West Midlands Combined Authority

Draft Air Quality Framework

[This document will be fully designed following the consultation process]

July 2023 (Version 1)

West Midlands Combined Authority

WEST MIDLANDS Greener Together

Foreword (to be added to final version)

Executive Summary

Our vision: ***The West Midlands will have air quality that is safe for all people, no matter where you live in the region, resulting in significantly improved public health and environmental outcomes.***

In 2022, air pollution was the subject of the Chief Medical Officer's annual report. In speaking about this report, Sir Chris Whitty said, 'Everyone is affected by air pollution, and it is everyone's problem'. This Air Quality Framework aims to establish what the West Midlands Combined Authority (WMCA), working with its partners, can do to deliver cleaner air across the region. The overall aim will be to reduce the inequality of exposure to poor air quality, giving everyone better air to breathe and improving health outcomes.

The document developed here is not a strategy, but an action plan for delivery. We know what needs to be done, and now have a prioritised list of actions to take forward. Importantly, we are not beginning from a standing start – local authorities and Transport for West Midlands (TfWM) have been delivering activity – but we know we need to accelerate plans to create a healthy environment for all communities across the region.

To date, air quality improvement measures have tended to focus on transport (the main pollutant here is nitrogen dioxide ($NO_{2)}$); this has been driven by UK government priorities. However, the Environment Act (2021) has put an additional focus on particulate matter, which has sources beyond transport, and which requires a different approach to address it. This is important for the WMCA as it is estimated that between 1584 and 2311 premature deaths in the region are from exposure to pollution from particulate matter. This plan covers both NO_2 and particulate matter, although it is the latter where a regional approach can be most effective as it spreads further geographically.

Reflecting the range of approaches that will need to be taken (there are 156 in total), this Framework has grouped the appraised options into the following categories:

- Engagement and behaviour change
- Domestic emissions and indoor air quality
- Transport
- Natural and built environment
- Commercial, industrial and agriculture
- Public health
- Planning, policy, governance and mechanisms for change
- Monitoring and digital
- Climate/net zero considerations

Each of the measures has undergone appraisal against the following criteria:

- Health outcomes, including direct improvement to human health and reduced health inequalities.
- Spatial impact, including whether a regional approach brings benefit.
- Alignment with local and national policy.
- Cost, implementation and timescales, assessing measures against feasibility, timescales and cost.
- Co-benefits – do the measures have any additional environmental or economic benefit?

This enables a clear steer on where to focus efforts, funding bids, investment and any behaviour change or communication campaigns, as examples.

Whilst this document has been produced by the WMCA, working with its constituent local authorities, it will need a collaborative approach to enable delivery. This will include local and regional government, but also the commitment of local businesses and communities. The Framework will also need financial investment in order to implement, and then sustain, the different measures identified. As air pollution is both produced and experienced locally and regionally, any emissions reduction (by industry, transport and housing) as a result of the implementation of the Framework will have immediate local and regional benefits.

We have begun our road to delivery through a DEFRA-funded air quality grant and we look to continue working with our regional partners, local businesses and communities as the Framework is delivered.

Contents

1. Introduction

Air pollution has significant local and regional impacts on the quality of health and the environment. In recognition of this, the West Midlands Combined Authority (WMCA), in conjunction with the WM-Air project at the University of Birmingham, prepared an Air Quality Options paper, which was presented to the WMCA Board in February 2022. That paper identified priority issues linked to air pollution in the region, including two significant issues:

1. The inequality of exposure to air pollution and, as a consequence, the disproportionate health impacts felt in communities across the region.
2. The significance of particulate matter in air pollution in the West Midlands and the need to take action beyond measures linked to transport in order to address that.

An initial overview of actions was identified in this paper, but there was recognition that this needed to be translated into an Air Quality Framework comprising a list of measures assessed against criteria including health outcomes, feasibility of implementation, cost and timescales as well as the likelihood to deliver air quality improvements.

Understanding the different roles of government and policymakers in addressing air quality is critical in ensuring that any interventions put in place are as effective as possible. The Framework seeks to explore where we can collaborate across the WMCA region to deliver more, at scale, and improve the environment and health outcomes for people living across the region. Our vision is that:

> ***The West Midlands will have air quality that is safe for all people, no matter where you live in the region, resulting in significantly improved public health and environmental outcomes.***

In developing the Framework, we have worked closely with our local authorities. This is critical for the successful delivery of the measures identified in this document as much of the necessary responsibilities for planning, for example, sit at a local level. However, that does not detract from the advantages of collaborating across regional geography to develop collective approaches. This document outlines the current UK, regional and local context for the successful delivery of the Framework.

Building on the two significant issues identified above (from the development of the Air Quality Options Paper Identified above), Section 3 provides an overview of the scale of the challenge that exists in the West Midlands linked to air pollution. In particular, the differences in tackling NO_2 and $PM_{2.5}$ as the two main pollutants of concern. Plans from local authorities and Transport for the West Midlands (TfWM) are largely focused on tackling nitrogen dioxide (NO_2), as this has been a driver from the Government. However, the modelling from the University of Birmingham indicates the importance of tackling particulate matter (particularly $PM_{2.5}$) not least because it lives longer in the atmosphere and its impact is therefore felt further from the source making a regional approach potentially advantageous when looking at how to reduce it. Further details on the key pollutants within the West Midlands can be found in **Appendix B**.

Addressing the air quality challenge will need to be a collective endeavour – no one organisation has all the solutions or the ability and powers to implement them. Each of the measures identified will require collaboration with one or more partners, including people and communities across the West Midlands. Some will be easier to deliver than others and the collective approach will range from a desire to work together to navigate some difficult and complex issues and identifying significant

funding for delivery. Section 4 outlines some of the key partners we need to work with to deliver the improvements needed. **Appendix C** outlines the contributors and consultees to date.

The Framework has adopted a robust methodology to assess the potential measures (see Sections 5 and 6 below). These measures are extensive – we have identified 143 possible measures in total, with the methodology for evaluation described in Section 6 and more detail provided in **Appendix C**. The measures have been broken down into nine thematic areas and Section 7 presents those that scored highest across all categories and should therefore be the focus of immediate implementation. The full list of measures and the detail of the assessment process can be found in **Appendix C**. The inclusion of case study material also illustrates some of the work that is already underway across the region; we will look to build on this as we move the Framework forward and learn from successful projects and programmes currently being delivered.

This Framework is a statement of intent to do better on improving air quality in the West Midlands for all people that live here and to create the conditions where it is easier for people to make choices that protect their own, and other people's health, from poor air quality. We expect that options and opportunities will change as policy, regulation, targets and innovation allows for different approaches to tackling air quality and we will build in a regular review of this Framework to ensure that it remains ambitious.

2. Legislation, Policy, Strategy and Key Updates

This Section reviews existing policy and regulations, along with additional complimentary work that has been published in the interim period.

2.1 National

There are several regulatory and advisory limits on air pollutants, as well as suggested policy approaches and measures for tackling poor air quality. Relevant legislation, policy and guidance, including technical standards already in place, are listed in this section.

Legislation

Environment Act 1995

Under Part IV of the Environment Act 1995[1], local authorities must review and document local air quality within their area by way of staged appraisals and respond accordingly, with the aim of meeting the air quality objectives that are given in secondary legislation (outlined below). Where the objectives are not likely to be achieved, an authority is required to designate an Air Quality Management Area (AQMA). For each AQMA the local authority is required to draw up an Air Quality Action Plan (AQAP) to secure improvements in air quality and show how it intends to work towards achieving air quality standards in the future. WMCA gained the concurrent duties within the Environment Act 1995 through the West Midlands Combined Authority (Functions and Amendments) Order 2017[2] which was agreed as part of the second devolution deal for the West Midlands. Before the Order, only the constituent authorities had these duties.

Environment Act 2021

The Environment Act 2021[3] sets a legally binding duty on the Secretary of State to bring forward air quality targets into secondary legislation; with specific regard to the annual mean level of $PM_{2.5}$ in ambient air.

Schedule 11 of the Environment Act 2021 also provides amendments to the Environment Act 1995 regarding the duty of the Secretary of State to report on air quality in England as well as the functions and duties of relevant public authorities including, but not limited to, the duty of a local authority to prepare an action plan for an Air Quality Management Area *"…for the purpose of securing that air quality standards and objectives are achieved…"*

Under the Environment Act 2021 the Office for Environmental Protection was formed to perform the role of an objective and impartial environmental watchdog in the UK. Previously this role was held by the European Commission.

Air Quality Regulations

[1] Environment Act 1995, c.25. Online: https://www.legislation.gov.uk/ukpga/1995/25/contents
[2] The West Midlands Combined Authority (Functions and Amendment) Order 2017 (SI 2017/510). Online: https://www.legislation.gov.uk/uksi/2017/510/made
[3] Environment Act 2021, c.30. Online: https://www.legislation.gov.uk/ukpga/2021/30/contents

The Air Quality (England) Regulations 2000[4] and the Air Quality (England) (Amendment) Regulations 2002[5] set objectives for ambient pollutant concentrations.

The Air Quality Standards Regulations 2010 (as amended)[6], the Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019[7] and the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020[8] set legally binding limit values for concentrations in outdoor air of major air pollutants that affect public health such as NO_2, PM_{10} and $PM_{2.5}$.

The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023[9] set a new annual mean concentration target and population exposure reduction target for $PM_{2.5}$ to be achieved by the end of 2040, in accordance with the Environment Act 2021. A non-statutory interim target has also been set for 2028.

The relevant air quality standards as objectives, limit values and targets are given in **Table 2.1**.

Table 2.1: Key Ambient Air Quality Standards for England

Pollutant	Government Objective in England (µg/m^3)	Averaging Period
NO_2	40, as the limit value not to be exceeded	Annual mean
	200, not to be exceeded more than 18 times a year	1-hour (hourly) mean
PM_{10}	40, as the limit value not to be exceeded	Annual mean
	50, not to be exceeded more than 35 times a year	24-hour (daily) mean
$PM_{2.5}$	20, as the limit value not to be exceeded	Annual mean
	12, as an interim target concentration not to be exceeded by the end of January 2028	Annual mean
	10, as a target concentration not to be exceeded by the end of 2040	Annual mean

Strategy and Policy

Clean Air Strategy 2019

The Department for Environment, Food and Rural Affairs (Defra) published the Government's Clean Air Strategy in 2019[10]. This sets out measures, which aim to reduce emissions from all sources of air

[4] The Air Quality (England) Regulations 2000 (SI 2000/928). Online: https://www.legislation.gov.uk/uksi/2000/928/contents/made
[5] The Air Quality (England) (Amendment) Regulations 2002 (SI 2002/3043). Online: https://www.legislation.gov.uk/uksi/2002/3043/contents/made
[6] The Air Quality Standards Regulations 2010 (SI 2010/1001). Online: https://www.legislation.gov.uk/uksi/2010/1001/contents/made
[7] The Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019 (SI 2019/74). Online: https://www.legislation.gov.uk/uksi/2019/74/made
[8] Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 (SI 2020/1313). Online: https://www.legislation.gov.uk/uksi/2020/1313/made
[9] The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (SI 2023/96). Online: https://www.legislation.gov.uk/uksi/2023/96/contents/made
[10] Department for Environment, Food and Rural Affairs (2019) *Clean Air Strategy 2019*. Online: https://www.gov.uk/government/publications/clean-air-strategy-2019

pollution, making air healthier to breathe, protecting nature and boosting the economy. The Strategy also provides goals to cut public exposure to airborne particulate matter, in line with the recommendations made by the World Health Organisation (WHO).

UK Air Quality Strategy 2007

The Government's policy[11] on air quality within the UK is set out in the Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland. It provides a framework for reducing air pollution in the UK to meet the air quality standards of the time.

Environmental Improvement Plan 2023

On the 31st January 2023, the UK government published its Environment Improvement Plan[12] which constitutes the first review of the 25-Year Environment Plan as required under the Environment Act 2021. Of relevance to air quality within this document is the 25-Year Environmental Plan goal to achieve clean air in the UK by cutting air pollution overall by tackling key sources of emissions and specific hotspots and reducing ammonia emissions.

Under 'Goal 2 Clean Air', the Government makes the following commitments:

- "A legal target to reduce population exposure to $PM_{2.5}$ by 35% in 2040 compared to 2018 levels, with a new interim target to reduce by 22% by the end of January 2028.
- Legal concentration limits for a number of other key pollutants. We already meet the majority of these limits including for sulphur dioxide and coarse particulate matter. We are working towards meeting compliance with a 40µg/m^3 limit for nitrogen dioxide.
- A legal target to require a maximum annual mean concentration of 10 micrograms of $PM_{2.5}$ per cubic metre (µg/m^3) by 2040, with a new interim target of 12µg/m^3 by the end of January 2028.
- Legal emission reduction targets for five damaging pollutants by 2030 relative to 2005 levels:
  - *Reduce emissions of nitrogen oxides by 73%.*
  - *Reduce emissions of sulphur dioxide by 88%.*
  - *Reduce emission of $PM_{2.5}$ by 46%.*
  - *Reduce emissions of ammonia by 16%.*
  - *Reduce emissions of non-methane volatile organic compounds by 39%."*

To deliver these commitments the Government has pledged a number of actions, including:

- "Continue to tackle domestic emissions by reducing the maximum emissions for domestic burning appliances in Smoke Control Areas and by promoting best practice in use of stoves and fireplaces.
- Challenge local authorities to improve air quality more quickly by assessing their performance and use of existing powers, while supporting them with clear guidance, funding, and tools.

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[11] Department for Environment, Food and Rural Affairs (2007) *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland*. Online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69336/pb12654-air-quality-strategy-vol1-070712.pdf

[12] Department for Environment, Food and Rural Affairs (2023) *Environmental Improvement Plan 2023.* Online: Environmental Improvement Plan (publishing.service.gov.uk)

- Facilitate the rollout of further Clean Air Zones by local councils in areas which are in breach of air quality statutory limits, with further zones and other non-clean air zone measures as required.
- Re-align regional air quality zones in line with local government boundaries to drive effective coordinated action.
- Reduce ammonia emissions by using incentives in our new farming schemes, while considering expanding environmental permitting conditions to dairy and intensive beef farms.
- Continue to support the move away from petrol and diesel cars …"

National Planning Policy Framework

The Government's overall planning policies for England are described in the National Planning Policy Framework (NPPF)[13]. The core underpinning principle of the NPPF is the presumption in favour of sustainable development, defined as *"… meeting the needs of the present without compromising the ability of future generations to meet their own needs"*.

One of the three overarching objectives of the NPPF is that the planning system should *"… protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution and mitigating and adapting to climate change, including moving to a low carbon economy."*

In relation to air quality, the following paragraphs in the document are relevant:

- Paragraph 185, states "Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development…."
- Paragraph 186, which states "Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."

A draft NPPF for consultation was released in December 2022[14] and has undergone a consultation process, with the outcomes yet to be published. The draft NPPF includes an amendment to the text

[13] Ministry of Housing, Communities and Local Government (2021) *National Planning Policy Framework (Showing indicative changes for consultation)*. Online: https://www.gov.uk/government/publications/national-planning-policy-framework--2

[14] Department for Levelling Up, Housing and Communities (2022) *National Planning Policy Framework (Showing indicative changes for consultation)*. Online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1126647/NPPF_July_2021_-_showing_proposed_changes.pdf

in paragraph 35, where it removes the requirement to accommodate unmet needs from neighbouring areas where practical. Furthermore, the draft NPPF wording of paragraph 35 removes the statement that plans are 'sound' if they are justified.

Significant Government Reporting

Chief Medical Officer's Annual Report 2022

In December 2022, the Chief Medical Officer's 2022 annual report[15] was published and focused on air pollution. It included various chapters ranging from the impacts of air pollution on health, trends, solutions and research and innovation. The report raises the profile of air quality work within the public health sector and does show the scale of the interventions required to meet the targets within the Environment Act 2021.

2.2 World Health Organisation Global Air Quality Guidelines

WHO set out global air quality guideline values in a 2021 report[16] which are based on up-to-date evidence on the harm from specific pollutants, including $PM_{2.5}$. **Table 2.2** shows key WHO air quality guideline values, which are more stringent than those required in England.

The WHO guideline values are not legally binding, and they are guidelines for counties that wish to adopt them. However, the consensus within the scientific community is that there is no safe level for $PM_{2.5}$ concentrations and therefore the aspiration should be to reduce them as close to the WHO guideline value where at all possible. As such, more local authorities and regions are wishing to adopt the 10µg/m^3 $PM_{2.5}$ threshold in advance of the Government's target date of 2040. This includes Walsall who in July 2022 published an interim position statement[17] outlining how they would incorporate more stringent objectives into planning decisions.

In addition to the guideline values themselves, the short-term averaging period values differ. The WHO averaging period for NO_2 is 24-hours, whilst the UK averaging period is 1-hour. There is no equivalent 24-hour objective in the UK for $PM_{2.5}$. The WHO guideline for 24-mean PM_{10} allows for three to four exceedance days per year, compared to no more than 18 in the England.

