

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

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Document Controls

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Section 1 Executive Summary

1 {Not yet available}

Section 2 Strategic Case

2.1 Context

- 2.1.1** 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).
- 2.1.2** The UK, including locations in Sheffield and Rotherham, has been in breach of the legal limits for Nitrogen Dioxide (NO₂) levels since January 2010.
- 2.1.3** The Department for Environment, Food and Rural Affairs (DEFRA) published its final National Air Quality Plan in July 2017, in response to a High Court ruling in December 2016. This Plan details how compliance with the European Union (EU) Ambient Air Quality Directive will be delivered in the United Kingdom, through focussing on improving air quality in a number of Local Authority areas. Those Local Authorities that have areas that are not compliant with the Directive were identified through national air quality modelling. 28 Local Authorities were included ('mandated') in the plan, including Rotherham Metropolitan Borough Council (RMBC) and Sheffield City Council (SCC). RMBC and SCC were 'jointly mandated' on the basis that the Parkway in both Sheffield and Rotherham was identified as being non-compliant.
- 2.1.4** Both Local Authorities were therefore 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'. The two Councils were required to undertake local feasibility studies to identify the measures that would reduce levels of nitrogen within the 'shortest possible time'. The Councils were required by DEFRA to include options for charging polluting vehicles, where this would deliver compliance in the shortest possible time.
- 2.1.5** In line with the guidance provided by the Government's Joint Air Quality Unit (JAQU)¹, the overall approach to this Study is aligned to follow the UK Treasury's '**5 Case Model**', as set out in the HM Treasury Green Book. The five components of this approach are as follows:
- **Strategic Case** – this aims to answer why are we doing this. It details the local and strategic context, outlining the situation and the case for change;
 - **Economic Case** – this aims to answer what option optimises public value. It conducts options appraisal against criteria and outlines the benefits and the costs of the options;
 - **Commercial Case** – this aims to answer, 'can this be delivered?' It details the service needs, supplier capability and capacity, and the procurement route;
 - **Financial Case** – this aims to answer, 'can and how will this be financed?' It details the funding needs, profile, sources of finance, and financial model; and
 - **Management Case** – this aims to answer how this will be delivered successfully. It details the governance and management arrangements to ensure benefits are delivered, the delivery programme, and the monitoring and evaluation programme.

¹ Made up of staff from Defra and the DfT

- 2.1.6** These five cases were developed through three key sequential deliverables-: the **Strategic Outline Case (SOC)**, the **Outline Business Case (OBC)** and the **Full Business Case (FBC)**. Different levels of completion of each of the 5 Cases was achieved at each of the three stages.
- 2.1.7** Government approved the OBC in February 2020 and issued a Ministerial Direction² 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 and to submit a full business case. At the same time, they awarded funding for delivery of the Clean Air Zone and mitigation funding to support drivers of non-compliant vehicles to upgrade their vehicles. The funding for mitigation measures is allocated from a competitive fund and the funding award was lower than requested.
- 2.1.8** A review of the Sheffield & Rotherham Clean Air Plan (CAP) was announced by SCC in September 2020 to consider the potential implications arising from the implications of the Covid-19 pandemic and wider issues related to the time since the original OBC was developed.
- 2.1.9** Following that review, SCC and RMBC have worked together to produce a Draft Full Business Case (FBC) for the Preferred Option. This Chapter describes the Strategic Case of this FBC. The other four cases are described in subsequent chapters.
- 2.1.10** Additional detailed supporting material is provided in a number of Appendices and Supporting Documents.

2.2 National Context

- 2.2.1** There are legally binding health-based limit values for concentrations of several pollutants in outdoor air, notably NO₂. The UK Government have used a combination of national modelling and monitoring in accordance with legislation to determine the concentrations of these pollutants in order to assess compliance.
- 2.2.2** The Pollution Climate Mapping (PCM) model is the UK's national air quality model and provides outputs of pollutant concentrations in the UK at a 1x1 km resolution and also at around 9,000 roadside locations for urban major roads (A and M class roads).
- 2.2.3** This national modelling identified Sheffield and Rotherham as one of 29 areas in England where concentrations of Nitrogen Dioxide (NO₂) exceed statutory limits and are projected to continue to do so over and beyond the next 3-4 years.
- 2.2.4** In particular, the Government's [National Air Quality Plan](#)³ (NAQP) identified a small number of corridors in the Sheffield and Rotherham area⁴ (See Figure 1 below) which are predicted to still be breaching the statutory 40 µg/m³ limit on the annual average concentration of NO₂ by 2021, under a 'Business as Usual' forecast scenario.

² Environment Act 1995 (Sheffield City Council and Rotherham Metropolitan Borough Council) Air Quality Direction 2020

³ DEFRA (2017) *UK plan for tackling roadside nitrogen dioxide concentrations*, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/633022/air-quality-plan-detail.pdf

⁴ A630 – A57 Parkway (from M1 J33 to City Centre, and sections of the A61 Inner Relief Road).

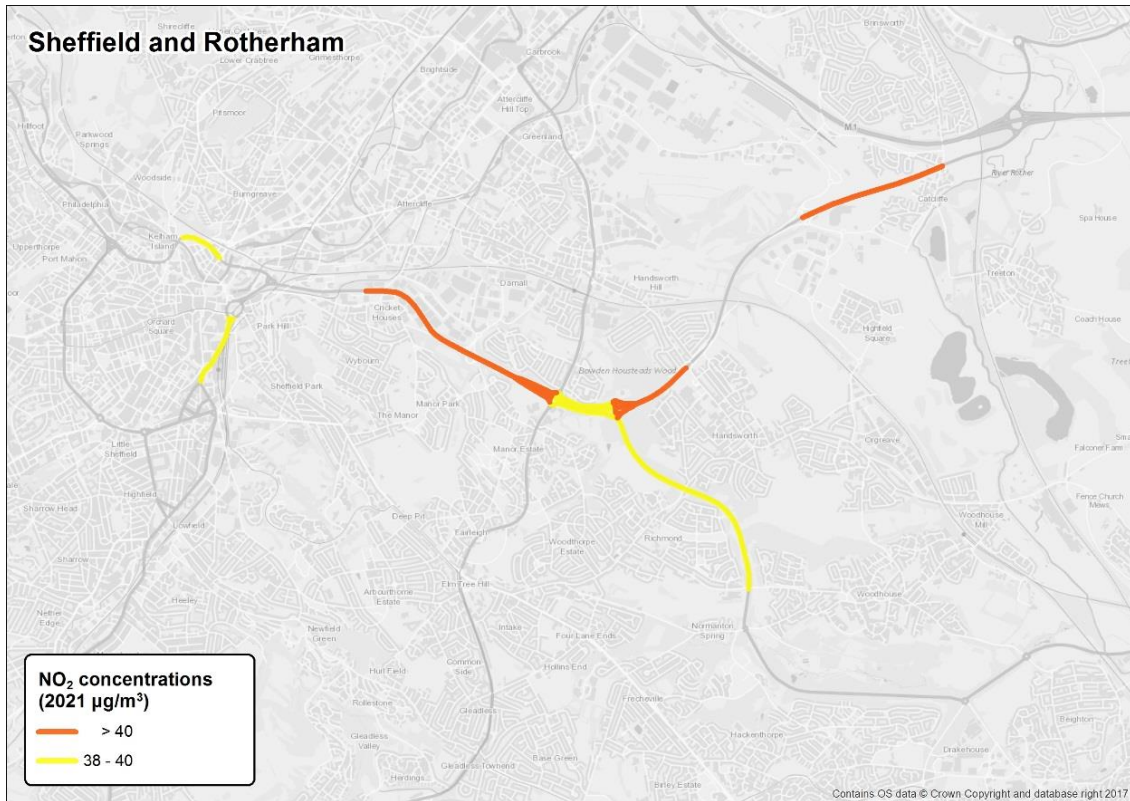


Figure 1 Potential Breaches of the Annual Average NO₂ Limit in 2021 Predicted by Defra's National Modelling

2.2.5 However, further detailed consideration of the PCM links on the Sheffield section of the Parkway (A630 between Sheffield City Centre and the M1) are not valid locations for reporting compliance with the EU LV, as they fall within the EU direction at section A subsection 2(a) (locations where members of the public have no access (as pedestrians and cyclists are prohibited on these road links) and there is no fixed habitation (See Supporting Document AQ2_SD01 for further details).

2.2.6 On the Rotherham stretch of the Parkway, there is one valid receptor point⁵, (where a public Right of Way footpath crosses the Parkway at-grade. The predicted air quality at this location is reported in the relevant technical supporting documents for this FBC.

2.3 The Problem to Be Solved

Local Air Quality in Sheffield

2.3.1 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.

2.3.2 Sheffield and Rotherham's own 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

⁵ (X=440725 East, Y = 387859 North)

them will continue to be problematic up to and beyond 2021, under a 'Business as Usual' forecast scenario.

2.3.3 Sheffield and Rotherham have therefore continued to work together to identify a package of measures which will help ensure area-wide compliance with the relevant limits 'in the shortest possible time'.

2.3.4 Figure 2 below shows the air quality monitoring locations in Sheffield where the annual average concentration of NO₂ exceeded 40 µg/m³ in 2017, with the gradated colour scheme highlighting the scale of the current exceedance. Note that some of these monitoring locations are close to busy junctions and/or closer than 4m from the kerb-side and so do not match with the 'standardised' locations used for determining and reporting compliance with the 40 µg/m³ limit value. The monitoring sites will also not directly correlate with the highest modelled value for each PCM link, which are used when reporting compliance with the EU Directive.

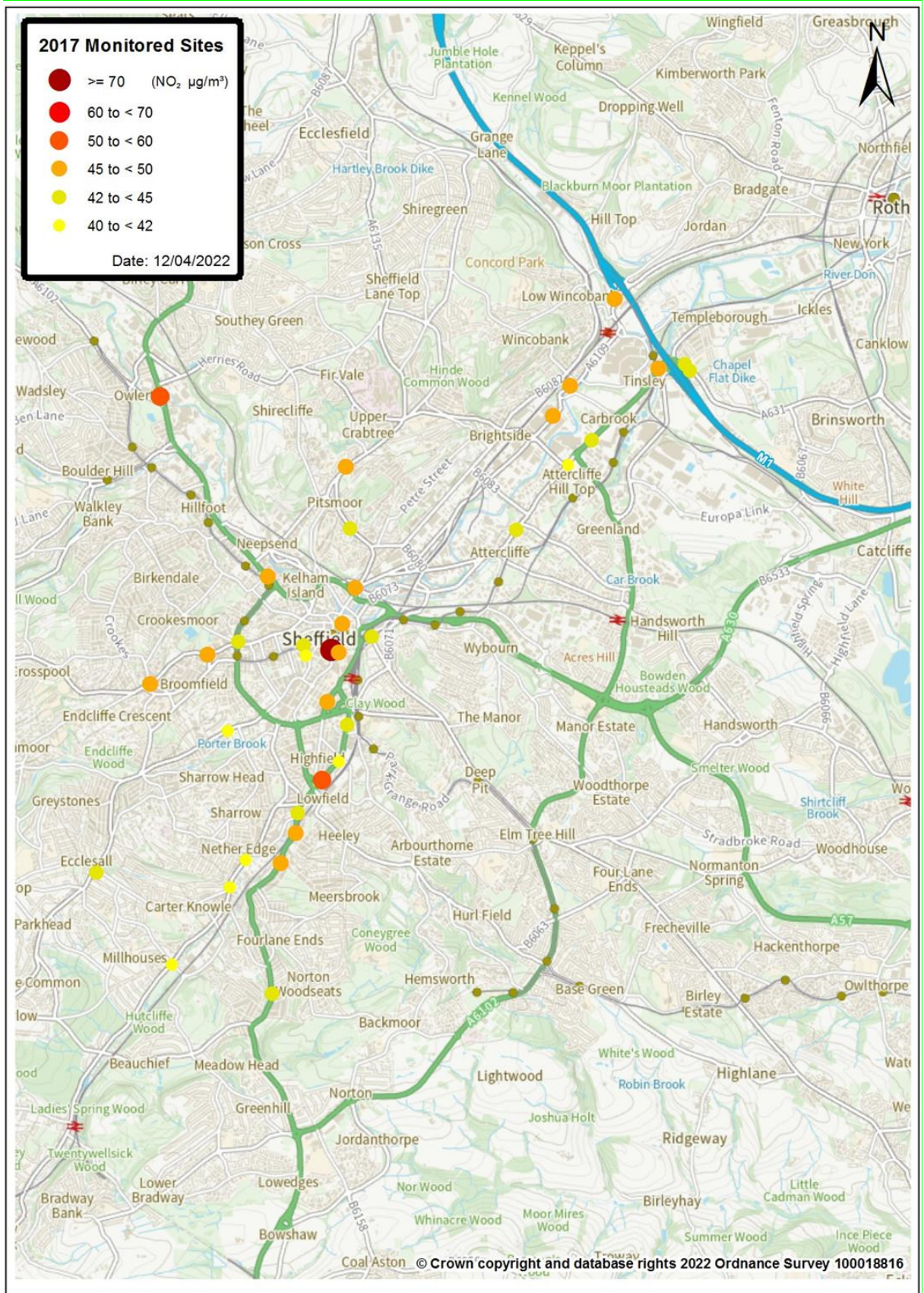


Figure 2 Monitored Locations in Sheffield Exceeding the Annual Average Limit Value of NO_2 in 2017

