

A city wide
approach to
tackling air
pollution

#brum**breathes**



brum
breathes

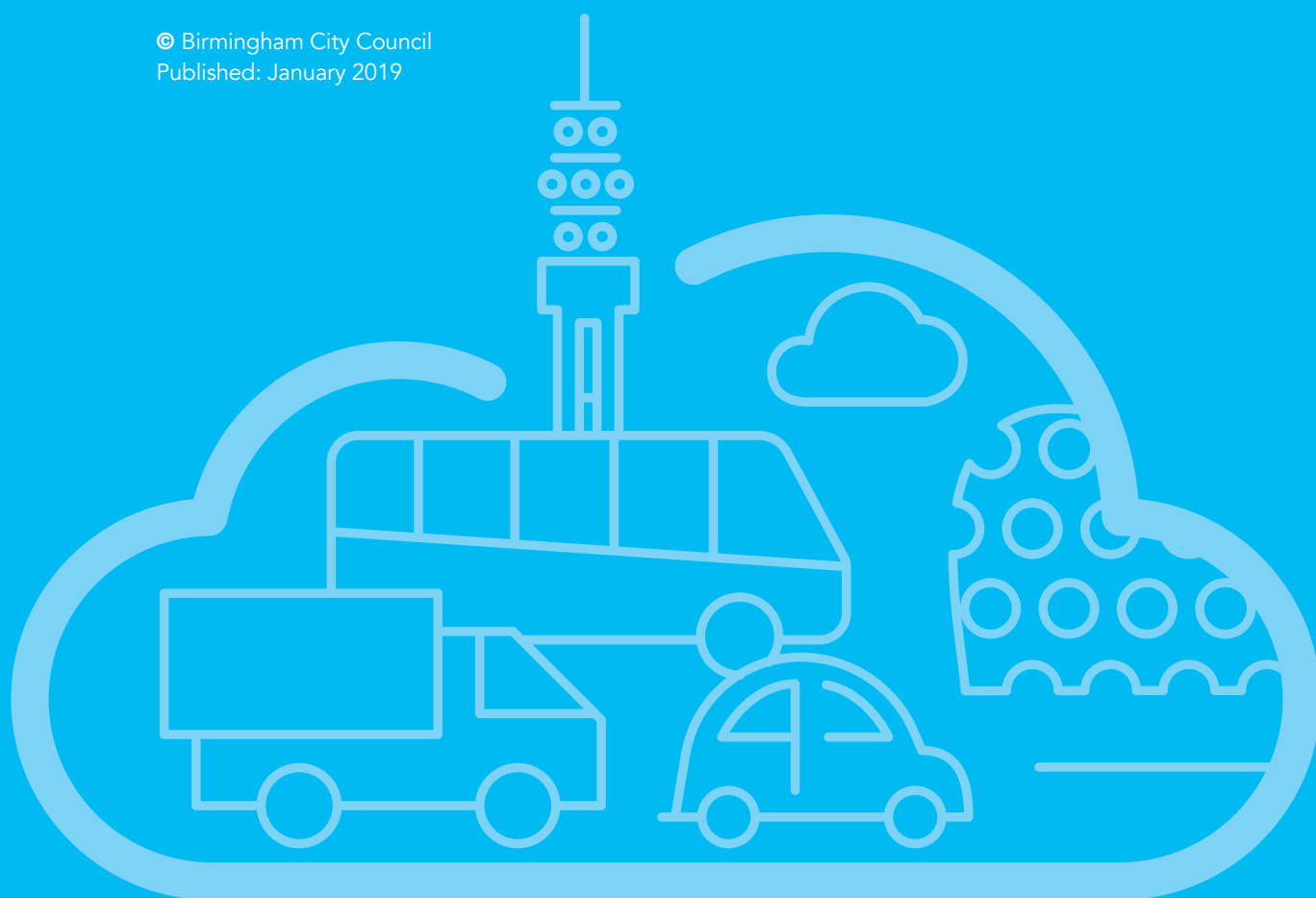
[birmingham.gov.uk/cleanair](https://www.birmingham.gov.uk/cleanair)

 **Birmingham**
City Council

Contents

- 3.** Introduction
- 4.** What are the causes of poor air quality?
- 6.** Vehicular emissions in Birmingham
- 7.** What are the health effects of poor air quality?
- 9.** What are we doing to tackle poor air quality?
- 10.** Route map to cleaner air in Birmingham
- 13.** Ways to improve air quality
- 14.** Pledges
- 24.** Framing the clean air strategy and next steps
- 26.** Reduce air pollution – 5 simple things
- 27.** Appendix 1

