

Consultation on

Traffic Clean Air Zone options

Update on compliance dates, 2 August 2019

Update on compliance dates

Bristol City Council is consulting on two options for a traffic clean air zone, which aims to bring nitrogen dioxide (NO₂) levels below legal limits. Further details on the proposals are available at bristol.gov.uk/trafficcleanairzone

Reducing air pollution to legal levels is also known as 'reaching compliance'. When thinking about the two options it's important for the council to share a clear timeline for when the city would reach compliance.

When the consultation launched on 1 July 2019, the dates for when the two options would reach compliance were not ready to be released. The technical work required to estimate the dates more precisely has now been undertaken.

This work indicates that the compliance date for Option 1 will be 2029 and for Option 2 will be 2028. Because of how close together these dates are, more technical modelling on each option is needed to reach a definite view on which option would reach compliance in the shortest possible time.

In the air quality directive, the European Union has set limits for NO₂ to protect our health. Therefore, the annual average of NO₂ must not exceed 40 micrograms per cubic metre (µg/m³). Technical work to see how quickly Bristol can meet this limit shows the majority of roads in Bristol are predicted to meet compliant levels before the indicative compliance dates (Option 1 in 2029 and Option 2 in 2028).

Non-compliant NO₂ levels

A technical note, prepared by the council's engineering consultant, Jacobs, includes a table showing projected pollution readings for both consultation options at nine locations in Bristol which currently record illegal NO₂ levels. The table also shows when each location is predicted to reach compliant levels of NO₂ for the two options. In Option 2, two locations – Marlborough Street and Church Road – are estimated to take longest to reach compliance. In Option 1, Park Street holds back the compliance date.

Background and baseline NO₂

Background NO₂ indicated in the table refers to the level of pollution away from busy roads while baseline figures show what pollution would look like if the council didn't introduce any interventions, beyond what is already planned. The baseline takes into account the fact vehicle engine technology is expected to improve year on year.

Sensitivity tests

Sensitivity testing carried out by Jacobs involves checking different variables which could affect the modelling, and hence the date of compliance, to ensure they don't radically change the outcome. It is important to check every scenario which could affect how quickly the two options reduce NO₂.

Street canyons

Air pollution lingers for longer in some areas of Bristol, for example in between tall buildings, also known as street canyons. This leads to higher concentrations and therefore illegal NO₂ levels. Marlborough Street is particularly sensitive to these conditions.

**Clean Air
for Bristol**



Technical Note: Bristol Traffic Clean Air Zone proposals Option 1 and Option 2 Compliance year

Prepared for: **Bristol City Council**
Prepared by: **Jacobs**

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1. Introduction

The purpose of this Technical note is to report the compliance year for two options which are currently being considered as part of the Bristol City Council consultation on Traffic Clean Air Zone options.

2. Context

To meet UK Government regulations, local authorities must demonstrate that they are working towards the National Air Quality Objectives. The objective level for concentrations of NO₂ and PM10 within the UK national legislation are the same as limits set within the European Ambient Air Quality Directive – AAQD (2008/50/EC) annual mean of 40 µg/m³) but are applied and assessed differently. Air Quality Objectives only apply where people are exposed for the averaging period of the objective (i.e. for a year) and therefore compliance with air quality objectives is assessed at building facades (where people are regularly present). Compliance with AAQD as transcribed by the Joint Air Quality Unit (JAQU) in order to comply with European air quality reporting protocols stipulate that compliance of Limit Values must be achieved at specific road side locations (i.e. within 4m) where there is public accessibility. This Technical Note will inform the Outline Business Case for the delivery

of a package of measures which will bring about compliance with the Limit Value for annual mean nitrogen dioxide in the shortest time possible in Bristol.

Prior to the work on the current options, modelling and assessment work was undertaken and reported in the following draft technical documents:

- Option Assessment Report
- Economic Case (for an Outline Business Case)
- Supporting transport and air quality modelling documentation

These documents will be updated to reflect the new options once all the assessment work is complete including the economic, social and financial implications of the scheme. Also, work is required to understand the sensitivity of the models to changes in key assumptions.

3. Option definition

3.1 Option 1 Clean Air Zone (private cars not charged)

Option 1 includes:

- A charging scheme for non-compliant buses, taxis, HGVs and LGVs. This charge would apply once a day regardless of how many times a non-compliant vehicle is driven in or out of the Medium area zone.
 - Taxis £9.00
 - LGVs £9.00
 - HGVs £100.00
 - Buses £100.00
 - ● Coaches £100.00

- Non-compliant vehicles are diesel vehicles which are Euro 5 or older and petrol vehicles which are Euro 3 or older – known as ‘non-compliant vehicles’. The “Euro” number relates to the emission standard set by the European Commission for certain types of vehicle. The larger the Euro number, the less polluting the engine is. More information on Euro standards is available within Table 1 of the consultation material.
- A HGV weight restriction (3.5 tons) on some of the most polluted routes: Rupert St, Baldwin Street, Park Row/Upper Maudlin Street, Marlborough Street and Lewins Mead: 24 hours a day, seven days a week.

