

Sheffield & Rotherham Clean Air Plan (CAP) Full Business Case Executive Summary April 2022

V1_00

Date Issued: April 2022



Rotherham
Metropolitan
Borough Council



Document Controls

Document Approval

Version Number:	V1_00		
Prepared by:	David Connolly	Date:	26 April 2022
Checked by:	Amanda Cosgrove	Date:	26 April 2022
Approved by:	Tom Finnegan-Smith Tom Smith	Date:	27 April 2022

Issue Record

Version	Circulation List	Date Issued	Format Issued
1.0	SCC/RMBC CAZ Team & JAQU	26 April 2022	PDF

Revision History

Version	Nature of Revision

Section 1 Executive Summary

1.1 Context

- 1.1.1** Air quality is a major issue of growing concern and significance at a national and international level. There is categorical evidence that long-term exposure to everyday air pollutants contributes to cardiovascular disease (including heart diseases and stroke), lung cancer, and respiratory disease (including asthma and chronic bronchitis).
- 1.1.2** The UK, including locations in Sheffield and Rotherham, has been in breach of the legal limits for Nitrogen Dioxide (NO₂) levels since January 2010.
- 1.1.3** Both Local Authorities were required to work together, supported by DEFRA's Joint Air Quality Unit (JAQU), to identify options to reduce annual average concentrations of Nitrogen Dioxide (NO₂) below the legal limit of 40µg/m³, on an annual average, in the 'shortest possible time'.
- 1.1.4** The UK Government issued a Ministerial Direction¹ under which SCC are legally obliged to implement a CAZ C Charging Clean Air Zone and Rotherham to deliver a number of traffic management measures, to achieve compliance in 2021.
- 1.1.5** The two Councils produced an Outline Business Case (OBC), which was approved by Government in February 2020 and have now completed the corresponding Final Full Business Case (FBC). Both the OBC and FBC follow the UK Treasury's '**5 Case Model**', as set out in the HM Treasury Green Book, consisting of five inter-connected 'Cases (Strategic, Economic, Commercial, Financial and Management). Each of these are summarised as stand-alone documents, which together make up this FBC.
- 1.1.6** Additional detailed supporting material is provided in a number of Appendices and Supporting Documents.

1.2 The Problem to Be Solved

Local Air Quality in Sheffield

- 1.2.1** Like many other UK cities, **central Sheffield** also has a problem with air pollution and air quality. There has been an Air Quality Management Area in place across the whole of the urban area of the city for nitrogen dioxide (NO₂) gas and fine particulate matter (PM₁₀) since March 2010.
- 1.2.2** Sheffield and Rotherham's local air quality monitoring suggested that there are a large number of sites across the combined area which were breaching this annual NO₂ limit in 2017 and projecting forward using series data for the air quality at these locations (as part of the preparation of the OBC) suggested that NO₂ concentrations at many of them will continue to be problematic up to and beyond 2021, under a 'Business as Usual' forecast scenario with certain sites not achieving legally compliant levels until 2025.
- 1.2.3** In particular, Arundel Gate, in central Sheffield, which currently operates as a busy bus interchange and is/was exposing a significant number of pedestrians and bus passengers

¹ Environment Act 1995 (Sheffield City Council and Rotherham Metropolitan Borough Council) Air Quality Direction 2020

to its non-compliant levels of NO_x/NO₂ and therefore needs to be addressed within the Clean Air Plan.

- 1.2.4** The key locations in terms of predicted non-compliance with the AQD in 2021 are the A629 Wortley Road, A633 Rawmarsh Hill, A630 Fitzwilliam Road and the A630 Parkway.
- 1.2.5** Sheffield and Rotherham have worked together over the past five years to identify a package of measures which will help ensure area-wide compliance with the relevant limits 'in the shortest possible time'.
- 1.2.6** In line with our legal direction, our Clean Air Plan focuses on tackling Nitrogen Dioxide (NO₂) from road traffic in the shortest time possible. Approximately 50% of NO₂ comes from tailpipes of the city's vehicles.
- 1.2.7** Source apportionment of the NO_x emissions from road traffic suggest that emissions from buses represent over 60% of the traffic emissions on Arundel Gate (in Sheffield) and around 13% of emissions on Rawmarsh Hill (in Rotherham), while emissions from older (pre-Euro 6) Light Goods Vehicles account for more than 20% of the NO_x emissions on Sheaf Street, Derek Dooley Way, the Rotherham end of the Sheffield Parkway, Wortley Road and Fitzwilliam Road.

