quality exceedances, B&NES, along with 27 other Local Authorities, was directed by Minister Therese Coffey (Defra) and Minister Jesse Norman (DfT) in 2017 to produce a Clean Air Plan (CAP). The Plan must set out how B&NES will achieve sufficient air quality improvements in the shortest possible time. In line with Government guidance B&NES is working towards implementation of a Clean Air Zone (CAZ), including both charging and non-charging measures, in order to achieve sufficient improvement in air quality and public health.

Jacobs has been commissioned by B&NES to produce an Outline Business Case (OBC) and Full Business Case (FBC) for the delivery of the CAP; a package of measures which will bring about compliance with the Limit Value for annual mean NO₂ in the shortest time possible in Bath. The OBC assessed the shortlist of options set out in the Strategic Outline Case³, and proposed a preferred option including details of delivery. The FBC develops the preferred option set out in the OBC, detailing the commercial, financial and management requirements to implement and operate the scheme. The OBC and FBC form a bid to central government for funding to implement the CAP.

This document is written to support the OBC and FBC and defines the signage strategy with regards to the Bath and North East Somerset Council (B&NES) Clean Air Zone (CAZ). It starts by discussing the sign face guidance provided by the Department for Transport (DfT) and the Department for Environment, Food and Rural Affairs (DEFRA)^{4, 5} and their Joint Air Quality Unit (JAQU)⁶. This guidance sets out the different types of signs required as part of CAZ implementation.

Following this discussion on required signs, the current proposed locations of all the signage relating to the Bath CAZ are outlined, covering zone entry, zone exit, enforcement and advance-warning signs. The rational and reasoning behind the selection of specific locations is also given, although clearly those relating to the identified zone entry/exit points are dictated by the final proposed boundary location. This zone boundary and its evolution to date is described in a separate report discussing CAZ boundary changes - FBC-04 'Clean Air Zone Boundary Updates' in Appendix A of the FBC.

The project is currently in the final, detailed design phase and, whilst locations are now largely confirmed, positions may be subject to minor change. As noted above, the boundary of the zone is also agreed at this stage and whilst major changes are not envisaged, there may be minor adjustments to its extent for technical reasons. This may, therefore, affect some of the positioning of zone entry/exit signing.

¹ Public Health England (2014) Estimating local mortality burdens associated with particular air pollution.

<https://www.gov.uk/government/publications/estimating-local-mortality-burdens-associated-with-particulate-air-pollution>

² <https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017>

³ Bath and North East Somerset Council Clean Air Plan: Strategic Outline Case, March 2018

http://www.bathnes.gov.uk/sites/default/files/siteimages/Environment/Pollution/strategic_outline_case_bath_28.03.2018_with_annexes.pdf

⁴ Clean Air Zone Framework; DEFRA

⁵ Signs and Road Markings for Charging Clean Air Zones; JAQU

⁶ Clean Air Zone Symbol Guidance; DEFRA

2. Signage Guidance

The Clean Air Zone Framework⁷, states in Section 3.8 ‘A minimum requirement for setting up a Clean Air Zone is to “*have signs in place along major access routes to clearly delineate the zone*”’. The Signs and Road Markings for Charging Clean Air Zones goes into further detail, stating a requirement for the following⁸;

- Clear signing at the point of entry into a charging CAZ,
- Signs in advance of entry, to provide adequate information about potential charges applicable and to provide alternative routes to divert around it.
 - The all-purpose trunk network road network will require advance signing, in order to provide road users with adequate guidance to make informed decisions.
- Clear and consistent signing is critical, so JAQU has designed signs centrally, with the assistance of the signs team in the DfT.
 - This is to ensure the sign meets DfT requirements and matches the design principles of existing Traffic Signs Regulations and General Directions (TSRGD) restriction signs.

2.1 Entry Signage

Entry signage must be placed as close as practicable to the point of entry on all roads at the boundary crossing points.

