



Birmingham City Council Air Quality Action Plan

Consultation Draft

In fulfilment of Part IV of the
Environment Act 1995
Local Air Quality Management

2020

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Executive Summary

This Air Quality Action Plan (AQAP) has been produced as part of our statutory duties required by the Local Air Quality Management framework. It outlines the action we will take to improve air quality in Birmingham between 2020 and 2025.

This action plan replaces the previous action plan which ran from July 2011. Projects delivered through the past action plan include: the extension of the red route network (red routes have been implemented on 6 major routes into and out of the city centre), increase in the number and use of Park and Ride schemes (Longbridge now operational), improvement of the bus fleet within Birmingham (support of CENTRO's Environment Strategy 2014-2019) and an improvement in the city's taxi fleet (a project to retrofit taxi's to LPG and the overall replacement of the taxi fleet).

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent^{1,2}.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion³. Birmingham City Council is committed to reducing the exposure of people in Birmingham to poor air quality in order to improve health. A Clean Air Zone, which will discourage the most polluting vehicles from central Birmingham, will be implemented in 2021 (postponed from 2020 due to the impact from Covid 19). This represents a major intervention, including all vehicle types and is likely to have a major impact on air quality, not only within the zone, but more widely as vehicle fleets have a more rapid turnover.

This Action Plan incorporates the Clean Air Zone, but provides a wider set of actions. We have developed seven broad actions that will be refined and focussed on specific areas, as ongoing work identifies where exceedances outside of the Clean Air Zone area persist.

¹ Environmental equity, air quality, socioeconomic status and respiratory health, 2010

² Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

³ Defra. Abatement cost guidance for valuing changes in air quality, May 2013

Our priorities are to implement the Clean Air Zone and mitigation measures, support and implement strategic transport improvements, promote behaviour change away from single occupancy vehicle use, promote alternatively fuelled vehicles and develop policies to support better air quality. In addition, specific measures will be identified once locations where exceedances persist outside of the CAZ area have been identified, and industrial and domestic emissions will also be controlled; as transport related emissions reduce, the relative importance of these sources will increase.

In this AQAP we outline how we plan to effectively tackle air quality issues within our control. However, we recognise that there are a large number of air quality policy areas that are outside of our influence (such as vehicle emissions standards agreed in Europe), but for which we may have useful evidence, and so we will continue to work with regional and central governments on policies and issues beyond Birmingham City Council's direct influence.

Responsibilities and Commitment

This AQAP was prepared by the Environmental Health service of Birmingham City Council with the support and agreement of key officers, in particular the sub-programme leads on the Brum Breathes programme.

This AQAP has been approved for consultation by Cabinet.

This AQAP will be subject to an annual review, appraisal of progress and reported to the relevant Cabinet Member and to the Licensing & Public Protection Committee. Progress each year will be reported in the Annual Status Reports (ASRs) produced by Birmingham City Council, as part of our statutory Local Air Quality Management duties.

If you have any comments on this AQAP please send them to Environmental Protection at:

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1 Introduction

Birmingham City Council (BCC) is the largest urban local authority in the UK and the largest council in Europe with 101 councillors representing 69 wards. It has a population of over 1 million residents spread over an area of approximately 26,777 hectares (103 square miles). It has a population density of 36.5 persons per hectare, which makes it the most densely populated of the West Midlands local authorities.

The city has a very complex road network with about a dozen major radial roads and two ring roads traversing the city. In addition, there are three heavily trafficked motorways, M5, M6 M6 Toll and M42 forming a box around the city with a section of the A38M running through the city. Figure 1.1 shows the Birmingham City Council area, including major roads and the extent of the Clean Air Zone.

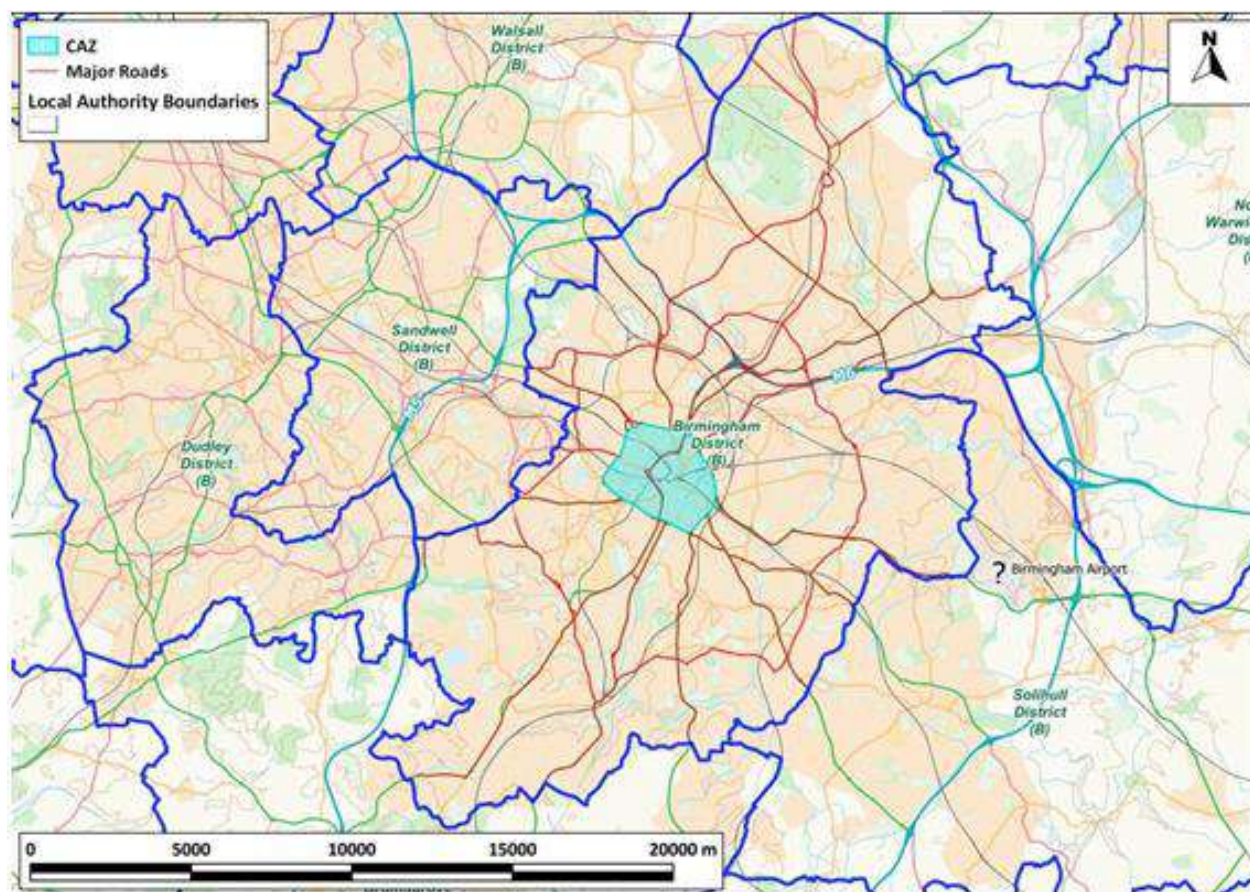


Figure 1.1 Map of the Birmingham City Council area

BCC declared itself an Air Quality Management Area in respect of Nitrogen Dioxide (NO₂) in 2010. The Council has recognised the importance of public health for many years and has a specific commitment in the Council Plan to tackle air pollution⁴.

This report outlines the actions that Birmingham City Council, in association with others, will deliver between 2020-2025 in order to reduce concentrations of air pollutants and exposure to air pollution, thereby positively impacting on the health and quality of life of residents and visitors to the local authority's administrative area.

It has been developed in recognition of the legal requirement on the local authority to work towards the Air Quality Strategy (AQS) objectives under Part IV of the Environment Act (1995) and relevant regulations made under that part, and to meet the requirements of the Local Air Quality Management (LAQM) statutory process.