1.3 Policy Context – the Health Impacts of Poor Air Quality

Public Health Policy

- 1.3.1** The WHO stated that on "Almost 80% of deaths related to PM2.5 could be avoided if the current air pollution levels were reduced to those proposed in the updated guideline". Some of the new guideline values look feasible for the UK to meet, within this decade, if clean technologies work as hoped and implementing net zero progresses at pace.
- 1.3.2** Nitrogen dioxide (NO₂) is already starting to fall as older vehicles retire and battery electric vehicles increase in number; there is the prospect of largely eliminating this as a cause of harm in the medium to long-term.
- 1.3.3** The WHO's September 2021 report devoted significant space to the most vulnerable in society; underscoring that the risks of air pollution are not evenly distributed. Meeting the public health challenge will need both population shift and effort to protect the most vulnerable. A 1µg/m³ change across a large populated area will have a significant impact. The implications are the need to shift social norms, make an environment that supports non car modes of travel and set out changes that we can all make supported by the right environment.

1.4 Policy Context – Relevant Local Policies & Plans

- 1.4.1** Sheffield's [Clean Air Strategy](#) adopted in December 2017 stated that air pollution is a public health emergency and taking action to improve air quality was urgently required. A number of actions have been delivered across the city with many of the objectives of the strategy included within our Clean Air Plan.
- 1.4.2** The areas prioritised for action to improve air quality in Rotherham are:
- Fitzwilliam Road AQMA;
 - Bradgate AQMA; and
 - Rawmarsh/Parkgate AQMA.

1.5 Local Traffic, Emissions and Air Quality Modelling

1.5.1 The two Councils have used the traffic and emissions forecasts from a multi-modal transport model covering the Sheffield City Region (including all of Sheffield and Rotherham) and the air quality forecasts from an Airviro-based air pollution dispersal model (covering the South Yorkshire area) to develop a full understanding of the location and causes of poor air quality across the two Council areas.

1.5.2 This approach has enabled us to:

- a) predict future NO₂ levels across the two Council areas (and hence identify all potential non-compliant areas);
- b) understand the main sources of the NO_x emissions which are contributing to these local air quality hot-spots – in particular, to identify which vehicle types and EURO emission categories are contributing most to the various problem areas; and
- c) test the likely impacts of the measures which might be introduced to tackle these current and future air quality problems, including the effects of any measures which significantly alter traffic flows across the two Council areas and beyond.

1.6 The Outline Business Case

1.6.1 An Outline Business Case identifying the Preferred Option for tackling the non-compliant levels of NO₂ was submitted to Government in December 2018 and approved in February 2020.

1.7 The Case for Change

1.7.1 The following facts set-out the Case for Change here:

- air quality in 2019 (ie pre-Covid) was non-compliant with the required annual average NO₂ standard at a number of locations in Sheffield and Rotherham;
- compliance can be achieved more-quickly by introducing cost-effective measures to reduce the number of older dirtier vehicles driving through these locations than simply waiting for 'Business as Usual' vehicle replacement to solve the problem encourage the relevant vehicle owners to upgrade their vehicles;
- the Secretary for State (and SCC and RMBC) are legally obliged to achieve compliant air quality 'in the shortest possible time'; and
- Sheffield and Rotherham are currently legally obliged to deliver a CAZ C scheme and additional supporting measures, to tackle their non-compliant air quality.

1.7.2 Evidence from the ULEZ in London and elsewhere suggests that the most effective way to achieve a significant improvement to the emission profiles of local traffic is to apply a daily charge to older/dirtier (predominantly diesel) 'non-compliant' vehicles.

1.7.3 The required level of fleet upgrades will require significant financial support, if they are to deliver the required reductions in emissions in 'the shortest possible time'.

1.7.4 The extensive transport and air quality modelling and appraisal carried out by Sheffield and Rotherham between 2018 and 2021 has identified and refined the measures needed to deliver this change. This package of measures is described in the following section.

1.8 Critical Success Factors & Spending Objectives

- 1.8.1** The OBC identified three Spending Objectives which were used in the appraisal process to identify the recommended Preferred Option package of measures, as follows:
- **Spending Objective 1:** deliver a package of measures that leads to compliance with annual average NO₂ concentration limits at all relevant locations in the shortest possible time – this is a ‘Critical Success Factor’
 - **Spending Objective 2:** ensure that local residents, disadvantaged groups and businesses are supported where appropriate with the changes we need to improve local air quality for everyone; and
 - **Spending Objective 3:** Create a place where people choose public transport and active travel more often, thereby reducing congestion and emissions, improving people’s health and improving their access to key services.