Table 2.2: Key WHO Air Quality Guideline Values

Pollutant	WHO Air Quality Guideline Values (µg/m^3)	Averaging Period
NO_2	10, as a limit value not to be exceeded	Annual mean
	25, not to be exceeded more than 3 to 4 times a year	24-hour (daily) mean
PM_{10}	15, as a limit value not to be exceeded	Annual mean
	45, not to be exceeded more than 3 to 4 times a year	24-hour (daily) mean

[15] Department of Health and Social Care (2022) *Chief Medical Officer's 2022 Annual Report: Air Pollution*. Online Chief Medical Officer's annual report 2022: air pollution - GOV.UK (www.gov.uk)

[16] World Health Organization. (2021). *WHO global air quality guidelines: particulate matter ($PM_{2.5}$ and PM_{10}), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide*. Online: https://apps.who.int/iris/handle/10665/345329

[17] Walsall Council Environmental Protection (2022) *Interim Position Statement Concerning Air Quality and Proposed Planning Developments*. Online: https://go.walsall.gov.uk/sites/default/files/2023-01/Environmental%20Protection%20-%20Interim%20Position%20Statement%20on%20Air%20Quality%20July%202022%20Ver%201.5.pdf

Pollutant	WHO Air Quality Guideline Values (µg/m^3)	Averaging Period
$PM_{2.5}$	5, as a limit value not to be exceeded	Annual mean
	15, not to be exceeded more than 3 to 4 times a year	24-hour (daily) mean

2.3 Regional

The WMCA does not act within any formal air quality role currently, however there are many benefits in leading and assisting on air quality matters. Air quality is very much a national issue, however there are significant benefits to addressing air quality on a regional level to both complement existing actions and new ones which aren't potentially feasible on a local level. Such benefits include:

- Consistency and co-working, where there are many air quality aspects which would benefit from a more consistent approach. This could include monitoring processes, guidance, behaviour change and communications. Consistency has the potential to make addressing air quality more effective in terms of results, resourcing and finances.
- Economies of Scale, with more co-working on air quality, economies of scale can be leveraged alongside more streamlined procurement processes. This will ensure that the region gets more value for money when it comes to air quality, while also procuring items and services which are fit for purpose.
- Opportunities through devolution – understanding if some powers and responsibilities could be helpfully devolved to enable effective delivery, subject to those powers coming with resources to ensure capacity.
- Data aggregation – the WMCA can aggregate data from the local/ regional air quality monitoring from across the region.
- Tackling pollutants (such as $PM_{2.5}$) that live longer in the atmosphere and therefore have less of a local footprint than those from NO_2, for example.
- TfWM has a specific role as the West Midlands local transport authority (LTA) and therefore an important function in reducing air pollution in relation to urban transport l. The Local Transport Plan is a key strategic (and statutory) document in this regard.
- Ability to incorporate air quality into additional regional programmes where relevant, for example air quality into the Net Zero Neighbourhood, and other retrofit programmes, or into transport infrastructure projects.

2.4 Local

Local Air Quality Management

Local authorities have local air quality management (LAQM) duties under the Environment Act 1995 and as amended by the Environment Act 2021. LAQM is defined as[18]:

> *"… the statutory process by which local authorities monitor, assess and take action to improve local air quality. Where a local authority identifies areas of non-compliance with the air quality objectives, and there is relevant public exposure, there remains a statutory need*

[18] Department for Environment, Food and Rural Affairs (2020) *Local Air Quality Management Technical Guidance (TG22).* Online: https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf

to declare the geographic extent of noncompliance as an Air Quality Management Area (AQMA) and to draw up an action plan detailing remedial measures to address the problem."

The LAQM regime requires every district and unitary authority to review and assess air quality in their area on a regular basis and present the findings in an Annual Status Report (ASR). The ASRs will identify if objectives have been or, or will be, achieved at relevant locations by the required date. If an AQMA is designated on the back of an ASR, an Action Plan should be prepared within 12 months following the declaration of the AQMA.

Air Quality Action Plans and Clean Air Strategies

Current air quality policy at a **local authority level** has tended to focus on transport interventions and is driven by the need to meet mandatory concentration limits for pollutants. As a result, the AQAPs and Clean Air Strategies (CAS) described below prioritise actions related to reducing NOx rather than particulates. However, new plans as those from 2020 onwards, do include more of a focus on particulates. The published plans and strategies from the constituent local authorities include:

- **Birmingham City Council/Brum Breathes Clean Air Strategy - Birmingham's Journey to Clean Air 2022**[19] (2022) includes eight key actions to improve air quality, which include behaviour change, access to data and reducing specific emissions from non-road mobile machinery.
- **Birmingham City Council Air Quality Action Plan**[20] (2021 – 2026) includes the implementation of the Clean Air Zone and other mitigation measures as well as exploring the impact of transport and demand reduction. There is also some work on controlling industrial and domestic emissions and behaviour change.
- **Sandwell MBC Air Quality Action Plan**[21] (2020 – 2025) focuses on a number of transport measures to improve air quality, as well as exploring the role of planning and behaviour change campaigns. It highlights the need for the local authority to lead by example.
- **Coventry City Council Local Air Quality Plan**[22] (approved by the Government in 2020) is focused on transport and behaviour change around travel, including promoting EVs, decarbonising the public transport network, real-time air quality monitoring linked to dynamic traffic management, improvements to the road network to tackle congestion, construction of segregated cycle routes and initiatives supporting behaviour change and active travel.
- **Solihull MBC Clean Air Strategy**[23] (2019 – 2024) focuses on a range of different behaviour change and transport interventions, including schools' programmes, electrification of

[19] Birmingham City Council/Brum Breathes (2022) *Birmingham's Journey to Clean Air 2022*. Online: https://www.brumbreathes.co.uk/download/downloads/id/197/air-quality-strategy-for-birmingham.pdf
[20] Birmingham City Council (2021) *Birmingham City Council Air Quality Action Plan 2021-2026.* Online: https://www.birmingham.gov.uk/downloads/file/19120/birmingham_city_council_air_quality_action_plan_2021-2026
[21] Sandwell Metropolitan Borough Council (2020) *Sandwell Metropolitan Borough Council Air Quality Action Plan 2020 – 2025*. Online: https://www.sandwell.gov.uk/download/downloads/id/30801/aqap_2020-2025.pdf
[22] Coventry City Council Cabinet Meeting Minutes (21/07/2020). Online: https://edemocracy.coventry.gov.uk/ieIssueDetails.aspx?IId=37015&PlanId=0&Opt=3#AI
[23] Solihull Metropolitan Borough Council (2019) *Solihull Clean Air Strategy 2019 – 2024.* Online: https://www.solihull.gov.uk/sites/default/files/migrated/StrategiesPlansPolicies_Solihull-Clean-Air-Strategy.pdf

transport, provision of infrastructure for electric vehicles and modal shift. Solihull's plan is different from the other local authorities as the only constituent authority not mandated (by Defra) to produce an Air Quality Action Plan.

- **Dudley MBC Air Quality Plan**[24] (2011) includes the following approaches to tackling air quality: behaviour change, addressing school travel, improvement of public transport, leading by example with the council's fleet and building air quality into planning.
- **Walsall Council's Air Quality Action Plan**[25] (2009) addresses the need to reduce vehicle emissions and traffic, as well as promote public transport and active travel. It also looks to address both road and rail infrastructure.
- **Wolverhampton City Council's Air Quality Action Plan** (2006) addresses the reduction of emissions from transport, industry and commerce, improving public transport and active travel options as well as reducing emissions and traffic volumes, and infrastructure improvements.

The ASRs provide updates from the local authorities on progress in improving local air quality. A summary of the ASRs and AQAP and the actions which are relevant to the Framework are outlined in **Table 3.1**.

Smoke Control Areas

Under the Clean Air Act 1993, as amended by the Environment Act 2021, within a smoke control area people and businesses must not:

- Emit a substantial amount of smoke from a chimney
- Buy or sell unauthorised fuel for use in a smoke control area unless it's used in an 'exempt' appliance (i.e. any appliances which are approved for use in smoke control areas).

Where local authorities determine that a smoke emission is substantial, they can take enforcement action. In addition to enforcement, smoke control areas can be seen as a vital tool to change behaviour by raising awareness of the health effects of solid fuel combustion and general air quality issues.

A breakdown of the smoke control areas active within the seven constituent local authorities can be found in **Table 3.1**.

The smoke control area rules are separate from statutory nuisance under Part 3 of the Environment Act 1990. Under this legislation, if the smoke emissions are harmful to health or a nuisance, then an abatement notice can be served, and any further breaches would constitute a criminal offence.

Clean Air Zones

Clean Air Zones (CAZs), or Low Emission Zones (LEZs) are designated areas where policies are applied to deal with NO_2 concentrations that are forecasted to exceed the legal limits. Typically, the areas are determined and operated by local authorities, but in some cases, combined authorities can designate a CAZ. WMCA has the power to create low-emission and clean air zones with the affected highway authority(ies) consent. Where there are exceedances of the NO_2 legal limits, the

[24] Dudley Metropolitan Borough Council (2011) *Air Quality Action Plan Dudley MBC.* Online: https://www.dudley.gov.uk/media/7168/dmbc-2011-aqap-final-v10.pdf
[25] Walsall Council (2009) *Air Quality Action Plan Version 2.1*. Online: https://go.walsall.gov.uk/sites/default/files/2023-01/Air%20Quality%20Action%20Plan%20-%20June%202009_0.pdf

Government has directed the relevant authorities to consider whether the establishment of a clean air zone would deliver a way to meet air quality targets in the shortest possible time. As such, it is possible to demonstrate that other approaches may be better at meeting air quality targets in the shortest possible time and in these cases, a CAZ would not be required.

The zones primarily reduce vehicle emissions, through the charging of non-compliant vehicles that enter the zone. The restrictions differ depending on the 'class' of the zone, but the most stringent is a 'Class D' zone, which is in place in Birmingham. A Class D CAZ deals with non-compliant buses, coaches, taxis, private hire vehicles, heavy goods vehicles (HGVs), light goods vehicles (LGVs) and cars. It is expected that the current vehicle exemption standards will be in place until at least 2025 and after this time, it is possible that additional vehicles are removed from the list of exempt vehicles.

The current legislation does not cover $PM_{2.5}$ exceedances, so it is possible that revisions or new legislation may come forward in the future to address both road and non-road $PM_{2.5}$ emissions where there are exceedances.

3. Air Quality Context

3.1 Air Quality, Sources and Health

Air pollution refers to the presence of gases and particles which can be of natural and human origin. Individual pollutants have varying short and long-term impacts on human health and the environment. The range and concentrations of each pollutant at a given location vary depending on the source of the pollution and the location of exposure. We refer to the air quality we breathe outside as outdoor (ambient) air quality and as indoor air quality when experienced within an enclosed or indoor space.

Air pollution sources are categorised as primary – directly emitted to the air, such as soot particles – and secondary – pollutants which are formed in the atmosphere, from the processing of primary emissions.

In the UK, the main sources of **outdoor air pollution** are transport, industry, domestic emissions and agriculture. The contribution of each of these sources varies according to the pollutant and location. It should be noted that both natural and transboundary pollution have a significant impact on pollutant concentrations at any given location. Transboundary and regional emissions can impact a wide area and therefore it is key for widespread action to address emissions in order to effectively enhance air quality across the UK. As part of the targets within the Environment Act 2021 and the subsequent Environmental Improvement Plan, it was noted that all areas within England should be able to reach the revised target within the timescales set. However, transboundary pollution, especially in London and the south-east was used to justify not setting a more ambitious target (such as the WHO guideline value).

There are several outdoor air pollutants that affect the West Midlands and have implications for human and public health (**Appendix B** outlines these in more detail). The main ones for human impacts are NO_2 and particulate matter (PM). PM is classified by size, either as PM_{10} (where particles are less than 10µm (micrometres) in diameter) or $PM_{2.5}$ (where particles are less than 2.5µm in diameter).

The mortality burden of long-term exposure to outdoor air pollution (i.e., an estimate of how many people die from long-term outdoor air quality exposure) in England in 2019 was estimated to be equivalent to 26,000 to 38,000 deaths a year[26]. Most of these deaths attributable to outdoor air pollution are related to long-term exposure to $PM_{2.5}$. In addition to the mortality burden, there is the causation and exacerbation of both avoidable and unavoidable chronic illnesses, such as asthma, along with associated impacts on mental health and cognitive function. As such, exposure to poor air quality has a significant impact on quality of life, public health and the economy. The impact of poor air quality can affect everyone across their lifetime (**Figure 1**), and impacts are typically not equal. Air quality inequality can stem from a variety of factors including what socio-economic and ethnic groups people belong to, age and other medical factors (such as pregnancy and pre-existing conditions).

[26] Mitsakou C et al. (2023) *UK Health Security Agency. Chemical hazards and poisons report; Issue 28. Reducing health harms associated with air pollution.* Online: https://www.gov.uk/government/collections/chemical-hazards-and-poisons-reports

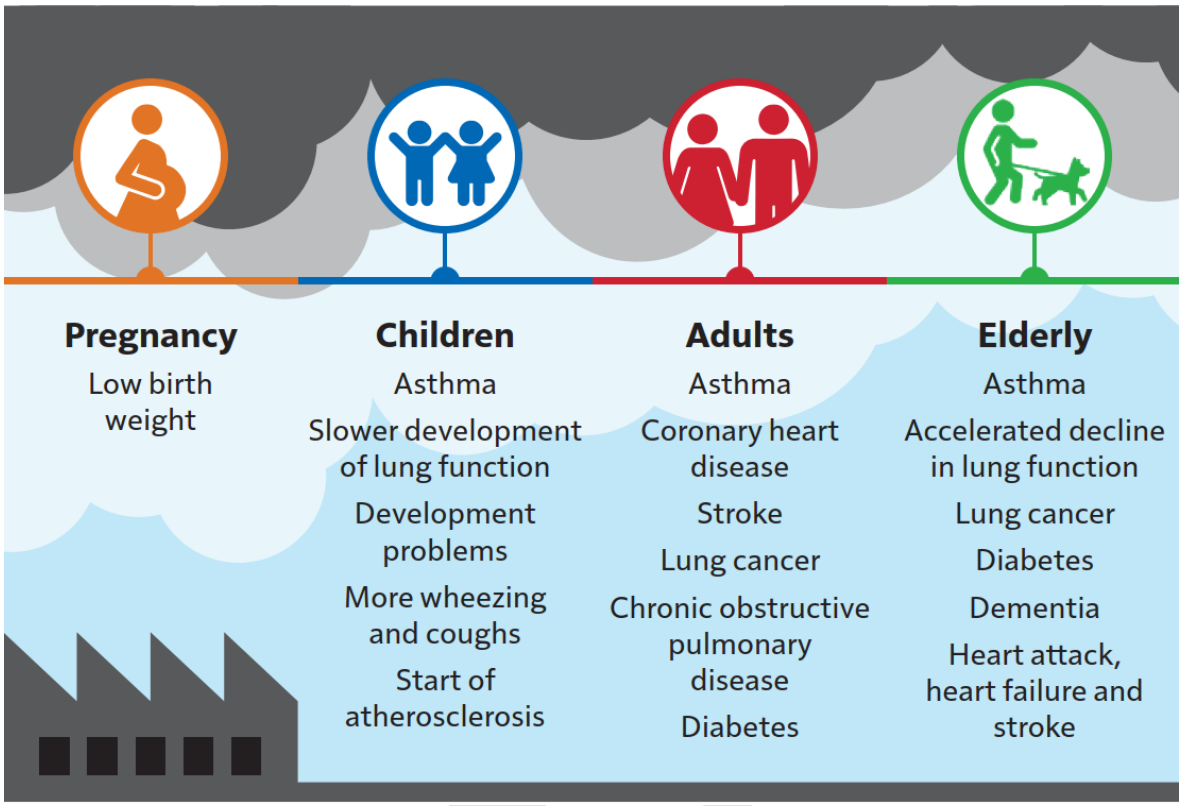


Figure 1: Health effects of air pollution throughout life. ***From Chief Medical Officer's 2022 Annual Report: Air Pollution***

Indoor air pollution is affected by both actions that happen indoors, and the quality of the air outdoors. Sources of indoor air pollution therefore be from combustion sources (such as gas boilers/hobs and solid fuel appliances like log burners), household products, furniture mould, cooking and outdoor pollutants. When compared to outdoor air pollutants, there is a different suite of pollutants that are considered (such as volatile organic compounds (VOCs)) and these are outlined in **Appendix B**. Indoor air quality is a much less established field of study than outdoor air quality. However, with improvements to outdoor air quality, it is expected that there will be an increased focus on indoor air quality, especially given the time that people spend indoors and that there are many things that can be done to reduce and mitigate exposure (such as improved ventilation and reducing combustion).

3.1 National Air Quality and Trends

There have been significant improvements in air quality for the last 50 years, especially with pollutants such as NO_2 decreasing significantly over this period and with an expectation for this to continue due to transport fleet moving to lower and zero-emission vehicles. **Figure 2** overleaf shows the trends in major pollutants, expressed as a percentage change from the base year.

The slowing reduction in particulate matter concentrations over the past 10 years, along with the recognition that the electrification of the vehicle fleet may not result in significant reductions in particulate matter, means that particulates pose a long-term threat to human health. This is because although electric vehicles (EVs) and other zero-emission vehicles do not produce tailpipe emissions, they produce more emissions from other sources such as tyre and road wear due to an increase in vehicle weight. Additionally, transport is not the only source of PM, with domestic combustion being the primary source of PM emissions in most locations (especially in the West Midlands) and

therefore the increase in solid fuel combustion seen in recent years has also contributed to the relative stagnation of emission reductions.

Ammonia (NH_3) is a pollutant which is typically most relevant to the natural environment (as part of nitrogen deposition and through direct toxicity), however it is becoming more of an important pollutant in terms of human health. This is because it can lead to increased secondary $PM_{2.5}$ concentrations through chemical processes in the atmosphere. Ammonia concentrations have not reduced by the same magnitude as the other key pollutants. The vast majority of ammonia emissions are from agriculture, however it is expected that the contribution from road transport will increase over the next few years due to the increased use of selective catalytic reduction (SCR) to reduce the emissions of internal combustion engine (ICE) vehicles. In addition, a warming climate will increase the volatilisation of ammonia emissions in agriculture (i.e. the release of ammonia gases from fertilisers).