It should be noted that whilst air quality objectives (under the Environment Act 1995) and limit values (under Directive 2008/50/EC Ambient Air Quality and Cleaner Air for Europe) are numerically the same: 40 µg/m³ for annual mean nitrogen dioxide concentrations, there are important differences in how they are assessed and reported, and where they apply. Compliance with the Limit Values is largely determined via the national monitoring network and the national model (the Pollution Climate Mapping (PCM) model) and reported to the EU by the competent authority, which in England is the Secretary of State for the Environment. In locations such as Birmingham, where Clean Air Zone feasibility work has been undertaken, local modelling has been used to assess against the Limit Value and generally uses a proxy of assessing receptors 4m from the kerb and 2m in height as being equivalent to the PCM model. Air quality objectives, by comparison, apply only where there is exposure relevant to the averaging period. In this case, for an annual mean objective, they apply at facades of residential properties and schools and would usually be applied at 1.5m height. There are clearly large overlaps between the two systems, and both are designed to improve public health, but throughout this report the term 'objectives' is used to denote the criteria under the Environment Act 1995, while the term 'Limit Value' is used to denote the criteria under Directive 96/62/EC.

This action plan is intended to complement the substantial amount of work which has been undertaken in relation to the Clean Air Zone (CAZ), which is due to come into force in 2021. It is intended that the Action Plan will implement measures to reduce

⁴https://www.birmingham.gov.uk/info/20011/your_council/237/council_plan_and_budget_2018_to_2022

concentrations in locations outside of the CAZ, and will complement the CAZ process.

This Plan will be reviewed every five years as a minimum, and progress on measures set out within this Plan will be reported on annually within Birmingham City Council's air quality ASR.

2 Summary of Current Air Quality in Birmingham

Annual average nitrogen dioxide (NO₂) concentrations exceed air quality objectives on several road links in and around Birmingham city centre, and this remains a challenge for Birmingham City Council. Birmingham is currently compliant with legal limits for particulate matter (PM). However, further reductions are needed (especially to PM_{2.5} levels⁵) to protect human health. This Action Plan, by definition, is focussed on reducing nitrogen dioxide, but care will be taken to ensure that any measures implemented do not worsen PM concentrations.

The area of Birmingham city centre where annual average nitrogen dioxide concentrations exceed the legal limit is expected to decrease by 2020, due to anticipated reductions in background concentrations, the ongoing upgrade of the local vehicle fleet and other local interventions. However, modelling indicates that if nothing further is done, concentrations will continue to exceed the limit on some major roads in and around the city centre, including the A38, A38M, A4400, A452 and A4540.

Birmingham City Council maintains an air quality monitoring network to allow the Council to understand the quality of the air within its area. The current network is included in Appendix C, which shows all monitoring locations both within and outside of the CAZ area, both real time (automatic) analysers and passive monitoring locations.

Historic modelling had suggested that the areas of exceedance / likely areas of exceedance were contained within the areas influenced by the incoming CAZ and monitoring was therefore focussed to assess concentrations in these locations. In the intervening years since that modelling was undertaken there have been significant changes, including to the emission factors on which air pollution models are based, including national models such as the PCM. This has resulted in a need to revisit and reassess pollution concentrations in areas outside of the city centre.

Whilst Birmingham's monitoring network has been focused on the city centre area, outside of the city centre the network is not presently sufficient to identify which locations have relevant exposure, and as such may be exceeding the nitrogen

⁵ This relates to pollutant particles with an aerodynamic diameter 2.5 microns where 1 micron equals 1 millionth of a metre

Dioxide annual mean objective. With the imminent introduction of the CAZ to deliver improvements within the city centre area, the Council has adopted an intelligence-led approach to identify any areas of exceedance outside the city centre, and this is based on an existing model and analysis of traffic data, with areas of public exposure in close proximity. This AQAP will therefore be amended as the outcomes from this process provide evidence as to where the AQAP should be targeted. It should therefore be considered a living document.

3 Birmingham's Air Quality Priorities

3.1 Public Health Context

Air pollution is a major public health risk ranking alongside cancer, heart disease and obesity. A review by the World Health Organization concluded that long-term exposure to air pollution reduces life expectancy by increasing the incidence of lung, heart and circulatory conditions. The Department of Health and Social Care's Advisory Committee on the Medical Effects of Air Pollutants (COMEAP) has estimated that long-term exposure to man-made air pollution in the UK has an annual impact on shortening lifespans, equivalent to 28,000 to 36,000 deaths (COMEAP, 2018). Poor air quality can affect health at all stages of life. Those most affected are the young and old. In the womb, maternal exposure to air pollution can result in low birth weight, premature birth, stillbirth or organ damage. In children there is evidence of reduced lung capacity, while impacts in adulthood can include diabetes, heart disease and stroke. In old age, a lifetime of exposure to air pollution can result in reduced life-expectancy and reduced wellbeing at end of life. There is also emerging evidence for a link between air pollution and an acceleration of the decline in cognitive function (Defra, 2019).

Poor air quality disproportionately affects the poorest and most vulnerable in our communities including children. Public health not only aims to improve health, but also reduce health inequalities by using an evidence-based approach to make recommendations on the delivery of health and wellbeing services. As such, this Action Plan will support work underway within the public health arena.

3.1 Planning and Policy Context

3.1.1 National Level Policy

Air Quality Strategy

The Air Quality Strategy (Defra, 2007) published by the Department for Environment, Food, and Rural Affairs (Defra) and Devolved Administrations, provides the policy framework for air quality management and assessment in the UK. It provides air quality standards and objectives for key air pollutants, which are designed to protect human health and the environment. It also sets out how the different sectors: industry, transport and local government, can contribute to achieving the air quality

objectives. Local authorities are seen to play a particularly important role. The strategy describes the Local Air Quality Management (LAQM) regime that has been established, whereby every authority has to carry out regular reviews and assessments of air quality in its area to identify whether the objectives have been, or will be, achieved at relevant locations, by the applicable date. If this is not the case, the authority must declare an Air Quality Management Area (AQMA) and prepare an action plan which identifies appropriate measures that will be introduced in pursuit of the objectives.

National Air Quality Plan

Defra has produced an Air Quality Plan to tackle roadside nitrogen dioxide concentrations in the UK (Defra, 2017); a supplement to the 2017 Plan (Defra, 2018a) was published in October 2018 and sets out the steps Central Government is taking in relation to a further 33 local authorities where shorter-term exceedances of the limit value were identified. Alongside a package of national measures, the 2017 Plan and the 2018 Supplement require those identified English Local Authorities (or the GLA in the case of London Authorities) to produce local action plans and/or feasibility studies. These plans and feasibility studies must have regard to measures to achieve the statutory limit values within the shortest possible time, which may include the implementation of a Clean Air Zone (CAZ). Birmingham City Council was in the first tranche of 5 local authorities named in the 2017 plan, and subsequent work identified that a Clean Air Zone including all vehicles (known as a CAZ D) is required. This is due to be in place in 2021.

National Planning Policy

The National Planning Policy Framework (NPPF) (2019a) sets out planning policy for England in one place. It places a general presumption in favour of sustainable development, stressing the importance of local development plans, and states that the planning system should perform an environmental role to minimise pollution. One of the twelve core planning principles notes that planning should “contribute to...reducing pollution”. To prevent unacceptable risks from air pollution, planning decisions should ensure that new development is appropriate for its location. The NPPF states that the “effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or

proposed development to adverse effects from pollution, should be taken into account”.

More specifically the NPPF makes clear that:

“Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan”.

Regional level policy

The West Midlands Combined Authority (WMCA), which came into being in June 2016, comprises the eighteen local authorities and four Local Enterprise Partnerships working together to provide strategic decision making in relation to transport, economic development and regeneration. Individual councils will still deliver services and retain their identity but at a regional level, the combined authority will have additional resources to work together.