- 2.3.5** As can be seen from the map in Figure 2 above, the area close to and inside the Inner Ring Road contains a number of monitoring locations that are/were of particular concern.
- 2.3.6** In particular, Arundel Gate, which currently operates as a busy bus interchange and is/was exposing a significant number of pedestrians and bus passengers to its non-compliant levels of NO_x/NO₂ and therefore needs to be addressed within the Clean Air Plan.
- 2.3.7** Following the submission of the OBC in December 2018, more recent roadside air quality monitoring data has become available. This includes data from a number of new potential 'air quality hot-spot' locations identified during the OBC preparation and added to the list of monitored locations at the start of 2019, allowing Sheffield and Rotherham to improve the calibration of their Airviro Air Quality model at these locations.
- 2.3.8** In addition, the traffic model which provided the estimates of current and future NO_x emissions and f-NO₂ parameters for road traffic across the modelled area in the OBC in 2018 has been replaced with a more-up-to-date multi-modal model of the South Yorkshire area. Details of this new transport model are provided in Supporting Documents T2 (Transport Model Validation Report), T3 (Transport Modelling Methodology Report) and T4 (Transport Model Forecasting Report).
- 2.3.9** SCC/RMBC have also undertaken a number of Quality Assurance checks on their Air Quality monitoring and modelling since the OBC submission, including detailed checks of the representation of the monitoring locations, including precise estimates of their distance from the kerbside, which has further improved the calibration of the Airviro model. Full details of this Airviro model and its calibration are provided in Supporting Documents AQ2 (The Air Quality Planning Methodology Report).
- 2.3.10** The latest set of observed and forecast levels of NO₂ for the Sheffield area are summarised in Supporting Document AQ3 (Local Air Quality Modelling Report).
- 2.3.11** The recent trends at the monitored 'Air Quality Hot-spots'⁶ in Sheffield (illustrated by the chart in Figure 3 below), suggest that the annual average concentration of NO₂ was dropping by around 2.7 µg/m³ per annum between 2014 and 2018, but rose by around 1.5 µg/m³ in 2019, before dropping by around 9 µg/m³ in 2020, presumably due to the impacts of Covid19-related restrictions (which should therefore not be included in any forecasting of the 'Business as Usual' trend in local air quality).
- 2.3.12** Additional discussion of the forecasting of 'post-Covid' traffic emissions is provided in Section 2.7 of this Strategic Case.

⁶ Monitoring locations where the annual average NO₂ concentration exceeded 40µg/m³ once or more in the past 5 years

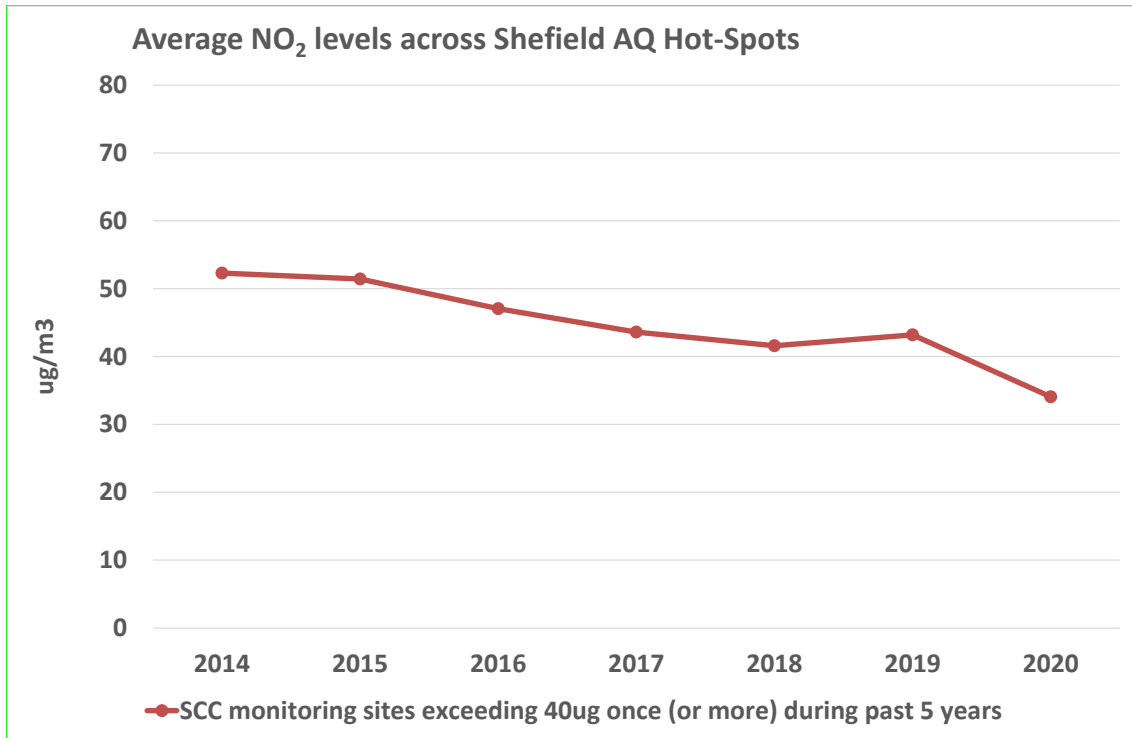


Figure 3 Recent Trend in Annual Average NO₂ Concentrations at the Monitored AQ Hot-Spots in Sheffield

Local Air Quality in Rotherham

2.3.13 In the Rotherham urban area, only one location (namely the A630 Sheffield Parkway) was predicted to be non-compliant in 2021 by the national PCM-based modelling. This location was predicted to remain non-compliant until 2022.

2.3.14 However, although air quality in most of the rest of Rotherham is compliant, a number of areas have been identified as having elevated air pollution and have been declared as Air Quality Management Areas (AQMA) and can be seen (shaded in green) on the map below. The red dots on this map indicate the location of the key air quality monitors. All Rotherham’s AQMAs have been declared because of road traffic.

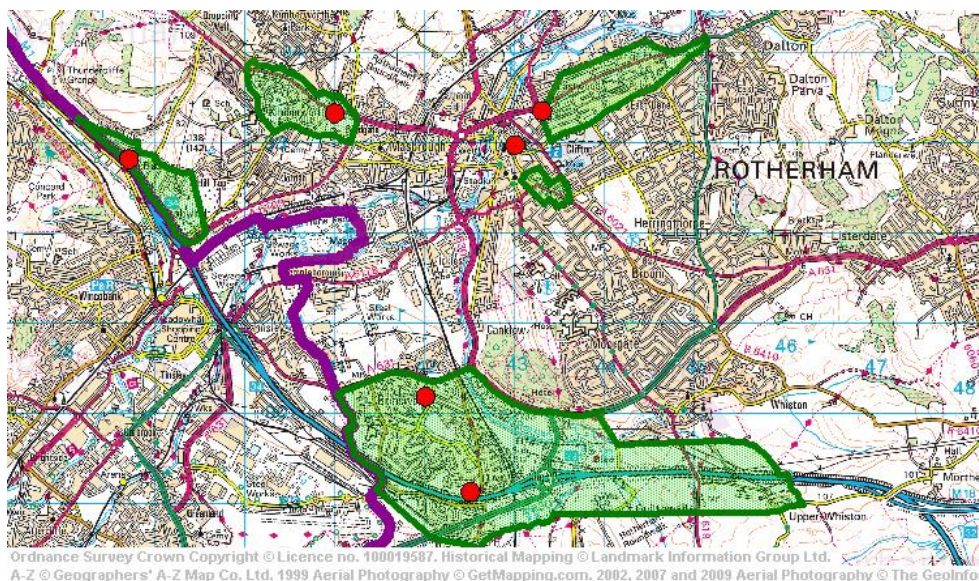


Figure 4 Air Quality Management Areas in Rotherham

2.3.15 The monitoring locations within Rotherham which exceed the National Air Quality Strategy objective of $40\mu\text{g}/\text{m}^3$ in 2017 are illustrated in the map in Figure 5 below. Again, it should be noted that these monitoring locations may be closer to busy junctions &/or the kerbside, so do not match with PCM reporting locations and will not be at the relevant highest modelled NO_2 location for each road link.

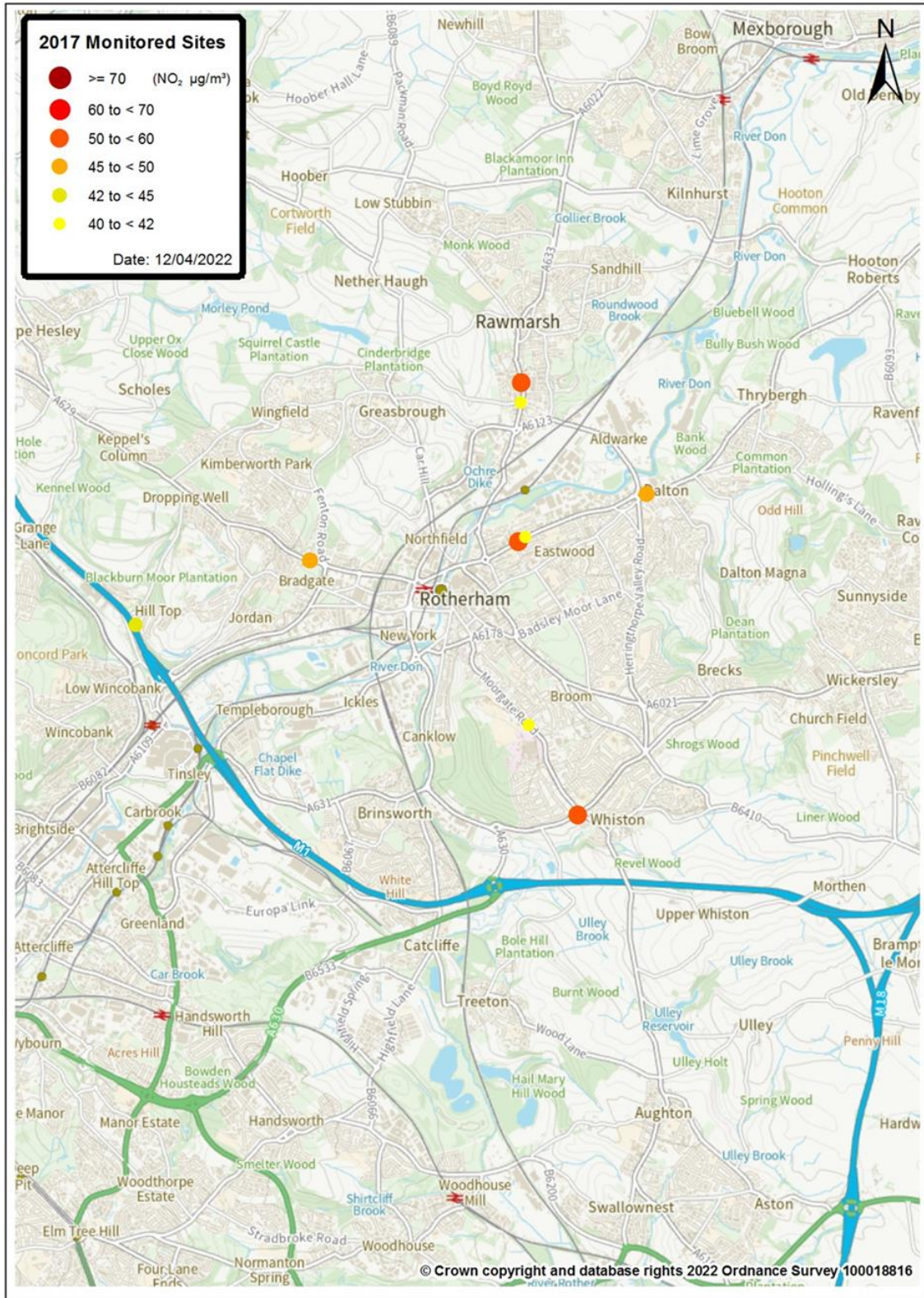


Figure 5 Monitored Locations in Rotherham Exceeding the Annual Average Limit Value of NO_2 in 2017