© Birmingham City Council
Published: January 2019



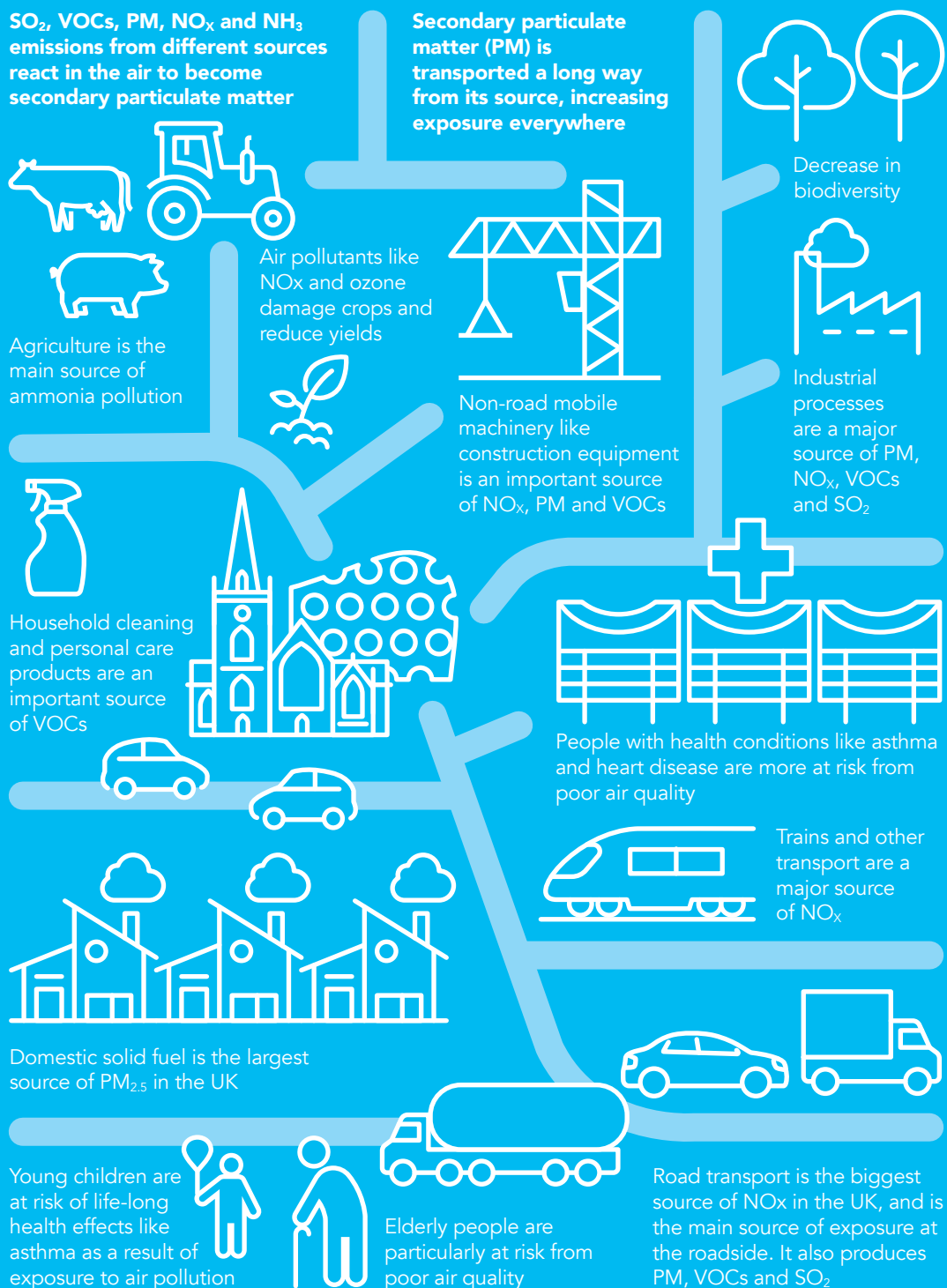
Introduction

Birmingham City Council believes that every person who lives and works in Birmingham has the right to clean air and that visitors to our city should also benefit from this clean air. But poor air quality in the city is contributing to hundreds of early, preventable deaths and making many existing health conditions worse. Poor air quality disproportionately affects the poorest and most vulnerable in our communities, including children. Furthermore, we have to recognise that many air pollutants have no known safe limits and although our efforts to date have rightly focused on the city centre we must ensure that all neighbourhoods of our city benefit from future interventions to improve air quality.

As well as tackling the health impacts from poor air quality we need to consider how improving air quality can be linked into economic growth for both the city and the wider region. This 'clean growth' means growing our income whilst tackling air pollution, protecting the natural environment, and cutting greenhouse gas emissions, thereby future-proofing our city as we look ahead to the middle of the century.

Birmingham is home to the largest local authority in western Europe and as the centre of the West Midlands conurbation is well placed geographically with well-developed businesses and academic institutions and a centralised transport network. This existing infrastructure, married to an ambition to be a 'first mover' within the region makes Birmingham perfectly placed to actively encourage change and enable regional discussion on the wider implications of clean growth. Working with partners across the region we can use this focus to maximise development in new technologies to encourage regional growth in world-class industries, such as the electric taxi production in Coventry. By embracing the air quality agenda as a positive challenge we can position the region, with Birmingham at the centre, as a centre of excellence which has the health of its citizens and improved air quality at the heart of decision making.

1. What are the causes of poor air quality?



Types of pollution: Nitrogen oxides (NO_x), Ammonia (NH₃), Sulphur dioxide (SO₂), Primary Particulate Matter (PM_{2.5}) and Volatile Organic Compounds (NMVOCs)

There are a range of pollutants which affect air quality and Government have identified five key pollutants to address within their National Clean Air Strategy¹. The preceding infographic taken from the Government's draft strategy explains the sources of the pollutants and how they interact in the environment.

As part of our on-going duty under Local Air Quality Management the City Council has reviewed and assessed the state of the air over two decades and considered the impact arising from a wide range of pollutants. Our experience tells us that in Birmingham the only pollutant which is found at concentrations above legal limits is nitrogen dioxide (NO₂), and that this has a measurable impact on health.

We also know from health studies that fine particulate matter (PM_{2.5}) has a significant health burden, contributing to a range of adverse health outcomes, and whilst we are presently compliant with legal limits, given the harm we know it causes, we believe more must be done to reduce emissions and lower concentrations; vehicular traffic will always generate particulate matter from both exhaust and non-exhaust sources (friction and wear from tyres and brakes), whilst the increasing lifestyle trend for wood burning stoves / boilers creates an increasing new source of pollution. Despite this we know that there remain many unknowns around PM_{2.5}, specifically around the sources and how they interact and seeking answers to these questions will better enable focused action to address pollutant concentrations.

We accept that other pollutants are important but due to the way they are formed and react in the environment we feel that a focus on NO₂ and PM_{2.5} will allow us to have the greatest impact on health in the city of Birmingham at this point in time.

We are conscious that a majority of local sources of NO₂ and PM_{2.5} are combustion based e.g. from vehicle engines, and that present solutions seek to provide alternative technologies to reduce the emissions. We acknowledge that there is a risk that this will result in a shift in the pollutants being emitted and/or a rise in carbon emissions. We will maintain a review on the evidence base surrounding all key pollutants to ensure they do not emerge as environmental risks to the population of the city.

¹ <https://consult.defra.gov.uk/environmental-quality/clean-air-strategy-consultation/>

Vehicular emissions in Birmingham

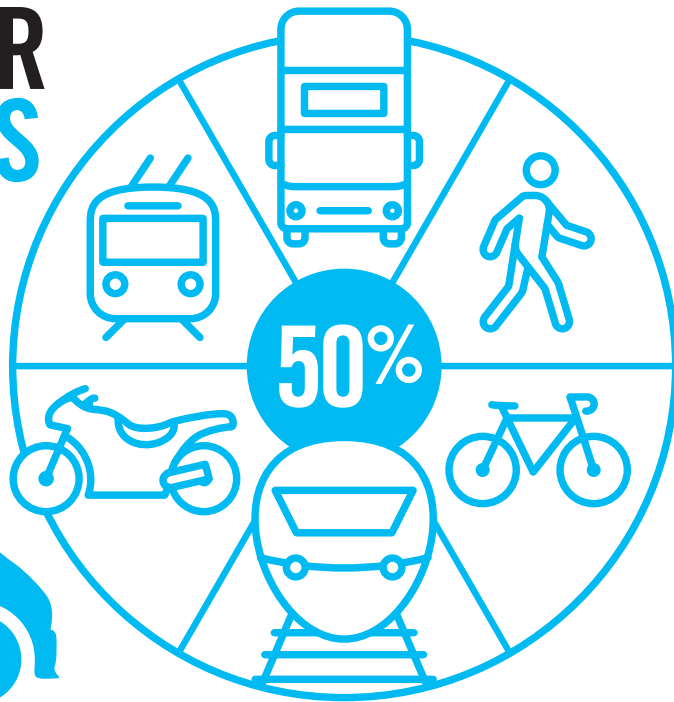
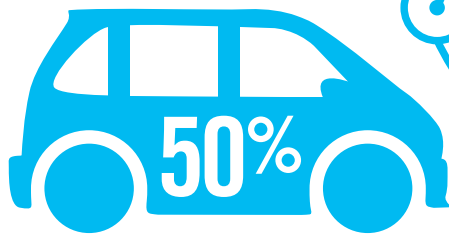
We know that vehicular emissions comprise the majority of local emissions to which people are exposed. Source apportionment undertaken for the Clean Air Zone study suggested that in 2016 road traffic accounted for 66% of nitrogen oxide emissions at key sites.

Clearly, a reduction in car usage will have a corresponding benefit in terms of reduced emissions and large health co-benefits, through increases in cycling, walking and other active transport.

VEHICULAR EMISSIONS

2.8m

The number of journeys made by the residents of Birmingham each day comprises 50% by car and 50% by all other forms of travel combined.*



0.5m

The number of car journeys made into Birmingham by people from outside of the city.

250k

The number of car journeys made by Birmingham residents that are less than one mile.

3.8

The average number of journeys per weekday in car-using households.

#brumbreathes

* West Midlands Household Travel Survey (HHTS)

Other emissions in Birmingham

Although the focus will initially be on vehicular trips we should not lose sight of the fact that there are other emissions sources, such as from industrial and commercial premises e.g. from factories and businesses, domestic emissions in the form of boilers such as older gas boilers and wood burning stoves, emissions from the rail network in the form of diesel trains, construction plant and other non-road mobile machinery, as well as emissions from outside the city such as from agriculture and from regional and trans-boundary sources.

Given this wide range of sources we will do what is within our power to control these emissions; for instance those industries with the greatest potential to pollute are regulated through an environmental permitting scheme by both the Council and the Environment Agency. The environmental permitting scheme is a successful example of pro-active regulation to protect the public from harmful emissions. Other emissions sources are also regulated predominantly on a by-complaint basis.