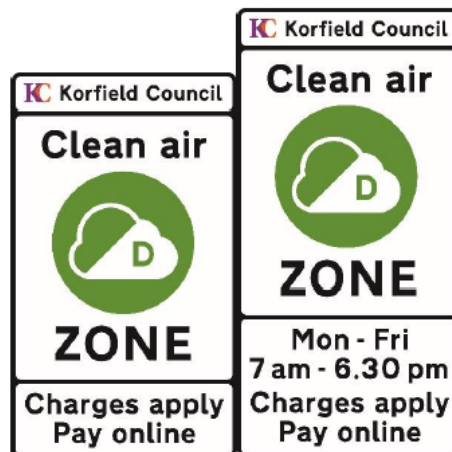


Figure 1. Entry signage examples as provided by JAQU (Department for Transport; Department for Environment, Food and Rural Affairs, 2018).

It is intended that the ‘cloud’ symbol will be the national symbol to represent a CAZ, with the letter inside representing the charging class of the CAZ; A, B, C or D. As can be seen in **Figure 1**, the controlling authority of the CAZ will need to be displayed on the entry sign, alongside a message informing the public that charges may apply if they enter the CAZ. Operating hours will not be required for the Bath CAZ as it is proposed to have 24-hour operation, but where a time restricted CAZ is in force the operating hours would need to be shown, as indicated on the sign variant.

Draft sign faces for entry signs for this project, can be found in FBC-01 Appendix A of this FBC on Drawing No. 674726.BR.042.01-CH-DR-1201.

⁷ Clean Air Zone Framework; DEFRA

⁸ Signs and Road Markings for Charging Clean Air Zones; JAQU

2.2 Exit Signage

As shown in **Figure 2**, these must be placed as close as practicable to the point of exit on all roads at the boundary crossing points.



Figure 2. Exit signage example as provided by JAQU (Department for Transport; Department for Environment, Food and Rural Affairs, 2018).

Again, it is necessary to make the public aware of the potential charges for driving within the CAZ. This is in case they have missed the entry sign or began their journey within the CAZ.

Draft sign faces for the Bath CAZ exit signs can also be found in FBC-01 Appendix A of this FBC, in this case on Drawing No. 674726.BR.042.01-CH-DR-1201.

2.3 Advanced Warning Signage

The guidance advises that these should be strategically placed to give drivers the option to avoid the CAZ, so:

- Should be placed at the last junction that could be used to avoid the zone
- May be necessary to place additional signage at an earlier junction if a more natural exit route exists
 - This is particularly salient for HGVs as they will need to be able to make safe diversions if avoiding the zone.
- It is essential that full route continuity is provided to the point where the original route is resumed.



Figure 3. Advanced warning signage example as provided by JAQU (Department for Transport; Department for Environment, Food and Rural Affairs, 2018).

As can be seen in **Figure 3**, a distance to the CAZ boundary as well as an implied direction should be shown on the sign. For example, if the sign states 'Clean Air Zone 2 miles on the left', this would indicate that the driver should not turn left if they wish to avoid entering the CAZ. Again, the requirements to inform the public of potential charges is necessary, to help them make early decisions about avoiding the CAZ.

Draft sign faces for advanced warning signs can be found in FBC-01 Appendix A of this FBC on Drawing Nos. 674726.BR.042.01-CH-DR-1202.

2.4 Enforcement Camera Signs

These will clearly need to be sited at the cordon or boundary entries to the zone to make sure that drivers are aware that ANPR camera technology is in use for enforcement purposes. However, camera signs may also be placed throughout the zone as a reminder to drivers within the CAZ. The required sign face is shown in **Figure 4** below.



Figure 4. Enforcement camera sign example as provided by JAQU (Department for Transport; Department for Environment, Food and Rural Affairs, 2018)

As noted above, these signs will additionally be required wherever ANPR cameras are positioned within the zone to capture key journeys within the zone. The purpose of this will be to identify journeys made by non-

compliant vehicles which are wholly within the CAZ. The importance of this will be influenced by the size of the intended zone and the inclusion of key local vehicle trip 'attractors'.

Draft sign faces for enforcement camera signs can be found in FBC-01 Appendix A of this FBC on Drawing No. 674726.BR.042.01-CH-DR-1201.