- 1.8.2** The OBC also used a set of five ‘scorable’ attributes of potential measures to inform its appraisal and scheme selection, as follows:
- **effectiveness** (ability to remove NO_x emissions from SCC/RMBC’s relevant air quality problem areas, measured in Kg of NO_x emission removed from the relevant areas in a specified time period);
 - **cost-effectiveness** (effectiveness divided by the likely cost of the scheme);
 - **deliverability** (no barriers to delivering the scheme within the required timescales);
 - **acceptability** (‘no losers’ and likelihood of public/political support); and
 - **strategic fit** (how well the measure and its outcomes match with SCC’s and RMBC’s broader aims/vision/responsibilities).

1.9 Summary of the Preferred Option

- 1.9.1** The full Preferred Option package required to achieve compliant air quality in the shortest possible time consists of the following components:
- The entire fleet of buses operating scheduled bus services in Sheffield and Rotherham to be upgraded or retrofitted to meet the EURO VI emissions standards;
 - A CAZ C Charging Scheme² covering the area of Sheffield City Centre bounded by, and including, the Inner Ring Road;
 - Significant improvement to the emission standards of the taxi fleets in Sheffield and Rotherham;
 - A limit on the number of buses using Rawmarsh Hill (in Rotherham), with the remainder rerouted via Barbers Avenue and Bellows Road;
 - A ban on HGVs using the steep uphill (i.e. northbound) A629 Wortley Road to access the M1 from Rotherham town centre;
 - A reduction from the national speed limit to 50mph on the section of the Sheffield Parkway approaching/leaving Junction 33 of the M1;
 - Early implementation of a northbound bus gate on Arundel Gate (to prioritise public transport and reduce other general vehicle use);
 - Anti-idling measures on Arundel Gate, to encourage bus drivers to turn off their engines while waiting at the bus stops on Arundel Gate; and
 - A package of incentive measures to deliver the required pace of fleet upgrades.

1.10 Why Doing Less than the Preferred Option Would Risk Failure

² i.e Charging pre-EURO 6 diesel goods vehicles, buses, coaches and taxis and pre-Euro 4 petrol vans a daily charge to enter or travel within the CAZ area

- 1.10.1** A supporting document known as the Analytical Assurance Statement considers in detail a wide range of factors which contribute to the uncertainties with the modelling and forecasting processes and various sensitivity tests reported in a Sensitivity Test Report identify a number of scenarios which reduce the safety margin between the 'best-guess' forecast of annual average NO₂ levels in 2022 and the required 40µg/m³ limit value.
- 1.10.2** We therefore need to build in sufficient slack between the Airviro-based model predictions and the 40µg/m³ limit value. In particular, this variability suggests that doing less is not a reliable option for achieving compliance with this limit value in the shortest possible time.

1.11 Consultation and Stakeholder Engagement

- 1.11.1** The OBC and FBC process included considerable local consultation and stakeholder engagement including:
- In-depth behavioural research with local vehicle owners (in 2017), to inform the modelling of their potential responses to a charging CAZ scheme;
 - an eight-week consultation period in August 2019 seeking the views of Sheffield and Rotherham taxi drivers, businesses, and the general public on the proposals outlined in the OBC;
 - Additional engagement with key stakeholders who would be most economically impacted by the proposed CAZ charges, undertaken during 2020 and early 2021 (undertaken within the relevant Covid restrictions);
 - re-engagement with stakeholders to understand the immediate impacts of the Covid pandemic on business and trades;
 - Collation of additional information to inform the design of the financial mitigation measures;
 - Engagement and consultation with local coach operators based in and around Sheffield and Rotherham, to inform a funding request for additional mitigation measures which was submitted to JAQU in September 2021;
 - Statutory consultation in late 201 to seek stakeholder views on the FBC version of the CAP proposals, including the Charging CAZ scheme, proposed exemptions, financial support measures and to help raise awareness and understanding of the full CAP, particularly the Sheffield CAZ component;
 - A freephone information line and consultation email address;
 - posters and postcards advertising the consultation in 36 public buildings;
 - Email notification to those who had previously requested updates on the CAZ;
 - A number of online briefings with key affected groups; and
 - A number of public Q&A webinars for the general public and local businesses.
- 1.11.2** Focused stakeholder engagement was also undertaken with a number of sector groups representing vehicle owners/operators who would be charged under the CAZ proposals, including hackney carriage drivers and their organisations, Private Hire Vehicle owners and their organisations, HGV owners and operators, bus operators (scheduled & non-scheduled), coach operators, major institutions and organisations in Sheffield and various voluntary, community and faith organisations.
- 1.11.3** The findings and recommendations from all of this consultation and the associated Equality Impact Assessment (EIA) and Health Impact Assessments (HIA) are summarised in the FBC and its supporting documents.