The first Mayor (Andy Street) was elected in May 2017, and whose manifesto includes pledges relating to air quality, including implementation of the Clean Air Zone, lobbying government to ensure that businesses and individuals who own polluting vehicles have the right level of financial support to help them invest and switch to cleaner vehicles, encouraging bus companies to upgrade their buses, and supporting the uptake of autonomous and electric cars in the West Midlands.

Transport for West Midlands Delivery Plan 2026

The WMCA has set out an ambitious plan for growth in its Strategic Economic Plan and has established a 20-year vision for the transport system needed to support this. The Movement for Growth (MfG) Strategic Transport Plan provides the long-term approach for this vision and provides a high-level policy framework for improving the transport system serving the West Midlands.

The first joint Delivery Plan of the MfG Strategic Transport Plan provides a view of what transport initiatives and schemes the WMCA will deliver by 2026. The plan will be updated annually to form a rolling 10-year delivery plan.

Some of the headline committed schemes and projects for the next delivery period include:

- New smart motorway sections (M6 junctions 13-15), M409/42 interchange)
- Better use of the M6 toll
- M54- M6-M6 Toll Link road
- Improved motorway junctions
- Making better use of the A46
- HS2 connectivity programme
- Metropolitan main road network pinch point junction improvements
- Priority links in the metropolitan cycle network
- Local initiatives such as local cycle network development, key walking routes, Birmingham 20 mph zones phases A and B, smarter choices initiatives, local bus network improvements etc.

3.1.2 Local Policy

Birmingham City Council Plan: 2018-2022

Birmingham City Council Plan outlines a number of outcomes it wishes to achieve, including being an entrepreneurial city to live, work and invest in; an aspirational city to grow up in; a fulfilling city to age well in; a great city to live in; and to ensure that Birmingham residents gain the maximum benefit from hosting the Commonwealth Games. One of the priorities of the Council plan is to improve the environment and specifically to tackle air pollution.

Clean Air Zone

The results of the traffic and air quality modelling undertaken have demonstrated that implementation of a charging 'class D' CAZ plus associated additional measures, exemptions and mitigations is the route to compliance with the EU Limit Value for NO₂ in the shortest possible time, predicted to be 2022. The CAZ is due to be implemented in 2021.

The implementation of a CAZ is more than just putting into place an access restriction for vehicles; this would simply constitute a Low Emission Zone (LEZ). In principle, a CAZ should deliver wider benefits, supporting economic growth and accelerating the transition to a low emission economy by raising public awareness and providing financial incentives to accelerate transition.

Brum Breathes Programme

Brum Breathes is an overarching communications and engagement programme and contains a number of sub-programmes, each of which have a number of discreet projects, all related to air pollution / air quality. The sub-programmes comprise:

- Early Measures designed to deliver infrastructure improvements in advance of the Clean Air Zone;
- The CAZ programme itself;
- Developing Infrastructure focusing on the deployment of alternate vehicle power train/refueling technologies to enable a shift from fossil fuel usage;
- Air Quality Policy Environment which contains policy-based projects to enable the Council to have air quality embedded within a wider range of decision-making processes e.g. planning, HR;
- Behaviour change comprises a range of projects which seek to engender and promote shifts from car usage to alternate modes of transportation;
- Mitigations and Exemptions focuses on delivering those items to which commitments were made within the CAZ business case, to support businesses and individuals in adapting to the CAZ;
- Communications is a monitoring sub-programme which seeks to ensure that suitable governance processes and communications are identified and followed by all other sub-programme projects.

Clean Air Strategy

This is a strategy sitting within the Air Quality Policy Environment sub-programme. The Clean Air Strategy (CAS) seeks to deliver air quality benefits across the entire city and will seek to consider those items that either go beyond legislative duties or pick up items for which no such duty exists, and includes six pledges made by the Council to improve air quality. For each pledge, there are a number of different, albeit related, actions within each. The strategy explains what has been done already, what is within the Council's power to change and be accountable for, and what else is required. It also identifies who the Council needs to work with in order to support the pledge. The pledges are:

- *We will introduce a Clean Air Zone in Birmingham City Centre;*

- *We will continue to deliver a world class transport system which prioritises public transport, cycling and walking;*
- *We will identify schools which are exposed to air pollution problems and work with the school to identify intervention strategies to reduce the exposure of the children;*
- *We will expand our air quality monitoring network, incorporating new technologies and through partnership working with educational institutions and citizen science projects we will make the results readily available to all;*
- *We will further develop our approaches to tackling emissions from both existing buildings and proposed developments;*
- *We will work with key partners and stakeholders throughout the West Midlands region to help inform our own work and provide leadership where required.*

A further important focus of the CAS is to maximise the synergies between the clean air (air quality) and carbon (global warming) agendas so as to avoid or mitigate any disbenefits arising from the result of actions.

Birmingham Connected

Birmingham Connected⁶ covers all transport planning activity and is built on the Birmingham Connected White Paper, BCC's 20 year transport strategy. The goal is *to create a transport system for everyone; one that puts people first and delivers better connections for citizens and businesses. We want to improve daily lives by making travel more accessible, more reliable, safer and healthier.*

Delivering this vision means investment in transport infrastructure: railways, roads and cycling and walking routes. Within this scheme, many of the Council's transport projects are focused on reducing pollution emissions and enabling more sustainable modes of transport. Birmingham Cycle Revolution aims to make cycling an everyday way to travel in Birmingham over the next 20 years. Two new, high quality cycle routes have been constructed, linking the city centre to Selly Oak and Perry Barr. Birmingham is creating Green Travel Districts with less congestion, less pollution, fewer accidents, and healthier, safer, more productive communities. In densely

⁶https://www.birmingham.gov.uk/info/20013/roads_travel_and_parking/498/birmingham_connected

populated residential areas, the aim is to create an environment where residents, workers and visitors can safely walk, cycle or take public transport as their preferred travelling option. Alongside the CAZ, the Council is reviewing and extending parking controls in and around the city centre.

Draft Birmingham Transport Plan & Emergency Birmingham Transport Plan

The Draft Birmingham Transport Plan was published in January 2020 and was undergoing public consultation when the pandemic occurred. In response to COVID-19 the Emergency Birmingham Transport Plan was published in May 2020. The full Birmingham Transport Plan will be published in late 2020.

Both the draft and emergency plans seek to reduce transport's damaging impact on the environment, supporting Birmingham's commitment to becoming a carbon neutral city by 2030. The draft plan's vision is for "Birmingham's transport is for a sustainable, green, inclusive, go-anywhere network. Safe and healthy environments will make active travel – walking and cycling – the first choice for people making short journeys. A fully integrated, high quality public transport system will be the go-to choice for longer trips. A smart, innovative, carbon neutral and low emission network will support sustainable and inclusive economic growth, tackle climate change and promote the health and well-being of Birmingham's citizens.

eScooter Trial

Birmingham is to take part in a national trial of electric scooters to determine if they will become a legal model of transport across the country. eScooters have the potential to be a low emission mode capable of removing short private car journeys. The trial is to start in August 2020 for one year.

Department for Transport Active Travel Funding

The Secretary of State for Transport announced in May 2020 £2 billion funding package to support active travel to help the country emerge from the coronavirus crisis, of which £225 million is for swift, emergency interventions to make cycling and walking safer. This funding is to promote cycling as a replacement for journeys previously made by public transport. Measures such as closing roads to through traffic and installing segregated cycle lanes will be delivered. These initial interventions will see an accelerations of active travel measures which will vastly assist in creating sustained modal shift to active modes.

West Midlands Strategic Local Transport Plan ‘Movement for Growth’

The West Midlands Strategic Local Transport Plan ‘Movement for Growth’ (WMCA 2016) commits to *“reduce transport’s impact on our environment – improving air quality, reducing carbon emissions and improving road safety”* and will achieve this through the development of projects that aim to *“protect the natural and historic environment including heritage, designated and local wildlife sites, protected species, landscape, water quality, soil quality, and air quality”*.