2.5 Non-prescribed sign approval

The development of a 'suite' of sign faces for use within B&NES and on the SRN (Highways England) is required. The JAQU Technical Signing Guidance states in Section 6 that "*Local authorities can apply to the Department for Transport (DfT) for authorisation by emailing Authorisation.Requests@dft.gov.uk and "Local authorities are able to apply for an area wide authorisation for the suite of signs. This can be completed in one authorisation. If a CAZ boundary crosses another authority's road, then both will need to apply for authorisation. Handling could be through one lead local authority, but DfT will require a completed application form from each authority. Similarly, for signing on the Strategic Road Network, this can be coordinated by the local authority, however, an application will also be required from Highways England"*

The suite of signs proposed within B&NES received non-prescribed sign approval from the DfT in November 2019. Discussions are ongoing with Highways England (HE) in relation to the proposed CAZ signage on the SRN, and this separate application will be submitted once the signage proposals are agreed with HE and JAQU.

3. Proposed Signage Locations

3.1 Boundary and Internal Signage

The proposed signage locations have been planned with the signage guidance in mind, as detailed in Section 2. Requirements for entry, exit and enforcement signs were firstly identified at each of the boundary crossing or 'cordon' points, as detailed in **Table 1**. Internal locations with enforcement camera signing are also indicated.

Table 1. Proposed Signing at the Bath CAZ Boundary Crossing Points (and internal camera locations).

| Location Reference | Location on Map | No of Sign Faces | | | Drawing Reference |
|--------------------|--------------------------------|------------------|------|---------|-------------------|
| | | Entry | Exit | Enforce | |
| 1 | Lansdown Road | 2 | 2 | 0 | 0002 |
| 2 | Richmond Road | 2 | 2 | 0 | 0002 |
| 3 | Camden Road | 2 | 2 | 0 | 0003 |
| 4 | Gay's Hill | 1 | 1 | 0 | 0003 |
| 5 | London Road | 2 | 2 | 0 | 0005 |
| 6 | Warminster Road | 2 | 2 | 0 | 0006 |
| 7 | North Hill | 2 | 2 | 0 | 0007 |
| 8 | Sydney Road | 2 | 2 | 0 | 0008 |
| 9 | Bathwick Hill | 2 | 2 | 0 | 0009 |
| 10 | Pulteney Gardens | 2 | 2 | 0 | 0011 |
| 11 | Widcombe Hill | 2 | 2 | 0 | 0012 |
| 12 | Prior Park Road | 2 | 2 | 0 | 0012 |
| 13 | Lyncombe Hill | 3 | 3 | 0 | 0012 |
| 14 | Wells Road / Roman Road | 2 | 2 | 0 | 0015 |
| 15 | Bloomfield Avenue | 2 | 2 | 0 | 0016 |
| 16 | Oldfield Road | 2 | 2 | 0 | 0016 |
| 17 | Upper Oldfield Park | 2 | 2 | 0 | 0017 |
| 18 | Westmoreland Road | 2 | 2 | 0 | 0017 |
| 19 | Brougham Hayes | 2 | 2 | 0 | 0019 |
| 20 | Lower Bristol Road | 2 | 2 | 0 | 0019 |
| 21 | Stothert Avenue | 2 | 2 | 0 | 0019 |
| 22 | Upper Bristol Road | 2 | 2 | 0 | 0021 |
| 23 | Victoria Park | 1 | 0 | 0 | 0022 |
| 24 | Weston Road | 2 | 2 | 0 | 0022 |
| 25 | Cavendish Road | 2 | 2 | 0 | 0023 |
| 26 | Lansdown Crescent | 2 | 2 | 0 | 0002 |
| 27 | Lansdown Road | 0 | 1 | 0 | 0002 |
| I1 | Cleveland Place | 0 | 0 | 2 | 0005 |
| I2 | Sydney Place / Bathwick Street | 0 | 0 | 3 | 0024 |
| I3 | Walcot Street | 0 | 0 | 2 | 0025 |
| I4 | Walcot Street | 0 | 0 | 1 | 0025 |
| I5 | Manvers Street | 0 | 0 | 1 | 0012 |

| Location Reference | Location on Map | No of Sign Faces | | | Drawing Reference |
|--------------------|---------------------------------------|------------------|-----------|-----------|-------------------|
| | | Entry | Exit | Enforce | |
| I6 | Ivo Peters Road | 0 | 0 | 2 | 0019 |
| I7 | Chapel Row | 0 | 0 | 2 | 0026 |
| I8 | Charlotte Street / Queen Square Space | 0 | 0 | 2 | 0026 |
| TOTAL | | 51 | 51 | 15 | |

The drawing reference refers to the set of drawings that can be found in FBC-01 Appendix A of this FBC numbered 674726.BR.42.01- CH-DR-0001 to 0038. For example, for Location 20 Drawing No. 674726.BR.42.01-CH-DR-0019 should be viewed.