1.12 Benefits, Risks, Constraints and Dependencies

Benefits

1.12.2 The benefits of the Preferred Option are summarised below:

- The Preferred Option will reduce NO₂ concentrations in the relevant air quality hotspot locations (and possibly elsewhere), which will deliver health benefits for those spending time in these locations; and
- The Clean Air Fund measures awarded to SCC & RMBC will ensure that local residents, disadvantaged groups and businesses are supported where appropriate which the changes needed to improve local air quality for everyone and will help ensure that no groups are disproportionately impacted by the Preferred Option.

1.12.3 A detailed appraisal of the costs and benefits of the Preferred Option package of measures is summarised in the Economic Case.

Risks

1.12.4 The Management Case includes a full consideration of the various risks, issues and dependencies affecting the proposed Clean Air Plan.

Constraints

1.12.5 The main constraints affecting the delivery of compliant air quality in the Sheffield and Rotherham area are as follows:

- C01 – inability to significantly influence emissions from non-traffic sources in the time available – the local air quality modelling identifies how much of the relevant NO₂ concentration can be influenced by traffic-related measures – given the significant of major NO_x-producing industries (notably steel and glass production) – this may show that some of the poor air quality issues cannot be adequately addressed by traffic-related measures alone;
- C02 – inability for SCC and RMBC to influence traffic emissions from the M1 (and M18);
- C03 – inability for SCC and RMBC to influence the emissions from diesel trains ('anytime soon');
- C04 - Resource constraints created by lack of funding for local government.
- C05 - Local capacity to supply and install the various retro-fitting technologies;
- C06 – the current shortage of new (right-hand-drive) vans; and
- C06 – the need to consider the ability of the owners of non-compliant vehicles to upgrade within the time available to them.

Other Strategic Issues

1.12.6 The key strategic issue is the need to balance the tension between the short-term objective to deliver a package of measures that leads to compliance with annual average NO₂ concentration limits in the shortest possible time, with the 'Bigger Picture'/longer term objectives of the two Councils.

1.12.7 In particular, the two Councils are keen to avoid introducing short-term measures which make it harder to achieve a long-term switch to more-sustainable modes, or for local short-term air quality issues to be used to block plans and schemes which deliver other significant long-term benefits.

1.12.8 Similarly, the two councils are very keen to ensure that the recommended package of measures does not add to problems faced by any disadvantaged groups, for example by unfairly impacting those on low incomes.

1.12.9 Both Sheffield and Rotherham councils are committed to making the air safe to breathe for all our communities. Achieving legal compliance in the short term and maintaining it for the long-term will require wider population behaviour change, which is likely to require

a high-profile joint communications campaign to encourage and incentivise people to make better travel choices, laying the foundations for a cleaner, healthier and more sustainable city/city region transport network.

1.13 Economic Impact

The Economic Case calculates the monetised benefits and disbenefits of the Clean Air Plan, including the impacts on

- the general public, including changes in emissions, highway congestion and vehicle operating costs;
- vehicle owners, including vehicle upgrade costs, incentives and CAZ charges;
- local and central government, including the costs of setting up and implementing the Clean Air Plan and revenue from CAZ charges

The benefits and disbenefits are all presented in 2018 prices and discounted in line with DfT Transport Analysis Guidance, such that benefits and disbenefits that occur further into the future are given less weighting.

Although the Preferred Option achieves compliance in the shortest possible time, the overall economic benefit of the scheme is negative, delivering a Net Present Value for the core case of -£34m. This is largely made up of travel time and vehicle operating cost disbenefit accrued by non-compliant goods vehicles in Rotherham and the charges paid by the owners of the non-compliant LGV owners who chose not to upgrade their (high-polluting) vehicles. These disbenefits more than offset the monetised benefits generated by the reduced emissions, based on average damage cost values (the valuation applied to each unit reduction in emissions) applied to these emissions.