Local Plan

In January 2017 Birmingham City Council adopted the Birmingham Development Plan for the period 2011 to 2031 (Birmingham City Council, 2017). It sets out a spatial vision and strategy for the sustainable growth of Birmingham, and to inform decisions on planning, development and regeneration.

Policy TP36 on health states that:

“The City Council is committed to reducing health inequalities, increasing life expectancy and improving quality of life by...Seeking to improve air quality and reduce noise within the City”.

While, regarding transport, Policy TP38 states:

“The development of a sustainable, high quality, integrated transport system, where the most sustainable mode choices also offer the most convenient means of travel, will be supported. The delivery of a sustainable transport network will require:

- *The facilitation of modes of transport that reduce carbon emissions and improve air quality.*
- *Building, maintaining and managing the transport network in a way that reduces CO₂, addresses air quality problems and minimises transport’s impact on the environment.”*

Joint Strategic Needs Assessment (JSNA)

The Joint Strategic Needs Assessment (JSNA) addresses current and future health and social care needs that could be met by the Local Authority, CCGs, or NHS England. The Strategic overview (2017/18) recognises that air quality can be linked to cardiovascular disease, Chronic Obstructive Pulmonary Disease and asthma, and

that children, pregnant women, older adults and those with pre-existing conditions are most vulnerable to adverse effects. It also states that almost 900 deaths per year are linked to air pollution.

Health and Wellbeing Strategy

The Health and Wellbeing Strategy addresses some of the critical challenges Birmingham faces and requires input from many organisations across the city. In January 2017 the Board agreed to a set of updated priorities which includes 'Making Birmingham a Healthy City', with one of the two associated ambitions of improving air quality.

Other Projects undertaken to improve air quality

BCC's proposed policy on emission standards for taxis and private hire vehicles means that these vehicles will need to reach increasingly stricter emission standards. Under the Birmingham NOx Reduction Champions' project, emissions from 65 of Birmingham's Hackney carriages (black cabs) have been reduced by fitting LPG (liquefied petroleum gas) fuelled engines. These engines are Euro 6 (category N1, class III) compliant, meaning they would not be charged to enter the CAZ. Additional funding has been awarded by the Office for Low Emission Vehicles (OLEV) to introduce 197 electric taxi charging points, all of which will offer fast or rapid charging facilities for Hackney carriages and private hire vehicles. Electric vehicles are also exempt from charging as part of the CAZ.

Low Emissions Towns and Cities Programme (LETCP)

The Low Emissions Towns and Cities Programme is a partnership comprising the seven West Midlands local authorities, (Birmingham City Council, Coventry City Council, Dudley MBC, Sandwell MBC, Solihull MBC, Walsall Council and Wolverhampton City Council) working together to improve air quality and reduce emissions from road transport.

Originally funded through a Defra Air Quality Grant, the intention is to promote the uptake of low emission fuels and technologies, establishing and sharing best practice policies, and developing various tools and resources. The objectives of the programme are to investigate and produce various regional strategies designed to improve air quality, with a view to meeting national air quality objectives.

3.2 Work to inform the identification of exceedance areas

Despite ongoing work on the Clean Air Zone, it is currently unclear whether there may be locations exceeding the air quality objectives outside of the CAZ area. It is therefore proposed, that in tandem with the drafting of this Action Plan, work is undertaken to identify these areas. BCC has devised a methodology for this work, which will be undertaken within the resources available to the City Council (i.e. without any additional modelling at this stage).

Initially, a geographic information system (GIS) approach was used to identify road links where the traffic flow was greater than 25,000 AADT and there was residential exposure within 20 metres of the centre-line of the road. The location of the residential exposure was based on address point data from the Local Land and Property Gazetteer (LLPG), which does not largely represent building facades. This information was then overlaid on an existing local air quality model displaying concentrations of nitrogen dioxide (NO₂) in micrograms per cubic metre (µgm³).

A desktop exercise was undertaken to identify three tranches of sites that could be assessed on a hierarchical basis, with tranche one representing the highest risk.

- Tranche one comprised sites where there are roads with greater than 25,000 AADT, with relevant exposure within 20 metres, and the existing model indicated concentrations above 40 µgm⁻³.
- Tranche two comprised sites where there are roads with greater than 25,000 AADT, with relevant exposure within 20 metres, and the existing model indicated concentrations between 36 and 40 µgm⁻³.
- Tranche three comprised sites where the existing model indicated concentrations above 40 µgm⁻³ but the roads have less than 25,000 AADT, or there is no relevant exposure within 20 metres.

This approach was taken to allow a further, more detailed assessment of the sites before any air quality monitoring is undertaken. The detailed assessment will check that the traffic flows are accurate and that the building facades are close enough to give relevant exposure. A monitoring strategy will then be put in place (diffusion tubes at worst case locations of relevant exposure) for a minimum period of 6 months. These data will be used to determine whether that particular location

requires continued monitoring, or whether the site can be safely discounted from requiring any specific action.

Because of this ongoing work, it has not been possible to target actions at specific locations, but instead, a suite of actions are included in this Action Plan, which, once specific locations have been identified, will be specifically targeted.

3.3 Source Apportionment

The AQAP measures presented in this report are intended to be targeted towards the predominant sources of emissions within Birmingham City Council's area. The most recent work on source apportionment was undertaken as part of the CAZ feasibility work, and, by definition covers locations within the CAZ. However, the results show that in 2020 (without the CAZ) contributions are predominantly from diesel cars and LGVs, with variable contributions from buses depending on location. This is likely to be applicable at any locations targeted by this Action Plan; however, following the implementation of the CAZ it is likely that the proportion of diesel cars in Birmingham as a whole may decrease. Table 3.1 includes data reported in the Birmingham Clean Air Zone Feasibility Study reported in 2018 (Full Business Case Air Quality Modelling Report) for a 'Do Minimum' Scenario in 2020.

Table 3.1 – Source Apportionment for a 2020 'Do Minimum' in Birmingham City Centre

Site Location	% Contribution from Respective Vehicle Classes					
	Diesel Cars	Petrol Cars	Diesel LGVs	Rigid HGVs	Artic HGVs	Buses & Coaches
A4400 Suffolk St. Queensway	53	6	25	14	2	0
A38 Corporation Street	54	6	22	13	2	3
A4540 Lawley Middleway – Garrison Circus	42	5	21	28	4	0
A4100 Moat Lane, Digbeth	25	3	8	13	2	49

3.4 Key Priorities

Based on the evidence provided above, the following issues need to be considered when deciding on which measures are likely to be effective:

- Identify any locations outside of the CAZ which have persistent exceedances of the nitrogen dioxide air quality objectives;
- Prioritise measures which will reduce emissions from road transport, especially diesel vehicles (cars, LGVs and HGVs, with some locations relevant for buses);
- Ensure that other sources (industrial and domestic) are also controlled (either through permitting or the planning system).

4 Development and Implementation of Birmingham City Council's AQAP

4.1 Consultation and Stakeholder Engagement

In developing/updating this AQAP, we have worked with other local authorities, agencies, businesses and the local community to improve local air quality. Schedule 11 of the Environment Act 1995 requires local authorities to consult the bodies listed in Table 4.1, which is being done through this consultation version of the AQAP. The document will also be made available on the Be Heard website, the consultation hub for Birmingham.

The response to our consultation stakeholder engagement will be provided in the next version of this document, and this section will be updated. Table 4.1 shows the relevant bodies to be included in the initial consultation exercise.

Table 4.1 – Consultation Undertaken

Yes/No	Consultee
Yes	the Secretary of State
Yes	the Environment Agency
Yes	the highways authority
Yes	neighbouring local authorities
Yes	other public authorities as appropriate, such as Public Health officials (PHE)
Yes	bodies representing local business interests and other organisations as appropriate

4.2 Steering Group

No Steering Group has been formed to take this Air Quality Action Plan forward, but there are a number of existing groups within Birmingham City Council who regularly meet and discuss issues in relation to air quality, particularly through the feasibility study, and now the implementation of the Clean Air Zone. In relation to the measures within the Action Plan, meetings have been held with key members of staff within Birmingham City Council, and discussions have also been held with all sub-programme leaders within the Brum Breathes programme, in order to ensure that all these processes align and complement each other. This engagement will continue as the Action Plan requires monitoring and evaluation, which will run alongside that for the Clean Air Zone and be monitored through the Brum Breathes programme.