It is proposed that the majority of the CAZ cordon points will have two entry and two exit signs, one of each on both sides of the carriageway. Posts will be required on both sides of the carriageway for the erection of one entry and one exit sign anyway, so adding the additional sign to the opposite side will be simple and inexpensive. This will help to make the CAZ boundary crossing point very clear and conspicuous to drivers of chargeable vehicles. However, in some locations, signs are not proposed to be 'doubled up'. This is because of the following:

- Location 4 is a two-way road with suitable areas only on one side. Therefore, the erection of posts is not possible on both sides on the carriageway; and
- Locations 23 and 27 are one-way roads. Therefore, this has been deemed unnecessary, as erection of posts is not required on both sides on the carriageway; and
- Locations I1, I2, I3, I4, I5, I6, I7 and I8 are internal ANPR camera locations, so only 'Enforcement' signage is necessary to make drivers aware that ANPR cameras are present.

A series of site visits have been carried out with B&NES officers to agree the sign mounting positions.

3.2 Advanced Warning Signage

Necessary advance-warning signage has been proposed and located by following the principles in Section 2.3. This has included the proposed location of warning signage at the last possible or most viable 'decision point' prior to reaching the CAZ boundary, thus warning and allowing drivers of non-compliant vehicles an opportunity to avoid the CAZ before errantly crossing the cordon. In many cases the advanced-warning signage is at the last junction before the CAZ boundary.

Further to this, additional advance-warning signs have been proposed at strategic locations on the major arterial roads into Bath, including the Strategic Road Network (SRN) - A46(T) and A36(T). This is primarily for use by non-compliant HGVs, which in some cases will require much earlier warning to take a safe and suitable route around the CAZ. The proposed location of these signs are as follows:

Table 2. Proposed Locations of Advanced-Warning Signs for the Bath CAZ (showing relevant speed limits and the acting Highway Authority at each of these locations)

| Location Reference | Location on Map | Speed Limit (mph) | Highway Authority | Drawing Reference |
|--------------------|-------------------|-------------------|-------------------|-------------------|
| 1A | Lansdown Road | 30 | B&NES | 0001 |
| 1B | Sion Road | 20 | B&NES | 0001 |
| 2A | Richmond Road | 20 | B&NES | 0001 |
| 3A | Fairfield Road | 30 | B&NES | 0004 |
| 3B | Eastbourne Avenue | 30 | B&NES | 0004 |
| 5A | Snow Hill | 20 | B&NES | 0005 |