2.3.16 Analysis of the recent trend in Rotherham’s monitored air quality at these ‘hot-spot’ sites (illustrated in Figure 6 below) suggests that the annual average concentration of NO₂ at the monitored AQ hot-spot locations in Rotherham sites fell by around 1.3µg/m³ per annum between 2014 and 2019, before dropping by more than 10µg/m³ in 2020, presumably due to the impacts of the Covid19 pandemic ‘lock-downs’ on traffic and local industry.

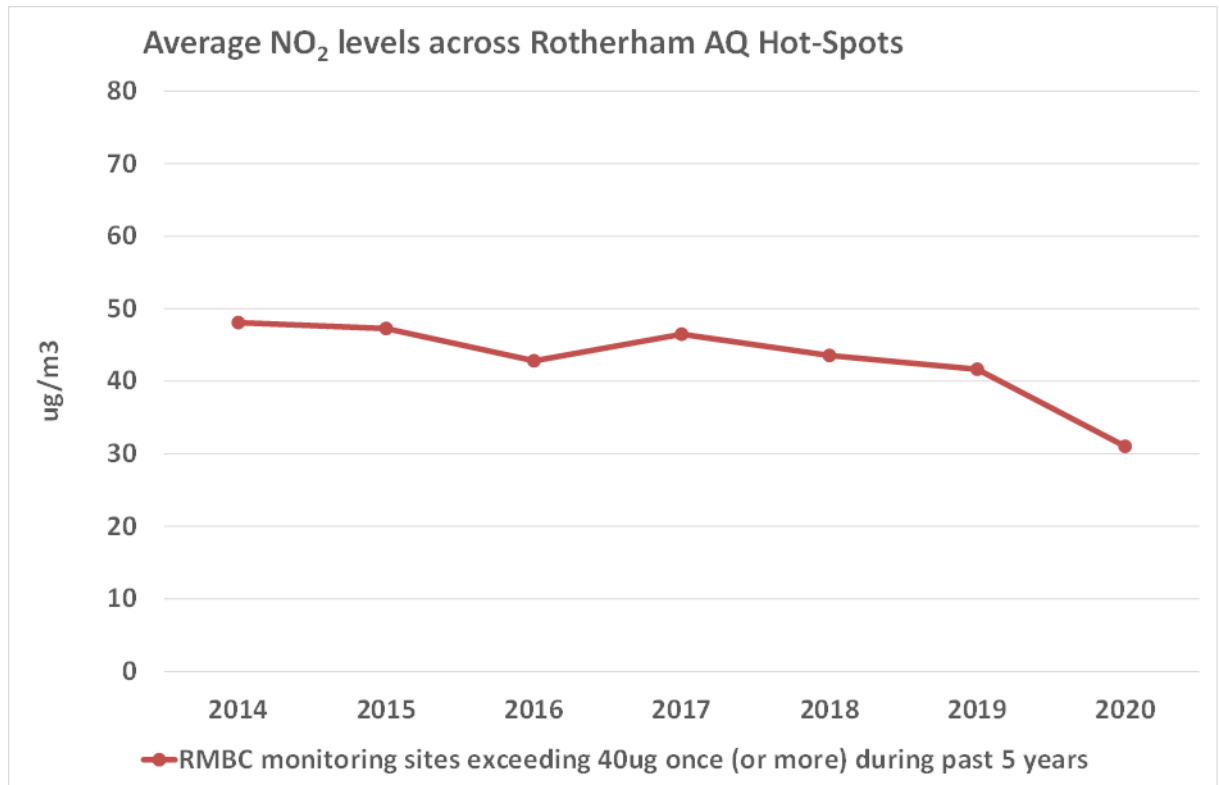


Figure 6 Recent Trend in Annual Average NO₂ Concentrations at the Monitored AQ Hot-Spots in Rotherham

2.3.17 Many of these Rotherham AQ Hot-Spot sites were affected by temporary traffic rerouting through Rotherham to avoid major roadworks on the M1 in 2017, which may help explain the rise in annual average NO₂ levels between 2016 and 2017.

2.3.18 The key locations in terms of potential non-compliance with the AQD in 2021 are expected to be the A629 Wortley Road, A633 Rawmarsh Hill, A630 Fitzwilliam Road and the A630 Parkway. Two of these roads (A629 and A633) have significant gradients, as described below.

2.3.19 The key features of these three locations are as follows:

- The A633 Rawmarsh Hill has a steep uphill gradient (which is not accounted for in the emissions data from the transport model), which results in acceleration from standing at traffic lights uphill (it should be stressed that we do not assess compliance within 25m of a junction as per JAQU requirements), and the presence of buildings close to the road. The link which is forecast to be non-compliant in 2021 without measures is in an Air Quality Management Area. The Council has monitored data going back many years. The highest measured nitrogen dioxide roadside annual mean 2017 was 54 µg/m³, however, this monitoring location is not the point with the highest level of nitrogen dioxide annual mean along the route. The road is

close to a major shopping centre which attracts a significant number of vehicle trips. For 2017, buses have been calculated to contribute 20 % of NO_x emissions at roadside.

- The A629 has a steep uphill gradient (which is not accounted for in the emissions data from the transport model), which results in acceleration from a roundabout uphill and is a route used by HGVs to the M1 J35, in spite of signage directing them to J34 (N) being present. The link which is forecast to be non-compliant in 2021 without measures is in an Air Quality Management Area. The Council have monitored data going back many years. The highest measured nitrogen dioxide roadside annual mean 2017 was 48 µg/m³, however, this monitoring location is not the point with the highest level of nitrogen dioxide annual mean along the route.
- The Parkway (A630) is the main route from J33 of the M1 to Sheffield City Centre. It has no sensitive receptors in terms of LAQM within 4m of the carriageway. The only possible pedestrian public exposure is an at-grade Right of Way footpath crossing. The speed in that section is currently 70mph. The road experiences congestion, in particular during the PM peak period, as vehicles head out of Sheffield to join the M1 at Junction 33.
- A630 Fitzwilliam Rd is on the main route from east to west through Rotherham town centre. The link which is forecast to be non-compliant in 2021 without measures is in an Air Quality Management Area. We have monitored data going back many years showing exceedance of the AQD.

2.3.20 Levels of NO₂ at 4m from the M1 (DfT census point 36007) are the highest in the borough and much higher than any of the levels at 4m from local roads. Rotherham, has relevant exposure of residents at distances of around 20m from the carriageway and the Council has declared several Air Quality Management Areas as a result of emissions from the M1 traffic. However, the M1 is outside the scope of this SCC/RMBC Clean Air Plan, as its emissions are to be tackled by National Highways.

2.3.21 In addition to a Smart Motorway scheme, a 24-hour 60mph speed limit has recently been introduced by National Highways on the M1 between J32 and J34, as part of the efforts to reduce NO_x emissions from this section of the M1. It remains to be seen how quickly this (and other measures being considered by National Highways) achieve compliant air quality along the M1 corridor through Sheffield and Rotherham, though initial indications are promising.

Source Apportionment at the Key AQ Hot-Spots

2.3.22 Supporting Document AQ3 identifies seven locations which are most at risk of non-compliant Air Quality 2022 and 2023, as follows:

- Arundel Gate (SCC);
- Sheaf Street (SCC);
- Derek Dooley Way (SCC);
- Rotherham end of the Parkway (RMBC);
- Wortley Road (RMBC);
- Rawmarsh Hill (RMBC; and
- Fitzwilliam Road (RMBC).

2.3.23 The table below summarises the source apportionment of the NO_x emissions at these seven locations in 2017.

Table 1. Source Apportionment of NO_x/NO₂ Emissions at Key Hot- Spots		
Location	Traffic/Non-Traffic (2017)	% of Traffic Emissions by Vehicle Type in 2022 Baseline
Arundel Gate	80%/20%	Cars (inc taxis): 16% CAZ-Compliant LGVs: 5% Non-Compliant LGVs: 12% CAZ-Compliant HGVs: 2% Non-Compliant HGVs: 3% CAZ-Compliant Buses: 27% Non-Compliant Buses: 34%
Sheaf Street	81%/19%	Cars (inc taxis): 46% CAZ-Compliant LGVs: 9% Non-Compliant LGVs: 21% CAZ-Compliant HGVs: 5% Non-Compliant HGVs: 8% CAZ-Compliant Buses: 5% Non-Compliant Buses: 6%
Derek Dooley Way	76%/24%	Cars (inc taxis): 55% CAZ-Compliant LGVs: 9% Non-Compliant LGVs: 21% CAZ-Compliant HGVs: 6% Non-Compliant HGVs: 9%
Rotherham end of the Parkway	75%/25%	Cars (inc taxis): 47% CAZ-Compliant LGVs: 13% Non-Compliant LGVs: 30% CAZ-Compliant HGVs: 2% Non-Compliant HGVs: 7%
Wortley Road	64%/36%	Cars (inc taxis): 51% CAZ-Compliant LGVs: 10% Non-Compliant LGVs: 24% CAZ-Compliant HGVs: 3% Non-Compliant HGVs: 7% CAZ-Compliant Buses: 2% Non-Compliant Buses: 3%
Rawmarsh Hill	75%/25%	Cars (inc taxis): 51% CAZ-Compliant LGVs: 8% Non-Compliant LGVs: 20% CAZ-Compliant HGVs: 2% Non-Compliant HGVs: 6% CAZ-Compliant Buses: 5% Non-Compliant Buses: 8%
Fitzwilliam Road	64%/36%	Cars (inc taxis): 50% CAZ-Compliant LGVs: 11% Non-Compliant LGVs: 27% CAZ-Compliant HGVs: 3% Non-Compliant HGVs: 6% CAZ-Compliant Buses: 1% Non-Compliant Buses: 2%

Variability in Local Air Quality Monitoring Data

2.3.24 As noted above, the monitoring of NO₂ concentrations in Sheffield, detected a slight (1.5µg/m³) increase in annual average NO₂ concentrations at the AQ hot-spots in Sheffield between 2018 and 2019, when averaged across the circa 50 hot-spot monitoring locations in Sheffield, but with no evidence of a corresponding increase at the Rotherham hot-spot locations.

2.3.25 Further investigation revealed a set of six monitoring locations in Sheffield where the NO₂ concentrations rose by around 6.5 µg/m³ between 2018 and 2019, as illustrated in Figure 6 below.