5 AQAP Measures

The following section outlines the Birmingham City Council AQAP measures, which are summarised in Table 5.1. Table 5.1 contains:

- a list of the actions that form part of the plan
- the responsible individual and departments/organisations who will deliver this action
- estimated cost of implementing each action (overall cost and cost to the local authority)
- expected benefit in terms of pollutant emission and/or concentration reduction
- the timescale for implementation
- how progress will be monitored

Future ASRs will include regular annual updates on implementation of these measures.

The following groups of measures, as outlined by Defra and categorised for reporting to the EU, have been considered. A brief overview of this consideration is included in the table below:

EU Measure Category	Current practice
Alternatives to Private Vehicle Use	Rail based Park and Ride already in operation. Birmingham's previous Action Plan had a measure to increase the number and use of park and ride schemes in partnership with CENTRO.
Environmental Permits	Work to ensure that all industrial installations are permitted and visits etc. are up to date. Not likely to be a significant issue in the locations which the AQAP will target.
Freight and Delivery Management	As part of the CAZ programme, mitigation for HGVs and coaches include measures funded by the compliance fund.
Policy Guidance and Development Control	As part of the BRUM Breathes programme, there is a sub-programme which covers all air quality policy and incorporates measures to implement a Clean Air Strategy for Birmingham, more sustainable HR policies, procurement policies, planning and transport policies. These policies will also be directly relevant for this Air Quality Action Plan.
Promoting Low Emission Plant	Birmingham's developing Clean Air Strategy recognises that although Birmingham City Council is focussing on transport, other sectors such as domestic and small plant should also be considered.
Promoting Low Emission Transport	The Council will implement a Clean Air Zone in 2021 covering the most polluted area of the city. The CAZ will charge higher polluting vehicles, with the Council seeking to encourage their owners to replace them or avoid entering the

	<p>zone. The zone will cover all vehicle types and therefore promote low emission transport across all vehicle types. A linked project has sought to convert diesel powered 'black' taxis in Birmingham to run on LPG. In 2016, 63 cabs were converted, (and will therefore be permitted to run in the CAZ without charge).</p>
Promoting Travel Alternatives	<p>Birmingham is committed to deliver a world class transport system to support additional growth in the city. It is estimated that the growth in the city's population will result in 1.2 million additional daily trips across the network by 2031. In the short term there are examples of local initiatives, for example: From 23 September, six Birmingham schools will be the first in the city to pilot a pioneering scheme where roads around the schools will be closed to motorised traffic at the start and end of the school day (Car Free School Streets) BCC Travel Plan (BB programme behaviour change)</p>
Public Information	<p>Birmingham aims to support citizen science projects, not only to build a more detailed picture of pollution concentrations across the city, but also to disseminate this information across the city. Through the work on the CAZ, the public is receiving more information about air quality, via various mechanisms. Brum Breathes includes extensive community engagement as part of the behaviour change sub-programme, including projects such as school NOx monitoring, Clean Air Cops (training programme for school engagement), Business Travel Network, community engagement with voluntary, faith groups and local residents and Make Every Contact Count (training for health professionals and others).</p>
Traffic Management	<p>It is likely that once specific locations have been identified as exceeding air quality objectives, traffic management is likely to be a useful tool, for example at congested locations, and at busy junctions.</p>
Transport Planning and Infrastructure	<p>In the summer of 2019, the A34 and A38 cycle routes were completed. The new A38 route from Selly Oak offers a 4 km two-way segregated cycle route for people cycling into the city centre from the south west of the city. The route is highly visible with a blue aggregate surface to make it stand out to all road users. This new route is part of a much bigger programme of new and upgraded cycle infrastructure delivered across the city over the last 5 years as part of the Birmingham Cycle Revolution (BCR) programme. This includes over 50km of canal towpaths improved with an all-weather cycling surface, over 25km of new or upgraded green routes through parks and open spaces and another largely segregated route along the A34 into the city centre from Heathfield Road, Birchfield.</p>
Vehicle Fleet Efficiency	<p>One of the main aims of the CAZ is to ensure fleet turnover occurs more quickly, and hence improve vehicle fleet efficiency.</p>

As discussed previously, at the time of writing this document, it is unknown where any exceedance areas are located outside of the city centre. Work is therefore underway to identify priority locations for monitoring, which will be implemented as soon as resources allow. Hence these measures will need to be refined (for example to ensure that specific geographical locations are covered), and potentially enhanced, as information on where exceedances persist becomes available. The actions are as follows:

Action 1: Implement Clean Air Zone and Mitigation Measures

A Clean Air Zone (CAZ) is an area where targeted action is taken to improve air quality, in particular by discouraging the most polluting vehicles from entering the zone. No vehicle is banned in the zone, but those which are non-compliant with the emissions standards will have to pay a daily charge if they travel within the area. The Clean Air Zone will cover all roads within the A4540 Middleway Ring Road (but not the Middleway itself) and will be implemented during 2021. Further information about the zone, including how to avoid paying to drive in the zone and exemptions and additional support, can be found at:

https://www.birmingham.gov.uk/info/20076/pollution/1763/a_clean_air_zone_for_birmingham

The CAZ is likely to have a positive impact on any locations identified as exceeding the air quality objective outside of the CAZ area, unless the CAZ diverts non-compliant vehicles to these areas (to avoid payment). This Action Plan supports the implementation of the CAZ and its supporting mitigation measures.

Funding Source: Government

Cost: £14.2 million has been allocated from the implementation Fund, and £38.0 million from the Clean Air Fund to support a package of mitigation measures to support businesses and individuals likely to be impacted by the introduction of a CAZ.

Action 2: Support and Implement Strategic Transport Improvements

The Birmingham Development Plan (BDP) sets out Birmingham's strategy for jobs and growth, meeting housing need and sustainable progress. Birmingham Connected links to the strategies and policies of the BDP and sets a bold new direction for the next 20 years that will see funding increased and new infrastructure

delivered. The vision is to complete a £1.2bn integrated public transport network within 20 years which will allow people to travel across the city in high-quality vehicles, feeling safe and secure, and enable rapid movement through some of the most congested sections of the network. This will include a minimum of three more Metro lines and up to nine cross-city bus rapid transit lines. As part of a city centre masterplan, a strategy will be developed for the long-term future and role of the A38 through the city centre, recognising the potential economic and social benefits which could be realised by removing structures, closing the existing tunnels, and redirecting through traffic on to a substantially upgraded ring road. Rail routes to Moseley and Kings Heath, Sutton Coldfield via Walmley and Tamworth via new stations at Fort Parkway and Castle Vale will be reopened and upgraded, supporting new housing and jobs in these areas. Up to £400 million will be used to upgrade Snow Hill Station, providing another gateway to the city. Green Travel Districts will be established which will enable packages of measures in specific locations to help achieve less than 50% single occupancy car mode share.

Funding Source: Government (Local Growth Fund), Highways England, Network Rail, Community Infrastructure Levy, Section 106,

Cost: £4 billion over 20 years

Action 3: Promote Behaviour Change away from Single Occupancy Private Vehicle Use

When considering solutions to reduce the environmental impacts of transport, it is important to first ascertain what drives transport demand. Access to efficient public transport will be of high importance in reducing demand for cars, including the provision of buses and bus priority measures in urban areas. Achieving change in travel mode choice can be an effective strategy to manage transport demand and so reduce NO_x emissions. Changes in travel mode may come about through incentivisation, public engagement or a regulatory scheme (such as the CAZ which will have an impact on modal choice). Measures to provide information on alternative ways of travelling or encouraging lift sharing can be implemented relatively quickly compared to provision of transport infrastructure or the development and introduction of cleaner vehicles, and in many cases can be a more cost-effective approach. Birmingham Connected is a long term programme of investment which aims to increase the number of people travelling by an active mode. The vision is to

establish walking and cycling as default modes across the city, and work on these aspects is already underway. Birmingham is one of five UK cities awarded the status of 'Walking City' by the Department of Health and Department for Transport. The city is already making significant investment to increase levels of cycling through the Birmingham Cycle Revolution (BCR). A £24 million injection has enabled the development and start-up of the BCR programme which is making it easier and safer for both new and experienced cyclists to travel to schools, shops and places of work, or simply to cycle for pleasure or fitness. To complement the Birmingham Cycle Revolution Programme, a successful £0.250 million funding bid was made for a Walking Cities Project which will be undertaken by the Third Sector Organisation Living Streets; which can be used as an example project which could be rolled out to other areas of the city.