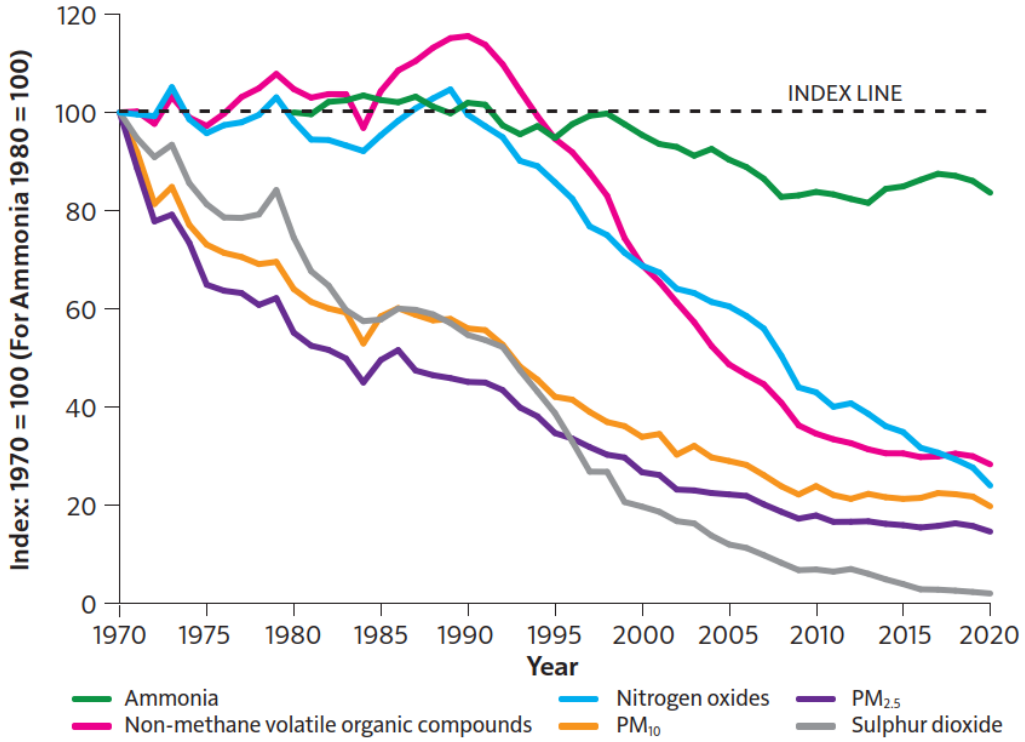


Figure 2: Trends in UK emissions of air pollutants from 1970 to 2020. ***From Chief Medical Officer's 2022 Annual Report: Air Pollution - Based on https://www.gov.uk/government/statistics/emissions-of-air-pollutants/emissions-of-air-pollutants-in-the-uk-summary***

3.2 West Midlands Air Quality and Trends

The environmental, social and economic impacts of NO_2 and PM on the region have previously been set out in our Air Quality Options Paper (approved by the WMCA Board in February 2022). The summary of the current air quality situation is as follows:

1. The highest annual average $PM_{2.5}$ concentrations in the West Midlands are modelled in central Birmingham, Coventry, Sandwell and Walsall (as shown in **Figure 3**). This is largely supported by the monitoring undertaken by the WMCA constituent local authorities and published within their Annual Status Reports (ASRs). More details on current concentrations and recent trends are provided in **Table 3.1**.

2. DEFRA provide air pollution estimates of pollution concentrations at 1km resolution. When averaged to ward level, these data show annual average $PM_{2.5}$ levels in 72 of the 192 wards within the West Midlands exceed 10µg/m^3 (the Environment Act 2021 $PM_{2.5}$ target for 2040)
3. Modelling suggests that 1.2m people or *ca*. 40% of the West Midlands' population live in wards exceeding the Environment Act 2021 $PM_{2.5}$ target for 2040/the 2005 WHO guideline level for (10µg/m^3).
4. The least advantaged areas (highest indices of multiple deprivation (IMD) score) tend to have the worst air quality.

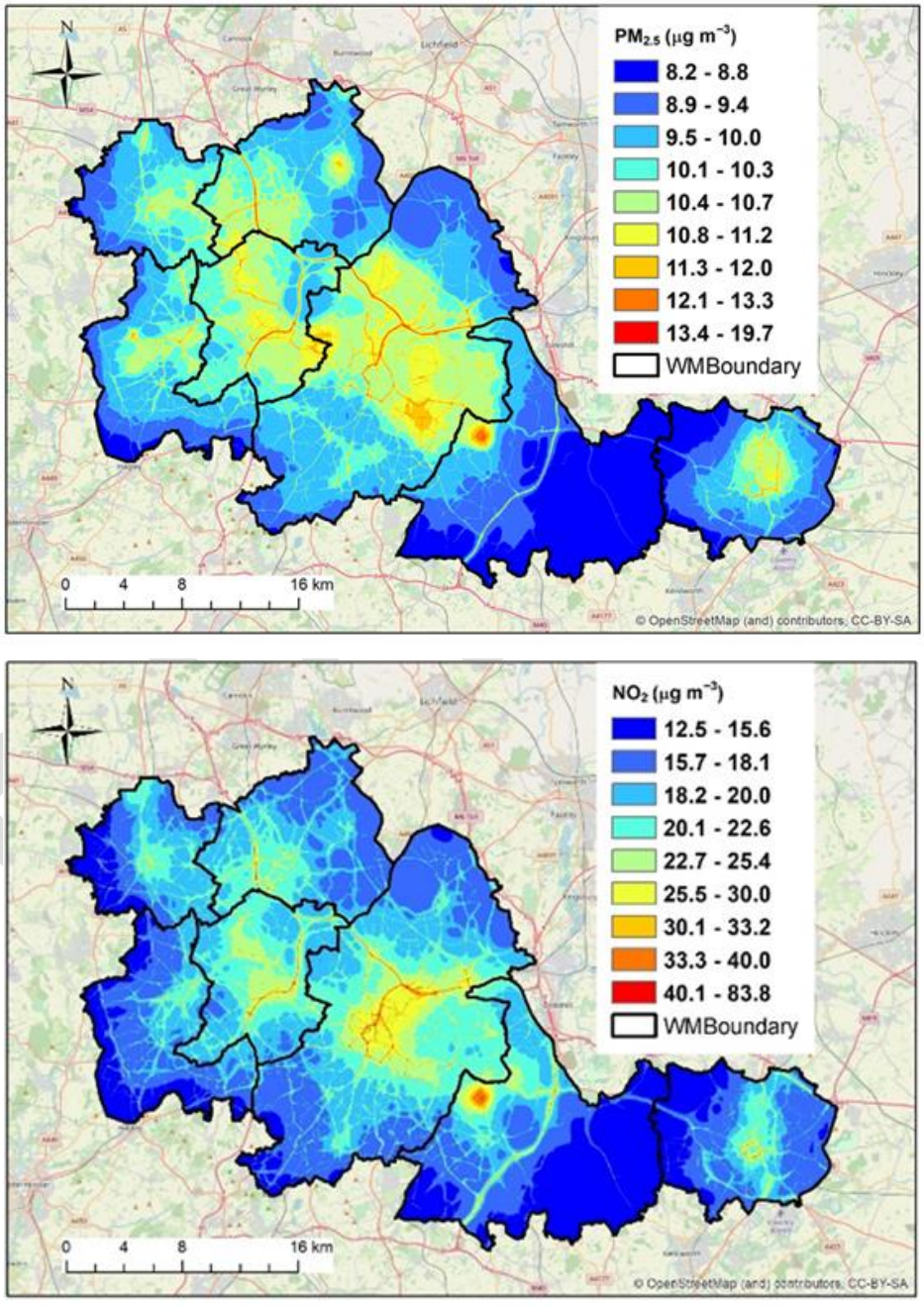


Figure 3: Predicted annual average concentrations of NO_2 (top) and $PM_{2.5}$ (bottom) in the West Midlands. Drawn from NAEI emission data & WM-Air modelling[27]

[27] https://www.mdpi.com/2073-4433/12/8/983

Table 3.1: A Summary of the Air Quality, Management and Controls Within Each Local Authority

Local Authority	Air Quality Management Areas /Other Controls	Fraction of Mortality Attributable to Particulate Air Pollution (2019 - 2021)	Public Air Quality Document Status (ASR, AQAP and CAS) and Summary of Local Air Quality	Key Air Quality Document Measures Relevant to the Framework
Birmingham City Council (BCC)	**One AQMA:** Birmingham AQMA, covering the whole of BCC's administrative area. Declared in 2005 for exceedances of the NO_2 annual mean objective. **One CAZ:** Class 'D' CAZ (i.e. all non-compliant vehicles are charged) Expected compliance with the objective is now anticipated by 2023/24 (previously 2022) **Smoke control area:** One covering the entire BCC area	2021 – 6.2% (0.8% higher than the West Midlands and England's average of 5.5%. 2020 - 6.3% (0.9% higher than the West Midlands average of 5.4% and 0.7% higher than England's average of 5.6%) 2019 - 8.0% (0.7% higher than the West Midlands average of 7.3% and 0.9% higher than England's average of 7.1%).	**Most recent publicly available ASR was published in 2022 covering 2021. The current AQAP was published in 2021 and covers up to 2026, with a new CAS published in 2022.** Historical widespread exceedances of the NO_2 long-term objective. The trends are relatively consistent across many locations, however there were signs of pre-COVID-19 decreases in concentrations in both 2018 and 2019. In 2019, the NO_2 annual mean objective was exceeded at continuous monitoring sites BCA2 (St. Chads Queensway) and BCA3 (Lower Severn Street) with an annual mean of 51.0µg/m^3 and 43.0µg/m^3 respectively. In 2021, the only exceedance was at BCA2 40.3µg/m^3. Concentrations at all other continuous monitoring sites are less than 40µg/m^3. The NO_2 annual mean objective was also exceeded at many of the non-automatic monitoring sites pre-covid, notably within the city centre and around the A4540 ring road. In 2021, of the 115 sites, 14 locations exceeded the annual mean objective. All the exceeding sites were located in the city centre or on the ring road and were therefore within the AQMA. The annual mean for PM_{10} has been consistently below the objective at the three automatic monitoring locations between 2015 and 2021 and neither were there any occasions where the daily mean limit was exceeded. Concentrations of $PM_{2.5}$ continue to be low, with the highest annual mean in 2021 occurring at BAU2 (9.0µg/m^3). However, it should be noted that automatic monitoring to a reference/reference equivalent standard only occurs at three locations so it may not be indicative of particular hot spots.	Several key measures are likely to be addressable within the framework, with Action 1 relating to CAZ implementation and Action 2 relating to the support and implementation of strategic transport improvements (likely to be mostly outside of the framework and within TfWM and BCC's remit). The measures which are likely to be addressable in some capacity within the framework are: ▪ Action 3: Promote Behaviour Change away from Single Occupancy Private Vehicle Use ▪ Action 4: Promote the use of Alternatively Fuelled Vehicles ▪ Action 5: When locations are identified as having an exceedance of the air quality objectives, assess traffic management options relevant to the location ▪ Action 6: Develop Policies to Support Better Air Quality ▪ Action 7: Control Industrial and Domestic Emissions

Local Authority	Air Quality Management Areas /Other Controls	Fraction of Mortality Attributable to Particulate Air Pollution (2019 - 2021)	Public Air Quality Document Status (ASR, AQAP and CAS) and Summary of Local Air Quality	Key Air Quality Document Measures Relevant to the Framework
Coventry City Council (CCC)	**One AQMA:** Coventry AQMA, covering the whole of CCC's administrative area. Declared in 2009 for exceedances of the NO_2 annual mean objective. **Smoke control area:** One covering most of CCC's administrative area	2021 – 5.7% (0.2% higher than the West Midlands and England's average of 5.5%) 2020 - 5.8% (0.4% higher than the West Midlands average of 5.4% and 0.2% higher than England's average of 5.6%) 2019 - 7.8% (0.5% higher than the West Midlands Average of 7.3% and 0.7% higher than England's average of 7.1%).	**Most recent publicly available ASR was published in 2020, covering 2019. The most recent AQAP was published in 2007. A full business case for a new air quality plan was undertaken in 2021, with a view to replacing the AQAP.** Coventry no longer undertakes automatic (continuous) monitoring that is of a reference or reference equivalent standard. There are historical widespread exceedances of the NO_2 long-term objective, with exceedances still being observed annually. Across most locations, there is a long-term downward trend in concentrations, however between 2017 and 2019, there are not the same level of decreases as seen prior to that. In 2019, the NO_2 annual mean objective was exceeded at 15 of 63 monitoring locations within Coventry. One of these (HR1c) exceeded 60 µg/m^3 (i.e. the proxy value for exceedances of the hourly objective). This tube is located close to the road which is a small stretch of a busy road on an incline and with a street canyon and is not representative of a receptor. Once distance corrected to the nearest receptor, 10 tubes exceeded the annual mean (40µg/m^3) and none exceeded 60µg/m^3.	Several key measures are likely to be addressable within the framework, with the following being present within the 2007 AQAP: ▪ Action 4.1 Enforcement of idling vehicles legislation ▪ Action 8.4 Emissions from domestic sources ▪ Action 8.5 Control of Bonfires ▪ Action 8.7 Public Information ▪ Action 8.8 Public Awareness ▪ Action 8.9 Sustainable Education Development ▪ Within the 2020 ASR, there are a number of existing measures which can be complimented/expanded within the CA area: ▪ Measure 6: Coventry Local Plan and Coventry City Centre Area Action Plan ▪ Measure 8: Air Quality Supplementary Planning Document
Dudley Metropolitan Borough Council (DMBC)	**One AQMA:** The Dudley Borough AQMA, includes the whole area covered	2021 – 5.7% (0.2% higher than the West Midlands and England's average of 5.5%)	**Most recent publicly available ASR was published in 2019, covering 2018. The current AQAP was published in 2011.**	Several key measures are likely to be addressable within the framework, with the following being present within the 2011 AQAP:

Local Authority	Air Quality Management Areas /Other Controls	Fraction of Mortality Attributable to Particulate Air Pollution (2019 - 2021)	Public Air Quality Document Status (ASR, AQAP and CAS) and Summary of Local Air Quality	Key Air Quality Document Measures Relevant to the Framework
	by the Dudley Borough Boundary. Declared in 2007 for exceedances of the NO_2 annual mean objective. **Smoke control area:** One, as the whole borough is designated as a smoke control area.	2020 - 5.8% (0.4% higher than the West Midlands average of 5.4% and 0.2% higher than England's average of 5.6%) 2019 - 7.5% (0.2% higher than the West Midlands Average of 7.3% and 0.4% higher than England's average of 7.1%).	Long-term diffusion tube and automatic monitoring within the borough indicate a general decrease in measured NO_2 concentrations compared to previous years. In 2018, 9 diffusion tube monitoring sites exceeded the NO_2 annual mean objective of 40µg/m^3. One located on Halesowen Road recorded a concentration of 68.77µg/m^3, which indicates that an exceedance of the 1-hour mean objective is likely. Only 1 automatic monitoring station (Wordsley site) showed an exceedance of the national air quality NO_2 annual mean objectives. PM_{10} monitoring at the two automatic sites shows no exceedances of the annual mean concentration of 40µg/m^3. Between 2008 and 2018 the annual average PM_{10} concentrations measured at the automatic air quality stations fluctuate from year to year, however, there is a noticeable overall downward trend, at Colley Gate. Dudley Central is showing a minor increase last year and this year. The results remain well below the air quality annual objective of 40µg/m^3. Dudley replaced the TEOM with a new monitor at the Colley Gate automatic monitoring site late in 2016, which enabled both PM_{10} and $PM_{2.5}$ to be monitored. The 2018 annual mean $PM_{2.5}$ concentration at Colley Gate for 2018 is 11ug/m^3 far below the current limit of 20ug/$m^{3,}$ but above 2040 targets.	▪ Action AP3: Reducing Vehicle Emissions ▪ Action AP4: Land Use Planning Initiatives ▪ Action AP5: Industrial, Commercial and Domestic Actions ▪ Action AP6: Promoting Awareness of Air Quality Issues ▪ Action AP7: Encouraging Changes In Travel Behaviour
Sandwell Metropolitan Borough Council (SaMBC)	**One AQMA:** Sandwell AQMA, covering the whole of SMBC's administrative area.	2021 – 6.5% (1% higher than the West Midlands and England's average of 5.5%)	**The most recent publicly available ASR was published in 2022, covering 2021. The current AQAP was published in 2020 and covers up to 2025.**	Several AQAP key measures are likely to be complemented within the framework. The measures which are likely to be addressable in some capacity within the framework are:

Local Authority	Air Quality Management Areas /Other Controls	Fraction of Mortality Attributable to Particulate Air Pollution (2019 - 2021)	Public Air Quality Document Status (ASR, AQAP and CAS) and Summary of Local Air Quality	Key Air Quality Document Measures Relevant to the Framework
	Declared in 2005 for exceedances of the NO_2 annual mean objective. **Smoke control area:** Currently one smoke control area that covers less than 50% of SMBC's administrative area. However, a borough-wide smoke control area order has been issued, which is likely to come into force in November 2023	2020 - 6.4% (1% higher than the West Midlands average of 5.4% and 0.8% higher than England's average of 5.6%). 2019 - 8.3% (1% higher than the West Midlands Average of 7.3% and 1.2% higher than England's average of 7.1%).	2020 was the first year since the Sandwell AQMA was declared in 2005, that Sandwell did not record any exceedances of any of the national objective levels for any monitored pollutants. As expected, 2021 saw increases in pollutant concentrations compared to 2021, however there was only one site on the A41 in West Bromwich that was in exceedance for NO_2. The COVID-19 pandemic and national lockdowns over the last two years have had an impact on traffic trends and behaviour and as such, the results from 2020 and 2021 are likely to become outliers in future data analysis and should not be relied on in predicting long-term trends. • NO_2 concentrations were on a downward trajectory before 2020, a reduction that was accelerated by less vehicle usage during the pandemic. In 2021, there was a slight increase in NO_2, but this has still not taken national averages back to those seen in 2019. Sandwell has generally mirrored the national trend in NO_2 over the last 5 years but at a slightly higher concentration. • PM_{10} concentrations at all sites demonstrated a general overall downward trend since 2007, however 2020 and 2021 may be skewing the trend analysis. However, all monitored concentrations are well below the 40ug/m^3 objective, with a 2019 concentration at Birmingham Road (Oldbury) of 19 ug/m^3. • The long-term $PM_{2.5}$ concentrations at Haden Hill were on a downward trend between 2007 and 2016, however concentrations plateaued before increasing slightly to 7.7ug/m^3 in 2021, after 4 years of plateauing closely to 7.0ug/m^3. • Given that there is no safe level of exposure to $PM_{2.5}$, Sandwell's ambition is to ensure that annual levels remain below 10µg/m^3 with the long-term aim of achieving WHO guideline concentrations of below	▪ Action 16: Improving access to information regarding transport options. ▪ Action 20: Provide air quality information and promote sustainable transport in schools ▪ Action 21: Publish Air Quality information website

Local Authority	Air Quality Management Areas /Other Controls	Fraction of Mortality Attributable to Particulate Air Pollution (2019 - 2021)	Public Air Quality Document Status (ASR, AQAP and CAS) and Summary of Local Air Quality	Key Air Quality Document Measures Relevant to the Framework
			5µg/m^3 per annum. By working to reduce all pollutant concentrations we will not only meet current national air quality objectives but also improve overall health outcomes for those who live and work in Sandwell.	
Solihull Metropolitan Borough Council (SoMBC)	**AQMAs:** There are no AQMAs in Solihull as of 2021. Monitoring will continue throughout the borough. **Smoke control area:** a discontinuous area across the borough, covering most of the border with Birmingham and other smaller targeted areas.	2021 – 5.7% (0.2% higher than the West Midlands and England's average of 5.5%) 2020 – 5.7% (0.3% higher than the West Midlands average of 5.4% and 0.1% higher than England's average of 5.6%). 2019 - 7.6% (0.3% higher than the West Midlands Average of 7.3% and 0.5% higher than England's average of 7.1%).	**The most recent publicly available ASR was published in 2021 covering 2020. There is no requirement for Solihull to produce an AQAP.** During 2020 there were no exceedances of the annual mean NO_2 objective. However, the 2020 results will have been affected by Covid lockdowns and reduced traffic. SMBC began deploying diffusion tubes in 2018 and therefore historical data is limited to 3 years for trend analysis (and for many sites only 1 or 2 years are available for comparison). However, in 2019 there were three locations above the annual mean objective, so it is possible that there may still be exceedances within Solihull. $PM_{2.5}$ and PM_{10} have been monitored in Solihull, however the equipment used was not suitable for providing data for LAQM purposes and has therefore been excluded from the ASR.	Several key measures are likely to be addressable within the framework, with the following being present within the 2019-2024 CAS: ▪ Theme 1 – Education ▪ Theme 2 – Transport ▪ Theme 3 – Planning ▪ Theme 4 – Environment ▪ Theme 5 – Public Messaging ▪ Theme 6 – Procurement
Walsall Council (WC)	**Two AQMAs:** Walsall AQMA, covering the whole of WC's administrative area. Declared in 2006 for exceedances of the NO_2 annual mean and hourly objective.	2021 – 6.1% (0.6% higher than the West Midlands and England's average of 5.5%) 2020 – 6.1% (0.7% higher than the West Midlands average of 5.4% and 0.5% higher	Walsall has not published a recent ASR and its most recent AQAP is from 2009. As such, the focus on formal actions was on NO_2, however since then, Walsall has targeted particulate emissions in other ways outside of the formal local air quality management process (through detailed modelling and planning guidance). A new ASR is in production and a new AQAP is likely to be provided once new air quality limits/objectives are set.	Several AQAP key measures are likely to be complemented within the framework. The measures which are likely to be addressable in some capacity within the framework are: ▪ Action Group 1: Reducing vehicle emissions (Page 25)

Local Authority	Air Quality Management Areas /Other Controls	Fraction of Mortality Attributable to Particulate Air Pollution (2019 - 2021)	Public Air Quality Document Status (ASR, AQAP and CAS) and Summary of Local Air Quality	Key Air Quality Document Measures Relevant to the Framework
	Chuckery AQMA, Declared in 2006 for exceedances of the PM_{10} daily mean objective. **Smoke control area:** One, which covers most of WC's administrative area.	than England's average of 5.6%). 2019 – 8.2% (0.9% higher than the West Midlands Average of 7.3% and 1.1% higher than England's average of 7.1%).		▪ Action Group 7: Promotion of Alternative Modes of Transport (Page 27)
City of Wolverhampton Council (CWC)	**One AQMA:** Wolverhampton Air Quality Management Area 2005, covering the whole city. Declared in 2005 for exceedances of the NO_2 annual mean and daily PM_{10} objectives. **Smoke control area:** One, which covers most of than 50% of CWC's administrative area.	2021 – 5.7% (0.2% higher than the West Midlands and England's average of 5.5%) 2020 – 5.6% (0.2% higher than the West Midlands average of 5.4% and the same as England's average). 2019 – 7.6% (0.3% higher than the West Midlands Average of 7.3% and 0.5% higher than England's average of 7.1%).	**The most recent publicly available ASR was published in 2020, covering 2019. The current AQAP was published in 2006.** The main air quality issues in Wolverhampton relate to emissions of nitrogen dioxide (NO_2) from road traffic. The areas most affected are close to busy roads, junctions and parts of the city centre, particularly where the traffic is congested, the roads are narrow, or there is a high proportion of heavy goods vehicles (HGV's). Trend data over the last 15 years shows that levels of NO_2 are reducing. This has led to a significant drop in the number of locations where the annual mean air quality objective for NO_2 of 40µg/m_3 is being exceeded, however, there are still hot spot areas remaining. In 2019 the monitoring data identified four exceedances of the objective. For PM_{10}, the maximum annual mean concentration in 2019 was 16µg/m^3 at the Penn Road monitoring site which is 60% below the objective and there have been no exceedances in recent years. Wolverhampton does not have any reference/reference equivalent monitors for $PM_{2.5}$, as such there is no data	Several AQAP key measures are likely to be complemented within the framework. The measures which are likely to be addressable in some capacity within the framework are: ▪ Action 15 West Midlands Low Emissions Towns & Cities Program (LETCP) ▪ Action 19 West Midlands Transport Emissions Framework ▪ Action 20 West Midlands Combined Authority Regional Air Quality Review and Action Plan ▪ Action 22 Local sustainable transport initiatives ▪ Action 25 Active travel strategy

Local Authority	Air Quality Management Areas /Other Controls	Fraction of Mortality Attributable to Particulate Air Pollution (2019 - 2021)	Public Air Quality Document Status (ASR, AQAP and CAS) and Summary of Local Air Quality	Key Air Quality Document Measures Relevant to the Framework
			available that is suitable for LAQM purposes. The low-cost sensors that have been used are not certified to any standard such as iMCERTS.	

The policy implication is that levels of primary pollutants typically respond in a straightforward way to control relevant emissions, while the response of secondary pollutants is more complex. This Framework is primarily dealing with two:

- **Nitrogen dioxide** is essentially a primary pollutant, emitted directly from or formed following high-temperature combustion (notably, road transport).
- **Particulate matter** that has both primary and secondary elements. Direct emission sources include biomass (wood) burning, combustion, resuspended dust and mechanically generated particles; secondary sources include particle formation from the atmospheric processing of NO_2, SO_2 and VOC gases, and ammonia.

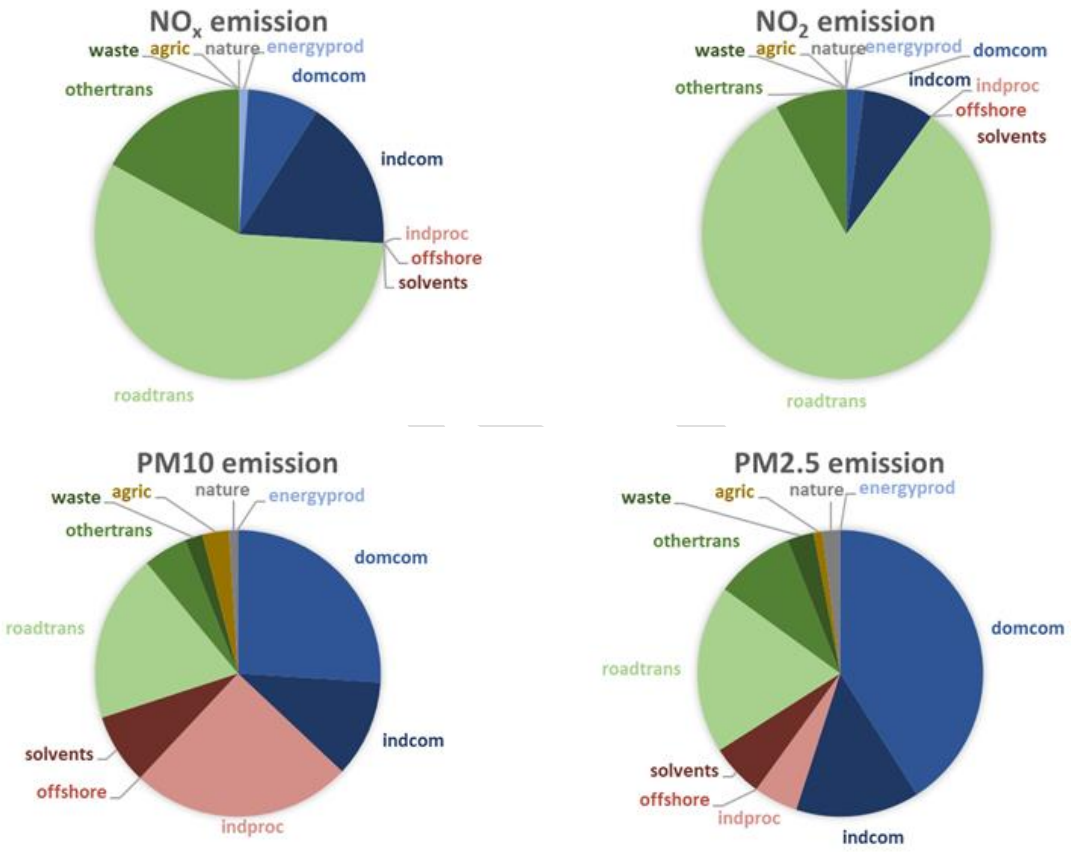


Figure 4: Direct emissions of pollutants by sector for the West Midlands

The dispersion modelling results in **Figure 3** along with the source apportionment for direct emissions (i.e. primary emissions) in **Figure 4** enable the following observations:

- NO_2 and NO_x emissions in the West Midlands are dominated by road transport. Within this, in typical urban UK environments, emissions are dominated by older diesel vehicles.
- Primary PM emissions in the West Midlands have a much wider spread of sources – including commercial and domestic combustion, industrial production and road transport. The largest single source of PM emissions in the West Midlands is domestic and commercial combustion.
- Air pollutants are dispersed and transported by the wind. Weather conditions can also affect their deposition and removal. Their rate of removal from the air – or lifetime – reflects how important transported pollution can be, relative to local emissions: levels of short-lived

species will be dominated by local or regional emissions (e.g. NO_2); at the opposite extreme levels of very long-lived species depend upon emissions globally (e.g. CO_2).

- PM, with a lifetime of a few days, bridges this divide: PM levels in the West Midlands reflect both local emissions, and transported pollution from elsewhere.

Whilst we are expecting NO_2 to decrease with the move to electric vehicles, projections from the National Atmospheric Emissions Inventory indicate that we cannot currently anticipate an equivalent reduction in $PM_{2.5}$ without additional interventions.

4. Key Stakeholders

Delivering this Air Quality Framework will require the involvement of a range of different stakeholders from the public, charity and voluntary, research and private sectors. A number of them have been involved in the development of this plan. These include:

- **Government organisations**: Department for Environment, Food and Rural Affairs (DEFRA), the Environment Agency, and the UK Health Security Agency.
- **Local authorities**: the seven constituent authorities have been consulted to date, although we also commit to working with our non-constituent authorities on delivery.
- **Health organisations**: public health within local authorities and the UK Health Security Agency (UKHSA - i.e. what was Public Health England) will be critical partners in delivering the air quality framework, and supporting its messaging; national groups seeking health outcomes (e.g. Asthma and Lung UK) will also be important partners.
- **Universities and the research sector**: we have a close working relationship with the University of Birmingham and the research that has been undertaken through the WM-Air project.
- **Private sector**: working with individual businesses and industry, as well as with business-facing organisations (e.g. Business in the Community, Sustainability West Midlands, Growth Hubs). We will use our Net Zero Business Pledge to support work in this area.
- **Voluntary sector**: there are a number of groups supporting awareness-raising of air quality issues, e.g. anti-idling campaigns and awareness about the health issues from solid fuel burning.
- **West Midlands communities**: Supporting and working with residents across the West Midlands to get involved in protecting, enhancing and restoring nature will be critical to the success of this plan.
- **Potential Air Quality Partners**: The Environment Act (2021) makes provision for working with Air Quality Partners and these will be critical for the delivery of some of the actions included.

Tables C.1 and **C.2** in **Appendix C** show the Framework core contributors and the additional contributors and consultees (to date) respectively. Both tables illustrate the significant level of involvement of the stakeholders listed above. The list of consultees is expected to grow further as the Framework progresses through the draft and targeted consultation stages.

As this work develops, it is clear that our engagement will need to stretch beyond this initial group, bringing in others that will be necessary to help us achieve the scale of intervention required. This will also include broadening the range of businesses involved; bringing significant landowners on board; and stakeholders who can support with understanding the routes to financing.

5. Introduction to the Framework

The West Midlands Air Quality Framework presents a list of 156 potential options that have been appraised to address poor air quality across the region. After a RAG (Red-Amber-Green) process was undertaken, **143 options** have been assessed and weighted (using a methodology described in Section 6 below) to provide a prioritised list of actions. The volume of measures identified is such that they have been grouped to make it easier to navigate the Framework, but there are clear overlaps between the different 'intervention areas'. These are:

- Engagement and behaviour change (7.1)
- Domestic emissions and indoor air quality (7.2)
- Transport (7.3)
- Natural and built environment (7.4)
- Commercial, industrial and agriculture (7.5)
- Public health (7.6)
- Planning, policy, governance and mechanisms for change (7.7)
- Monitoring and digital (7.8)
- Climate/net zero considerations (7.9)

For the purposes of this document, the main measures for each of these areas have been presented within the sections above. A complete list is provided in **Appendix D** which provides shows all measures appraised across the appraisal process, along with full details of the scoring applied during each appraisal stage. We have also recognised that there is a significant amount of work already taking place across the region to tackle poor air quality; case studies have been provided to highlight where this is the case.

As has already been set out, this document is not a strategy, but a live 'to-do' list to reduce air pollution in the WMCA region and inequality of exposure more specifically. As policy and regulation changes and updates, or as new technology becomes available, the Framework can be refreshed to incorporate those changes.

There are a number of dependencies related to the delivery of the actions identified here. These include:

- Sufficient investment/ financing to implement or sustain activity. There is a grant available to initiate actions, but investment needs to be secured to maintain it in the long term.
- A policy environment that supports and rewards an accelerated approach to improving air quality, locally, regionally and/ or nationally.
- A willingness to collaborate to deliver projects and programmes where scale provides efficiency and consistency.
- Capacity to deliver the options and actions, as some are more time and resource intensive, which could become a major constraint if multiple options are implemented at the same time.

6. Framework Scope and Methodology

This section highlights the scope of the Framework along with the methodology used to determine and appraise the options for inclusion within the Framework.

6.1 Framework Scope

The scope of this Framework is defined by both geography and powers:

Geography - The West Midlands Combined Authority comprises 7 constituent local authorities (Birmingham, Coventry, Dudley, Sandwell, Solihull, Walsall and Wolverhampton) and 11 non-constituent local authorities[28]. For the purposes of this work, we have focused on the role of the constituent local authorities but, as with many other environmental issues, there is scope to collaborate across different geographies, for example, the Coventry and Warwickshire Air Quality Alliance have been a stakeholder in developing the Framework.

Powers - Delivering air quality outcomes requires a range of powers. The main ones are highlighted here, including the role of different organisations in delivery.

Table 6.1 shows the organisations and which areas they are responsible for. It should be noted that although some partners have powers for some aspects (such as CAZ responsibility for WMCA), they are not always enacted. As such, anything that can be delivered by WMCA, constituent local authorities or partners is within the scope of the Framework. Options which fall outside of the scope of the Framework typically are those which rely upon Government to promote or are not implementable within the current powers. Each option also has an indicative WMCA role assigned to it, which is as follows:

- Lead – WMCA would have direct responsibility and would take action;
- Enable – WMCA can enable the option to go forward in some capacity (i.e. undertaking preliminary assessment work, providing physical items (i.e. trees) to enable the work to go forward); and
- Convene – Bring parties together to discuss an issue/option and how it can be resolved. This could include providing inputs on challenging issues and then finding the mechanisms to enable them.