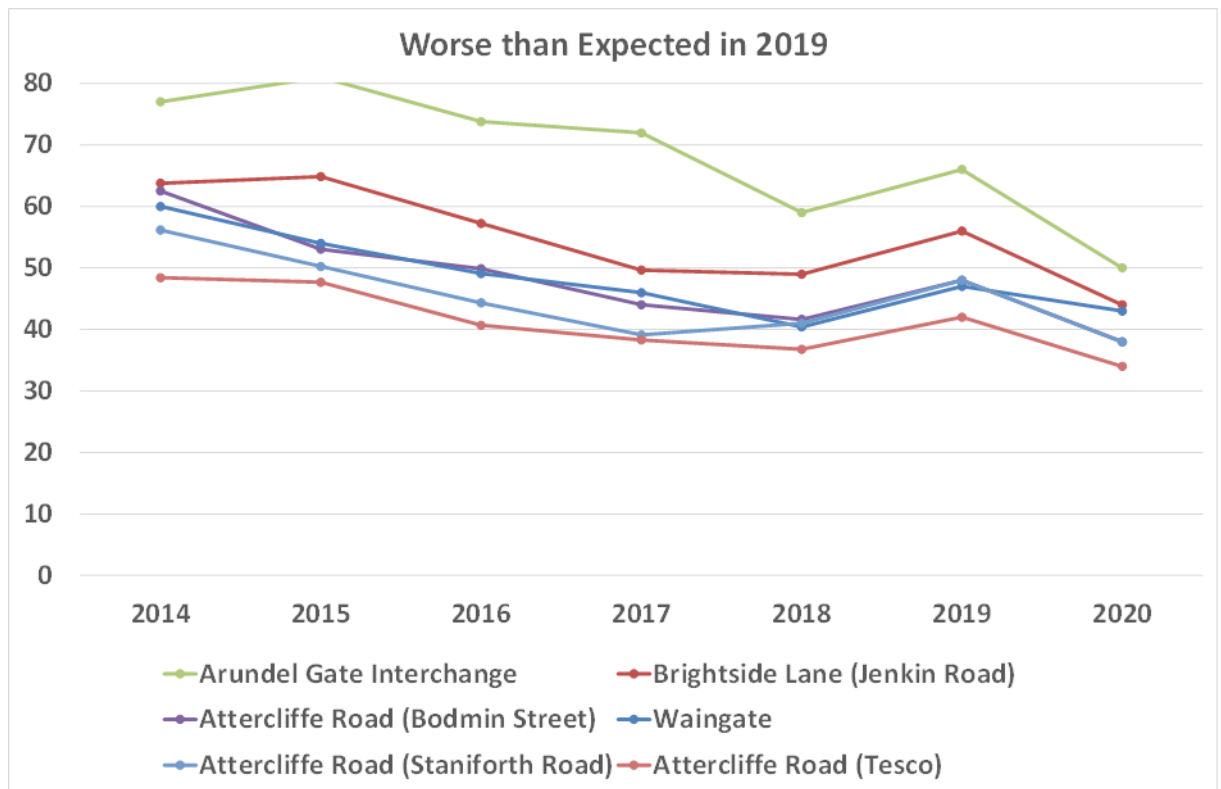


Figure 7 AQ Hot-Spots Showing Higher-than-Expected Increases in NO₂ Concentrations in 2019

2.3.26 These six sites contributed much of the rise in Sheffield’s monitored NO₂ levels in 2019, as illustrated in Figure 8 below.

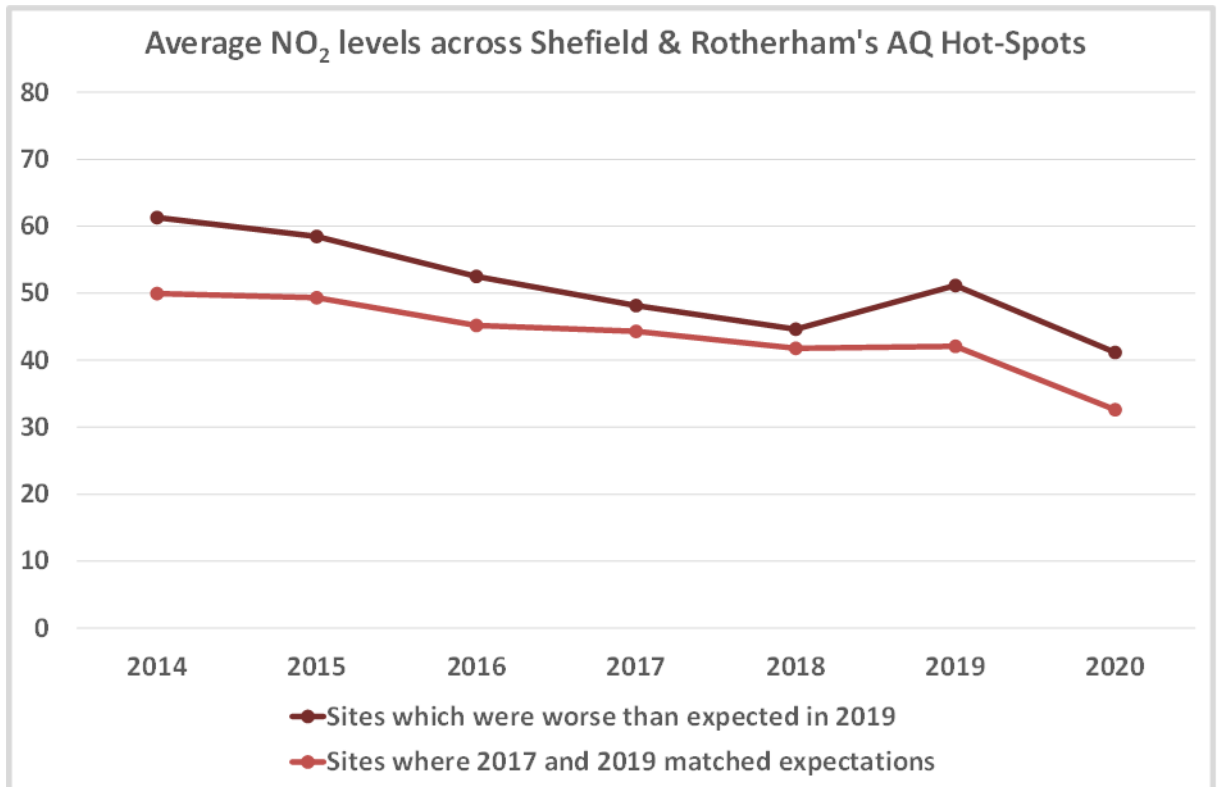


Figure 8 Impact of SCC's 'Worse than Expected' Hot-Spot Sites

2.3.27 This 'unexpected' 6µg/m³ increase at these Sheffield sites gives an indication of the level of year-on-year variability in NO₂ concentrations in Sheffield and suggests a need for careful continued monitoring of the local air quality data, to ensure that the Preferred Option remains on track to achieve the required 'success'.

2.4 Policy Context – the Health Impacts of Poor Air Quality

2.4.1 Air quality at certain locations in Sheffield and Rotherham has exceeded required legal levels since 2010. In Sheffield air pollution contributes to the early deaths of around 500 people every year and particularly affects the long-term health of young people and those with existing health conditions. The Sheffield Clean Air Strategy 2017 stated that addressing the effects air pollution is a public health emergency.

2.4.2 In September 2021 the World Health Organisation released new Global Air Quality Guidelines that provide clear evidence of the damage air pollution inflicts on human health, at even lower concentrations than previously understood. The guidelines recommend new air quality levels to protect the health of populations, by reducing level of key air pollutants, some of which contribute to climate change.

2.4.3 Poor air quality is responsible for about 3% of all illness and just less than 5% of deaths in Sheffield. There is no bodily process that isn't accelerated by one form of pollution or other. In assessing impact, it is also important to consider the role of pollutants both causing and accelerating the progress of a disease. The estimates are probably under-estimates, as the science is continually developing and we are continually learning more about the negative health impact of air quality.

2.4.4 There are a significant number of children who are having their life course influenced by something which isn't in their control, and we know the impact of air pollution is regressive - people of low income exposed to greatest pollutants. Pre-existing conditions (for

example asthma or cardiovascular disease) make people more prone to the impacts of pollution, those conditions are more common in more deprived communities, combined with pollution per se being higher in more deprived communities.

- 2.4.5** Increasingly we are seeing that particulates (PM – particulate matters) and black carbon can get into the placenta and into unborn babies, and we know children are also more sensitive to the negative impacts in terms of the impact on developing brains, lungs, immune system (moving it to a more allergic/ inflammatory prone phenotype). We are beginning to see a different type of asthma with more, late onset non allergic asthma. We are also beginning to see more very early onset wheezing in very young babies.
- 2.4.6** The [coroner's report](#) on the death of Ella Kissi-Debrah concluded that air pollution contributed directly to her death and noted that this will probably not be the last time such a case is heard.

Public Health Policy

- 2.4.7** Whilst it is perhaps inevitable that national policy is driven by compromise, there are no circumstances in which air pollution could be seen as a good thing. The distinction between legal limit and safe can't be underscored enough. There isn't a "safe" limit from a public health perspective. The World Health Organisation (WHO) set out a dramatically reduced limit for emissions linked to fossil fuels, the recommended NO₂ limit is lowered from 40 µg/m³ to 10µg/m³. It has also lowered the recommended limits for average annual PMs.
- 2.4.8** 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.
- 2.4.9** Nitrogen dioxide (NO₂) for example 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.
- 2.4.10** 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.

Rotherham

- 2.4.11** The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion (Defra. Abatement cost guidance for valuing changes in air quality, May 2013). Rotherham's Director of Public Health recognises air quality as a priority, as can be seen in the Air Quality section of the latest Joint Strategic Needs Assessment (on the Rotherham Data Hub):
- <https://www.rotherham.gov.uk/data/environment/air-quality-1/1>
- 2.4.12** Our South Yorkshire 'Care4Air' film communicates key messages about air pollution and health to the public in an accessible way: <http://www.care4air.org/>

RMBC's 2014 Health Impact Assessment

2.4.13 Rotherham MBC's Public Health Registrar carried out a Health Impact Assessment in 2014 with the aim stated as follows:

' .. to collate and apply the international evidence of the detrimental effects on health from outdoor air pollution to the Borough of Rotherham. By examining and describing the relationship between inequalities in both health outcomes and poor air quality, it will enable future decision-making regarding development to include consideration of the health consequences of any likely change in air quality. It will also assist communities in better understanding the effects on their health of policy decisions regarding air pollution generated by development.'

2.4.14 The key findings of this assessment were:

- a) There are widespread inequalities in the spatial distribution of health outcome indicators in Rotherham, that to a large extent mirror the inequalities in distribution of socio-economic deprivation.
- b) There is considerable variation in the spatial distribution of Nitrogen Dioxide air pollution across Rotherham, again mirroring the distribution of socio-economic deprivation.
- c) There is a statistically significant association between these two sets of inequalities (Health Outcomes and NO₂ µg/m³) after adjustment for confounders (deprivation), suggesting that in part poorer air quality in some areas of Rotherham may independently affect health outcomes (CHD Deaths in under 75's, Circulatory Disease Deaths in under 75's and the Percentage of Low Weight Births).

2.5 Policy Context – Relevant Local Policies & Plans

Sheffield's Action on Air Pollution and Carbon Emissions from Transport

2.5.1 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. In addition, 27% of the city's overall Carbon emissions (CO₂e) comes from transport, which is the biggest overall contributor in Sheffield.

2.5.2 Our [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.

2.5.3 Whilst the Clean Air Plan measures are essential to achieve current legal limits, addressing air pollution more fully and tackling transport's role in responding to the Climate Emergency is fundamentally an issue of how we live and how we choose to move around the city. In June 2018, Sheffield City Council agreed a new [Transport Strategy](#) which created a long-term vision for transforming the city's infrastructure to make it easier to travel around Sheffield by the most sustainable modes, prioritising the delivery of improved infrastructure for walking and cycling and ensuring that public transport is integrated, faster and more reliable.