Funding Source: Combination of bids to Government, planning contributions and internal budgets.

Cost: £24 million injection to BCR programme, other bids to cover specific schemes

Action 4: Promote the use of Alternatively Fuelled Vehicles

The primary objective of promoting a switch to low emission vehicles is the reduction of carbon and air pollutant emissions from transport. However, it does not have additional benefits such as congestion reduction, or increased levels of physical activity that are generated by measures to encourage active travel modes. Provision of suitable infrastructure to support low emission vehicles is critical to their introduction. For commercial vehicle operators the financial case for investing in electric vehicles is strongly dependent on ensuring high vehicle usage. Vehicle retrofit consists of the implementation of an on-board device that allows vehicles to comply with more stringent standards by reducing the emission of pollutants through technical measures. Retrofit measures are usually either Exhaust Gas Recirculation (EGR) or Selective Catalytic Reduction and Urea technology (SCR and Urea).

Birmingham has led the way in many of these technologies, the following projects being examples of the work underway.

- Business Breathes (<https://businessbreathes.co.uk/>) is a website designed to support business operators transition to cleaner vehicle technology in light of

the incoming CAZ and supporting fleet transition beyond compliance towards zero emissions.

- The City Council has utilised OLEV funding (£0.500 million) to retrofit 65 hackney carriage taxis from diesel to LPG. This involved developing the technology, establishing the supply chains, ensuring the technology is CVRAS accredited to be utilised in CAZ areas, and ensuring transferability of the technology from beyond hackney carriages to other vehicles e.g. VW Transporters.
- Birmingham presently has 18 EV chargers with 36 charge points. To encourage wider uptake of EV technology and in particular to support the changes to the taxi licensing policy the Council has leveraged OLEV funding (£2.92m) to draw in additional funding (£4.6m) from the private sector to increase the charging network to 197 chargers holding 394 rapid / fast charge points. Installation will commence in 2020.
- A new refuelling hub for commercial vehicles, known as the Tyseley Energy Park, is being developed. This will provide for a taxi charging hub, hydrogen refuelling infrastructure for buses and a transition point for existing Euro VI commercial vehicles through biodiesel and CNG. Funding has come from a range of sources including OLEV and FCHJU as well as from the private sector (over £7m in total).
- Working in partnership with Cadent at Gravelly Hill, Erdington, the Council is establishing a CNG station for commercial vehicles accessing the city centre from the north and the M6. This opens in April and is funded via Cadent with policy/planning permissions advice and support provided by the City Council.
- Working with TfL and Aberdeen City Council, Birmingham have set up a procurement framework to procure a number of hydrogen buses. Funded through OLEV, FCHJU, the LEP and the City Council (combined £11m), the intention is to purchase 20 buses with delivery expected by the end of March 2021. This is expected to incentivise the market for further development.

Funding Source: Where specified, in the paragraphs above

Cost: Where specified, in the paragraphs above

Action 5: When locations are identified as having an exceedance of the air quality objectives, assess traffic management options relevant to the location

Traffic management can be used to improve air quality by reducing numbers of vehicles, smoothing traffic flow, or potentially holding queues/ congestion away from relevant exposure locations. The associated reduction in braking, acceleration and stop-start driving improves the emissions performance of vehicles. Particulate emissions from brake and tyre wear may also be reduced as a result. Traditional control systems use traffic lights to control the flow of vehicles across a road network. These are widely used at key road junctions to reduce congestion and increase traffic flow. What specific measure will be most effective will depend on the particular location; hence, when locations are identified which exceed the air quality objectives, traffic management schemes will be assessed in conjunction with Birmingham City Council transport planners.

Funding Source: Local Transport Plan or Section 106 agreements

Cost: Dependant on specific scheme

Action 6: Develop Policies to Support Better Air Quality

There are a number of policies already in place which will help support air quality. The Clean Air Strategy makes a number of pledges to improve air quality in the short to longer term. Most of these policies cannot be quantified in terms of the impact on pollutant concentrations at specific locations (which is the aim of this Action Plan), but they will lead to an overall reduction in emissions across Birmingham.

The appropriate regulatory framework is in place to guide new and existing developments to minimise emissions. All new developments will be required to implement or support actions that make a positive contribution to improving air quality, for example by reducing travel demand and opening up possibilities for cycling and walking.

Central Government will be lobbied to ensure that future policy is fit for purpose and tightens existing regulatory frameworks.

HR policy will be used to formulate a 'staff travel and expenses' policy to incentivise/simplify access to low emission transport options.

When resources allow, it is the aim to implement a system to reduce emissions from construction, by reducing emissions of dust and particulate matter from construction and demolition activities and manage emissions of NO_x from construction and

demolition machinery by way of controls through the planning system on Non Road Mobile Machinery (NRMM).

Funding Source: Mainly from existing budgets. Planning system could generate funding for measures within this Action Plan.

Cost: unknown, but mainly staff time

Action 7: Control Industrial and Domestic Emissions

In order to ensure that industrial and domestic emissions are controlled, joint working with the Environment Agency and industries permitted by Birmingham City Council (BCC) will be undertaken to ensure that permits are enforced. At the start of the 2019/20

financial year the City Council's Environmental Protection team regulated 219 such industries including the car manufacturing plant Jaguar Land Rover, four crematoria, various solvent coating plants, cement batching plants and a range of other processes.

In order to assist homeowners with decisions around wood burning stoves (to ensure they are in line with the current regulatory framework), guidance has been provided for residents introducing new appliances. This guidance is available through BCC's website⁷ which has been updated to provide up to date guidance on 'Ready to Burn' and 'Woodsure' schemes. In addition, BCC will continue to respond to Government consultations on this issue and lobby for a revision of legislation to assist in dealing with these sources.

Funding Source: From existing budgets

Cost: Unknown but staff time only

⁷ https://www.birmingham.gov.uk/info/20076/pollution/1277/what_causes_air_pollution/4

Table 5.1 – Air Quality Action Plan Measures

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
1	Implement a Clean Air Zone and Mitigation Measures	Promoting Low Emission Transport	Low Emission Zone or Clean Air Zone	Birmingham City Council	2018-2020	Early 2021 (date TBC)	Evaluation Plan to be undertaken (locally and at national level)	Achievement of Limit Values by 2022 within CAZ area	Feasibility work undertaken, scheme accepted and funded	2021 for implementation. Ongoing evaluation	
2	Support and Implement Strategic Transport Improvements	Transport Planning and Infrastructure	Bus route improvements, cycle network, public transport improvements – interchanges stations and services	Birmingham City Council	2019-2020	Ongoing for the next 20 years	Level of modal shift	n/a at this stage	Ongoing improvements in cycle network, walking provision and public transport	2040	Long term measure, rather than a quick achievement of air quality objectives, although strategic transport improvements could be focussed on locations of exceedance when identified
3	Promote Behaviour Change away from Single Occupancy Private Vehicle Use	Promoting Travel Alternatives	Encourage/facilitate home working, Personalised Travel Planning, Promotion of Cycling, Promotion of Walking, School Travel Plans, Workplace Travel Planning	Birmingham City Council	Ongoing	Ongoing	Level of modal shift	n/a at this stage	A number of projects already underway such as 'Walking City' and the Birmingham Cycle Revolution	Ongoing	