What are the health effects of poor air quality?

While the World Health Organisation advises that no levels of air pollution are safe, those with pre-existing respiratory and heart conditions and children are most vulnerable to its effects. Furthermore, people from socially and economically disadvantaged backgrounds are more likely to be exposed to higher levels of air pollution and are more at risk of negative health effects with children being particularly vulnerable.

The evidence base underpinning the detail in the above infographic is drawn from a wide range of research articles, with new evidence emerging on an almost constant basis. A list of the key articles is presented in Appendix 1, although this is by no means exhaustive.

Small changes can make a big difference – just a $1\mu\text{gm}^{-3}$ reduction in $\text{PM}_{2.5}$ concentrations this year could prevent 50,000 new cases of coronary heart disease and 9,000 new cases of asthma nationwide.

THE EFFECTS OF

AIR POLLUTION

UP TO

900
DEATHS
IN BIRMINGHAM

per year linked to man-made air pollution.



61%

**OF JOURNEYS
TO WORK
ARE BY CAR
OR VAN**



Exposed to
21% higher levels
of pollution.

CHILDREN IN

**HIGH POLLUTION
AREAS**

4

more likely to
have reduced
lung function
when they
become adults.



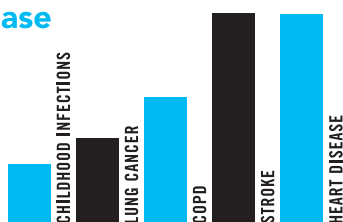
LINKED TO

Still births
Infant deaths
Low birth weight
Organ damage
Premature deaths



LINKED TO

Heart disease
Diabetes
Asthma
Obesity
Cancer
Dementia



Deaths due to air pollution worldwide per year.

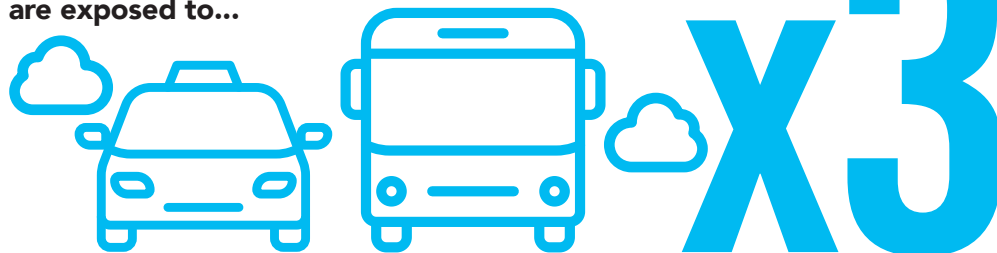
AFFECTS THE

**VULNERABLE
& DEPRIVED
AREAS MOST**



BUS & TAXI DRIVERS

are exposed to...



...more pollution than anyone else.

#brumbreathes

What are we doing to tackle poor air quality?

Earlier this year we announced plans to introduce a Clean Air Zone and ran an extensive consultation with the citizens and businesses of Birmingham. Through this consultation we have been able to talk to a wide range of business leaders, health experts, academics and, importantly, our community – inviting them to share their ideas for improving the air we breathe.

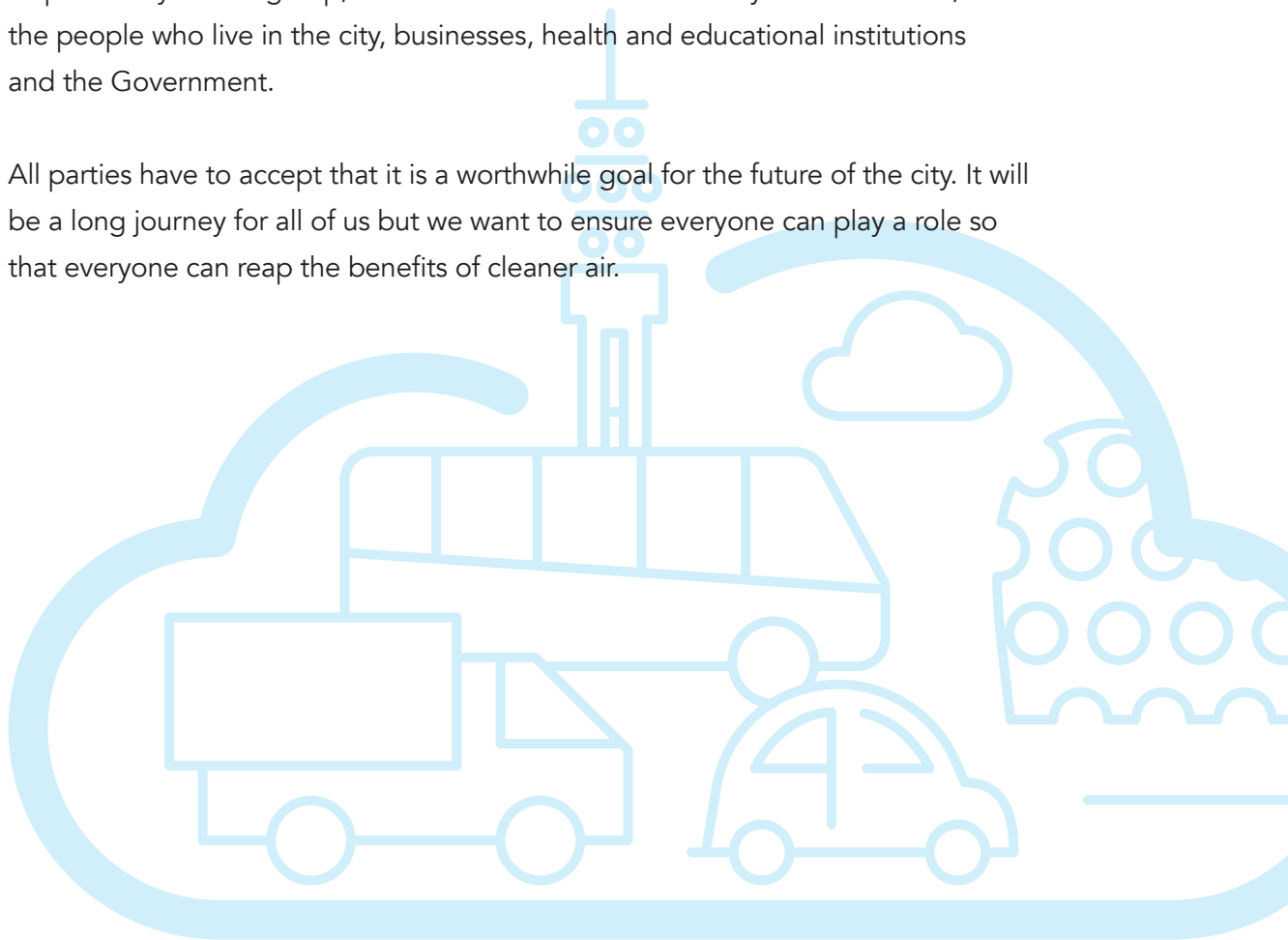


We now know that clean, green and healthy environments in urban and rural areas are an essential component of progress, not a barrier to economic development”

National Clean Air Strategy, Defra, 2018

Cleaning up our air and allowing Birmingham to breathe is not the sole responsibility of one group, rather it is a collective social duty on the Council, the people who live in the city, businesses, health and educational institutions and the Government.

All parties have to accept that it is a worthwhile goal for the future of the city. It will be a long journey for all of us but we want to ensure everyone can play a role so that everyone can reap the benefits of cleaner air.