2.5.4 Through the development of the recent [Pathways to Zero report](#) we know that the action required will need to result in an overall reduction in vehicle trips; with a significant switch to active and public transport away from private cars; and that all remaining motorised

vehicles will need to be upgraded to electric or other zero emission fleet to deliver our Net Zero ambitions. This is reflected in our recently adopted ⁷[10 Point Plan for Climate Action](#).

2.5.5 There are a number of significant projects that we have delivered to contribute towards these outcomes, and further improvements are planned through our [Connecting Sheffield](#) programme, which will be expanded through to 2027 following the recent announcement that South Yorkshire will receive £570m from Government's City Region Sustainable Transport Settlement (CRSTS). These infrastructure projects sit alongside the continued delivery of wider initiatives including, but not limited to: training, support, and bike loans to enable active travel; EV van and taxi trial schemes; the roll out of public EV Charging; objectives within the SY Bus Service Improvement Plan (BSIP) and proposed Enhanced Bus Partnership with SYMCA partners.

2.5.6 Delivery of projects to improve conditions within local communities will also be essential and measures we are progressing include: Low Traffic Neighbourhoods, to reduce rat running and create safe and accessible streets; School Streets, to reduce traffic and emissions outside schools and encourage people to walk, scoot or cycle; continued delivery of the citywide commitment to 20mph speed limits in residential areas.

Rotherham Metropolitan Borough Council – Relevant Policies & Plans

Rotherham Air Quality Action Plan⁸

2.5.7 Rotherham MBC's Air Quality Action Plans (AQAP) have been produced and updated in response to the Council's statutory duty in fulfilment of Part IV of the Environment Act 1995.

2.5.8 The current AQAP outlines the actions that the Council will take to improve air quality in the borough between 2020 and 2022. The AQAP follows the standard format published by Defra in statutory guidance (LAQM 2016).

2.5.9 The AQAP reaffirms the Council's commitment to improve the health and wellbeing for the people of Rotherham, and a key component of this is protecting and improving air quality. Elevated levels of air pollution have a negative impact on our health, particularly on the young and the elderly, resulting in significant levels of illness, early death and financial costs to the NHS and wider society.

2.5.10 The areas prioritised for action to improve air quality in Rotherham are:

- Fitzwilliam Road AQMA;
- Bradgate AQMA; and
- Rawmarsh/Parkgate AQMA.

2.5.11 The vehicle fleets which are prioritised for improvement are:

- Bus fleet;
- Taxi fleet;
- LGV fleet; and
- Car fleet

2.5.12 The Council recognises that improvement to its own fleet through, for example, the uptake of ultra-low emission vehicles, has an important role to play.

⁷ Approved at [SCC Cooperative Executive meeting on 16 March 2022](#)

⁸ Rotherham Air Quality Action Plan;

http://www.rotherham.gov.uk/info/200075/pollution/375/a_guide_to_air_pollution/2

2.6 Policy Context – Local Transport Strategies and Local Plans Sheffield Transport Strategy⁹

2.6.1 Sheffield City Council's current Transport Strategy (adopted in March 2019), recognises that tackling the most polluting vehicles directly is important. Sheffield City Council is also aiming to enable people to make more journeys by active travel and public transport, in order to help address the climate crisis, improve air quality, ease congestion and realise the health benefits of an active population:

- Sheffield's Transport Strategy (2019-35) adopts a "Sustainable Safety" approach to the provision of highway space for less polluting modes of transport;
- This has the advantage of reducing conflict between modes and gives greater priority and therefore better reliability and journey times for public transport, as well as enabling greater uptake of active travel, especially for shorter trips;
- The Strategy slightly predated the City Council's declaration of a climate emergency. That declaration has now led to the production of a 10-Point Plan, to establish a framework for how the Council proposes to work with the city to address the challenge of the climate crisis.;
- Decarbonisation across the piece will reinforce the move towards less-polluting vehicles and towards enabling more journeys to be made by active travel and public transport;
- In terms of the economy, a shift towards more sustainable and space-efficient transport modes is essential, in order to create headroom for growth and new development, including housing, in the city centre especially but also in the Lower Don Valley and across the city;
- A congested and unreliable road network will limit the capacity for future growth, with increased levels of stationary traffic and worsening levels of air quality;
- We are therefore delivering the infrastructure that enables people to take up active travel, especially for shorter journeys, as the necessary investment is made available for the provision of safe, direct and accessible walking and cycling networks;
- Cleaner vehicles at the point of use will lead to reduced air pollution, and also reduced noise pollution in the case of electric vehicles, both of which have a proven link to mental and physical health detriment;
- This will also provide economic benefits, through improving the long-term health and wellbeing of residents – as will having a more active population; and
- In addition, a city which is easier to get around using an efficient and sustainable public transport system and easy, safe types of active travel, is one which is well connected and attractive to businesses.

Rotherham Transport Strategy¹⁰

2.6.2 The Rotherham Transport Strategy explains how on a local level, Rotherham will contribute to the strong policy direction set out in the Sheffield City Region Transport Strategy (2011-2026). It features proposals to work in partnership to continue to improve the local road network in Rotherham and to support sustainable and affordable transport modes of travel. There is a commitment to ensuring improvement and focused investment in reducing congestion, promoting public transport and promoting more walking and cycling. The Strategy outlines two primary reasons for doing so:

⁹ [Sheffield Transport Strategy \(March 2019\) web version.pdf](#)

¹⁰ Rotherham Transport Strategy;

http://www.rotherham.gov.uk/downloads/file/2687/rotherham_transport_strategy_2016-26

- To support economic recovery in Rotherham; and
- To adapt to and reduce the transport systems impact on safety, health and climate change to help safeguard its benefits for future generations.

2.6.3 In accordance with the second point, there are a number of themes which have cross cutting implications for air quality. The Strategy references the need to integrate land use to ensure new developments are focused around key public transport corridors whilst recognising the benefits that walking and cycling can deliver in relation to reducing congestion and more sustainable behaviour.

2.6.4 The Strategy includes a specific scheme (Theme 19) which outlines the commitment to “To work to improve the efficiency of vehicles and reduce carbon emissions and to improve air quality, especially in designated areas”. This Theme identifies a number of specific actions;

- The use of Intelligent Transport Systems to improve traffic flow and therefore reduce emission of pollutants that compromise local air quality and have a significant effect on Health.
- The promotion of the ECO Stars Fleet Recognition Scheme (Efficient and Cleaner Operations). The ECO Stars programme is a free, voluntary scheme designed to provide recognition, guidance and advice to operators of goods vehicles, buses and coaches across South Yorkshire.
- Internal working relationships within the Council between the Transportation and Air Quality teams promote schemes that will reduce emissions from transport sources (these are the major contributor to pollution) particularly in Air Quality Management Areas.
- Actively promote the installation of an electric charging network to aid the adoption of low carbon fuels. This is a long-term project, but the council has been (and will continue to be) at the forefront in adoption of new technologies, evidenced through the provision of a hydrogen demonstration project to provide a refuelling station (at Waverley AMP).

Rotherham Local Plan Core Strategy¹¹

2.6.5 The Core Strategy sets out a “spatial” strategy identifying the towns and settlements where new housing schemes and land to support new industry and business are required. Provision will also be made for retail, leisure and supporting community facilities, as well as green infrastructure. It also sets out the strategic policies to make all this happen, taking into consideration potential environmental impacts and the implications of climate change.

2.6.6 The Local Plan supports the provision for improvements to air quality, either through physical interventions such as restricting where development takes place, but also through softer measures such as the need to promote a healthier lifestyle through walking / cycling and the provision of open spaces and recreation facilities. The Strategy has several policies which directly contribute towards improving air quality, as follows:

- Policy CS 14 - Accessible Places and Managing Demand for Travel; Not allowing new development in Air Quality Management Areas unless traffic and air quality impacts are appropriately mitigated.

¹¹ Rotherham Local Plan Core Strategy;
http://www.rotherham.gov.uk/downloads/file/1571/adopted_rotherham_core_strategy

- Policy CS 27 - Community Health and Safety; Development should seek to contribute towards reducing pollution and not result in pollution or hazards which may prejudice the health and safety of communities or their environments. Appropriate mitigation measures may be required to enable development.

2.6.7 Rotherham Local Plan Supplementary Planning Document No. 2 Air Quality and Emissions can be found at:

[Air Quality and Emissions \(rotherham.gov.uk\)](http://rotherham.gov.uk)

2.6.8 Air quality is a concern in parts of the borough, particularly in the M1 corridor and close to Rotherham town centre, mostly caused by traffic. A number of Air Quality Management Areas have been designated where pollution levels may exceed guidelines set by the government. Town centres and urban areas are the places where the Core Strategy concentrates most new development, so without action, air quality in these areas might deteriorate. It is important that new development throughout the borough does not worsen air quality. Proposals will need to take into account the cumulative impacts on air quality from individual sites in local areas. New development in Air Quality Management Areas is required to be consistent with the local air quality action plan. Air quality in Air Quality Management Areas will inevitably be influenced by factors beyond their and individual Local Authority boundaries. It is therefore important that the possible impact on air quality of developments close to Air Quality Management Areas is also considered.

Rotherham Economic Growth Plan¹²

2.6.9 Commensurate with regional economic growth priorities set out in the Sheffield City Region Strategic Economic Plan, the Rotherham Economic Growth Plan outlines specific objectives and improvements to certain policy areas to maximise employment opportunities and contribute towards growth on a more granular level. Although the key theme in this document is how to grow the productivity output of the area, there is clear recognition that this growth must be undertaken in a sustainable way, to ensure inclusive and long-term economic growth.

2.6.10 The Plan considers transport as an enabler to growth and as such details the important role that connectivity plays in business development and access to education, training and employment. Persuasion of active travel choices, modal shift away from private car trips and more efficient journeys through reduced congestion features prominently within the delivery aspect of the plan, further making the link between the need to control air quality as the economy grows in the future.

South Yorkshire MCA (SYMCA - Previously Sheffield City Region) Transport Strategy

2.6.11 The [SYMCA Transport Strategy](#) Policy 4 states within the Cleaner and Greener Sheffield City Region Goal that action will be undertaken to 'Improve air quality across our City Region to meet legal thresholds, supporting improved health and activity for all, especially in designated AQMAs and CAZs'.

¹² Rotherham Economic Growth Plan;
http://www.rotherham.gov.uk/downloads/file/2710/rotherham_economic_growth_plan_2015-25

2.7 Local Traffic, Emissions and Air Quality Modelling

- 2.7.1** To achieve a full understanding of the location and causes of poor air quality across the two Council areas, we have used a combination of a detailed traffic model (to provide estimates of traffic flows and speeds), a traffic emissions model (based on the DFT's EFT vehicle emission methodology) and an air pollution dispersal model, based on South Yorkshire's Airviro model.
- 2.7.2** The fleet emission profiles underpinning these models come from two extensive sets of local ANPR data, the first collected over a 12-month period in 2017 (from Sheffield & Rotherham's traffic management ANPR camera system) and the second from a 4-week extract of ANPR data from 6 of Sheffield's traffic monitoring sites in February 2019. The analysis of this ANPR data is described in more detail in Supporting Document SD03 of the T3_Transport Modelling Methodology Report.
- 2.7.3** 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.
- 2.7.4** The calibration of these three inter-linked models required, among other things, a detailed understanding of the local traffic fleets, derived by linking observed number plate data (from 12-month local ANPR data) with the vehicle type and emission characteristics (e.g. fuel type and EURO class) available from the DVLA's database.

2.8 The Outline Business Case

- 2.8.1** An Outline Business Case identifying the Preferred Option for tackling the non-compliant levels of NO₂ was submitted to Government in December 2018.
- 2.8.2** The Delivery Program within this OBC assumed that the OBC would be approved in March 2019, with a Full Business Case approved by cabinet for submission to the JAQU in December 2019. Procurement of the ANPR infrastructure was aligned to this. Based on this timeline the original planned date for the Clean Air Zone to go live was early 2021.
- 2.8.3** However, JAQU requested a sequence of updates to the modelling assumptions and strengthening of the associated evidence base throughout 2019, which resulted in the official approval of the OBC not being received until 24th February 2020, along with a Ministerial Direction¹³, under which SCC are legally obliged to implement a CAZ C charging Clean Air Zone, to achieve compliance in 2021 and to submit a Full Business Case (FBC) and funding for delivery of the Clean Air Zone and mitigation funding to support drivers of non-compliant vehicles to upgrade their vehicles. The funding for these mitigation measures was allocated from a competitive fund, with SCC/RMBC receiving c£20m from this fund. See the Financial Case, Appendix FC2 and 3.