Table 6.1: Roles and Responsibilities Within the West Midlands

Organisation	Responsibilities					
	Transport	Planning	Public Health	Environment[1]	LAQM	CAZ
WMCA	✓			✓		✓
Local Authorities	✓	✓	✓	✓	✓	✓
Environment Act (2021) Air Quality Partners[2]	✓	✓	✓	✓	✓	✓
Notes [1] This is a responsibility that is shared across regional and local authorities. There are currently no statutory obligations (that sit outside planning), but the WMCA is expecting to be appointed responsible authority for the Local Nature Recovery Strategy (as outlined in the Environment Act,						

[28] There is more information about the constitution here: Who we are (wmca.org.uk)

2021). In relation to air quality, there are some very specific powers and responsibilities that have been outlined in Section 2 above.

[2] Air Quality Partners may be a neighbouring local authority; a designated Relevant Public Authority; the Environment Agency.

6.2 Framework Methodology

The Framework methodology has been subject to an ongoing development process, with reviews at each stage to ensure that it remains relevant and satisfies the requirements of all parties. As shown in **Figure 5**, there will have been nine distinct stages to the Framework and up to now, stages one to six are complete. Consultation is expected to be undertaken during August 2023, with the approval of the document expected to be in October 2023. Once approved by the WMCA board, the Framework can be utilised and implemented where required.

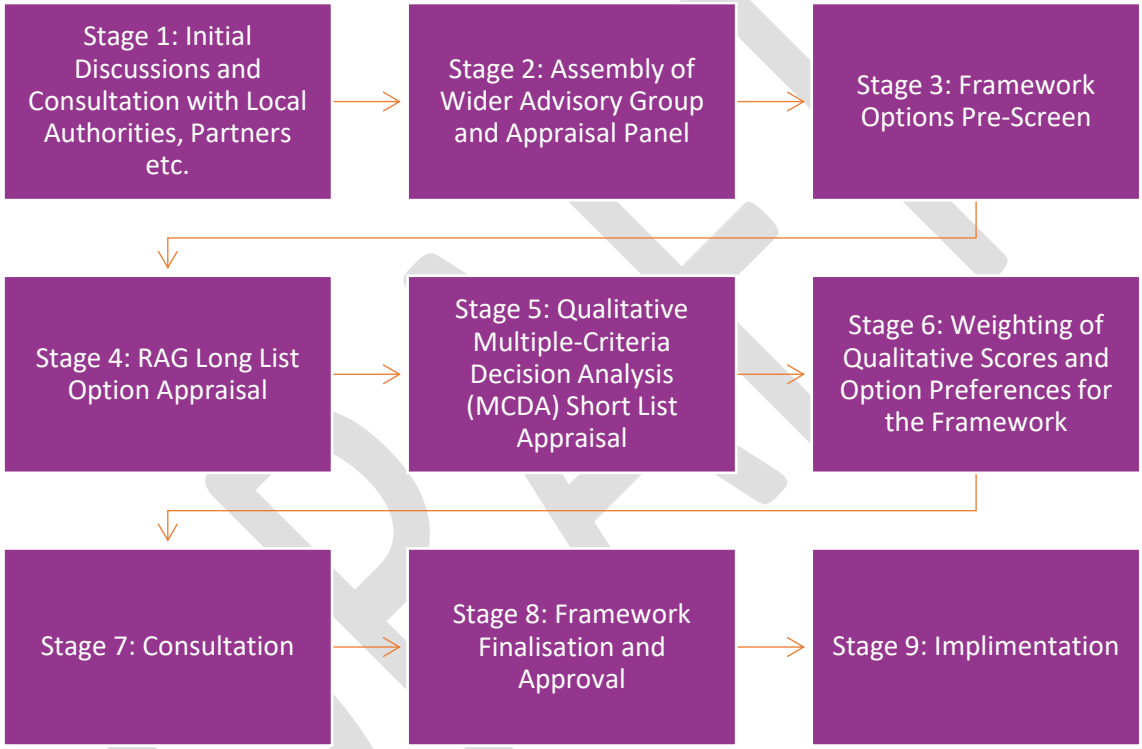


Figure 5: Framework Stages and Workflow

Stage 1:

At the inception of the Framework and throughout the process, regular discussion and consultation were undertaken with TfWM, constituent local authorities and partners such as WM-Air. These discussions shaped the Framework's scope and direction, along with specific options which had not been previously identified.

In-person meetings were used to understand what the local authorities and partners would like to get out of the Framework, and to build the foundations for the increased regional co-operation which underlies many of the Framework themes and options within them.

Stage 2:

To develop the Framework in more detail, a significant number of air quality professionals were consulted at different stages. This includes representatives from WMCA, TfWM, Birmingham University/WM-Air, air quality representatives from the constituent local authorities and Framework consultant WSP. **Table C.1** in **Appendix C** outlines the members and who contributed at each stage. This list does not include the wider collaborators and consultees who are listed in **Table C.2** in **Appendix C**. The WMCA's Greener Together Citizens' Panel also led the development of principles that should be used to assess the implementation of options outlined in this Framework.

Stage 3:

All options outlined within the initial Air Quality Options Paper[29] and other key sources (such as from Defra[30]) were complied with the outputs from Stage 1 and the ongoing consultation process. Any options which were clearly outside of the Framework scope or were unlikely to be within scope in the future were excluded from the long list. All options which may be at all feasible or within the scope of the Framework were carried forward.

Stage 4:

A RAG rating system was used to summarise qualitative indicator values, where green denotes a 'favourable' value, amber a 'neutral' value and red an 'unfavourable' value. The four indicator values cover a wide range of key areas and were deliberately qualitative, so that there would not be a preference towards specific options which do not typically have quantitative evidence to support them.

Table 6.2 shows the four key indicators and the rationale behind their inclusion, and **Table D.1** in **Appendix D** details the specific criteria used to determine if a red, amber or green rating would be applied to each indicator.

Table 6.2: RAG Indicator Values and Rationales

Indicator Value	Rationale
Is the option within the Framework scope and/or directly implementable by WMCA or constituent local authorities?	To determine if the option is deliverable and is within the scope of the Framework.
Funding and resourcing	When working with local authorities, officers have made it clear that funding and resourcing are major constraints. Even with sufficient funding for some options, when it comes to delivery, the current staffing and workload would present an issue.
Air quality, health and inequality	The potential impact of a measure on pollutant concentrations, health and inequality are some of the key considerations. Having an adverse impact on one or more of these.

[29] WM-Air (2022) *Air Quality in the West Midlands: Options Paper*. Online: https://governance.wmca.org.uk/documents/s6510/Appendix.pdf

[30] Wood Group UK (2022) *Study to identify potential measures to reduce future PM2.5 concentrations to inform PM2.5 target development*. Online: https://uk-air.defra.gov.uk/assets/documents/reports/cat09/2302091627_Wood_Sector_Review_Report.pdf

Indicator Value	Rationale
Co-benefits	Options that benefit other areas of related work (such as carbon and climate) are important, however not all options will have co-benefits, and some may be detrimental to other work.

An additional 'objection to inclusion' indicator was added to enable an objection could be raised to the continuation of the option, based on professional judgement, officer opinion or other justifiable reasons.

An option was stopped from proceeding to the final Framework shortlist if there were two 'red' ratings from the four main indicators and/or a 'red' rating given based on an objection. This was to ensure that only options that had a realistic chance of implementation would be appraised further. **Table D-2** in **Appendix D** shows the results of the RAG grading.

Stage 5:

To appraise the shortlisted Framework options, a qualitative multiple-criteria decision analysis (MCDA). MCDA is a systematic approach used to make decisions when multiple criteria or factors need to be considered. It provides a structured and systematic framework to support decision-making by considering multiple criteria. Given the nature of the Framework, it will also assist in clarifying objectives and facilitating the evaluation and comparison of alternatives, leading to more informed and transparent decision-making processes. As with the RAG rating, the criteria were deliberately qualitative, so that there would not be a preference towards specific options, which do not typically have quantitative evidence to support them. The aim is for a more detailed assessment of the options to take place at any funding stage should it be required.

The MDCA matrix can be found in **Table D.3** in **Appendix D**. The core groupings for each of the criteria (and the weightings) and the criteria themselves are as follows:

- Health (40% weighting)
  - Improvement to human health
  - Exposure and/or emission reduction and/or promote long-term behaviour change
  - Protect and enhance social and health equality
- Spatial impact (10% weighting)
  - Scale of benefit within WMCA's area
  - Address hotspots/areas of existing and future exceedance
- Alignment with local and national measures/policy (15% weighting)
  - Compatible with achieving Environment Act 2021 AQ targets ($PM_{2.5}$)
  - Accelerate local authority AQAP/CAP measures
- Cost, implementation and timescales (25% weighting)
  - Implementation feasibility
  - Timescales for the effective first implementation
  - Indicative implementation cost
  - Health cost-benefit
- Co-benefits (10% weighting)
  - Accelerate the transition to a low-emission economy (including net-zero and climate co-benefits)
  - Facilitate regional economic growth and ambition

Table C.1 in **Appendix C** outlines the people who contributed to the MCDA stage. The appraisal and scoring for the MCDA process were agreed upon between the MCDA appraisal team and primarily undertaken as a group in person. This was to ensure that ideally a group consensus can be formed, or where there are disagreements, these can be discussed and then either agreed upon or a compromise made. Given multiple options for each theme would be considered and it is a high-level assessment of the options, this was seen to be the most robust way of appraising the options.

Stage 6:

Once the options had been appraised, a overall check on the MCDA group weightings was undertaken to check that they achieved the right balance. The only changes that were made were to uplift the health weighting and slightly downgrade *spatial impact* and *alignment with local and national measures/policy*. Once the options had been weighted, they were ranked based on their position within their theme sub-category (i.e. the transport sub-category within engagement and behaviour change); rank within the theme (i.e. within engagement and behaviour change); and rank within all Framework options.

The ranking process aided the selection of the key options (as highlighted within Section 7); a full breakdown of the appraisal and scoring can be found in **Table D.4** in **Appendix D**.

Stage 7:

It is envisaged that a targeted consultation process following the environment board will provide the most appropriate feedback given that it is a Framework and not a document with definitive deliverables. However, the consultation process will cover colleagues within WMCA/TfWM, local academic institutions and partners, local authorities, external organisations and the potential for community representation through the Greener Together Citizens' Panel. The consultation will include both time for written comments and then a platform to discuss the Framework at a 'Framework' summit in August.

Stage 8:

Following the consultation, feedback will be analysed, and changes made where required. At this stage, the Framework documentation will be created in the final accessible 'graphical' layout for approval by the WMCA board and subsequently published.

7. The Options

This section highlights the options that have come through the analysis undertaken. The complete list of options sorted by ranking and with associated detail, can be found in **Appendix D**. This section outlines the priority options, either because of the impact they will have or because they are things that can be delivered quickly and/ or with minimal budget.

The Framework lists all potential actions, none of which have yet been approved to be taken forward. Taking any of these actions forward will be subject to WMCA and local authority governance processes. Where required, additional business cases and detailed assessment will be produced for WMCA board sign off.

7.1 Engagement and Behaviour Change

This section outlines some of the areas where there is potential for people to make changes that will directly benefit their health and immediate environment in relation to air quality. However, it is important to recognise that, for many, there need to be changes in infrastructure, affordability and ease of access to enable them to make better choices; this section does not therefore sit in isolation from the measures described in Sections 7.2 – 7.9 below. The highest-ranking behaviour change measures, along with selected options that the appraisal team wish to highlight have been included here (with the full list provided in **Appendix D**). They focus on:

- Reducing solid fuel burning inside and outside the home;
- Supporting active travel and reducing car use;
- Providing better information to support decision-making through web platforms and interactive digital solutions; and
- Linking green space, and what people and communities can do, to improve air quality/ reduce exposure to air pollution through the uptake of natural environment measures.

This will form a significant part of the WMCA's work on air quality over the next two years through a DEFRA air quality grant. This work will build on some of the activity that is already taking place in our local authorities. This is described in the case studies highlighted here.

Case study: DEFRA air quality grant

In March 2023, the WMCA was awarded just under £1m of DEFRA funding to develop engagement and behaviour change campaigns in conjunction with its local authorities. The work will take place over 2 years and will include:

- 21 community events to raise awareness of air quality as an issue;
- 7 in-depth behaviour change campaigns to try and identify ways we can work with people to improve air quality outcomes across the West Midlands;
- An air quality literacy training programme to support policy officers and decision-makers; and
- The development of a communications tool kit to support consistent messaging on air quality issues across the region.

In addition, the WMCA has worked with the Greener Together Citizens' Panel to consider some of the measures that have been put forward through this Framework and to take feedback on the acceptability and urgency of implementation. Their thoughts have been included in this document.

Case study: Improving air quality in Sandwell through encouraging behavioural change

Following the challenge of improving air quality in Sandwell, and after receiving an Air Quality Grant from DEFRA in 2021, Sandwell Metropolitan Borough Council are using eight EarthSense Zephyr air quality monitors and a public portal to deliver live air pollution data to faith centres and their communities. The services are being used by faith leaders to raise public awareness of air pollution in Sandwell and demonstrate how people can adjust their everyday behaviour to minimise personal exposure and improve local air pollution levels.

The Zephyr monitors were positioned outside 8 different faith centres across the borough in 2022 and have been relocated to 8 new faith centres in 2023. Measured and modelled data for nitrogen dioxide (NO_2) and fine particulate matter ($PM_{2.5}$) is available on a public data portal which is displayed on TV screens inside the main areas at each faith centre. Air pollution data can be accessed by faith communities and the wider public through computers, tablets, or smartphones, enabling individuals to identify areas of pollution and potential personal exposure across Sandwell.

Sandwell Metropolitan Borough Council has also developed a toolkit for faith leaders that provides information about indoor and outdoor air pollution, methods for community engagement, and a range of options and actions that all support the aim of reducing local air pollution. All centres also receive a monthly Faith Centre Air Quality newsletter, with a different air quality theme each month. By using the public portal, the toolkit and support from council air pollution officers, the council is helping faith groups to find and engage with simple pollution reducing interventions.

A conference was held in November 2022 for faith leaders to report their experiences and to offer advice to the next eight centres. Many positive actions were reported, including tree planting, car free days, anti-idling campaigns, free bicycle repair workshops, garden planting as well as the adoption of energy reduction measures in their centres and homes. In response to faith centre feedback, all centres now have an air quality notice board, which increases the level of information than that just displayed on the public portal and can also be used advertise activities that support better air quality, i.e. learn to ride sessions, walking groups, led bicycle rides and energy saving sessions.

Table 7.1: Top Ranked Engagement and Behaviour Change Options

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
To raise awareness of specific air quality issues and potential solutions associated with the use of log burners, fireplaces and bonfires.	1 (6.05)	A reduction in solid fuel combustion and exposure.	Raise awareness of the risks to health, how to reduce exposure and promote a reduction in use through behaviour change	Enable	£50-100k; and <1 Year
Leverage campaigns for public transport, walking and cycling to promote the various co-benefits (including emissions and health) along with exposure mitigation	2 (5.95)	Accelerate modal shift and co-promote the associated air quality and health benefits	Adding the air quality aspect to active travel and public transport to advise on common perceptions (such as increased exposure) and look at the wider environmental, cost and health benefits	Lead	£100-250k; and 1-2 Years
Raise awareness of air quality issues and potential solutions associated with general domestic combustion.	T3 (5.65)	A reduction in solid fuel combustion and exposure.	Raise awareness of the risks to health, how to reduce exposure and promote a reduction in use through behaviour change	Enable	£50-100k; and <1 Year
Raise awareness for when solid fuel combustion is required, to ensure the correct fuels are used (i.e. dry seasoned wood)	T3 (5.65)	A reduction in pollutant concentrations from appliance use and exposure.	The right fuel for domestic combustion information campaign. Raise awareness of the effects of using the incorrect fuel (along with the co-promotion in the reduction in solid fuel combustion) and what the associated impacts on health are.	Enable	£50-100k; and <1 Year
Use health professionals to educate and disseminate targeted air quality information to vulnerable and at risk patients	5 (5.25)	Provide critical information to vulnerable people and resources on how they can manage and mitigate the risks	Work with health professionals to implement a standardised set of information and resources to reduce the risk associated with air quality exposure. Working with professionals and organisations with an interest in this area will encourage the dissemination of information from trusted advisors and result in greater awareness and behaviour change. It can be linked to existing and future services (such as air quality warning tools) so that users can reduce the risk of complications and benefit both themselves and the healthcare system.	Enable	£100-250k; and 1-2 Years
Use low-cost sensors to capture high level domestic combustion data to be used in effective behavioural change advertisement and create real life stories/ case studies.	6 (5.20)	Produce effective behavioural change through a reduction in the sale and use of combustion sources in the home, resulting in reduced pollutant concentrations and exposure	A more personal approach to engagement is likely to produce results and similar approaches have been done by Public Health Scotland/University of Sterling where monitoring in homes was used for second-hand smoking impacts	Enable	£50-100k; and 1-2 Years
Engage with the council and private housing organisations to increase awareness of indoor air quality issues and the actions that need to be taken to reduce the impacts	7 (5.10)	An increase in the visibility of indoor air quality as a major issue across the housing industry, to promote more action to be taken and mitigation implemented where possible.	Advice and toolkits can be developed to provide information and upskill those in the industry (as those residents have less control over certain aspects) to have another avenue for information sharing and behavioural change	Convene	Officer time only and/or below £50k; and 1-2 Years
Use a regional air quality website to deliver key air quality information and effective information to facilitate behavioural change through a single point for the West Midlands	T8 (5.05)	Raise awareness of air quality and the associated issues by providing key information in a digestible format and feasible methods of behaviour change	Through the already secured DEFRA funding, compile key monitoring, engagement and behaviour change onto one centralised website which can be used in all communications. This will ensure there is consistency within publicly facing information and becomes a resource which is used for multiple uses including health, planning and STEM. A self-contained website with information covering all areas will be much easier to approach than seven different websites by each local authority. Pooled resources plus specific behavioural change support by the WMCA will shape the website based on resident demand and how it can effectively improve air quality outcomes and promote behaviour change	Lead	£50-100k; and <1 Year
Interactive online resources to demonstrate air quality issues	T8 (5.05)	Use engaging methods to communicate air quality and exposure as an issue in order to promote effective awareness and behaviour change.	This could be included within the regional air quality website through specific pages and integration into monitoring aspects. This could include enabling an accessible way for people to look up their local air quality (along with what it means for them). This could then be expanded to show differing scenarios of what widespread behaviour change could achieve and how it could affect air quality and health outcomes.	Lead	£50-100k; and <1 Year