- A diesel car ban on Upper Maudlin Street and Park Row running from St James Barton roundabout to Park Street – not including James Barton roundabout itself, 7am to 3pm, seven days a week (this would not apply to taxis, private hire vehicles or emergency vehicles).
- Bus and local traffic interventions in the most polluting areas; this includes an inbound bus lane on the M32 from Junction 2 to Cabot Circus car park, an inbound bus lane on Cumberland Road, and using existing traffic signals to control the amount of traffic entering congested areas with poor air quality.
- A scrappage scheme (up to £2,000) for private diesel cars. This would provide a grant towards a new

vehicle or an alternative mode of transport. Vehicles belonging to residents in Bristol, Bath & North East Somerset, North Somerset and South Gloucestershire would be eligible – as long as their drive into work includes the Option 1 charging zone area.

3.2 Option 2: Diesel car ban

Option 2 includes:

- All diesel cars would be banned from entering a specific central area from 7am to 3pm, seven days a week (this would not apply to taxis/private hire or emergency services).

Other measures including a local scrappage scheme have not been included but could be considered in Option 2.

4. Compliance year

The year of compliance is the first year that all modelled receptor locations show NO₂ at 40 µg/m³ or less. Table 4.1 shows the compliance details at locations which have NO₂ level that could drive the option compliance year.

This indicates that Option 1 would be compliant in 2029 and Option 2 would be compliant in 2028.

Table 4.1: Details of the non-compliant sites.

	Rupert Street	Marlborough Street	Upper Maudlin Street	Park Row	Park Street	Queen's Road	College Green	Newfoundland Way	Church Road
2021 Results (ug/m3)									
Background NO ₂	19.0	19.2	19.4	18.9	18.0	17.8	18.3	17.6	15.7
Baseline – updated	50.0	59.4	46.9	47.5	49.1	41.9	49.2	50.6	53.3
Option 1	45.4	47.6	39.2	36.8	48.0	40.2	43.6	44.2	50.3
Option 2	46.2	51.1	41.9	40.3	47.1	38.9	46.3	45.8	53.9
2031 Results (ug/m3)									
Baseline – updated	32.9	37.6	29.6	30.2	31.9	27.0	29.8	31.9	32.1
Option 1	33.0	34.2	27.8	27.1	37.0	30.2	30.5	31.6	32.6
Option 2	31.2	32.5	26.9	26.7	29.5	25.3	28.2	29.2	31.9
Compliance Year									
Baseline – updated	2027	2030	2025	2026	2027	2023	2026	2027	2028
Option 1	2026	2027	2021	2021	2029	2022	2024	2025	2027
Option 2	2026	2028	2023	2022	2026	2021	2025	2025	2028

4.1 Sites which are ‘holding back’ the compliance date

The sites which are “holding back” the compliance dates are as follows:

Option 1:

- Park Street

Option 2:

- Marlborough Street
- Church Road

4.2 Certainty of year of compliance

The assessment indicates Option 1 will be compliant in 2029 and Option 2 will be compliant in 2028, subject to some further sensitivity testing. Given the proximity of the compliance dates, it is important to understand the potential variance of the compliance date associated with changes of key assumptions. There will be greater certainty of this following the completion of sensitivity tests as part of the Outline Business Case work. The proposed sensitivity tests are shown in Table 4.2.

Table 4.2: Proposed sensitivity tests

Test name	Description
Euro 6 Diesel Vehicles	Low and High Euro 6/6c/6d Diesel emission scenarios should be modelled.
Emissions at Low Speeds	Speed on any given road section is an average accounting for acceleration and deceleration events, and likely to be lower at start/end of road sections and higher in the middle. JAQU provided ‘Supplementary Note of Sensitivity Testing’ which includes a methodology for assessing sensitivity of emissions at variable speeds.
Background Concentrations	Defra backgrounds have been calibrated based on local background site, but there may be unknown issues with the monitoring. Sensitivity testing would use uncalibrated backgrounds.
Model Verification	This involves examining a selection of monitoring sites to determine whether different combinations of parameters in the modelling set up affect the adjustment factor and therefore the results differently.
Road Widths and Geometries	Risk of uncertainty with professional judgement / assumptions regarding road widths. This can affect the pollution mixing zone and hence the resulting concentration.
Gradients	In assigning gradients to links, some may have been over/under estimated. High/low scenario where height has been raised / lowered by 2m to change the gradient.
Updated EFT	Use the updated EFT version published on Huddle in June 2019 (v9.1). This will test whether the forecast of fleet improvement has a downward emissions effect compared to the version applied at the onset of this study for all scenarios and base case.

Until this work has been completed it is not possible to say definitively which option will result in compliance in the shortest possible time.

It is noted that since the modelling work presented to the client on 6 June 19, work has commenced to understand the sensitivity of the dispersion models to changes in the assessment of street canyons.

These changes will affect previously reported work particularly locations where canyons have an important influence on pollution mixing such as Marlborough Street.