¹³ Environment Act 1995 (Sheffield City Council and Rotherham Metropolitan Borough Council) Air Quality Direction 2020

- 2.8.4** The delay in obtaining Government approval for the OBC had the following knock-on impacts on the Delivery Program:
- a) Inability to progress meaningful discussions with the market / suppliers in relation to the mitigation measures without clarity on the Directed category of charging CAZ and likely extent of funding available for relevant measures;
 - b) Inability to finalise charging CAZ policy decisions, exemptions and other detail required within the Charging Order until Ministerial Direction confirmed the charging CAZ category;
 - c) Inability to confirm final Preferred Option with consultants and team members, therefore could not progress detailed development of final FBC; and
 - d) Inability to fully progress the planned engagement and detailed dialogue with stakeholders (internal and external) re final proposal development and delivery requirements until the OBC was approved and there was greater certainty with regard to the CAF/IF funding envelope.

2.9 Covid Impacts

- 2.9.1** The Covid-19 pandemic brought new challenges and uncertainties that impacted the project, including:
- Changes in travel behaviour;
 - Reduced traffic, particularly during the 'lock-down' conditions;
 - Changed economic position for local business – concerns that more would pay and pollute (as the cheapest option), making the CAZ less effective and concerns about local business's ability to pay the CAZ charge, leading to increased rates of local business failure;
 - A step-change decrease in a) NO₂ concentrations (due to the significant reduction in traffic and local industry) and b) vehicle purchasing, particularly private cars, making it more-difficult to forecast the 'Business as Usual' trajectory.
- 2.9.2** Dealing with the pandemic and the impacts of the initial lock-down also absorbed significant levels of Council resources, making it difficult for the two Councils to make much progress on the various appraisal and delivery tasks associated with preparing the FBC during 2020_Q2. It also became apparent that the ongoing impacts of the pandemic meant that the delivery program set out in the OBC (with the Preferred Option going live in 2021) was no longer achievable.
- 2.9.3** A number of other Local Authorities also reviewed their Clean Air Plan and CAZ proposals during 2020 and the go-live dates of all charging CAZs that were due to go live in 2020 were postponed to early 2021.
- 2.9.4** In February 2020 the implications of the national pandemic were emerging and national lockdown in the UK was announced on the 16th March 2020. Different periods of lockdown restrictions continued at a national and local level through 2020 and at the start of 2021. The implications on travel were significant and this brought about associated improvements in air quality.
- 2.9.5** In April 2020 the SCC and RMBC project team began to consider whether the medium and long-term impacts of the Covid19 pandemic would result in long-lasting travel behaviour changes (i.e. beyond the easing of the main 'lock-down' measures) which would affect compliance with the NO₂ target limit in the earliest possible compliance year (which at that time was forecast to be 2021).

- 2.9.6** JAQU continued to advise Sheffield and Rotherham to develop our measure packages to tackle the exceedances predicted from modelling ‘as planned and agreed’ until late May 2020, when they requested local authorities to undertake additional (limited) sensitivity testing, focussing on the impact of reduced fleet turnover on our preferred option.
- 2.9.7** In July 2020 JAQU wrote to LAs acknowledging the uncertainty around the local economic impact of Covid-19 and encouraging local authorities to draw on emerging evidence from a range of sources (including any available local evidence), while continuing to implement their Directed schemes.
- 2.9.8** SCC/RMBC/JAQU then agreed a program of evidence gathering and travel demand and emissions modelling which would help determine the likelihood and scale of any long-term impacts of the Covid19 pandemic, in order to assess:
- whether the assumptions underpinning the main CAZ modelling and appraisal remain valid and robust;
 - whether the combined impacts would increase or decrease the likelihood Sheffield and Rotherham’s local air quality will remain in exceedance of legal NO₂ limits in any given future year;
 - whether the economic impacts of the pandemic on the local vehicle owners’ ability/willingness to upgrade their non-compliant vehicles and the corresponding impacts on the need for financial support to encourage the required fleet improvements.
- 2.9.9** This review consisted of three main steps:
- Step 1 - Theoretical consideration of the potential medium and long-term impacts and a high level ranking of these to identify the ‘Top 10’ which have the greatest potential to significantly affect the NO₂ compliance over the next 2-3 years;
 - Step 2 - A program of evidence gathering to attempt to confirm the likelihood and scale of these ‘Top 10’ impacts; and
 - Step 3- A comprehensive (and ongoing) traffic monitoring exercise, to identify the scale of the drop in traffic volumes during the various stages of lock-down and the speed and scale of recovery in the ‘post-lock-down’ and, hopefully, ultimately ‘post-Covid’ periods, essentially to sense-check the results from the two preceding theoretical/modelling steps.
- 2.9.10** Towards completion of our analytical review (in February 2021), we were advised in a letter from Ministers that due to the significant uncertainties associated in forecasting these impacts that no Covid-19 related impacts should be considered as part of our review.
- 2.9.11** Our ongoing monitoring of road traffic suggests that between ‘lock-down’ conditions traffic volumes in Sheffield and Rotherham return to close to or slightly lower than the pre-pandemic levels at most locations.
- 2.9.12** In particular, as illustrated in Figure 9 below, between 2nd September 2021 and 8th December 2021, average daily traffic levels had returned to around 98% of pre-Covid levels at the traffic monitoring locations in Sheffield and to around 94% of pre-Covid levels at the monitoring locations in Rotherham.

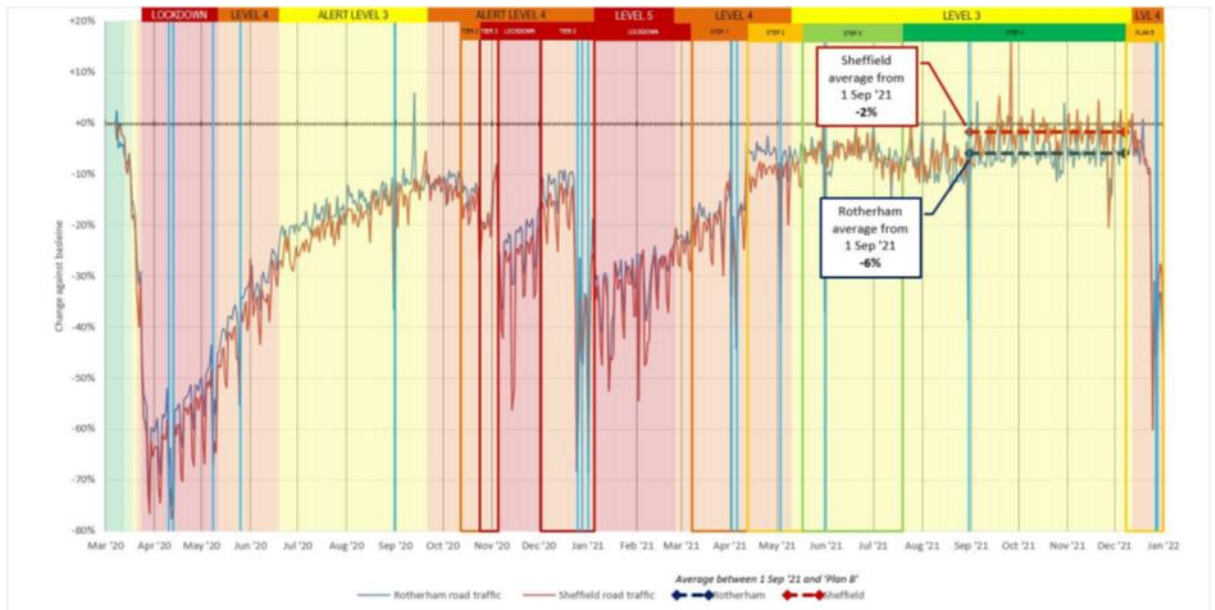


Figure 9 Daily Traffic Profiles – March 2020 to December 2021

2.9.13 We would expect this slight ongoing reduction in traffic will be sufficient to counteract the impact of any loss of Business as Usual fleet upgrades due to Covid restrictions during the past two years. The emissions modelling reported throughout the remainder of this FBC is therefore based on this ‘No long-term impact of Covid’ assumption suggested by the Minister. However, we propose to continue to monitor the relevant local traffic volumes and vehicle fleets closely and will consider appropriate mitigation measures if the local fleet emission characteristics diverge from the Business as Usual fleet renewal profile by more than can be offset by the ongoing reduction in ‘post-Covid’ daily traffic levels.

2.10 The Case for Change

2.10.1 In Section 2.8 above, we highlighted a number of factors which contributed to a delay between the OBC modelling and the OBC direction.

2.10.2 In Sections 2.8 and 2.9 we describe the change factors from OBC submission that resulted in a need to update the evidence base, followed by the rationale for a review to consider the potential implications arising from the implications of the Covid-19 pandemic.

2.10.3 In Section 2.2 we presented a summary of the observed annual average concentrations of NO₂ at various air quality hot-spots across Sheffield and Rotherham, which suggested that there are a number of locations which will exceed the target 40 µg/m³ limit values, as soon as traffic returns to close to, pre-covid levels, unless there is an accelerated program of improvements in the traffic fleets using those routes and streets.

2.10.4 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.

2.10.5 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.

2.10.6 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'.

2.10.7 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.

2.11 Critical Success Factors & Spending Objectives

2.11.1 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.

2.11.2 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).

2.11.3 Table 2 below shows the linkage between these attributes and the three spending objectives.

Table 2. Links Between Spending Objectives and Scheme Appraisal Attributes			
Scheme Appraisal Attribute	Spending Objective 1	Spending Objective 2	Spending Objective 3
Effectiveness	✓		
Cost-effectiveness	✓ (ensuring the available funds deliver as much NO _x reduction as possible)		
Deliverability	✓		
Acceptability		✓	
Strategic Fit			✓

2.12 The Measures Required to Deliver NO₂-related ‘Success’ in Sheffield & Rotherham

The Proposed CAZ C and bus-gate scheme compliance measures in Sheffield

- 2.12.1** In Sheffield, the current and potential future exceedances are predominantly around the inner ring road, where the high volume of traffic is a combination of private cars, taxis, goods vehicles and coaches travelling between a wide range of origins and destinations, plus Arundel Gate, where the majority of the emissions are coming from diesel buses using this street as one of the key bus interchange locations in the city centre.
- 2.12.2** The options appraisal included within the OBC (initially submitted in December 2018 and approved in February 2020) identified the Preferred Option to be a Class C+ charging Clean Air Zone (CAZ) in central Sheffield (covering the area including and within the Inner Ring Road), plus a set of measures to clean up Sheffield’s bus and taxi fleets as much as possible (as each vehicle in these two classes travels a disproportionately large number of kilometres within the city centre).
- 2.12.3** The CAZ C+ scheme identified as the Preferred Option in the OBC would apply a daily charge to all non-compliant HGVs, LGVs, buses, coaches and taxis operating within the CAZ area. The standard CAZ C compliance standards (Euro VI/6 diesel and >=Euro IV/4 for petrol) would be applied to goods vehicles and buses/coaches, but with tighter (‘C+’ (Ultra Low Emission Vehicle)) standards applied to taxis.
- 2.12.4** The OBC confirmed that a CAZ C (charging non-compliant buses, taxis, HGVs and LGVs) and a CAZ D (which would add non-compliant private cars to this list), would both achieve compliance in the year that the scheme was introduced. However, the OBC showed that the extra costs required to upgrade the large number of private cars that would be affected by a CAZ D scheme covering the inner ring road and its interior would exceed the resulting monetised air quality benefits, so that the cost benefit analysis in the OBC confirmed that the more cost-effective (and more-easily-delivered) of these two options became the Preferred Option for delivering compliance in the shortest possible time.