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
Use trusted advisors to disseminate air quality messaging (including faith leaders, GPs, nurses, fire service etc).	10 (4.75)	Effectively deliver air quality information to achieve outcomes such as reduced exposure, health awareness and co-benefits of reduced pollution	The use of trusted advisors rather than the typical local authority sources is likely to aid both the reach and likelihood of behavioural change occurring. It will also allow for at-risk groups to be specifically targeted in the correct setting and to have messaging specifically tailored for them.	Enable	£50-100k; and 1-2 Years

Table 7.1.2: Selected Other Engagement and Behaviour Change Options

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
Ensure that air quality communication and engagement are consistent and inclusive across the West Midlands (and modified where necessary) to make messaging as clear as possible with the best chance of behavioural change.	11 (4.60)	Achieve better air quality outcomes and knowledge leading to behaviour change through widespread standardised but effective communications	Currently, each local authority has its own method and approach to air quality communications, which allows for a wide range of topics to be covered in theory. By having specific communication packages and details for specific air quality subjects, campaigns can be more easily co-ordinated on a mass scale with less time burden on comms teams and officers. Currently, there is little co-ordination between local authorities and communications happen at different times in different areas and the messages differ. A coordinated and consistent approach would still give local authorities autonomy on what communications to send, however, the messaging distributed would be consistent (which will also promote time efficiencies) and the WMCA/partners could aid in the support and enabling of such communications. It is expected that more widespread communication campaigns occurring at the same time will produce better air quality outcomes than the current approach.	Lead	Officer time only and/or below £50k; and 1-2 Years
Provide a centralised online public resource and/or platform for engagement and behaviour change co-ordination across the West Midlands	12 (4.55)	The WMCA could act as a centralised organisation/platform to manage and coordinate large-scale behavioural change to ensure consistency and use economies of scale to deliver results for the region.	By having a platform and process for reporting ideas and delivering engagement and behaviour change, it can enable benefits such as economies of scale and consistent messaging. It will also promote the sharing of information, experience and data between constituent local authorities.	Lead	£50-100k; and 1-2 Years
Provide advice on how residents can utilise green spaces to improve health and reduce pollution exposure during exercise	T14 (4.40)	Reduce exposure to poor air quality during exercise and outdoor time, whilst promoting health co-benefits	Provide a resource that explains the benefits of changing behaviour and outlines the co-benefits of exercise and exposure to green spaces. Can provide an inventory of spaces with available maps and cross reference with WM-Air modelling to show what areas are most suitable for exercise and reducing exposure. This will promote a positive response, especially in the cases where younger people will be using the areas/mums.	Lead	Officer time only and/or below £50k; and <1 Year
Provide information on how residents can use planting and green infrastructure to reduce pollutant exposure and improve health/wellbeing.	T14 (4.40)	Reduce exposure to poor air quality by providing advice on the most effective methods of reducing the dispersion of pollutants from emission sources	Provide a resource that outlines the methods of reducing exposure from planning and green infrastructure and the benefits this can bring	Lead	Officer time only and/or below £50k; and <1 Year
Raise awareness of wider general indoor air quality issues, how to manage and potential solutions	19 (3.95)	An improvement to the general indoor air quality within the home and reduce exposure	Raise awareness of the sources and environmental factors which control indoor air quality, the impact on health and how these can be mitigated. Tie in with minimum energy efficiency standards and potential for a regional pass scheme	Enable	£50-100k; and <1 Year
Have an open route for communication and co-ordination between comms teams at the WMCA and local authorities to be able to effectively co-ordinate and deliver air quality communications	20 (3.80)	Improved air quality outcomes through more effective communications	Currently one of the major constraints in terms of air quality communications is the timescales for each local authority comms team and then having agreement on what should be delivered. Having a more open dialogue and then drawing on a pre-prepared package of messages as proposed elsewhere within the options will ease the burden on both the comms and officer side, along with providing more effective communication.	Lead	Officer time only and/or below £50k; and 1-2 Years

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
Work with existing public health channels to deliver consistent messaging across the West Midlands	21 (3.65)	Use existing contacts to increase air quality awareness, and promote behaviour change through the delivery of consistent messaging	Using a mixture of existing channels and new partnerships, disseminate a common message on air quality relating to public health.	Enable	£50-100k; and 1-2 Years

7.2 Domestic Emissions and Indoor Air Quality

This section outlines some of the key options that could be implemented to reduce domestic emissions and improve health outcomes. Domestic combustion is a key source of $PM_{2.5}$, typically accounting for around 40% of the emissions across the West Midlands region. Domestic emissions have both outdoor and indoor air quality impacts and therefore are a critical part of improving health and reducing disparities in the West Midlands.

There will be improvements forced by net-zero initiatives (such as the phasing out of gas boilers), however the growth in solid fuel appliances (i.e. log burners) over the last few years has significantly increased preventable domestic emissions. In the vast majority of cases, solid fuel appliances are not needed as a primary source of heat and are less cost-effective than using gas or electric heating. As such, reducing the non-essential emissions as much as possible, alongside the other mandated changes, will result in reduced $PM_{2.5}$ concentrations. Unlike the engagement and behavioural change elements in Section 7.1, the options in this section will require more funding and potential Government support/backing to implement widely.

Work is already underway on some of the options, however a more consistent national and regional approach will aid the implementation and effectiveness of the options. The highest-ranking domestic emissions and indoor air quality options have been included here (with the full list provided in **Appendix D**).

Table 7.2.1: Top Ranked Domestic Emissions and Indoor Air Quality Options

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
Support landlords and homeowners in accessing grants to retrofit	1 (5.60)	Improve the uptake of retrofit in properties in both rented and owned properties to reduce emissions across all retrofit areas	Accelerate retrofit programmes which will aid air quality by signposting and supporting applications	Enable	£250-500k; and 2-3 Years
More stringent requirements within the planning process for expediting the transition from gas central heating	2 (5.25)	Reduce the installations of gas boilers in new builds in advance of the proposed 2025 deadline set by the government	By creating and leveraging more stringent planning requirements where possible (plus the consideration of the expansion of other methods currently in use), the transition could be accelerated. Otherwise, any boilers installed for new builds are unlikely to be replaced before the proposed 2035 phasing out of new installations.	Convene	£50-100k; and 5-10 years
Reduce fuel combustion by improving home energy efficiency	T3 (5.00)	A reduction in the fuel and energy used to heat and cool the home	In the UK, new homes are typically very well insulated so that in the winter, they require less energy to keep warm, however suffer when it comes to cooling in the summer. Older buildings may be more challenging to warm in the winter but have better properties to keep cooler in the summer. Therefore, tailored advice and changes for each home are required. This could be achieved through the expansion of current retrofit programmes and be something that has the potential to be expanded upon in devolution discussions in the future. A key area given the changing climate	Lead	>£5m; and 2-3 Years
Supporting the transition from gas central heating	T3 (5.00)	Accelerate the transition from gas central heating to improve both ambient and indoor air quality.	Accelerate retrofit programmes which will aid air quality by signposting and supporting applications	Enable	>£5m; and 2-3 Years
Smoke control area expansion	5 (4.50)	Reduce the use of non-approved appliances and move towards cleaner fuels to reduce emissions and improve both ambient and indoor air quality	Except for Birmingham and Dudley, there is scope to expand the smoke control areas in the other five constituent local authorities. The expansion of the existing smoke control areas will make it an offence to emit smoke from a chimney, furnace, or other solid fuel combustion appliance (unless the fuel used is an authorized "smokeless" fuel or the appliance is an "exempt" appliance). By providing information through advertising the smoke control area expansions, there are opportunities for both behaviour change in frequency of combustion and fuel/appliance used. The enforcement of smoke control areas is costly and somewhat difficult in some cases, so using it primarily as a behaviour change engagement tool is likely to be the most effective.	Convene	Officer time only and/or below £50k; and 1-2 Years
Use the planning process to restrict the installation of new solid fuel appliances in the cases where planning consent is required	6 (4.30)	Reduce the number of solid fuel appliances being installed and therefore reduce potential new emission sources	By using various approaches within the planning process, it may be possible to restrict the installation of solid fuel appliances where planning permission is required. Some local authorities are investigating this, however, there does not seem to have been a legal test to determine how this fits in with permitted development rights.	Convene	£100-250k; and 2-3 Years

7.3 Transport

This section outlines some of the key transport options that could be implemented to reduce road transport emissions and exposure. Transport has been the primary area of action for air quality impacts in recent years, primarily because 80% of the NO_2 emissions in the West Midlands region are from road transport. TfWM and the local authorities have responsibilities for transport, with TfWM being the Local Transport Authority (LTA) for the West Midlands and the local authorities having highway authority responsibilities. As an LTA, TfWM has the statutory duty to produce a Local Transport Plan (LTP) which sets out policies to promote safe, integrated, efficient and economic transport to, from and within the area, as well as plans to implement those policies. .

The recently published West Midlands Local Transport Plan (WMLTP5) core strategy[31] outlines the overarching plan for the region. This document sets out the wider strategy, which will then be followed up by four areas strategies and six detailed strategies to cover the 'big moves'. The objectives for the LTP are centred around '5 Motives for Change', which are "*five areas where changing transport could help us better support Inclusive Growth by improving the impacts of transport on people, and the places and environment on which they depend*". These motives are:

- Sustaining economic success;
- Creating a fairer society;
- Supporting local communities and places;
- Becoming more active; and
- Tackling the climate emergency.

The avoid, shift and improve framework has been used to create the six big moves which are:

- Behaviour change;
- Accessible and inclusive places;
- Walk, wheel, cycle and scoot;
- Public transport and shared mobility;
- Safe, efficient and reliable network; and
- Green transport revolution.

The "avoid, shift, improve" framework was used to develop each of the big moves and air quality can be improved through the plans which will come forward. However, sufficient assessment needs to be undertaken to ensure that human health is not affected as a result of the implementation of the big moves once the details are presented within the area strategies.

The highest-ranking transport related options, along with selected options that the appraisal team wish to highlight have been included here (with the full list provided in **Appendix D**).

Case study: West Midlands bus fleet upgrades to improve air quality

TfWM has worked in partnership with West Midlands bus operators since 2019 to secure the largest Euro VI bus fleet in the UK outside London, approximately 2,000 buses. Progress is now being made to upgrade the fleet further, so that all buses will be zero emission electric, or hydrogen powered, by 2030.

Since April 2019, over 950 buses have been modified to Euro VI standard through a £21m programme of national, regional and private funding.

To progress further improvements, Transport for West Midlands (TfWM), Coventry City Council, and operators were awarded £50m by the Department for Transport in 2022 to help secure an all-electric bus fleet for Coventry. Approximately 300 buses serving the city will be electric by 2025, through the All-Electric Bus Town funding.

Department for Transport "ZEBRA" funding was also awarded to the West Midlands in 2022, for a further 124 zero emission buses, including 24 articulated buses for the Sprint Bus Rapid Transit route between Walsall, Birmingham and Solihull.

Significant investment by National Express West Midlands means that an additional 300 electric double decker buses will be operating in the West Midlands by the end of 2024, in line with the strategy of a 2030 zero emission bus fleet.

[31] Transport for West Midlands (2023) *Reimagining transport in the West Midlands: Local Transport Plan Core Strategy*. Online: https://www.tfwm.org.uk/media/1p4ccrwt/wm-ltp-2023-core-strategy-v2-1.pdf

Case study: Reducing concentrations at hotspots in Dudley

Dudley has long-term monitored NO_2 exceedances at several locations within the borough, with the primary cause being road transport emissions. As such, there have been a series of schemes to reduce concentrations by improving traffic flow and therefore reducing emissions from repeated start/stop events.

The Castle Gate Island area forms part of an arterial route into Dudley and therefore there are particularly high NO_2 concentrations at junctions. Funding was secured to undertake a package of measures to improve traffic flow, including:

- Improvements and upgrades to the pedestrian crossing; and
- Adding intelligent sensors to the five sets of traffic lights around this Island, this has reduced the start stop burden on vehicles travelling through the area.

In the Wordsley area, there have been monitored exceedances of the NO_2 annual mean objective. As such, a package of measures was implemented that included:

- Alterations to the road layout including adding box junctions and filter lanes; and
- Upgrading the traffic lights in two key locations to improve the flow of traffic.

Following these changes, it brought an area that previously exceeded the annual mean objective for NO_2 into compliance.

Table 7.3.1: Top Ranked Transport Options

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
Prioritise newer buses used for most polluted routes	1 (6.75)	Reduce pollutant concentrations at hotspots and areas with relevant exposure as a priority to improve health outcomes where is it needed most	Where there are high concentrations and/or receptors are disproportionally affected, zero-emission/hydrogen buses could be deployed first to see the greatest benefit. TfWM aims to have all buses be zero-emission electric or hydrogen by 2030.	Convene	£50-100k; and 1-2 Years
Speed limit reduction (or dynamic speed limits) on high speed roads	2 (5.10)	To reduce the emissions from vehicles on high-speed roads and the associated exposure to receptors nearby.	Typically, the areas around high-speed roads are more deprived and a reduction in emissions will reduce exposure and improve health outcomes. A reduction in speeds has been used successfully elsewhere (typically 70mph to 50mph) as this brings most vehicles into the range of optimal fuel efficiency and a reduction in tailpipe emissions. This could be implemented through a fixed speed limit change, or a dynamic limit triggered by traffic flows or specific air quality limits	Convene	>500k; and 2-3 Years
Support and accelerate transition to zero emission bus fleet	3 (4.85)	Reduce the emissions associated with public transport by moving to a zero-emission bus fleet as quickly as possible	Support from an air quality perspective could include funding and grant support, increased ridership through behavioural change campaigns and making buses more attractive and therefore more economically viable to become zero-emission in the shortest period of time.	Lead	>£5m; and 2-3 Years
Ensure that there is the sufficient assessment/integration of transport plans and projects (such as area transport strategies and mitigation schemes) to ensure that the air quality impacts are quantified and where necessary, mitigated	4 (4.45)	Promote and realise wider benefits to air quality/health and an increased consideration and mitigation of disbenefits. Transport schemes should not lead to an increase in emissions or public exposure.	Not all transport schemes will have a positive benefit on air quality, especially those which result in the redistribution, reduction in usable road space or slowing of traffic. Therefore, plans and projects need to assess both the local health impact on receptors and the wider health outcomes at a strategic level. In addition, a set of criteria should be set to identify where there is a risk of air quality deterioration, which would then ensure that schemes which would not normally be assessed are correctly assessed.	Lead	£50-100k; and 2-3 Years
For new developments where local services are not available, ensure that transport needs are addressed and are improved in the local area.	5 (4.25)	Reduce the reliance on cars and require robust transport options to ensure the uptake of active and public transport for new residents	Through the planning process, ensure that transport measures are correctly assessed and where there are limited public transport/active travel options, these should be provided at an agreed stage prior to completion of the development	Convene	£250-500k; and 2-3 Years

