



Bristol City Council Clean Air Plan
Outline Business Case

Signage Design Strategy

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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 Bristol City Council (BCC). BCC has monitored and endeavoured to address air quality in Bristol for decade and declared their first Air Quality Management Area in 2001. Despite this, Bristol has ongoing exceedances of the legal limits for Nitrogen Dioxide (NO₂) and these are predicted to continue until around 2029 without intervention.

The UK has in place legislation transposing requirements in European Union law, to ensure that certain standards of air quality are met, by setting Limit Values on the concentrations of specific air pollutants. In common with many EU member states, the EU limit value for annual mean nitrogen dioxide (NO₂) is breached in the UK and there are on-going breaches of the NO₂ limit value in Bristol. The UK government is taking steps to remedy this breach in as short a time as possible, with the aim of reducing the harmful impacts on public health. Within this objective, the government has published a UK Air Quality Plan and a Clean Air Zone Framework, both published in 2017. The latter document provides the expected approach for local authorities when implementing and operating a Clean Air Zone (CAZ).

Due to forecast air quality exceedances, in 2017 Bristol City Council has been directed by the Minister Therese Coffey (Defra) and Minister Jesse Norman (DfT) to produce a Clean Air Plan to achieve air quality improvements in the shortest possible time. In line with Government guidance, as part of the Plan, Bristol City Council has considered a range of options for the 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 and in line with legal requirements as set out below. This process requires the production of a Strategic Outline Case, an Outline Business Case (this report and a Full business Case, that will be prepared following the Outline Business Case.

In line with Government guidance BCC is considering implementation of the 'Hybrid Option' which includes a diesel car ban across a small area (from 7am-3pm) and a charging scheme for non-compliant buses, taxis, HGVs and LGVs, alongside a number of other measures. An Outline Business Case (OBC) has been produced 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 Bristol. The OBC assesses the shortlist of options set out in the Strategic Outline Case, and proposes a preferred option including details of delivery. The OBC forms a bid to central government for funding to implement the CAP.

This document is written to support the OBC and defines the signage strategy with regards to the Bristol City Council (BCC) Clean Air Plan 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)^{2, 3} and their Joint Air Quality Unit (JAQU)⁴. This guidance sets out the different types of signs required as part of scheme implementation.

Following this discussion on required signs, the current proposed locations of all the signage relating to the hybrid option (which contains a Medium CAZ C and a small area car diesel ban) are outlined, covering zone entry, zone exit, enforcement and advance-warning signs. The rationale 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 current proposed boundary location. This zone boundary and its evolution to date is described in a separate report discussing scheme boundary changes.

As the project is still in its development phase, the signage positions are subject to change. As noted above, the boundary of the zone is not necessarily fixed and agreed at this stage so, whilst major changes are not envisaged, there may be minor adjustments to its extent. This will clearly affect the positioning of zone entry/exit

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>

³ Clean Air Zone Framework; DEFRA

⁴ Signs and Road Markings for Charging Clean Air Zones; JAQU

⁵ Clean Air Zone Symbol Guidance; DEFRA

signing, whilst it may dictate a need for reviewing/amending the position of advance-warning signs as appropriate.

This document reflects the changes made since the scheme was originally put out to public consultation and addresses some of the issues which have arisen since then.

Draft

2. Signage Guidance

2.1 Medium Clean Air Zone Class C

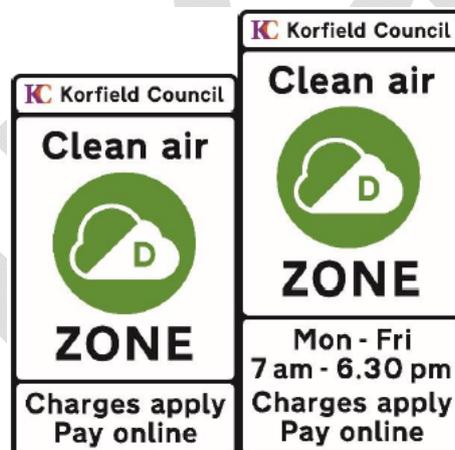
The Clean Air Zone Framework⁵, states in Section 3.8 ‘A minimum requirement for setting up a Clean Air Zone is to “have signs in place along major access routes to clearly delineate the zone”’. The Signs and Road Markings for Charging Clean Air Zones goes into further detail, stating a requirement for the following⁶;

- 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 motorway and 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 a sign centrally, with the assistance of the signs team in the DfT. It is anticipated these signs will be incorporated into the Traffic Signs Regulations and General Directions (TSRGD) during the Autumn 2019 so that they would no longer require special authorisation from the DfT.