- 2.12.5** Because of the cost-effective benefits delivered by upgrading taxis (hackney carriages and private hire vehicles), due to the high mileage each vehicle travels within the proposed CAZ area in central Sheffield, the OBC recommended that Sheffield's two taxi fleets should be made as clean as possible, by requiring them to upgrade to ULEV standards (battery electric, plug-in hybrid or LPG) to avoid the CAZ charge. This higher standard for taxis was predicted to achieve compliance more-cost-effectively than the alternatives considered during the OBC, including a CAZ D option.
- 2.12.6** However, we are now proposing to revert to the standard CAZ C charging scheme (ie charging only pre-Euro IV/4 and pre-Euro VI/6 diesel vehicles) for the following reasons:
- the year's delay in implementation of the CAZ (due to the Covid19 pandemic) and the fact that the HGV fleet has got cleaner quicker than predicted in the OBC, means that the current air quality modelling is now predicting that the assumed responses to a standard CAZ C scheme will achieve compliance;
 - there were significant concerns about the ability of the vehicle manufacturers to deliver enough wheel-chair accessible ULEV vehicles to replace the entire Sheffield fleet of hackney cabs prior to the proposed go-live date for the CAZ C scheme; (and retaining wheel-chair accessible hackney provision is a key priority for SCC);
 - there was considerable concern about the proportion of local taxi owners who would be in a position to upgrade to a new ULEV vehicle because of the high cost of hybrid-electric black cabs, particularly given the impact of the pandemic on the taxi trade; and
 - the UK's central charging portal would have required expensive modification to enable it to reliably identify the required ULEV-standards.

The Proposed Rotherham Schemes for compliance

- 2.12.7** In Rotherham, the localised nature of the current and potential future NO₂ exceedances suggested that a package of measures targeted closely on the air quality hot-spots and the vehicles contributing to these air quality problems would be more cost-effective than a Charging CAZ scheme.
- 2.12.8** These measures include:
- Upgrading the fleet of scheduled buses operating in Rotherham to EURO VI emission standards;
 - Introducing an HGV ban on the northbound (uphill) direction of Wortley Road, to require HGVs travelling north from central Rotherham to use the alternative more-suitable route along the A6178 (Sheffield Road) and the M1; and
 - Reducing the number of buses operating along Rawmarsh Hill, by diverting some of these bus routes onto the parallel Barbers Avenue through a highways scheme.
- 2.12.9** It should be noted that upgrading vehicles which travel into the CAZ in central Sheffield will result in the corresponding emission reductions on these vehicles' other routes, so that the air quality benefits of the SCC CAZ will spread well beyond the interior of the Charging CAZ zone.
- 2.12.10** The review work undertaken between the submission of the OBC and the submission of this FBC has suggested that:
- air quality in central Sheffield is generally better than predicted within the OBC;
 - the HGV fleet has improved more-quickly than forecast in the OBC;
 - there are a number of locations in Sheffield and Rotherham that are still expected to remain non-compliant in 2022, under the agreed post-Covid Baseline scenario;

- A standard CAZ C (i.e. dropping the requirement for taxis to be ULEV to avoid the daily charge) plus the Rotherham mitigation measures identified in the OBC would still deliver area-wide compliance in the year following its implementation;
- Sensitivity tests (including inclusion of 2019 air quality data within the calibration of the baseline air quality model), suggests that lesser charging options (i.e non-charging, CAZ A or CAZ B based-schemes) may fail to deliver compliance in this 'Shortest possible time' year;
- A CAZ C scheme can be delivered more quickly than other CAZ-based charging options, due to the appraisal work included in the OBC, the consultation undertaken to date and the current Legal Directive.

2.12.11 The Preferred Option being appraised within this FBC are summarised in the following section, with additional detail provided in Chapter 6 of supporting document T4 (Local Plan Transport Model Forecasting Report).

2.13 Summary of the Preferred Option

2.13.1 The full Preferred Option package is summarised in the table below.

Table 3. Summary of the Preferred Option	
Scheme ID	Description
50 mph on Parkway	Reduction from the national speed limit to 50 mph on the section of the Parkway between M1 Junction 33 to the intersection with Handsworth Road on the A630 Sheffield Parkway. This extends the existing 50mph section operating to the west of the Handsworth Road Junction.
Rawmarsh Hill bus rerouting	Reduction in number of buses using Rawmarsh Hill to ensure no more than 26 in-service buses per hour (12-hr weekday average) use this route, with any excess rerouted to use Barbers Avenue. Junction changes will be made to allow for re-prioritisation of bus routes.
Bellow's Road	The buses re-routed from Rawmarsh Hill use Bellows Road to reach Barbers Avenue.
Bus upgrade/retrofit to Euro 6	The full bus fleet in Sheffield and Rotherham is upgraded or retrofitted to Euro VI. Those which are pre-Euro 6 have been retrofitted so that their emissions are Euro VI equivalent or better.
HGV ban on Northbound A629 Wortley Road	A full (100%) HGV ban on Northbound/Uphill direction only A629 Wortley Road between junction with Wilton Gardens and junction with Old Wortley Road. This is intended to prevent HGVs using this route to access the M1 from Rotherham Town Centre.
TCF9 (Arundel Gate Bus Gate Partial Scheme)	Early implementation of the 'Cross-City Bus' bus gates on Arundel Gate.
Taxi upgrades	Compliance with Euro 6 emission standards rises from 21% to 90% for black cabs in Sheffield and to 98% for Private Hire Vehicles (PHV) across Sheffield and Rotherham, due to a combination of the financial incentives and behavioural responses to the charging scheme.
Sheffield Inner Ring Road CAZ C Charging Area	See Supporting Document (T4 Local Plan Transport Model Forecasting Report) for details.
Anti-idling Measures on Arundel Gate	Measures to combat bus-idling on Arundel Gate, in particular to increase compliance with a maximum 2-minute idling rule.
Financial incentives to deliver the required pace of vehicle upgrades	The required financial mitigation measures are described in detail in the Financial Case.

2.13.2 Full details of the current version of the CAZ C-based Preferred Option are provided in Chapter 6 of supporting document T4 (Local Plan Transport Model Forecasting Report).

2.14 Why Doing Less than the Preferred Option Would Risk Failure

- 2.14.1** Section 4 of the Analytical Assurance Statement considers in detail a wide range of factors which contribute to the uncertainties with the modelling and forecasting processes.
- 2.14.2** In particular, the 'unexpected' 5µg/m³ increase at some Sheffield sites in 2019 (as reported in Section 2.5 above) gives an indication of the potential level of year-on-year variability in NO₂ concentrations in Sheffield.
- 2.14.3** The various sensitivity tests reported in the Sensitivity Test Report also 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.
- 2.14.4** We therefore need to build in sufficient slack between the Airviro-based model predictions and the 40µg/m³ limit value.
- 2.14.5** 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.

2.15 Summary of Consultation and Stakeholder Engagement

Consultation in 2019

- 2.15.1** The S&R CAP Outline Business Case was submitted in December 2018, however the OBC stage Ministerial Direction was not received until February 2020. In August 2019, following Government advice that the OBC Direction would be issued that September, SCC proceeded to consult on the OBC Preferred Option which at that time proposed a charging CAZ C with additional '+' standard measures in Sheffield.
- 2.15.2** The consultation covered an eight-week period and sought views from taxi drivers, businesses, and the general public on the outline proposals. Approximately 9,000 responses were from the public, 2,000 from the taxi industry, 300 from businesses and around 20 from other large stakeholders, this was an unusual high response rate overall. A summary of results can be found in Appendix MC 5, the consultation reports can be viewed on the Sheffield City Council website Clean Air Zone proposals (sheffield.gov.uk).
- 2.15.3** RMBC also ran a consultation in 2019 linked to the above, conclusions are summarised in Appendix MC5, the consultation reports can be viewed on the Clean Air Rotherham – Rotherham Metropolitan Borough Council.

Engagement and consultation undertaken in 2020 / early 2021

- 2.15.4** The pandemic is unprecedented in modern times, the impacts are still being observed and cannot be fully understood at this time. Whilst the Government has made a number of financial packages available to businesses and the self-employed, the Local Authority is very aware that the pandemic has and continues to impact on people's lives in different ways.
- 2.15.5** As far as was possible during the pandemic, stakeholder engagement took place with key stakeholders who would be most economically impacted by the CAZ charges. Feedback has been incorporated into the detailed CAF funding mitigation packages put to JAQU to strengthen the case for financial support for Taxi, HGV, LGV, buses and coaches to upgrade to compliant vehicles.

- Engagement with key stakeholders was undertaken during 2020 and early 2021:
- Re-engage with stakeholders after the prolonged period awaiting the OBC Direction (December 2018 – February 2019)
- Begin to understand the immediate impacts of the pandemic on business and trades
- Update on the current position
- Gather additional information to inform the final financial mitigation proposals
- Engage and consultant with local coach operators to inform the mitigation funding request to JAQU, submitted September 2021, see the Financial Case, Appendix FC2 and FC3.

2.15.6 Due to COVID restrictions, a number of remote 'zoom' engagement sessions were undertaken for these purposes, the groups and organisations who were involved are listed below, a summary of findings can be found in Appendix MC5.

Consultation undertaken in 2021 on the final CAP proposals

2.15.7 Following the SCC Cooperative Executive decision on 26th October 2021 confirming the change from a Category C+ to a Category C Clean Air Zone, statutory consultation on the final proposals for inclusion within the Full Business Case was undertaken.

2.15.8 The consultation ran from 22nd November 2021 until 17th December 2021, the primary purposes were to:

- Provide detail of the final proposals of the S&R Clean Air Plan
- Consult (statutory requirement) on the final proposals for the Sheffield CAZ scheme
- Provide detail of the proposed exemptions and seek stakeholder views
- Provide detail of the financial support measures, and seek stakeholder views
- Raise awareness and understanding of the CAP and the forthcoming CAZ in Sheffield.

2.15.9 An online approach was taken given the rise of the Omicron variant of Covid-19. Two online surveys were hosted on SCC citizenspace website - one for the general public, and one for business including the taxi trade.

2.15.10 In addition:

- A freephone information line was promoted alongside a consultation email address for any queries to be answered.
- Posters advertising the consultation and postcards on how people can get in touch to feedback on the proposals were hosted in 36 public buildings covering each area of the city to engage the wider population.
- Notification of the consultation was sent out to the mail list of people who have signed up for email updates on the CAZ.
- A number of online briefings were held with key affected groups.
- Public webinars for the general public and businesses were held to take questions and provide answers.

Communications

- Communications were undertaken to promote and raise awareness of this latest consultation
- Comms reached all parts of Sheffield/Rotherham and the wider City Region
- Methods used included:
 - Radio advertising
 - Digital advertising on social media

- Comms via council-owned channels such as GovDelivery emails, organic social media, and press releases.
- Use of messaging on the electronic roadside messaging boards around Sheffield
- Considering the audience reach of each medium, an estimated 600,000 people were exposed to messaging about the clean air zone
- This messaging was seen nearly 6million times – via repetition of advertising, social media posts and other mentions.
- At least 47,000 individuals directly viewed the clean air zone consultation web content on the SCC website
- 2,471 completed a consultation response.
- 282 people emailed asking for further information or clarity - the majority of these focused on financial support and whether a vehicle would be charged:

Stakeholder Engagement During Consultation

2.15.11 Focused stakeholder engagement was undertaken with sector groups representing vehicle owners/operators who would be charged under the proposals.

2.15.12 Online meetings were held with the following groups:

- Hackney carriage drivers and representative organisations
- Private hire taxi drivers and representative organisations
- Heavy Goods Vehicle (HGV) owners and operators
- Bus companies (both scheduled & non-scheduled)
- Coach operators
- Major institutions and organisations in the city
- Voluntary, community and faith organisations

2.15.13 As no group exists that specifically represents LGV owners/operators, a targeted briefing could not be held. However, groups including the Chamber of Commerce and Business Improvement District did attend briefings. In addition, two online webinars were arranged; one for the general public and one for businesses, which meant LGV owners/operators had the opportunity to attend. The webinars were publicised via Eventbrite and Sheffield City Council and included a live presentation and a Q&A session.