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
Additional Clean Air Zones/congestion charge zones which consider NO2 and other pollutants	T6 (3.90)	Reduce emissions and exposure in key areas through the limitation of certain vehicle types, promoting fleet evolution and gaining revenue to spend on transformational schemes and projects.	Through the restriction or charging of non-compliant vehicles, it should detract non-compliant vehicles from entering the area or raising funds by doing so which can be spent on other areas, such as domestic combustion. Current CAZ's are used for NO2 exceedances, so other metrics or a change to the triggers would be required for more areas to become part of one. This would be subject to changes to current national legislation on Clean Air Zones. However other methods of charging such as the London ULEZ could be used, however this would need to be carefully considered as the West Midlands and London differ in terms of car ownership and the reliance on car use (both of which could adversely affect more deprived areas).	Convene	>£5m; and 3-4 Years
Create a route planning tool with modelled/real time air quality information so that people can reduce exposure when walking and/or make the decision to take public transport	T6 (3.90)	To provide an effective route planning tool which both promotes the uptake of active/public transport, but also considers air quality exposure and will therefore allow users to avoid high concentrations if required for health reasons etc.	The end product would provide residents with information that allows them to make informed decisions, while being a solution which requires just small changes to behaviour. Using the tool would be simple change and when linked to digestible air quality information, has the potential to be effective in reducing transient exposure. The co-promotion of active and public transport being is likely to be used the most by those who have underlying health conditions which are sensitive to air pollution.	Lead	>500k; and 2-3 Years
Investigate the lowering and enforcement of speed limits in urban centres and residential areas.	8 (3.55)	Assess the impacts that lower speeds and fewer deceleration and acceleration events will have. This could include changes in tailpipe emissions and brake wear from ICE vehicles and wear of parts on all vehicles.	The impact of lowering and enforcement of speed limits should be looked at to see if effective schemes can be introduced to reduce vehicle emissions as part of a range of traffic management measures, particularly for residential areas.	Convene	>£1m; and 2-3 Years
Designating new & priority bus measures	9 (3.50)	Promote the uptake of buses by having it as a quick and efficient mode of transport and therefore promoting behaviour change and less car usage	Making the bus network more time efficient and better to use should promote modal shift and with the move to zero-emission buses, improve pollutant concentrations further. However, there are potential associated short term drawbacks with increasing bus priority, especially if there is not the expected initial modal shift. This includes additional delay and congestion for car users. which in turn is likely to increase emissions at a time when the majority of the car fleet is still ICE vehicles.	Convene	>£5m; and 5-10 years
HGV bans/restrictions in urban centres, including out of hours freight delivery	10 (3.35)	A reduction in the number of highly polluting HGVs and/or the uptake in low emission HGVs leading to reduced pollutant concentrations	By restricting HGVs in urban centres and/or limiting their time of operation, this should reduce the emissions from such vehicles increasing existing pollutant concentrations and at times where exposure would be at its highest. Moving the freight delivery time will be a compromise, however this does have associated issues with staffing to receive such deliveries. As such, investigating the impacts of all potential approaches (including emissions thresholds) would need to be undertaken to appraise in detail.	Convene	>£1m; and 2-3 Years

Table 7.3.2: Selected Other Transport Options

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
Redesign bus stops and other minor waiting locations (where there will be transient exposure to high concentrations)	17 (2.40)	Determine key locations to reduce the exposure of public transport users to poor air quality by using features to reduce the dispersion of pollutant/moving away from sources in areas where there is transient exposure	Create more inviting environments at waiting locations where the exposure to pollution is reduced by using features such as vegetation barriers and separation from emission sources. Avoid putting bus stops in street canyons and enforce zero idling in the vicinity of the waiting areas for all traffic, with associated signage	Lead	£250-500k; and 3-4 Years

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
Implementation of new road surface compositions/construction methods and road treatments once research reveals effective solutions	18 (2.25)	To reduce particulate emissions related to road wear and resuspension.	There is ongoing research into new road materials, construction methods and treatments. It is not yet clear what of these will emerge as being a viable and cost-effective method to take forward into the future. Additional action is likely to be needed for roads given the increase in average vehicle weight associated with BEVs, so new approaches are most likely to be implemented for new roads or when work is being undertaken.	Convene	>£5m; and >15 years
Research and 'test-bed' implementation of new road surface composition and construction to reduce particulate emissions, particularly from battery electric vehicles (BEVs)	24 (0.85)	Research and utilise new technologies and techniques to reduce pollutant concentrations from road transport	Partner with companies and research facilities to research, test and implement new technologies	Convene	£250-500k; and 3-4 Years
Research and 'test-bed' implementation of new tyre composition and manufacturing techniques to reduce particulate emissions, particularly from battery electric vehicles (BEVs)	24 (0.85)	Research and utilise new technologies and techniques to reduce pollutant concentrations from road transport	Partner with companies and research facilities to research, test and implement new technologies	Convene	£250-500k; and 3-4 Years
Research and 'test-bed' implementation of road treatments to reduce resuspension	24 (0.85)	Research and utilise new technologies and techniques to reduce pollutant concentrations from road transport	Partner with companies and research facilities to research, test and implement new technologies	Convene	£250-500k; and 3-4 Years

7.4 Natural and Built Environment

Air quality, health and the environment we live in are all interlinked and so ensuring that the environment that surrounds us promotes healthy and sustainable lifestyles is key. The natural environment plays a large role in air quality and the health of towns and cities, but in the past, there has been a reduction in the number of green spaces and vegetation. This is now being improved by mechanisms such as biodiversity net gain (BNG), however more can be done to improve the natural and built environment around us. Many of the options within this section merge both the improvement in the natural environment being used to compliment and improve the built environment.

Access to green spaces is important for many health reasons, but it also provides spaces for people to enjoy where they are exposed to lower concentrations of many pollutants. Dense treelines and hedgerows also serve important roles, especially when it comes to particulates. Such green barriers can reduce the dispersion of pollutants from roads and other sources and reduce concentrations where people may be exposed for long periods of time. However, detailed assessment should be taken as the barriers will inhibit the dispersion of the pollutants and may increase concentrations elsewhere.

Case study: West Midlands Natural Environment Plan

The WMCA Natural Environment Plan, published in 2021, sets out a number of actions that will contribute to improving air quality and reducing exposure to poor air quality in local communities across the region.

Specific action include:

- Exploration of incorporating tree-lined streets into the finished design for every West Midlands transport scheme which involves redesigning streets and is funded by the Combined Authority.
- Working with Transport for West Midlands at the early stages of programme/ project development to include green infrastructure as part of the transport network, e.g. green roofs on shelters, semi-natural habitat into verges /leftover land.
- Providing support to local community groups to develop a network of accessible open spaces through the Community Green Grant, giving communities the opportunity to access greenspace away from major sources of air pollution.

Further to this the WMCA as Responsible Authority for the development and delivery of the Local Nature Recovery Strategy will explore mechanisms for incentivising the creation of nature-based solutions in urban areas are part of delivering nature recovery, biodiversity net gain and other environmental outcomes.

Table 7.4.1: Top Ranked Natural and Built Environment Options

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
Land use planning - give preference to developments in locations that minimise the need to travel and/or propose sufficient facilities, which will therefore reduce operational impacts	1 (4.85)	Use land use planning to reduce the impact of new developments through reduced reliance on private vehicle use and promote active travel	Reducing the reliance on cars and other modes of transport by being near existing facilities or providing sufficient facilities on site. This will reduce emissions related to travel compared to a site which is further away/does not have any on on-site facilities	Convene	£50-100k; and 2-3 Years
Promote transport schemes and road alterations that include effective green infrastructure to reduce exposure to poor air quality	T2 (4.60)	Reduce the impact of transport schemes through considered design by ensuring the design is mindful of air quality and reduces exposure as much as possible from the outset.	Although transport schemes can be designed to reduce the impact as much as possible (including siting away from areas of exposure and managing traffic flows), additional effective green infrastructure should reduce the impact of any schemes on receptors. Design guides could be produced to ensure that the consideration of green infrastructure to improve air quality and the natural environment is considered by all parties during the design phases.	Lead	£50-100k; and 2-3 Years
Require the consideration of the co-benefits of site Masterplanning and ecological features on reducing exposure to poor air quality	T2 (4.60)	Reduce the impact of development through considered design by leveraging ecological features within the masterplan that are also designed with air quality benefits in mind. This should reduce exposure as much as possible from the outset.	This should reduce exposure as much as possible from the outset, while providing ecological benefits. This could be implemented using design guides and a requirement to consider in the planning process.	Convene	£50-100k; and 2-3 Years

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
Use damage cost contributions to effectively improve the environment and green infrastructure around new schemes	T2 (4.60)	Improve the environment in the vicinity of the development and increase the funding available to improve air quality and the natural environment in the surrounding area.	By assigning a damage cost methodology (including a clear process on where it should sit within the planning process) the process can be used to either mitigate impacts during the design phase, or be used to target air quality and natural environment improvements elsewhere. The process should not be a way to simply let a developer pay their way out of mitigating any impacts, but ensure the betterment of the environment as a whole in the area of development.	Convene	£50-100k; and 2-3 Years
Increase the use of dense urban vegetation to create barriers between sources of pollution and places of exposure.	5 (4.35)	Use dense vegetation as a barrier to pollutant sources and reduce exposure.	Dense barriers are an effective method to improve air quality outcomes than planning trees which are dispersed over a wider area. Key hotspots could be targeted and prioritised to ensure that exposure is reduced where it needs to be, and that funding can be targeted.	Convene	£100-250k; and 2-3 Years
Leverage modified biodiversity net gain (BNG) metrics to improve urban design and reduce exposure to poor air quality	6 (4.30)	Use BNG as a method to drive air quality improvements in design which will aid in the reduction of exposure for future residents and users of the area	By adjusting local/regional BNG metrics to promote measures/features which promote air quality benefits and combining them with planning requirements, there can be a shift in the West Midlands towards reducing exposure and embedding that within the design of schemes from the start.	Lead	Officer time only and/or below £50k; and 1-2 Years
Use street furniture and natural features to reduce exposure and create barriers at key waiting locations	7 (3.70)	Leverage new street furniture and natural features in waiting locations to reduce exposure.	Where there is significant transient exposure, new street furniture such as bus stops could be installed further away from the road and include dense vegetation as a barrier to pollutant sources and reduce exposure.	Convene	£250-500k; and 2-3 Years
Construction of new cycle lanes and paths, especially linking new developments with key services to reduce demand on road transport.	8 (3.60)	Reduce emissions from vehicles due to modal shift and through considered design of new developments	Increasing the attractiveness and ease of cycling will promote modal shift. In the long term, the increased uptake of cycling as a regular mode of transport will reduce the number of cars in key urban locations. However, there are short-term disbenefits where there may be more congestion due to road works/road space being used to create the cycle lanes and the uptake lag.	Enable	>£1m; and 2-3 Years

7.5 Commercial, Industrial and Agriculture

This section outlines the options which could be implemented to address emissions from commercial, industrial and agriculture. Typically, many aspects of industrial and agricultural emissions are outside of the remit of local authorities (many permitted by the Environment Agency), however there are options that can bridge this gap. The options here cover a broad range of areas, with many using existing and potential pathways for implementation, while others may require co-working or support from the Government. It should be noted that the emission sources do vary across the West Midlands, with sources affecting both local and regional pollutant concentrations.

Table 7.5.1: Top Ranked Commercial, Industrial and Agriculture Options

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
NO_x, SO_2, VOC and PM abatement guidance and providing support on how this can be achieved/funded	1 (4.15)	Reduce emissions from plant and installations through guidance, advice and signposting to funding	Work with the Environment Agency to provide tailored West Midlands guidance and distribute it through established and new communication channels.	Convene	£50-100k; and 2-3 Years
Consistent advice, policy and enforcement of dust abatement measures	2 (4.10)	Reduce the impact of construction on air quality	Through the provision of consistent policy and guidance, constructors will have a clear understanding of the expectations when working across the West Midlands. As such, a higher consistent standard should deliver results when it comes to reducing dust nuisance and its impact on health. Enforcement will be difficult within the current resourcing for the local authorities.	Convene	£50-100k; and 1-2 Years
Promote off-site construction and manufacturing	3 (3.90)	Reduce the level of dusty manufacturing within the construction process and reduce local construction emissions	Promoting off-site construction in urban areas will reduce the emissions from on-site processes which will impact receptors more. This includes less operation of on-site plant which will reduce emissions unless the machinery is zero-emissions. It will also aid in the re-education of materials wastage and speed up construction, so any pollutants emitted on site will take place in a shorter period.	Enable	Officer time only and/or below £50k; and 1-2 Years
Increased scrutiny and consideration of health impacts relating to heat/power generation from biomass/waste.	4 (3.80)	Ensure that combustion sources are appropriately sited to reduce exposure and that emissions are appropriately mitigated.	Biomass and other combustion processes can have a significant impact on local and regional air quality, especially when the cumulative impacts are considered. Such additional scrutiny should include more stringent consideration of air quality health impacts, location suitability and appropriate mitigation where required. Alternatives should also need to be appraised to ensure that all options have been considered. It is also one of the main public concerns when air quality comes up as a discussion as it is very visual, so public feedback and education are also key if such plant is going to be more prevalent in the future.	Convene	Officer time only and/or below £50k; and 2-3 Years
Discourage investment in biomass fuelled heat/power and potential for regulating biomass combustion plants <1MW	5 (3.35)	Reduce emissions from smaller plant and promote alternatives which do not have such an impact on emissions and exposure.	Through a more rigorous assessment of biomass plant and the air quality/climate trade-offs, the viability of smaller-scale energy/heat generation should be a requirement, especially in urban areas.	Convene	£50-100k; and 2-3 Years
Facilitate and promote access to funding for commercial retrofit of heating and cooling systems	T6 (3.30)	An improvement in heating/cooling efficiency leads to a reduction in emissions and an improvement in indoor air quality	By providing guidance and advice on what current grants and support are available, the uptake of such schemes is likely to be higher and promote a move to more efficient methods and reduce the reliance on on-site combustion.	Convene	£50-100k; and 1-2 Years
Increase/establish co-working with the Environment Agency to enforce permits	T6 (3.30)	Reduce the emissions from Environment Agency permitted installations and promote best practice	Enforce compliance and open communication channels for operations which fall outside of the local authority remit by having joint operations and communication campaigns.	Convene	£100-250k; and 2-3 Years
Non-domestic buildings - Reduce fuel combustion by improving Energy efficiency through grants and guidance	8 (3.05)	Reduce local and regional emissions through a reduction in the volume of fuel required	By providing guidance and advice on what current grants and support are available, the uptake of such schemes is likely to be higher and lead to improvements in energy efficiency. New grants through devolution funds/deals will be able to target specific needs if required. This may not have a large local impact as it depends on the fuel that is being used.	Enable	>£5m; and 3-4 Years
Undertake audits of the local authority commercial building stock to determine what measures can be implemented	9 (2.85)	Assess what can be done to reduce emissions, improve indoor air quality and improve energy efficiency.	By understanding what the baseline situation is for the commercial stock, retrofit and upgrades can be made based on priority and the impact that can be made.	Enable	£100-250k; and 2-3 Years

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
Non-domestic buildings – Transformation of heating away from the combustion of fuels	10 (2.80)	Reduce local and regional emissions through a change in the fuel type or heating method used	By providing guidance and advice on what current grants and support are available, the uptake of such schemes is likely to be higher and promote a move to heating methods that do not use on-site combustion. New grants through devolution funds/deals will be able to target specific needs if required.	Enable	>£5m; and 5-10 years

7.6 Public health

This section outlines the options that can be implemented to improve the air quality related health outcomes in the West Midlands. The Government has declared poor air quality as the largest environmental risk to public health in the UK. It has long been recognised that health outcomes are largely determined by the conditions in which people are born, grow, live, work and age. Air pollution impacts health directly and is one such 'wider determinant of health' with implications for quality of life among those living in the WMCA area. The impact of poor air quality with the West Midlands is unequal and therefore those who have pre-existing and long-term health conditions are disproportionally affected. As such, improving air quality should realise tangible benefits to health and the costs associated with delivering and managing the healthcare for those most affected. Based on the latest evidence[32] from the Committee on the Medical Effects of Air Pollutants (COMEAP) and 2019 modelling data, particulate air pollution is estimated to be responsible for between 1584 and 2311 early deaths per year in the West Midlands[33].

There are several partners who have established public health work within the West Midlands. One of the major ones is the WM-Air project, which has specific health strands and is developing tools and assessing the real-world impact of air pollution on health. More local authorities are also taking on increased air quality responsibilities within their public health functions (SaMBC is one example where the air quality officers sit within public health), however a joined-up approach between all of those responsible for air quality and health is key to improving public health in the West Midlands.

Case study: Public health impacts of air pollution in the West Midlands

The WMCA has a population of approximately 2.9 million people, but life expectancy varies across the region, impacted in part by environmental pollution and air quality. Recognising these differences across the West Midlands, WM-Air researchers have developed the Air Quality-Lifecourse Assessment Tool (AQ-LAT), which uses local population and health data to better understand how the impacts of poor air quality are patterned across the region. The ward-level tool also enables appraisal of regional policies to understand where, and to what extent, health and monetary gains will be achieved from a given reduction in air pollution.

Applying the AQ-LAT, researchers have estimated that air pollution in the WMCA area contributes to ~2100 early deaths each year. Pollution also increases the risk of long-term health conditions, including over 2000 new asthma diagnoses among adults and children. Reducing pollution to within WHO 2021 Global Air Quality Guidelines would gain ~130,000 years of life for the WMCA population over the next 20 years; with most benefits experienced in Birmingham and Sandwell. These improvements would generate economic savings exceeding £3.2bn over the next 20 years.

AQ-LAT dashboard showing example figures for Birmingham

Table 7.6.1: Top Ranked Public Health Options

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
Roll out tools to warn and update residents about poor air quality; supported by the regional/local healthcare system	1 (4.10)	Increase awareness of air quality and associated health issues through existing health channels and a tool to help more vulnerable residents reduce their exposure at key times.	Reduce the exposure of those who are at risk and/or have underlying health conditions. at times when there are heightened concentrations. This would need to be inclusive to not exclude those who are not digitally literate and would need to be supported through healthcare providers. The tools would need to both warn and outline measures to mitigate risk where required.	Convene	£100-250k; and 1-2 Years
Develop tools to reduce exposure to poor air quality outside of the home, such as journey planners linked to pollution modelling and real time data	2 (4.05)	Reduce exposure and increase awareness of air quality	With the increased promotion of active travel and public transport, there is the potential for increased transient exposure to pollutants when moving around outside the home. A West Midlands route planner that includes public and active transport and includes modelled and/or real-time concentrations to provide alternative routes which would	Lead	£100-250k; and 1-2 Years

[32] The concentration response function for attributable mortality was increased from 1.06 to 1.08 per 10µg/m^3. This reflects a significant relative increase in magnitude and therefore is partially responsible for the increase in the estimated mortality attributable to particulate air pollution.