The sensitivity tests undertaken lead to a range of NPVs between -£25m and £-39m. Using the higher damage cost values leads to the highest PVB but this is still a small negative value (-£4m) as the higher emissions benefits are not large enough to outweigh the travel time, operating cost and LGV vehicle owner disbenefits. The sensitivity tests merely change the scale of the economic disbenefit generated by the Preferred Option.

However, as noted in the Economic Case, the reason to intervene is not to deliver the best value for money (relative to doing nothing), but because intervention has been mandated by government to deliver compliance with EU legal limits for NO_x in the shortest possible timeframe.

1.14 Commercial Strategy

Both Local Authorities will comply with all UK Public Procurement Legislation and therefore, staff must, by law, adhere to the same. Several policies and procedures have been developed to help us achieve these objectives and to ensure that our procurement activities:

- Comply with Public Contract Regulations 2015
- Comply with the Council's Contract Standing Orders

- Are approved in accordance with the Council's Leaders Scheme of Delegation
- Achieve evidenced value for money in terms of quality and the price paid
- Are open and transparent and safeguard against allegations of corruption, fraud, or bias
- Are well documented to provide a clear audit trail
- Manage and address risks as well as opportunities

In addition to the requirements above, SCC and RMBC have an Ethical Procurement Policy which aims to drive ethical behaviour as a standard through the supply chain and deliver more effective, efficient procurement outcomes.

Within the Commercial Case, the procurement strategy sets out the following objectives and for the CAP implementation programme and describes how these will be achieved:

- The best option to deliver the infrastructure and services to achieve compliance with statutory limits for NO₂ concentration within the shortest possible timescales. Delivery of the CAZ relies on critical delivery timelines; as such procurement decisions will need to be informed by identification of options that will minimise procurement timeframes, or which present the least delays or barriers to expediting delivery
- Ensure compliance with all legal, statutory and regulatory requirements

Deliver value for money, where possible ensuring that secondary uses are developed from CAZ-specific infrastructure/services provided.

1.15 Financial Impacts

The FBC confirms that an additional £3,755,616 is required to fully implement our Clean Air Plan Preferred Option measures. Our expectation is that the additional funding required to successfully deliver our CAP mitigation will be funded by JAQU from the Implementation Fund and paid upfront in order to enable delivery to continue at pace.

Our funding requirements account for risks that can be reasonably foreseen and quantified at this stage of the project. The Council is assuming that any unforeseen and/or national scale risks arising that are not accounted for within the Quantified Risk Assessment (QRA) and impact on the capital or operating cost of the scheme will be underwritten by JAQU and funded in the year that the impact is realised.

In the event that the Council incurs operating costs for the CAZ in excess of any income generated by the scheme in the years where the scheme is operational the Council is assuming that any resulting revenue deficits will be underwritten by JAQU and funded in the year that the shortfall is realised.

Positive discussions with JAQU colleagues on the final proposed Clean Air Fund measures have taken place. It is our understanding that our CAF programme will be confirmed outside and in advance of the FBC approval process and the information we have submitted to JAQU in support of this confirms that the full £7,990,000 stretch funding will be required to deliver the programme.

1.16 Management of the S&R CAP Programme

Sheffield and Rotherham councils have track record in delivering transport, technical and environmental projects including complex highway infrastructure schemes, active travel schemes, bus lane enforcement, change management programmes and the

administration of grant funding such as COVID grants. Therefore, both Local Authorities are well placed to deliver the CAP work within their respective remits.

The RAID log sets out the key risk and issues, some of those that could impact on delivery timescales and / or costs are outside the CAP Programmes control, for example:

- Potential limited market supply of vehicles, materials, goods and resources including staff
- Increasing costs of goods, materials, services and fees

The delivery timescales described within the FBC are dependent on a number of factors some of which link directly with the FBC approval process and grant funding, for example:

- Launch of the CAF financial measures is dependent on JAQU sign-off and receiving revised grant terms for the final CAF funding profile within May 2022
- Full scheme implementation is dependent on receiving the final FBC grant funding including contingences / risk allowance
- The launch of exemptions is dependent on FBC approval

A robust Monitoring and Evaluation plan has been developed to support realising the benefits and outcomes required., data will be shared with the central evaluation team at JAQU.