Summary of Consultation Feedback

Financial Mitigation Funding

2.15.14 The key finding of the 2021 consultation on financial support is that the levels of support on offer were insufficient to encourage a substantial number of smaller businesses in particular to upgrade their vehicle.

2.15.15 Just over £20m has been secured for financial support for vehicle owners/operators to replace or upgrade their vehicle(s). A further c.£8m of financial support grant is held as a 'stretch' fund by Govt should demand for support extend beyond the funding already paid to SCC.

2.15.16 As a result, the Council has proposed a number of amendments to improve the levels of support available, see detail of the final proposals for the financial mitigation support in the Financial Case section 5.4 and Appendix FC 2 and FC 3. Further detail on consultation responses is provided in Appendix MC5 and copies of the full consultation reports are available on the Council's website [Clean Air Zone proposals \(sheffield.gov.uk\)](https://www.sheffield.gov.uk/clean-air-zone-proposals).

2.15.17 We submitted the final financial mitigation scheme proposals to JAQU in March 2022 and expect to receive their sign-off with confirmation of revised grant terms in early May 2022.

Exemptions

2.15.18 Broadly there was support of the exemptions proposed, more detail of the consultation responses is covered below and provided in appendix MC 5. The final proposed exemptions are included in Appendix MC1 and detailed within the draft Charging Order (Appendix MC2).

In summary:

- A number of respondents raised vehicle supply concerns.
- A number of individual requests were put forward for exemptions across a wide range of fleet
- A number of respondents were seeking further details of the criteria and application process.
- Main focus of responses relating to Campervans / Motorhomes was a request by 44 respondents that these vehicles should be given an exemption. It is proposed that in order to encourage improved emissions that access to financial support equivalent to the LGV package will be made available. Motorhomes over 3.5 tonnes will be offered a discount daily charge rate of £10.00.
- Some businesses suggested charging private cars instead of, or as well as, vans. However, cars cannot be charged instead of vans/LGVs, for example. The government framework for CAZs stipulates that private cars can only be charged should a Category D CAZ be required to bring air pollution within the maximum legal limit, our evidence does not support the need for a CAZ D.

Impact on those with reduced mobility, charities and voluntary Sector

2.15.19 The CAP proposals involve significant change but are intended to bring positive health and wellbeing outcomes for all communities and particularly those most exposed to the harmful levels of NO₂. There are economic impacts resulting from the CAZ charges which have been considered, and the financial support measures have been developed to mitigate these as much as possible. Consideration is needed to protect people with limited mobility to mitigate potential impacts on essential services such as accessible taxis or buses.

2.15.20 Charities including the RNIB, which is located within the CAZ boundary, expressed concerns about the impact on their operations of the CAZ. Not-for-profit groups are covered by the ability to apply for a section 19/21 permit holders exemption and can apply for financial mitigation funding.

2.15.21 Vehicles of any type used specifically for people who need to use that vehicle as a result of their disability, can be registered as a Disabled Tax Class 85 vehicle, which makes them permanently exempt.

2.15.22 Private vehicles owned by people who need their specific vehicle as a result of their disability can also register their vehicle as a Disabled Tax Class 85 vehicle to be permanently exempt.

2.15.23 People with a physical disability have a limited pool of transport vehicles / options available to them and the CAP proposals is not intended to reduce these travel choices. There will be financial mitigation available for taxis, coaches and minibuses.

2.15.24 A temporary exemption for 12 months post go live is now proposed for commercially operated fully wheelchair accessible coaches (where these have been specifically constructed or retrofit for this purpose).

Concerns Regarding Displaced Traffic

2.15.25 Concerns were raised in respect to traffic displacement as a result of the CAZ and that this may increase traffic and create air quality issues in surrounding areas of the city. There are no plans to divert traffic as part of the introduction of a CAZ Charging Zone around the City Centre.

- The PO scheme modelling assumes that some traffic may choose to avoid entering the CAZ.
- Before and after monitoring will be undertaken to ascertain that the modelling is correct, or whether displacing traffic is becoming an issue. Should displacement be more substantial than the modelling suggests, mitigating actions will be identified and implemented where necessary.

Economic Impact on City Centre

2.15.26 Concern was raised about the negative impact the CAZ could have on the economy of Sheffield city centre. A new City Centre Strategic Vision was recently consulted on, showing considerable support for strengthening the whole city centre, designed to help it to adapt to the 21st century and to become a thriving, vibrant place, despite challenges such as online shopping, home entertainment and Covid-19.

- Key to this Strategy is the aim of delivering up to 20,000 new homes in the city centre through the development of new neighbourhoods, each with their own character.
- This policy is designed to dramatically increase the number of people both working, living and visiting the city centre. It also helps the city to minimise the need to build homes on green spaces in and around the city.
- More people located in the city centre all week, night and day, is key to sustaining retail, leisure, food and drink and cultural attractions that are themselves, then an attraction to people across the whole city and wider region. It is also fundamental to creating thousands of job opportunities, in hospitality and retail, but also in new professional services that seek to locate in thriving city centres.
- As recognised at the October Co-operative Executive, tackling air pollution through the introduction of the CAZ is a crucial element in seeking to make the city centre an attractive place to not only visit but live in, creating an environment whereby thousands of permanent residents want to live in the city centre.
- It will be important to use communications channels to address any confusion and ensure the public understands that private cars, motor bikes and mopeds will not be charged.

2.16 Equality Impact Assessment

- 2.16.1** The primary outcome of the CAP is to reduce air pollution that can be harmful to everyone. Some people are more vulnerable than others because they are exposed to higher levels of air pollution in their day to day lives, live in a polluted area, or are more susceptible to health problems caused by air pollution. The most vulnerable people face all of these disadvantages.
- 2.16.2** Overall, the Preferred option including the introduction of a category C CAZ will have positive health benefits for all and in particular for those people in the following protected characteristic groups:
- Age: Children and the elderly are most at risk
 - Disability: Those with respiratory or cardio-vascular conditions are specially at risk
 - Pregnancy and Maternity: Unborn babies are at risk and there is increased risk of miscarriage.
- 2.16.3** Addressing NO₂ pollution from road traffic across the CAP area should bring benefits to communities across the whole city, particularly as some of the most significant polluters (buses, taxis, LGVs) drive around and through neighbourhoods in every part of Sheffield.
- 2.16.4** As vehicle fleets upgraded and are replaced in response to the CAZ, the NO₂ concentrations around the whole road network should improve at a faster rate than without action. Changes in the automotive industry and shift toward hybrid and electric vehicles and away from diesel should continue to bring reductions in air pollution to communities and neighbourhoods in Sheffield.
- 2.16.5** The EIA will be published on the SCC website with the publication of the Full Business Case documents.

2.17 Health Impact Assessment

- 2.17.1** A full Health Impact Assessment of the Clean Air Plan has been undertaken. It's conclusions can be summarised as follows:
- The Clean Air Zone, if successful in reducing NO₂ will improve Sheffield's air quality which should directly impact on cardiovascular and respiratory health of residents. The CAZ is only for nitrogen dioxide reductions and other air pollutants are not covered – these pollutants such as fine dust (PM10 and PM2.5) will continue to be produced by less polluting vehicles as they are a result of wear and tear on the vehicle and road surface. Therefore, a modal shift to active travel and mass transit would be needed to deliver overall air quality improvements. Those switching from car use to active travel (particularly walking, cycling, running, scooting, skateboarding) are likely to be healthier as they will be more likely opportunistically to achieve physical activity targets of 30 minutes, 5 times a week as part of their commute.

2.18 Logic Mapping

2.18.1 The table below explains how the components of the Preferred Option will deliver improvements to local air quality.

Table 6. How the Components of the Preferred Option will Deliver Improved Air Quality	
Scheme ID	How this Measure Delivers Improved Air Quality
50 mph on Parkway	NO _x emissions follow a U-shaped curve wrt speed, so that vehicles travelling at 50mph emit less than those travelling at 70mph or above. Reduced speed limits also tend to deliver smoother-flowing traffic, again directly reducing vehicle emissions.
Rawmarsh Hill bus rerouting	A direct reduction in emissions from buses close to the AQ hot-spot on Rawmarsh Hill.
Bellow's Road	Emissions increase on Bellow's Road, but NO ₂ levels are currently well below the legal limit.
Bus upgrade/retrofit to Euro 6	Direct reduction in tailpipe emissions from all scheduled buses operating across Sheffield & Rotherham
HGV ban on Northbound A629 Wortley Road	Reduction in the number of HGVs travelling up the hill past this AQ hot-spot, leading to a direct reduction in NO _x emissions at this 'AQ hot-spot' location
TCF9 (Arundel Gate Bus Gate Partial Scheme)	Removal of the general traffic from this AQ hot-spot occurs 1-2 years earlier than planned, leading to a direct reduction in NO _x emissions along this street.
Taxi upgrades	Cleaner taxi fleet, leading to reduced NO _x emissions across Sheffield
Sheffield Inner Ring Road CAZ C Charging Area	Combination of accelerated upgrades of the taxis, good vehicle and bus fleets and the diversion of the most-polluting vehicles away from the city centre AQ hot-spots
Anti-idling Measures on Arundel Gate	Direct reduction in tail-pipe emissions at this key AQ hot-spot location
Financial incentives to deliver the required pace of vehicle upgrades	Accelerated upgrades of SCC's taxis, goods vehicles and coach fleets, leading directly to reduced NO _x emissions

2.19 Benefits, Risks, Constraints and Dependencies

Benefits

2.19.2 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.

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

Risks

2.19.4 Risks, issues and dependencies are covered within the Management Case Section 6.8, see the RAID log, Appendix MC6

Constraints

2.19.5 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) vans¹⁴; and
- C06 – the need to consider the ability of the owners of non-compliant vehicles to upgrade within the time available to them.

2.19.6 The measures to be delivered are described within the Management Case (Section 6.6) Commercial Case (Section 4.3 and 4.4) and the Financial Case Section 5.2. The Management Case section 6.6 with the RAID log, Appendix MC6, (6.9) describe the key risks and dependencies which have the potential to affect delivery of the Preferred Option and/or the realisation of the expected benefits.

Dependencies

2.19.7 The main dependencies which needed to be borne in mind during the design and delivery of the preferred package of measures are as follows:

¹⁴ [New van sales hit by supply shortages | Van News \(commercialfleet.org\)](https://www.commercialfleet.org/news/new-van-sales-hit-by-supply-shortages/)

- D01 – the need for close working between SCC and RMBC and with neighbouring authorities, particularly with respect to bus retrofit and taxi licencing, but potentially also when considering measures to influence fleets which operate across the South Yorkshire area and beyond;
- D02 – the impact of CAZ-based schemes elsewhere in the UK will have impacts on the local traffic fleet in SCC/RMBC involving a hard-to-predict combination of ‘fleet cascading’, where older vehicles are pushed out of other local authority CAZ areas onto non-charged areas of SCC/RMBC’s road network and the ‘beyond-the-CAZ boundary’ benefits of the fleet upgrades generated by the emission-reduction measures delivered in other UK authorities;
- D03 – the ‘chicken-and-egg’ inter-relationship between the supply of public chargers for electric vehicles and the uptake of electric vehicles;
- D04 - the impact of suppressed demand – the reduction in traffic travelling into or through the CAZ due to the introduction of the CAZ charge will reduce congestion in the city centre and on the key radial routes, but this decongestion benefit will be eroded if there is a significant amount of ‘suppressed demand’, which re-routes to take advantage of the reduced journey times through these congestion hot-spots.

Other Strategic Issues

- 2.19.8** 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.
- 2.19.9** 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.
- 2.19.10** 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.
- 2.19.11** 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 requires 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.