| Location Reference | Location on Map | Speed Limit (mph) | Highway Authority | Drawing Reference |
|--------------------|---------------------|-------------------|-------------------|-------------------|
| 5B | London Road | 30 | B&NES | 0005 |
| 6 | Warminster Road | 30 | B&NES | 0006 |
| 7A | Cleveland Walk | 20 | B&NES | 0007 |
| 7B | North Hill | 20 | B&NES | 0007 |
| 8A | St Ann's Way | 20 | B&NES | 0008 |
| 8B | Sham Castle Lane | 20 | B&NES | 0008 |
| 9A | Sydney Buildings | 20 | B&NES | 0009 |
| 9B | St Ann's Way | 20 | B&NES | 0009 |
| 9C | Cleveland Walk | 20 | B&NES | 0010 |
| 9D | Bathwick Hill | 30 | B&NES | 0010 |
| 10A | Horseshoe Walk | 20 | B&NES | 0011 |
| 10B | Abbey View | 20 | B&NES | 0011 |
| 11 | Widcombe Hill | 30 | B&NES | 0013 |
| 12A | Ralph Allen Drive | 30 | B&NES | 0013 |
| 12B | North Road | 30 | B&NES | 0014 |
| 12C | North Road | 30 | B&NES | 0014 |
| 13 | Lyncombe Hill | 30 | B&NES | 0012 |
| 15A | Bloomfield Road | 20 | B&NES | 0015 |
| 15B | Wells Way | 30 | B&NES | 0015 |
| 16A | Junction Road | 20 | B&NES | 0016 |
| 16B | Oldfield Road | 20 | B&NES | 0016 |
| 18 | Lower Oldfield Park | 20 | B&NES | 0018 |
| 19A | Lower Oldfield Park | 20 | B&NES | 0018 |
| 19B | Livingstone Road | 20 | B&NES | 0018 |
| 20 | Lower Bristol Road | 30 | B&NES | 0020 |
| 21 | Windsor Bridge Road | 30 | B&NES | 0020 |
| 22A | Windsor Bridge Road | 30 | B&NES | 0020 |
| 22B | Park Lane | 20 | B&NES | 0021 |
| 22C | Upper Bristol Road | 30 | B&NES | 0020 |
| 23 | Park Lane | 20 | B&NES | 0022 |
| 24 | Weston Road | 20 | B&NES | 0022 |
| 25 | Sion Hill PI | 20 | B&NES | 0023 |
| 28 | A46 | 50 | Highways England | - |
| 29 | A4 | 50 | Highways England | - |
| 30 | London Road West | 30 | B&NES | 0027 |
| 31 | Gloucester Road | 20 | B&NES | 0028 |
| 32 | London Road West | 30 | B&NES | 0028 |
| 33 | Claverton Down Road | 20 | B&NES | 0029 |
| 34 | A36 Viaduct | 40 | Highways England | - |

| Location Reference | Location on Map | Speed Limit (mph) | Highway Authority | Drawing Reference |
|--------------------|----------------------------|-------------------|-------------------|-------------------|
| 35 | A36(T) Beckington | Nat | Highways England | - |
| 36 | Midford Road | 30 | B&NES | 0030 |
| 37 | Midford Road | 30 | B&NES | 0031 |
| 38 | Wellsway | 30 | B&NES | 0031 |
| 39 | Roman Road | 30 | B&NES | 0031 |
| 40 | Roman Road | 40 | B&NES | 0032 |
| 41 | A39 Wells Road | 50 | B&NES | 0033 |
| 42 | A4 Bristol Road | 50 | B&NES | 0033 |
| 43 | A4 Bristol Road: Eastbound | 60 | B&NES | 0034 |
| 44 | Newbridge Road | 30 | B&NES | 0035 |
| 45 | Kelston Road | 30 | B&NES | 0036 |
| 46 | Lansdown Road | 50 | B&NES | 0037 |
| 47 | Lansdown Road | 50 | B&NES | 0038 |

As can be seen in Table 2, not all the advance-warning signs are located on roads administered by B&NES as Highway Authority; some are on the Strategic Road Network (SRN) maintained by Highways England. In these cases, consultation with HE is required to agree the positioning of these signs.

The current speed limit in force at each of the advance signing locations has also been included in the table, as this will dictate the size of the sign required and the supporting post arrangement needed. This is likely to require a need for passively safe posts in the higher speed locations.

For SRN signage, discussion with HE is ongoing. This continued dialogue is important, as securing agreement for any proposed signs on the SRN can take extended consultation to get the design and positioning approved.

In discussion with B&NES officers, it is agreed that making use of the existing Variable Message Signs (VMS) to accompany the introduction of the CAZ would assist in imparting extra information to the public. Extra text could include messages such as: "BATH CLEAN AIR ZONE STARTS [DATE]", "BATH CLEAN AIR ZONE INFORMATION BATHNES.GOV.UK" and "BATH CLEAN AIR ZONE AHEAD", subject to DfT approval. If this was not accepted by DfT then temporary static signs could be used for this purpose to supplement the permanent advance signing.

3.3 Sign Installation

The possibility of combining CAZ signs with existing signs and lighting columns in the City Centre has been considered, to minimise visual intrusion and cost. Where possible, existing lighting columns will be used for enforcement camera signs.

It is probable that most of the locations will require trial holes. Due to utilities and cellars in some locations, a specialist post arrangement may be needed and in some other locations the post may not be able to be installed without obstructing the footway. As such a specialist foundation with retention socket detail is proposed, to enable flexibility with managing existing constraints and the foundations to be installed initially, with the posts and sign faces erected at a later point, closer to the CAZ operational date.