2.1.1 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 (2).



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 Bristol 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 Appendix Ai to the OBC on Drawing No. E19015 – P0005.

⁵ Clean Air Zone Framework; DEFRA

⁶ Signs and Road Markings for Charging Clean Air Zones; JAQU

2.1.2 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 (2).



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 Bristol CAZ exit signs can also be found in Appendix A.i to the OBC, in this case on Drawing No. E19015 – P0005.

2.1.3 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 divert around 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.
- Essential that full route continuity is provided to the point where the original route is resumed. However it must be taken into account that some drivers, particularly those making longer journeys, will be able to continue to their destination via an alternative route without being returned to their original route. Route number signing will be installed at junctions judged to be suitable alternative routes around the CAZ.

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 to the left', this would indicate that the driver should not turn left if they wish to avoid entering the CAZ, unless their destination is reached before the start of the zone. Again, the requirements to inform the public of potential charges is necessary, to help them make early decisions about diverting their route away from the CAZ.

Draft sign faces for advanced warning signs can be found in Appendix Ai to the OBC on Drawing No. E19015 – P0005.

For more remote signing on the Strategic Road Network (SRN) or other principal roads outside of Bristol, it is proposed to add text stating 'Bristol Central Area', to give better locational information for drivers. However, this will not be needed on advanced warning signs within Bristol or on its urban edge, where the existence of a CAZ in the city can be implied. This variant to the template sign provided by JAQU, will be sought when applying for DfT authorisation for the use of these signs in BCC, neighboring authority areas or on the SRN as required.

Figure 3. Advanced warning signage example as provided by JAQU (2).



2.1.4 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. It is proposed that these camera signs will be co-located with the last warning signs before entering the zone, or mounted separately nearby to these locations. 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**.

Figure 4. Enforcement camera sign example as provided by JAQU (2)



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 inclusion of key local vehicle trip 'attractors'.

Draft sign faces for enforcement camera signs can be found in Appendix Ai to the OBC on Drawing No. E19015 – P0005.

2.2 Diesel car prohibition over the small area

Unlike the Clean Air Zone there is currently no guidance for the implementation of a diesel car prohibition zone and the level of signage that will be required however we believe it would be appropriate to take the signage proposed by JAQU in their Signs and Road Markings for Charging Clean Air Zones document as a basis for an implementation strategy. This strategy would include;

- Clear signing at the point of entry into the diesel car prohibition zone
- Signs in advance of entry, to provide adequate information and to provide alternative routes to divert around it. The motorway and 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 again critical in order that drivers are appropriately informed of the presence of the zone. Signs will need special authorisation from the DfT and should as far as possible match the design principles of the TSRGD and Traffic Signs Manual.

It is proposed that the ban is in place from 07:00 to 15:00 hours. In addition, private hire vehicles and taxis will be exempted from the diesel car ban

Similarly to a weight limit signage, drivers of diesel cars would have no choice but to obey the signs for the diesel prohibition zone. This differs to the CAZ, where non-compliant vehicles would still be able to travel through the zone and pay the charge.

The signage proposed would be similar in format to the Clean Air Zone Signage but replace the “Clean Air Zone” text with the “Diesel Prohibition Zone” text and a revised symbol to better reflect type of zone. For the purpose of the report it is assumed that this is the option to be progressed alongside the Medium CAZ.

It is proposed that the exit and entry signs to the diesel prohibition zone would be illuminated, but advanced signage would not.

It is noted that The Local Authorities' Traffic Orders (Procedure) (England and Wales) Regulations 1996 requires that a public inquiry shall be held if a valid objection is received to any TRO if its effect is to prohibit the loading or unloading of vehicles of any class in a road on any day of the week:

- i. at all times;
- ii. before 07.00 hours;
- iii. between 10.00 and 16.00 hours; or*
- iv. after 19.00 hours.

2.3 Weight Limit Signing

The proposed scheme includes an environmental weight limit area (3.5 tons). Weight limit signage will match the design principles of the TSRGD and Traffic Signs Manual. Signage will include:

- Clear signing at the point of entry into the Weight limit area; and
- Signs in advance of entry, to provide adequate information.

Weight limit signage can be seen within Appendix A, drawing E19015 – P0005 (Diag. 622.1A) and proposed locations of this signage can be found in Appendix A, drawing P0006 and P0011.