ROUTE MAP TO

#brumbreathes

CLEANER AIR IN BIRMINGHAM

Encouraging transport behaviour change

2018

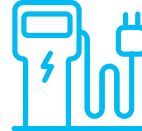


Consultation into Clean Air Zone proposals begins

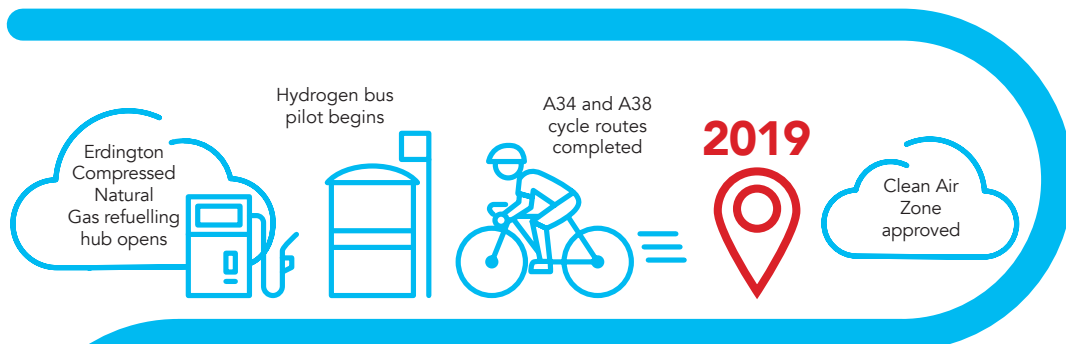


Tyseley Energy Park opens

Electric vehicle charge point network partner appointed



Taxi and public electric vehicle charge points installed



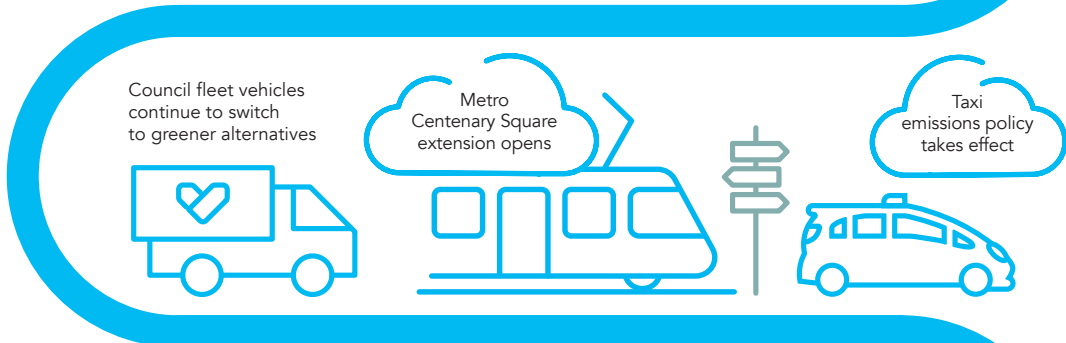
Hydrogen bus pilot begins

A34 and A38 cycle routes completed

2019



Clean Air Zone approved



Council fleet vehicles continue to switch to greener alternatives

Metro Centenary Square extension opens

Taxi emissions policy takes effect



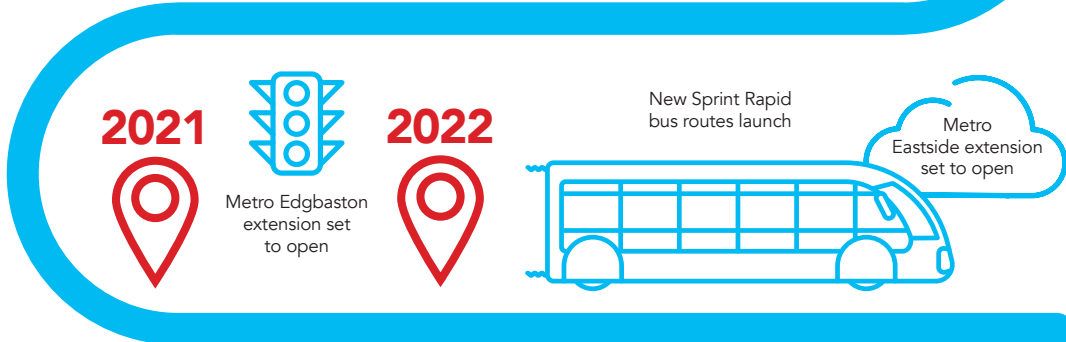
Commercial vehicle electric vehicle charge point network completed

Clean Air Zone implementation

2020



Perry Barr CNG refuelling hub opens



2021



Metro Edgbaston extension set to open

2022



New Sprint Rapid bus routes launch

Metro Eastside extension set to open

Based on these conversations we believe that the most effective way to clean up our air is to focus on transportation sources as these have the greatest impact, however other sources should not be overlooked. Accordingly, we believe the priorities for cleaning up our air are:

- 1.** A reduction in the number of dirty journeys by reducing the most polluting vehicles whilst improving the infrastructure for electric and low emission vehicles to support cleaner vehicle journeys.
- 2.** Improving the wider transport network to support smoother and faster journeys, whilst increasing the range of cleaner and environmentally/health-friendly journey options available to travellers e.g. cycling networks, walking schemes.
- 3.** Continuing to invest in our public transport network to produce services which the city can be proud of and which encourage more people to shift from private vehicle journeys.
- 4.** Ensuring that reducing emissions and exposure to air pollution are key considerations for decision making when planning development of buildings and public space.
- 5.** Embedding behaviour change as a golden thread that runs through and supports all of our conversations with residents of Birmingham, As we make physical changes to the infrastructure and transport of the city to make it easier to travel in ways that don't contribute to poor air quality, it is important that we support citizens to respond.
- 6.** Building support for the agenda at a local, regional and national level.

These are broad priorities for the city and each is framed to encompass a range of possible measures or interventions to allow more relevant, targeted action based on the input from key partners and stakeholders.

We also believe that a focus of our approach should be in maximising 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. The most obvious example of this was the push to diesel fuelled cars to reduce carbon emissions without the accompanying appreciation of the adverse public health impacts that have contributed to our current position. Our decisions have to be joined up and have to future proof our city.

Based on these priorities we have made a series of pledges which outline our commitment to make Birmingham a cleaner, greener and healthier city, a place where businesses will thrive and where people are happy to grow up and live fulfilling lives.

These pledges will explain the broad approach we intend to take to deliver on our commitment. However, because air quality is an issue that affects everyone we want to build a consensus with others around the city. We want to foster a real spirit of collaboration and partnership working and this Strategy is the first step and with your support will form the basis for developing actions to improve air quality across the City of Birmingham, incorporating your views and opinions and a set of common goals.

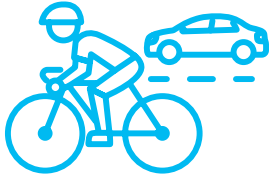
It is not possible to detail all the interventions that could be undertaken to improve air quality within this strategy and although the pledges are more focused than the priorities some still encompass a mix of actual actions to bring together thematic approaches and maximise the impact from the pledge. Just because an approach is not specifically stated does not mean it is excluded as many different interventions will come together to provide the maximum benefit.