Birmingham City Council

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
4	Promote the use of alternatively fuelled vehicles	Promoting Low Emission Transport	Company Vehicle Procurement CAZ, Priority Parking for LEVs, Procuring alternative refuelling infrastructure, taxi emission incentives	Birmingham City Council	Ongoing	Ongoing	Proportion of local fleet which is low emission	n/a at this stage	Lots of projects already underway for example retrofitting taxis to LPG, hydrogen buses, refuelling infrastructure	Ongoing throughout the lifetime of the CAZ	
5	When locations are identified as having an exceedance of the air quality objectives, assess traffic management options relevant to the location	Traffic Management	Could be any of the measures within Traffic Management	Birmingham City Council	2020 onwards (once outcomes of monitoring at specific locations is available)	Unknown	Unknown until specific schemes are decided on	n/a at this stage	n/a at this stage	n/a at this stage	
6	Develop policies to support better air quality	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance, Low emission strategy, other policy, regional groups, sustainable procurement guidance	Birmingham City Council	2020	2020-2025		n/a at this stage	Birmingham Clean Air Strategy published, regulatory framework in place for new developments	Ongoing	
7	Control Industrial and Domestic emissions	Promoting Low Emission Plant	Regulations for fuel quality for stationary and mobile sources	Birmingham City Council	n/a	Ongoing		Unlikely to reduce pollution within specific locations identified	Guidance provided for residents through website	Ongoing	

Appendix A: Response to Consultation

Table A.1 – Summary of Responses to Consultation and Stakeholder Engagement on the AQAP

Consultee	Category	Response
Defra	Statutory	To be consulted on draft report
Environment Agency	Statutory	To be consulted on draft report
Highways Authority	Statutory	To be consulted on draft report
Neighbouring local authorities	Statutory	To be consulted on draft report
Public Health	Statutory	To be consulted on draft report
Residents		To be consulted on draft report on Brum Breathes website

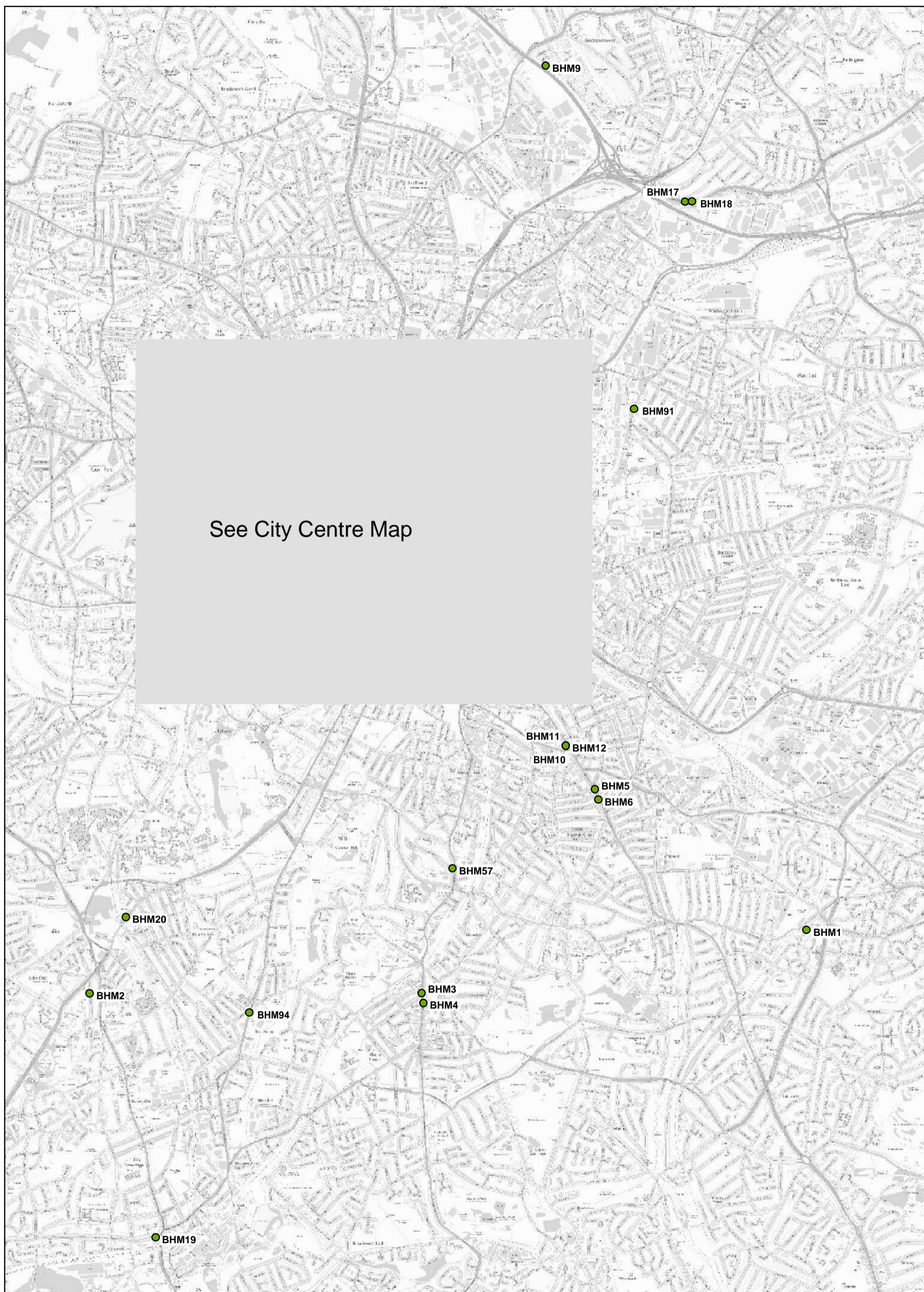
Appendix B: Reasons for Not Pursuing Action Plan Measures

Table B.1 – Action Plan Measures Not Pursued and the Reasons for that Decision

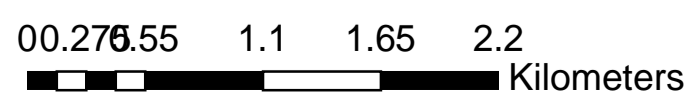
Action category	Action description	Reason action is not being pursued (including Stakeholder views)
Currently no actions specifically <i>not</i> being pursued		