The weight limit signage at the entrance to the weight limit area would need to be illuminated to enforce the prohibition in accordance with TSRGD.

The provision of weight limits would need to go through the TRO process, including advertisement of the TRO. In certain circumstances, valid objections to the TRO would result in a public enquiry.

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. Table 3-1 summarises the number of entry and exit signs located on the CAZ, diesel prohibition zone and weight limit areas.

Table 3-1. Proposed number of entry/exit signs

Type of Signage	Number of Locations	Number of Entry Signs	Number of Exit Signs	Total Entry/Exit Signs
CAZ - Boundary Signage	80	131	132	263
Diesel Prohibition Zone – Boundary Signage	58	84	86	170
Weight Limit Area – Boundary Signage	13	26	30	56
Total	151	241	248	489

The locations of the signs for both options can be found in Appendix Ai Drawing No. E19015 – P0006 to P0015.

It is proposed that the majority of the cordon points for both options will have two entry and two exit signs, one of each on both sides of the carriageway. Posts would 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 would be simple and inexpensive. This would help to make the boundary crossing point very clear and conspicuous to drivers. However, in some locations signs are not proposed to be 'doubled up'. This is because they are one-way streets therefore, this has been deemed unnecessary, as erection of posts is not required on both sides on the carriageway. In certain other circumstances, for example a very narrow road, areas lacking footway space and where considerations of amenities are required, one entry and exit sign may be installed.

3.2 Decision Point Signage

Necessary advance-warning signage has been proposed and located by following the principles in 2.1.3

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 divert away from the CAZ before errantly crossing the cordon, in many cases this is at the last junction before the CAZ boundary. The last possible decision point will vary for different classes of vehicle.

3.3 Advanced Warning Signage

Further to the Decision Point Signage, additional advance-warning signs have been proposed at strategic locations on the major arterial roads into Bristol, including the Strategic Road Network (SRN). This is primarily for use by HGVs, which in some cases will require much earlier warning to take a safe and suitable diversionary route around the CAZ. The proposed number of advanced signs for the CAZ, diesel prohibition zone and weight limit area, can be seen in Table 3-2.

Not all the advance-warning signs are located on roads administered by BCC as Highway Authority. Some are on the Strategic Road Network (SRN) maintained by Highways England (HE), whilst some are proposed to be positioned on roads administered by North Somerset Council (NSC) and South Gloucestershire Council (SGC). In these cases, consultation with the acting highway authority will be required to agree the positioning of these signs.

Table 3-2: Proposed number of advanced signs

Type of Signage	Number of Locations	Number of Advanced Signs
CAZ – Advanced Signage	287	287
Diesel Prohibition Zone – Advanced Signage	315	315
Weight Limit Area – Advanced Signage	19	19
Total	621	621

The current speed limit in force at each of the advance signing locations will need to be considered, 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.

Once the cordon points and position of boundary signage has been fixed, the advance-warning signs will need to be reviewed as necessary.

For SRN signage, early discussion with HE, SGC and NSC will need to take place. This early dialogue is important, as securing agreement for any proposed signs on the SRN can take extended consultation to get the design and positioning approved.

All signs, including boundary signs, will vary in size depending on the prevailing speed limit and width of road.

3.4 Sign Installation

The possibility of combining Medium CAZ and Diesel Car Prohibition signs with existing signs in the City Centre will be considered as appropriate, and where practical, to minimise visual intrusion. Additional positional changes may also be necessary at detailed design stage, to ensure there is adequate forward visibility to the signs for approaching drivers and that any existing signs (or signals) are not obscured.

It is probable most of the locations will require trial holes. Due to utilities in some locations, a specialist post arrangement may be needed whilst, in some instances, the post may not be able to be installed without obstructing the footway. As such, it is probable each location will have its own specific issues that will require resource and budget to resolve, which may well outweigh the cost of the sign.

3.5 Next Steps

There are several actions which are being progressed at the Outline Business Case (OBC) of the CAZ project with respect to signage. These are as follows:

- The development of a 'suite' of sign faces for use within BCC, adjoining authority areas (North Somerset Council and South Gloucestershire Council) and on the SRN (HE). 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"*
- Continuing dialogue with Highway England, South Gloucestershire Council and North Somerset Council to obtain 'Technical Approval' for the erection of proposed CAZ signage on the SRN and these other adjoining Authority roads. An immediate priority will be understanding the 'package' of information required for submission for approval in each case, noting also that the HE and other authorities will need to be party to DfT authorisation applications for CAZ signs installed on roads under their jurisdiction.