Many other approaches can be taken to improve air quality as shown in the following infographic:

WAYS TO IMPROVE

#brumbreathes

AIR QUALITY



CYCLING & CYCLE LANES



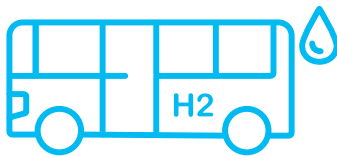
E-BIKES



WALKING



ELECTRIC VEHICLES



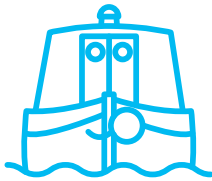
HYDROGEN BUSES



TREES & SHRUBS



TRAINS



CANAL BARGES



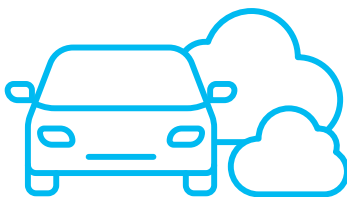
AIR MONITORING



CLEAN AIR DAY



CLEANER INDUSTRY



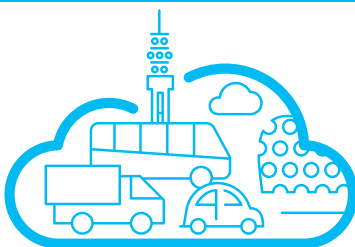
ANTI-IDLING



PARK & RIDE



LOCAL COMMERCE



CLEAN AIR ZONES



OUTCOME:
BETTER
HEALTH

FOR
ALL

2. Pledges

Each pledge comprises the actions to be considered within the broad approach. Given the breadth of the pledges there can be a number of different, albeit related, actions within each. The commentary explains what we have done to date, what is within our power to change and be accountable for, what else we intend to do and, importantly, what we need others to do and what individuals can do to support the pledge.

The Council's commitments are framed within the City Council's model of "lead – support – communicate – collaborate";

Lead

The City Council will take responsibility for its own actions and provide a lead for the city. We will invest the appropriate resources into becoming a clean, sustainable and inclusive city. We will set the standard and ensure that the Council's wider policies contribute to tackling air quality.

Support

We will support and encourage our communities and businesses to make healthy and active choices that result in clean air, focussing support on those most affected by poor air quality.

Communicate

We will communicate a clear and consistent message on air quality which acknowledges and accepts the challenge we have. We will raise awareness of the impact of poor air quality making it clear why action is needed.

Collaborate

Improving air quality is our shared responsibility. We will work in partnership with the West Midlands Mayor and the Combined Authority, neighbouring districts, educational institutions, transport operators and the communities and business of Birmingham.

PLEDGE 1:

We will introduce a Clean Air Zone in Birmingham city centre

In order to provide the singular greatest reduction in pollution Birmingham City Council will implement a Clean Air Zone (CAZ) covering the most polluted area of the city. The CAZ will target the dirtiest vehicles, seeking to encourage their owners to replace them or to avoid entering the area covered by the zone.

The aim is to reduce concentrations of nitrogen dioxide (an oxide of nitrogen) to under health based legal limits in the shortest possible time and reducing public exposure to this harmful pollutant.

Principle priorities supported

1, 2, 6.

Lead

The City Council has already undertaken detailed traffic and air quality modelling to identify the most polluted area and which vehicles contribute to that poor air quality. Our data suggests that the area within the A4540 ring-road will need to be included within the CAZ, whilst the ring-road will become the cordon.

Our data further suggests that all vehicles types will need to be affected in order to reduce pollution concentrations and public exposure in the shortest possible time (a Class D CAZ).

We will continue to progress the CAZ by submitting our business case to Government and accessing appropriate funds to deliver the required infrastructure to enable the CAZ to go live at the beginning of 2020.

Support

We accept that the CAZ will have an impact on citizens and businesses and to help we will consider exemptions and mitigation where appropriate and we will seek to leverage monies from Government funds to support affected businesses in changing or retrofitting their affected vehicles. We will look at how we reach out to organisations and community groups who want to work with us to help support their travel planning and encourage behaviour change, where this is feasible.

Communicate

We have undertaken a six week public consultation in which we have presented all our work to date, including the detailed models which underpin the requirement for a class D CAZ.

Collaborate

We will work with businesses and residents to mitigate the impacts arising from the CAZ where we can do so.

What can others do to support this pledge?

We would like to see businesses and citizens consider their future journeys in the light of whether they are necessary or whether they can be undertaken by a different route or mode.

We would like to see businesses and citizens continue to engage with the Council to ensure the maximum benefit is gained from the CAZ.

PLEDGE 2:

We will continue to deliver a world class transport system, which prioritises public transport, cycling and walking

Birmingham has ambitious plans for sustainable and inclusive economic growth and the Birmingham Development Plan 2031 sets out how this will be achieved. If Birmingham is to deliver its growth agenda and attract investment it must provide the necessary infrastructure to support the projected growth levels.

Population is projected to grow by an additional 150,000 people by 2031 and in order to provide employment for the city's growing population, an additional 100,000 jobs need to be created. 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 (by all transport modes within Birmingham). It is not possible or indeed desirable to accommodate these by private car.

The aim is to deliver world class transport system to support a world class city. We are committed to creating a cleaner, greener, go-anywhere, integrated transport system that puts people first and delivers better connections and will

work with partner organisations and key stakeholders to make this happen. This includes: rebalancing the network (in favour of sustainable modes), managing demand for travel, transformational investment and maximising efficiency.

Principle priorities supported

1, 2, 3.

Lead

Building on the foundations of the Birmingham Connected Transport Strategy, the City Council will bring forward an updated Birmingham Transport Plan to reenergise established strategic principles and set out a series of Big Moves to accelerate the transformation of the city's transport networks. The 2022 Birmingham Commonwealth Games is a focal point for much of this work, and we will make the most of this synergy to encourage healthier and less polluting travel on the network.

The Birmingham Walking and Cycling Strategy sets out a long-term plan to ensure that active travel becomes the popular choice for short journeys and to increase the opportunities for recreational cycling and walking with a particular focus on short journeys and linked trips. The Strategy aims to raise levels of cycling to 5% of all trips by 2023 and 10% of all trips by 2033.

Support

We will support our partners, businesses and communities to fundamentally change the way they travel, and keep the city moving during periods of transition, construction and disruption.

We will support Network Rail in improving the air quality at New Street Station through the provision of expert advice on reducing pollution and passenger exposure and the lobbying of Government to shift from diesel to cleaner trains.

Communicate

We will ensure that the vision for the future of transport in our city, and need for and pace of change, is widely communicated and understood.

Collaborate

We will work with our delivery partners, in particular Transport for West Midlands, to secure additional investment needed to transform our transport network and deliver the highest standard of service.

What can others do to support this pledge?

Individual citizens can help by considering the use of modes other than the car for some journeys, even just one or two changes a week make a difference.

Businesses and schools can support through implementing travel plans. Longer term, planning now for the way that transport networks will operate in the future.

PLEDGE 3:

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 know that air pollution has a disproportionate effect on certain members of our society. Evidence has shown that children in areas of higher pollution are four times more likely to have reduced lung function when they reach adulthood as a consequence of their exposure during their formative years.

Using our monitoring and modelling expertise we can determine which schools are most likely to be affected by air pollution. We can follow the principle of Clean Air Zones (CAZ) to either restrict traffic in full or in part, or take alternate action at key times. A one size fits all approach may not be appropriate and the CAZ concept allows for targeted interventions (not necessarily involving restricting vehicles or charging) based on the relevant evidence.

Principle Priorities Supported

1, 5.

Lead

The City Council will take the lead in devising a programme to identify those schools most exposed to pollution. We will share this information with citizens so that the real impact of poor air quality can be seen, and will encourage changes in behaviour.

Support

The Council will support schools who are seeking to reduce the exposure of their children through the use of a range of interventions from education and engagement campaigns, utilising enforcement policy, leveraging funding for infrastructure and energy efficiency improvements, through to the sensible and targeted use of green infrastructure.

Communicate

We will ensure adequate consultation takes place with schools and parents on the issues arising and on options available to reduce the exposure to children attending school. Furthermore we will build on existing engagements including 'Modeshift STARS' and the 'Clean Air Cops' programmes.

Collaborate

We will work in partnership with schools and parents to identify the most suitable intervention(s) for their particular school.