Appendix C: Maps of Monitoring Locations

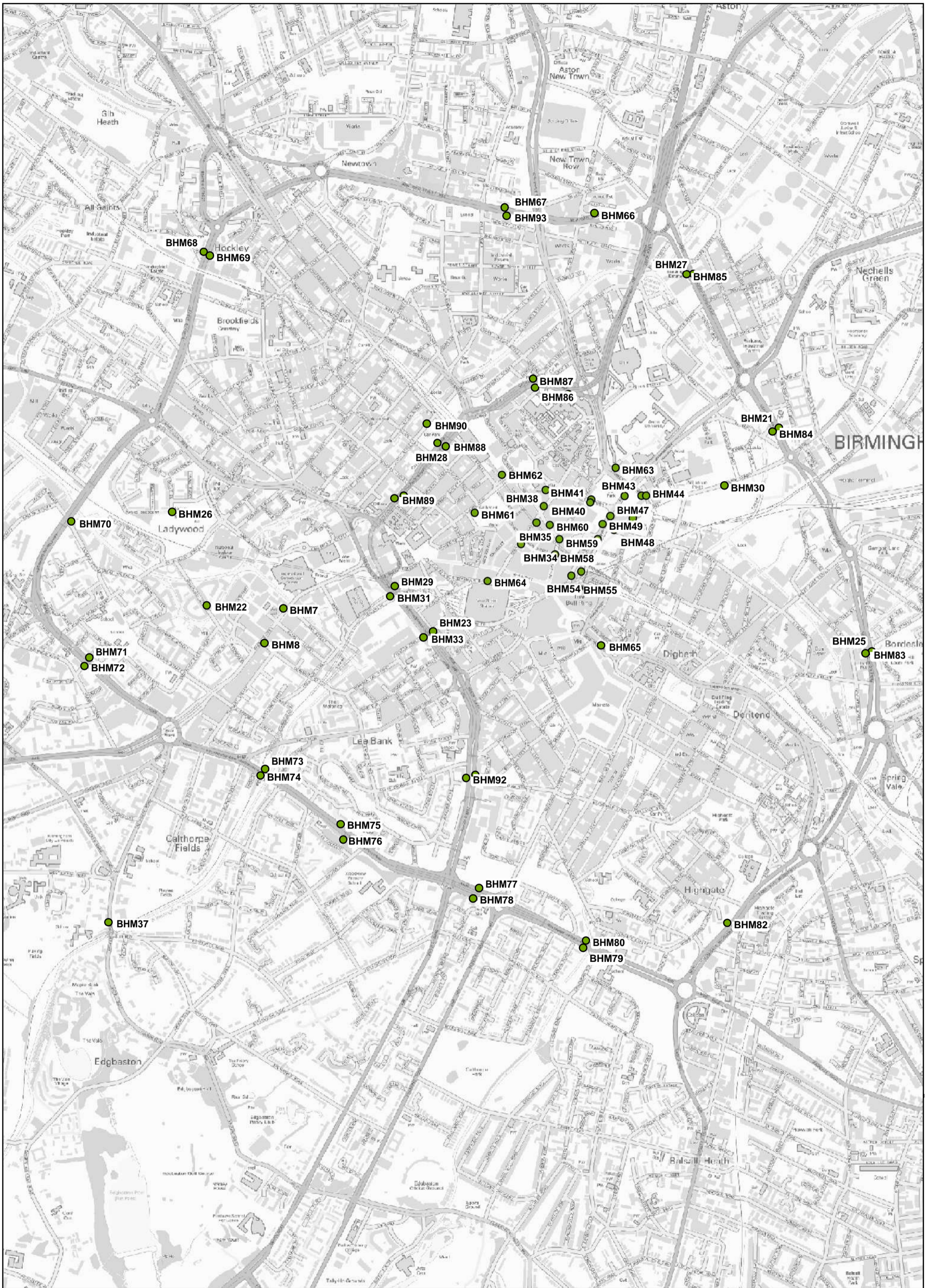
Diffusion Tube Monitoring Locations (City Wide)



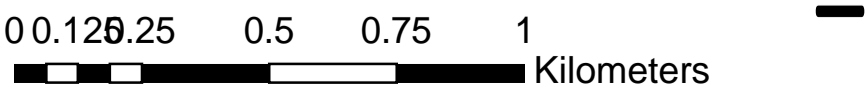
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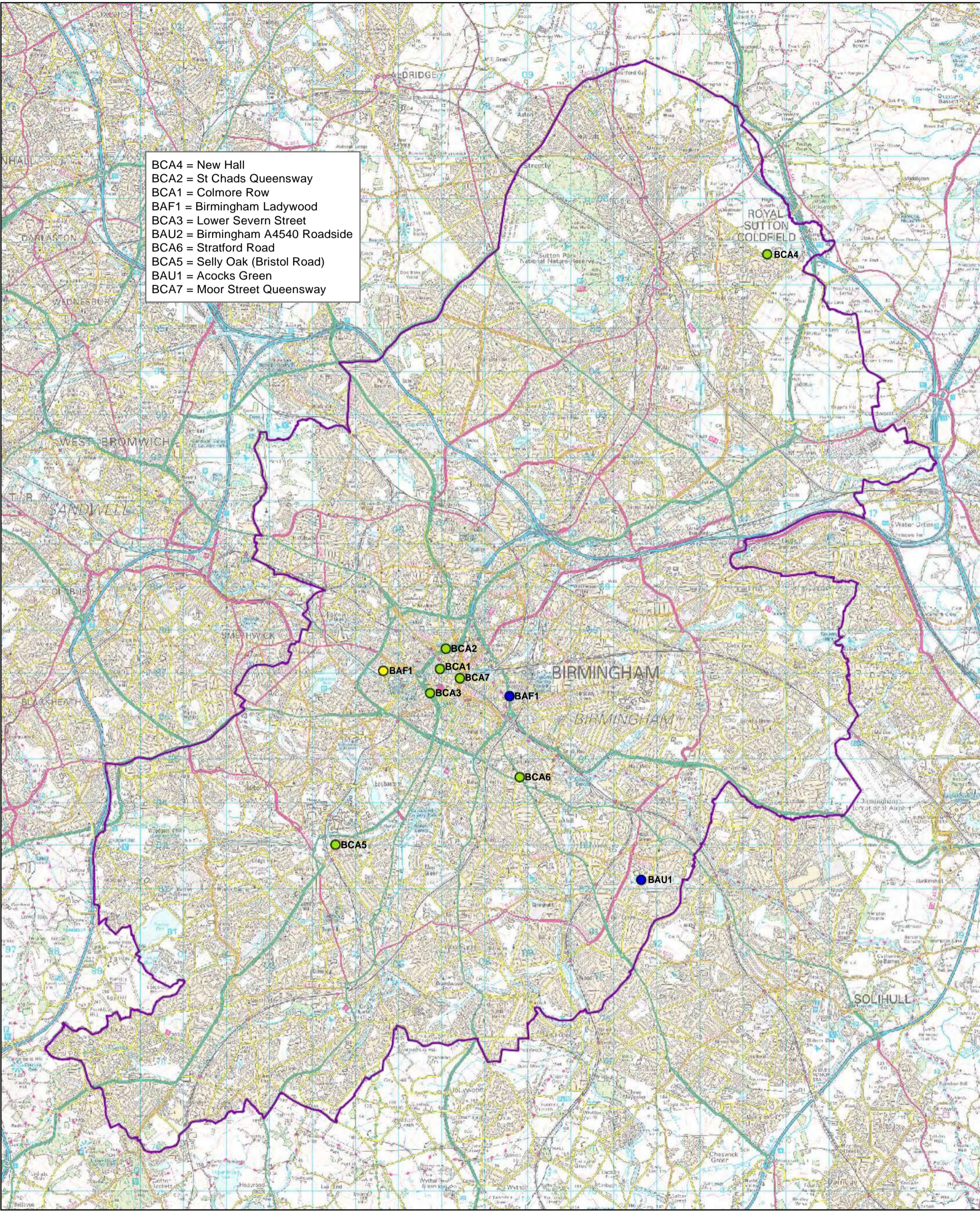
Diffusion Tube Monitoring Locations (City Centre)



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Locations of Automatic Monitoring Sites



Sites coloured blue are in the AURN network.
Sites coloured yellow are affiliated into the AURN network.
Sites coloured green are BCC operated sites.

Glossary of Terms

Abbreviation	Description
AADT	Annual Average Daily Traffic
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
AQS	Air Quality Strategy
ASR	Air quality Annual Status Report
BCC	Birmingham City Council
BCR	Birmingham Cycle Revolution
BDP	Birmingham Development Plan
CAZ	Clean Air Zone
CENTRO	West Midlands Passenger Transport Executive, now Transport for West Midlands
COMEAP	Committee for the Medication Effects of Air Pollution
Defra	Department for Environment, Food and Rural Affairs
EGR	Exhaust Gas Recirculation
EU	European Union
GIS	Geographical Information System
HGV	Heavy Goods Vehicle
JSNA	Joint Strategic Needs Assessment
LAQM	Local Air Quality Management
LETCP	Low Emissions Towns and Cities Programme
LGV	Light Goods Vehicle
LLPG	Local Land and Property Gazetteer

LPG	Liquefied Petroleum Gas
MfG	Movement for Growth Strategic Transport Plan
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
NPPF	National Planning Policy Framework
NRMM	Non-Road Mobile Machinery
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
SCR	Selective Catalytic Reduction
WMCA	West Midlands Combined Authority

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