What can others do to support this pledge?

Schools who are flagged as being affected by poor air quality can help by assisting the Council in engaging with parents to help determine the most appropriate intervention for the school to deliver air pollution reductions.

PLEDGE 4:

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

Birmingham City Council monitor air pollution at a number of sites across the city under the Local Air Quality Monitoring (LAQM) regime and publish these annually in the Annual Status Report. There is an increasing demand for environmental information and newer technologies are being developed which can help deliver greater levels of information at a cheaper rate.

By working with partners, including supporting citizen science projects, we can build a more detailed picture of pollution concentrations across the city and not

just in areas where we have exceedence of legal limits to both inform policy and guide local action.

Principle Priorities Supported

5, 6.

Lead

The City Council will continue to monitor air pollution under LAQM and will expand the network where resources permit to ensure that the network enables the Council to deliver on its legal duties.

Support

We will support action to monitor air quality through citizen science projects by the provision of advice and, where possible, monitoring equipment to enable pollution concentrations to be determined at local sites, with the results coordinated with the wider network.

Communicate

The City Council will develop a website to hold all air quality monitoring data from the range of sources and permit the easy identification of pollutant concentrations at a local level.

Collaborate

The City Council work in partnership with Universities and developers of monitoring technologies to field test emerging equipment alongside the Council's own stations with a view to gaining better understanding of the use to which alternate technologies can be put and to aid in their further development.

What can others do to support this pledge?

Key partners will be educational institutions who will be asked to maintain their close working relationship with the Council to both test new technologies and to undertake joint funding bids to develop new tools to assist the monitoring and modelling processes.

Citizen groups will be key in supporting the Council by deploying monitoring

equipment (diffusion tubes) in local areas to provide data that can be used by the Council to help better target future interventions.

PLEDGE 5:

We will further develop our approaches to tackling emissions from both existing buildings and proposed developments

The Birmingham Development Plan (BDP) 2031 sets out a spatial vision and strategy for the sustainable growth of Birmingham for the period 2011 to 2031, and will be used to guide decisions on planning, development and regeneration. We will use this plan to form policy to guide developers on reducing emissions from their development or preventing new development from being affected by existing pollution sources. Our officers will utilise this plan when responding to planning applications to ensure that developers are properly guided in progressing their developments.

The increasing trend for wood burning stoves in the domestic setting presents an increasing risk to urban air quality. Domestic solid fuel burning is the largest source of particulate matter in the UK (38%) and is estimated to contribute to between 23 and 31% of the urban derived fine particulate matter (PM_{2.5}) in Birmingham with certain other emissions being known carcinogens e.g. benzo(a)pyrene.

Principle Priorities Supported

4, 5.

Lead

The City Council will ensure appropriate regulatory framework is in place to guide new and existing developments to minimise air pollution emissions. We will develop policy to ensure that development proposals consider air quality and are accompanied by an appropriate scheme of mitigation where negative impacts are identified. We will continue to lobby Government to ensure that future policy e.g. National Clean Air Strategy, review of air quality legislation, revisions to the National Planning Policy Framework, are fit and appropriate for the 21st century and that they deal with emerging risks.

Support

The City Council will provide guidance to enable people wishing to undertake development or introduce new appliances e.g. wood burning stoves, to do so in line with the regulatory framework.

Communicate

We will consult on the development of planning policies in relation to air quality.

Collaborate

We will collaborate with a range of stakeholders to develop appropriate planning policies in relation to air quality.

What can others do to support this pledge?

We need Government to review and tighten the legislation around the use of both domestic and commercial wood burning stoves in urban areas.

PLEDGE 6:

We will work with key partners and stakeholders throughout the West Midlands region to help inform our own work and provide leadership where required

There are many organisations within the city of Birmingham and the wider region who wish to either take direct action to improve air quality or who simply wish to ensure it is incorporated in their day to day business operations. For many organisations identifying the right or proper action to take may not always be clear given the requirements of the business.

The correct action to improve air quality is often delivered through legislation, but there are many optional actions that may be taken which organisations may either be unaware of, or require additional support in developing. By ensuring that legislation is correctly framed and that key organisations are able to identify one another to enable effective and targeted communications, as well as being aware of what support is available and how to access that support, organisations can be reassured that the actions they take are the most effective and are consistently applied within the city and across the region.

Principle Priorities Supported

5, 6.

Lead

The City Council will push Government to develop air quality legislation that is fit for the 21st century and that considers the risks to health and climate. The City Council also calls on the Combined Authority to lead in coordinating business engagement and investment in the region.

Support

Working in conjunction with key partners we will support businesses to transition to a cleaner and greener economic and business base by identifying funding streams and providing the expertise to assist them in making successful bids.

Communicate

We will communicate our knowledge around air quality and how it can be best applied across all sectors through regular channels e.g. internet, business engagement, as well as through a series of workshops and directed events e.g. Clean Air Day.

Collaborate

The City Council will support joint ventures which have a focus on improving air quality and the environment as an active partner. The City Council is a key partner in the University of Birmingham led NERC RISE Project “WM-Air” which seeks to provide a series of joint work-streams designed to inform air quality decisions across a range of public and private sector organisations.

What can others do to support this pledge?

We need organisations and businesses to recognise what they can do to improve air quality, from single actions to policies which span entire organisations, and internalise air quality decisions in their business models in a constructive method to achieve clear and defined positive outcomes.



3. Framing the clean air strategy and next steps

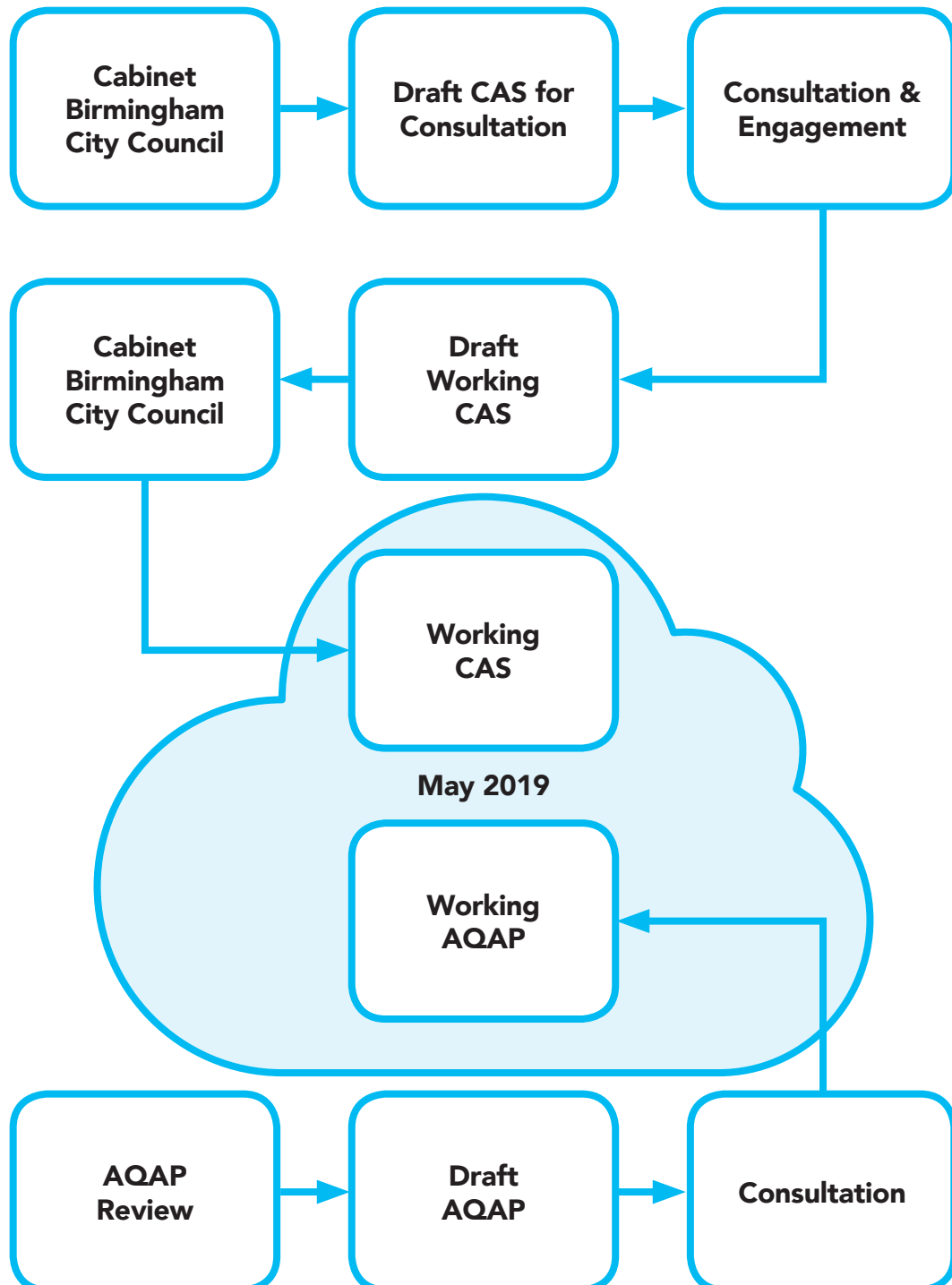
This Clean Air Strategy forms the first stage in a wider engagement process with key stakeholders and partner organisations including the citizens of Birmingham to ensure that items that matter to organisations or individuals are identified and considered and where appropriate built into the strategy and taken forward as actions.

This developing Clean Air Strategy is not a stand-alone document, rather it is a key component in the wider City Council BrumBreathes air quality programme. The strategy overarches all City Council functions where air quality is or may be a factor, ensuring that the City Council embeds air quality into the decision making process.

Furthermore, the strategy links into the Air Quality Action Plan (AQAP), a statutory document required under the Local Air Quality Management (LAQM) regulatory regime. The AQAP is presently being updated and the intention is to have a document which identifies those actions which need to be undertaken to improve air quality to the legal level and also actions which go beyond our legal duties; to consider pollutants for which we have no direct legal duty under LAQM e.g. PM_{2.5}, to consider action in areas of the city that presently comply with legal limits but where air quality could nevertheless be improved, such as local centres, to focus action to benefit the more vulnerable members of our society, e.g. around schools, and to identify and deliver cross cutting measures that benefit both air quality and climate change.

The AQAP will also include a mechanism for the rapid review, addition or removal of actions which are additional to our legal requirements so as to ensure that changes to the Clean Air Strategy can be progressed without the need to wait for a formal review of the AQAP. In this way the Clean Air Strategy will remain a live document and have a structured delivery framework in the form of the AQAP.

The process flow and estimated completion date are presented in the diagram below.



REDUCE AIR POLLUTION

5 SIMPLE THINGS

1 CHANGE THE WAY YOU TRAVEL

By leaving your car at home and choosing to cycle, walk or use public transport, you can help reduce air pollution by 20%.



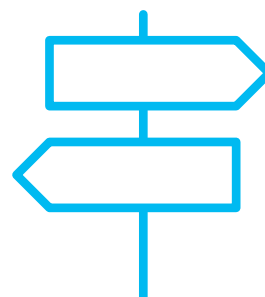
2 CHANGE THE TIME YOU TRAVEL

If you must use your car, avoid morning and evening rush hours – this will reduce congestion and produce less pollution as a result of not idling in traffic jams.



3 CHANGE THE ROUTES YOU TRAVEL

If you are cycling or walking, avoid main roads and choose routes using quieter back streets, parks or canals. Even walking on the side of the pavement furthest from the road can help reduce your exposure to air pollution.



4 CHANGE THE WAY YOU DRIVE

Driving economically – such as accelerating gently and sticking to speed limits – uses less fuel, saves money, reduces the risk of having an accident and reduces air pollution.



5 THE SCHOOL RUN

Cycling or walking to school with your children will help reduce the impact of air pollution. If you do have to drive then turn your engine off when waiting by the school gates.



#brumbreathes

Appendix 1

Single citation on health effects

Royal College of Physicians. Every breath we take: the lifelong impact of air pollution. Report of a working party. London: RCP, 2016.

More details of the individual papers: Heart Disease

Cesaroni G, Forastiere F, Stafoggia M, Andersen ZJ, Badaloni C, Beelen R, et al. Long term exposure to ambient air pollution and incidence of acute coronary events: prospective cohort study and meta-analysis in 11 European cohorts from the ESCAPE Project. *Bmj*. 2014;348:f7412

Lee BJ, Kim B, Lee K. Air pollution exposure and cardiovascular disease. *Toxicological research*. 2014 Jun;30(2):71.

Simoni M, Baldacci S, Maio S, Cerrai S, Sarno G, Viegi G. Adverse effects of outdoor pollution in the elderly. *Journal of thoracic disease*. 2015 Jan;7(1):34.

Shah AS, Langrish JP, Nair H, McAllister DA, Hunter AL, Donaldson K, Newby DE, Mills NL. Global association of air pollution and heart failure: a systematic review and meta-analysis. *The Lancet*. 2013 Sep 21;382(9897):1039-48.

Mustafić H, Jabre P, Caussin C, Murad MH, Escolano S, Tafflet M, Périer MC, Marijon E, Vernerey D, Empana JP, Jouven X. Main air pollutants and myocardial infarction: a systematic review and meta-analysis. *Jama*. 2012 Feb 15;307(7):713-21.

Gan WQ, Koehoorn M, Davies HW, Demers PA, Tamburic L, Brauer M. Long-term exposure to traffic-related air pollution and the risk of coronary heart disease hospitalization and mortality. *Environmental health perspectives*. 2010 Nov 16;119(4):501-7.

Langrish JP, Bosson J, Unosson J et al. Cardiovascular effects of particulate air pollution exposure: time course and underlying mechanisms. *J Intern Med* 2012;272:224–39.

Diabetes

Eze IC, Hemkens LG, Bucher HC, Hoffmann B, Schindler C, Kunzli N, et al. Association between ambient air pollution and diabetes mellitus in Europe and North America: systematic review and meta-analysis. *Environ Health Perspect*. 2015;123(5):381-9.

Janghorbani M, Momeni F, Mansourian M. Systematic review and metaanalysis of air pollution exposure and risk of diabetes. *Eur J Epidemiol*. 2014 Apr;29(4):231-42.

Bowe B, Xie Y, Li T, Yan Y, Xian H, Al-Aly Z. The 2016 global and national burden of diabetes mellitus attributable to PM_{2.5} air pollution. *The Lancet Planetary Health*. 2018 Jul 31;2(7):e301-12.

Asthma

COMEAP. Does Outdoor Air Pollution Cause Asthma? 2010

Khreis H, Kelly C, Tate J, Parslow R, Lucas K, Nieuwenhuijsen M. Exposure to traffic-related air pollution and risk of development of childhood asthma: A systematic review and meta-analysis. *Environment international*. 2016.

Jacquemin B, Siroux V, Sanchez M, Carsin AE, Schikowski T, Adam M, et al. Ambient air pollution and adult asthma incidence in six European cohorts (ESCAPE). *Environ Health Perspect*. 2015;123(6):613-21.

Anderson HR, Favarato G, Atkinson RW. Long-term exposure to air pollution and the incidence of asthma: meta-analysis of cohort studies.

Air Quality, Atmosphere & Health. 2013;6(1):47-56

Zheng XY, Ding H, Jiang LN, Chen SW, Zheng JP, Qiu M, Zhou YX, Chen Q, Guan WJ. Association between air pollutants and asthma emergency room visits and hospital admissions in time series studies: a systematic review and meta-analysis. *PloS one*. 2015 Sep 18;10(9):e0138146.

Gowers AM, Cullinan P, Ayres JG, ANDERSON H, Strachan DP, Holgate ST, Mills IC, Maynard RL. Does outdoor air pollution induce new cases of asthma? Biological plausibility and evidence; a review. *Respirology*. 2012 Aug 1;17(6):887-98.

Bowatte G, Lodge C, Lowe AJ, Erbas B, Perret J, Abramson MJ, Matheson M, Dharmage SC. The influence of childhood traffic-related air pollution exposure on asthma, allergy and sensitization: a systematic review and a meta-analysis of birth cohort studies. *Allergy*. 2015 Mar 1;70(3):245-56.

Dick S, Friend A, Dynes K et al. A systematic review of associations between environmental exposures and development of asthma in children aged up to 9 years. *BMJ Open* 2014;4:e006554.

Gasana J, Dillikar D, Mendy A et al. Motor vehicle air pollution and asthma in children: a meta-analysis. *Environ Res* 2012;117:36–45

Obesity

Kim JS, Alderete TL, Chen Z, Lurmann F, Rappaport E, Habre R, Berhane K, Gilliland FD. Longitudinal associations of in utero and early life near-roadway air pollution with trajectories of childhood body mass index. *Environmental Health*. 2018 Dec 1;17(1):64.

Jerrett M, McConnell R, Wolch J, Chang R, Lam C, Dunton G, Gilliland F, Lurmann F, Islam T, Berhane K. Traffic-related air pollution and obesity formation in children: a longitudinal, multilevel analysis. *Environmental Health*. 2014 Dec;13(1):49.

Jerrett M, McConnell R, Chang CR, Wolch J, Reynolds K, Lurmann F, Gilliland F, Berhane K. Automobile traffic around the home and attained body mass index: a longitudinal cohort study of children aged 10–18 years. *Preventive medicine*. 2010 Jan 1;50:S50-8.

Cancer

Loomis D et al, for the International Agency for Research on Cancer Monograph Working Group. The carcinogenicity of outdoor air pollution. *Lancet Oncol* 2013;14:1262–63

Hamra GB, Laden F, Cohen AJ, Raaschou-Nielsen O, Brauer M, Loomis D. Lung Cancer and Exposure to Nitrogen Dioxide and Traffic: A Systematic Review and MetaAnalysis. *Environ Health Perspect*. 2015;123(11):1107-12. 27.

Hamra GB, Guha N, Cohen A, Laden F, Raaschou-Nielsen O, Samet JM, et al. Outdoor particulate matter exposure and lung cancer: a systematic review and metaanalysis. *Environ Health Perspect*. 2014;122(9):906-11.

Ole Raaschou-Nielsen O et al. Air pollution and lung cancer incidence in 17 European cohorts: prospective analyses from the European Study of Cohorts for Air Pollution Effects (ESCAPE). Volume 14, No. 9, p813–822, August 2013.

Boothe VL, Boehmer TK, Wendel AM, Yip FY. Residential traffic exposure and childhood leukemia: a systematic

review and meta-analysis. American journal of preventive medicine. 2014 Apr 30;46(4):413-22.

Carey IM, Atkinson RW, Kent AJ, Van Staa T, Cook DG, Anderson HR. Mortality associations with long-term exposure to outdoor air pollution in a national English cohort. American journal of respiratory and critical care medicine. 2013 Jun 1;187(11):1226-33.

Dementia

Oudin A, Forsberg B, Adolfsson AN, Lind N, Modig L, Nordin M, et al. TrafficRelated Air Pollution and Dementia Incidence in Northern Sweden: A Longitudinal Study. Environ Health Perspect. 2016;124(3):306-12.

Clifford A, Lang L, Chen R, Anstey KJ, Seaton A. Exposure to air pollution and cognitive functioning across the life course—a systematic literature review. Environmental research. 2016 May 1;147:383-98.

Power MC, Adar SD, Yanosky JD, Weuve J. Exposure to air pollution as a potential contributor to cognitive function, cognitive decline, brain imaging, and dementia: a systematic review of epidemiologic research. Neurotoxicology. 2016 Sep 1;56:235-53.

Killin LO, Starr JM, Shiue IJ, Russ TC. Environmental risk factors for dementia: a systematic review. BMC geriatrics. 2016 Dec;16(1):175.

Infant Deaths

Glinianaia SV, Rankin J, Bell R, Pless-Mulloli T, Howel D. Does particulate air pollution contribute to infant death? A systematic review. Environmental health perspectives. 2004 Oct 1:1365-70.

Litchfield I, Hwang BF, Jaakkola J. The Role of Air Pollution as a Determinant of Sudden Infant Death Syndrome: A Systematic Review and Meta-analysis. Epidemiology. 2011 Jan 1;22(1):S165-6.

Woodruff TJ, Darrow LA, Parker JD. Air pollution and postneonatal infant mortality in the United States, 1999–2002. Environ Health Perspect 2008; 116:110–15.

Low Birth Weight

Pedersen M, Giorgis-Allemand L, Bernard C, Aguilera I, Andersen AM, Ballester F, et al. Ambient air pollution and low birthweight: a European cohort study (ESCAPE). The Lancet Respiratory medicine. 2013;1(9):695-704

Shah PS, Balkhair T, Knowledge Synthesis Group on Determinants of Preterm/LBW births. Air pollution and birth outcomes: a systematic review. *Environment international*. 2011 Feb 28;37(2):498-516.

Bonzini M, Carugno M, Grillo P, Mensi C, Bertazzi PA, Pesatori AC. Impact of ambient air pollution on birth outcomes: systematic review of the current evidences. *La Medicina del lavoro*. 2010;101(5):341-63.

Pedersen M, Giorgis-Allemand L, Bernard C et al. Ambient air pollution and low birthweight: a European cohort study (ESCAPE). *Lancet Respir Med* 2013;1:695–704.

Organ Damage

Vrijheid M, Martinez D, Manzanares S, Dadvand P, Schembari A, Rankin J, Nieuwenhuijsen M. Ambient air pollution and risk of congenital anomalies: a systematic review and meta-analysis. *Environmental health perspectives*. 2011 May 1;119(5):598.

Suades-González E et al. Air Pollution and Neuropsychological Development: A Review of the Latest Evidence *Endocrinology*. 2015;156:3473–3482

Latzin P, Rösli M, Huss A, Kuehni CE, Frey U. Air pollution during pregnancy and lung function in newborns: a birth cohort study. *Eur Respir J* 2009;33:594–603.

Gehring U, Gruzieva O, Agius RM et al. Air pollution exposure and lung function in children: the ESCAPE project. *Environ Health Perspect* 2013;121:1357–64.

Premature Births

Shah PS, Balkhair T, Knowledge Synthesis Group on Determinants of Preterm/LBW births. Air pollution and birth outcomes: a systematic review. *Environment international*. 2011 Feb 28;37(2):498-516.

Bonzini M, Carugno M, Grillo P, Mensi C, Bertazzi PA, Pesatori AC. Impact of ambient air pollution on birth outcomes: systematic review of the current evidences. *La Medicina del lavoro*. 2010;101(5):341-63.

Ha S, Hu H, Roussos-Ross D et al. The effects of air pollution on adverse birth outcomes. *Environ Res* 2014;134: 198–204.

#brumbreathes



Follow us on Facebook
/BirminghamCityCouncil



Follow us on Twitter
@BhamCityCouncil



Follow us on Instagram
@BhamCityCouncil

Published: January 2019