[33] This range reflects the 95% confidence interval for the concentration response function provided by COMEAP (1.06-1.09)

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
			reduce exposure. This can also include a 'tolerance' setting where you could set it to allow quick detours to avoid the highest concentrations or to allow you to avoid major roads, at the expense of journey time for when you have more time and can use it as an opportunity for exercise.		
Research into the real-world exposure of West Midlands residents (including the differences in exposure based on age and socio-economic situation) and what measures can be effectively implemented based on the findings.	3 (3.95)	Assess in more detail who is being exposed to what pollutant concentrations and target measures to reduce any disparities that exist.	Having more insight into real-world exposure will allow for the targeting of measures to the areas which need it most. Such research shouldn't discount time spent in exposure hotspots and the impact of the exposure i.e. public transport hubs/children in cars being exposed more.	Convene	£100-250k; and 2-3 Years
Introduce a West Midlands schools accreditation and education scheme for air quality	4 (3.80)	Increase awareness and air quality outcomes through greater standardised school participation, but still allows for local variations.	A West Midlands schools accreditation scheme would need to be both consistent and flexible. Having a consistent set of metrics, measures and resources is likely to improve uptake and effectiveness, but there needs to be flexibility in what is being offered as depending on the setting, different things may be required. For example, there may need to be changes to active transport aspects between urban and suburban areas. Metrics to be used for the accreditation could include roll out of air quality education, transport planning, wider engagement, STEM and making changes to reduce emissions and exposure.	Convene	£100-250k; and 2-3 Years
Develop a toolbox of measures that local authorities can easily implement and have pre-packaged communications packages that local authorities can use to promote the measures	5 (3.60)	Enable effective (in terms of cost, time and outcomes) engagement which is easy to deploy and leads to behaviour change	Having a package of approved and consistent measures that are ready to go is likely to improve the effectiveness of communications and how often they can be deployed. This would also make running concurrent campaigns much easier for comms teams as the packages are pre-approved and are ready to be deployed	Lead	£100-250k; and 2-3 Years

7.7 Planning, Policy, Governance and Mechanisms for Change

This section outlines the options that cover planning, policy, governance and the mechanisms for change. Air quality is one of the material planning considerations considered as part of the planning decision making process and therefore, there are mechanisms that can influence air quality. Although the WMCA does not have any formal planning powers, it is able to convene and enable elements relating to planning, policy and governance. Having consistency wherever possible across the West Midlands will be key to improving air quality as quickly as possible. This is expected to have a range of benefits for the local authorities including reducing the time burden on officers, being more cost effective and more likely to produce results.

There are a range of proposed changes to how air quality could be considered within the planning process and achieve better air quality outcomes for the West Midlands. One major area is assessment best practice/guidance and its subsequent application varies across the local authorities. Much of the current guidance (such as the West Midlands Low Emissions Towns and Cities Programme) is not up to date and is falling behind in terms of methodology and using the planning process to shape air quality. Some Local Authorities are implementing more up-to-date guidance, however for maximum benefit, there should be a regional approach to assessing air quality within the planning process. It should be noted that this is reliant on DEFRA releasing the proposals for $PM_{2.5}$ assessment going forward, as proposed within the Environmental Improvement Plan 2023.

There are also distinct synergies with other aspects within the planning process (such as energy, climate and net-zero) and establishing what can benefit and harm air quality and making the appropriate decisions within the planning process is important. Not all the options relate to the planning process and policy, and there is the potential for the WMCA to optimise some aspects such as:

- Upskilling and training for local authority officers and members
- Provide grant and project co-ordination to ensure the West Midlands attains funding where possible
- Provide a platform to co-ordinate air quality improvements across the region and reduce the duplication of work

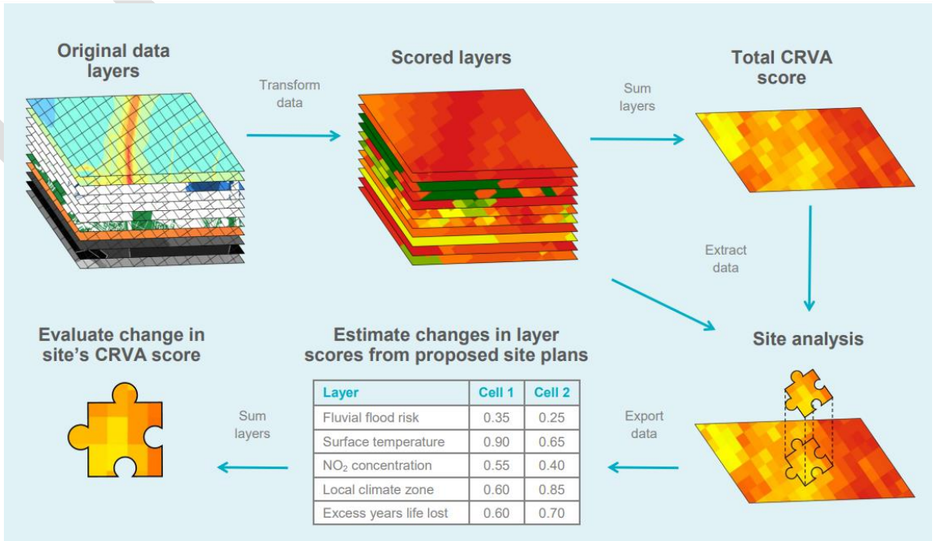
As such, the aim should be to promote and enable better ways of working to make sure that these typically more cost-effective measures can have such a great impact on air quality and health.

Case Study: Climate Risk and Vulnerability Assessment (CRVA) tool

Birmingham City Council and the WM-Air Project team at the University of Birmingham have co-developed a Climate Risk and Vulnerability Assessment (CRVA) tool that will help communicate climate vulnerability across the city. Climate resilience is a key component of the city's corporate risk strategy, and the CRVA map provides the means to consider this risk during city planning and design, and to identify areas and communities who will be most, and least, impacted by climate risks. The map of Birmingham uses publicly available data from a variety of sources, scoring 100m grids across each layer, which are then summed to provide the overall CRVA score. The CVRA map identifies those areas of greatest climate risk and vulnerability, and will feed into investment prioritisation decisions and support climate-sensitive development. The CVRA map is also being used for Carbon Disclosure Project reporting commitments.

Air quality is included as two layers within the CVRA map. Including air quality is fundamental to the approach to ensure that air quality implications are considered at the earliest stages of the planning process, as highlighted in the WM-Air Urban Design for Air Quality guidance note. There are many co-benefits of design interventions such as increasing green space or tree canopy cover in tackling liveability, climate and air quality issues.

The adoption of the CRVA tool – which is available to view at ward-level - should place Birmingham as a global leader in transparency and bold climate action. The University and Birmingham City Council have published the CRVA method so that other Local Authorities or regions can produce their own CRVA tool.



Multiple layers of data are converted and combined to create a single CRVA map layer

Table 7.7.1: Top Ranked Planning, Policy, Governance and Mechanisms for Change Options

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
Introduce air quality neutral and/or air quality positive assessments into the planning process across the West Midlands	1 (5.90)	Have air quality as a greater design and planning consideration by providing more stringent assessment and design requirements. This will have both impact and exposure benefits and aid in ensuring widespread cumulative development is adequately controlled and assessed.	Through the setting of 'benchmarks' in the case of air quality neutral, the cumulative impact of all developments can be reduced, and more stringent standards set in terms of trip generation and parking. Such benchmarks would need to be locationally specific to account for variations in public transport accessibility and other barriers to transport. An air quality positive approach would aim to leverage air quality benefits on larger scale developments by requiring air quality to be considered as a core part of the development and design of a development. This would also include the minimising of exposure and a core outcome would be to demonstrate what measures have been taken to achieve the best possible outcomes for air quality. Both of these methods elevate air quality further up the agenda in the design and planning process and will have clear benefits.	Convene	£50-100k; and 2-3 Years
Scope for a “Net Health Gain” principle	2 (5.60)	Embed the requirement for air quality and health improvement within the planning process to reduce cumulative development degrading health and the environment	Potentially differing slightly from air quality neutral/positive, net health gain could cover a wider range of considerations outside of air quality. It would mean that any new development or proposal for change to existing development should deliver an overall benefit to people’s public health. As such, any new development should be 'clean' by design. For example, the development could be designed to promote active/public transport, access to green space, provide on-site facilities and provide full access to EV charging across the site.	Enable	Officer time only and/or below £50k; and 1-2 Years
Establish a region-wide planning and design for air quality best practice document which will be kept updated with local, regional and national changes in guidance and legislation	3 (5.50)	A more homogonous approach to the assessment of air quality across the region to promote and enforce air quality improvements over and above what may be required nationally.	Will supersede various documents and be designed in a way in which each local authority can add its own specific sections, but will include aspects such as air quality assessments, damage cost calculations, air quality positive design, site suitability assessment and mitigation. However, it will need to be consistent in key areas to ensure that the assessment undertaken is somewhat standardised and kept up-to-date with guidance and regulation changes. Some local authorities are updating guidance, so as soon as new $PM_{2.5}$ assessment guidance is published (and alongside any other developing areas such as net health gain and heath-based impact assessments).	Lead	£50-100k; and 2-3 Years
Including Health Impact Assessments (HIA) in planning applications and containing air quality	4 (5.35)	Identify and optimise the health and wellbeing impacts of planning	HIA is a method of systematically identifying the impacts of plans and projects, informing recommendations to promote and protect health and wellbeing and narrow inequalities. It has a wide-ranging brief with some aspects similar to air quality positive but does so over five stages. Given the health impacts that air quality has, it should be a core component of any HIA guidance.	Convene	£50-100k; and 1-2 Years
Promote district heat networks (using heat pumps) for large developments	5 (4.90)	Centralise the generation of heat within developments to reduce emissions and both indoor and ambient exposure	A district heat network would remove the requirement for each household/unit to have a boiler or heat pump. As such, it may provide a more efficient heating solution. This includes lower costs for users and benefits air quality and the climate.	Convene	£50-100k; and 1-2 Years
Move away from the IAQM assessment criteria to both more stringent thresholds for detailed assessment and using health based assessment for the quantification of impacts	6 (4.8)	Reduce the standalone and cumulative degradation of air quality by using more stringent and applicable metrics	Currently, air quality assessments are compared against impact criteria, which considers changes in concentrations relative to an objective. Typically, professional opinion is used to determine if impacts are significant. If impacts are determined to be negligible, no mitigation is typically required outside of what is outlined in other planning policies. Concentrations that are below 75% of the objective require more change relative to the objective to realise an impact that is not 'negligible'. As such, there is no driver to reduce impacts and improve health outcomes and the cumulative impact of many developments can be missed. The IAQM criteria have not been revised following changes to the future PM2.5 targets.	Convene	£50-100k; and 2-3 Years
Provide centralised support for local authorities in areas such as local plan policy to promote consistency and dealing with more complex air quality assessment methodologies	T7 (4.20)	Promote consistency and accurate decision-making by local authorities through upskilling and support	By providing expert support on complex air quality matters, local authorities who have less air quality specialism/those who don't solely work on air quality are not disadvantaged when it comes to decision-making on air quality. This will also promote consistency within the local authorities.	Lead	£250-500k; and 2-3 Years

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
Use mechanisms (such as future local plans) to enforce more stringent regional air quality limits/compliance timescales.	T7 (4.20)	Use proposed NPPF change to enable evidence-based policies to go above and beyond legislation to improve air quality in the West Midlands	Given there are already expressions of interest to go above the 2040 $PM_{2.5}$ targets, using planning mechanisms to either set more ambitious targets or to reach compliance in a shorter period of time will have a benefit to health. This would require regional co-operation on guidance, standards and processes to ensure that development aids and aims	Convene	Officer time only and/or below £50k; and 3-4 Years
Develop guidelines for best practices for procurement that will support air quality improvements (e.g. use of Non-Road Mobile Machinery)	T9 (4.10)	Improve air quality through the procurement of less polluting options.	Produce guidance that can be adopted within procurement processes to ensure that air quality outcomes are a consideration. This can then be used both internally and externally to promote air quality as a greater consideration, especially if more stringent standards are implemented at some point.	Enable	Officer time only and/or below £50k; and 1-2 Years
Provide guidance on how planning will consider the air quality and climate/net zero co-benefits and disbenefits within the planning process and are addressed in a joined up way by officers	T9 (4.10)	Have planners and officers responsible for specific areas discuss co-benefits/disbenefits of specific scheme aspects to better assess applications	There will be some interplay between disciplines when considering climate and net zero. Some actions which are beneficial to net zero goals may not benefit air quality and therefore have an impact on the health of local residents. There will also be instances where a changing climate has an impact on overheating, so along with other areas such as acoustics, wind and outdoor/indoor air quality will need to work together. Mitigation requirements should suit all areas when feasible, and solutions are worked out when there are conflicting requirements.	Convene	Officer time only and/or below £50k; and 1-2 Years

Table 7.7.2: Selected Planning, Policy, Governance and Mechanisms for Change Options

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
Have a platform for WMCA and local authority officers to share ideas and plans for engagement to ensure that regional rollouts can happen, facilitate knowledge sharing and leverage combined procurement where applicable	11 (4.05)	Improved communication and collaboration to reduce the time burden and improve the effectiveness of air quality interventions	This could take the form of a restricted access collaboration platform so that air quality officers can exchange ideas and coordinate air quality campaigns. There are some instances where plans for air quality are not shared until further down the line, when it may have been possible to join up and improve the campaign. By highlighting potential ideas and strategies which sit outside of the usual work, it is hoped that a wide range of benefits can be achieved. This can then also be used for grant co-ordination and procurement.	Lead	Officer time only and/or below £50k; and <1 Year
Co-ordinate regional air quality upskilling and knowledge share for air quality officers	13 (3.85)	Enable air quality officers to be able to have a specialism in a wider range and more niche areas of air quality to ensure correct decisions and actions are made	This could be facilitated through another option outlined within this section (such as an air quality assembly) or as a separate option. There is already extensive knowledge on the majority of areas within the West Midlands, but these could be supplemented by partners providing information on topics. This could be in person, or in the form of interactive online sessions to reduce the travel and time burden.	Lead	Officer time only and/or below £50k; and <1 Year
Provide grant and project co-ordination through the WMCA to ensure that there is consistency across the West Midlands and procurement is effective.	15 (3.70)	Increase the access to and efficiency of grant applications, plus the coordination of procurement to gain associated benefits	As demonstrated by the DEFRA $PM_{2.5}$ fund win, it is possible for large funding bids to be co-ordinated by the WMCA. This reduces the burden on local authority officer time and allows for both greater scope and consistency. This could be set up more formally alongside other options set out within this section or on an ad hoc basis based on funding schedules.	Lead	Officer time only and/or below £50k; and <1 Year
Have a centrally managed regional air quality assembly to provide support, guidance and co-ordination for local authorities and to ensure where possible, there is consistency, open communication channels and leveraging opportunities for funding etc.	T18 (2.90)	Increase communication, support and collaboration between local authorities which will promote better air quality outcomes, along with other benefits	The current West Midlands Environmental Protection Group (WMEPG) covers air quality as a core component, but it covers a range of disciplines (such as contaminated land, LAPPC) and is focused on regulatory/LAQM aspects. As may not be the best mechanism to drive the aims of an air quality assembly. As such, a complimentary assembly to drive aspects within this PPG section will be more focused to drive forward changes. Periodic in-person meetings of the core assembly would allow for more in-depth and focused meetings and for the discussion of issues which aren't possible in other forums.	Convene	Officer time only and/or below £50k; and <1 Year

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
Coordinate regional approaches to government on policy and resources to tackle air quality challenges (DEFRA, HMT and key partners, e.g., Environment Agency, National Highways)	T18 (2.90)	Where possible coordinate responses to best represent the best interests and improve the profile of the West Midlands	Increasing the profile of the work and interests of the West Midlands, should result in better outcomes, more of a say in policy development and even autonomy in some aspects. This would need to be organised and new communication channels opened to effectively community and co-ordinate quickly on responses.	Lead	Officer time only and/or below £50k; and <1 Year

7.8 Monitoring and Digital

Monitoring has such a key role within air quality as it impacts many areas including planning and policy. The requirement to monitor key pollutants as part of local authorities LAQM responsibilities means that many local authorities have an extensive evidence base on pollutant concentrations. Now there is an increased focus on particulates (particularly $PM_{2.5}$) the monitoring landscape is undergoing a major change from using primarily low-cost passive methods for NO_2 (such as diffusion tubes), to requiring more costly $PM_{2.5}$ automatic analysers and utilising low-cost sensors. In comparison to diffusion tubes, low-cost sensors are much more expensive and require continual annual costs after purchase. However, they do have similar drawbacks when compared to the more costly automatic monitoring – they are not as accurate. Some low-cost sensors (such as the EathSense Zephyr and the South Coast Science Praxis/Urban) have been awarded MCERTS for indicative measurement of dust in ambient air. As such, they can be used as a key indicative tool to understand the relative concentrations and use them as an engagement tool, but they are not yet able to be used for LAQM purposes/for determining compliance.

With the increased focus on digital and data, being able to capture widespread air quality data in real time through a network of low-cost sensors presents an excellent opportunity. Such opportunities include:

- Use as an engagement tool through a West Midlands air quality website, a visual talking point and highlighting issues by placing monitors in homes;
- An increase in citizen science and science, technology, engineering, and mathematics (STEM) applications;
- Enable a local air quality warning service and rapid modelling capabilities;
- Improve the granularity of source apportionment studies; and
- Identify particularly key pollutant sources and the potential impact on receptors

As part of the increase in low-cost sensor usage, there will need to be regional co-ordination and guidance on their application and use. National guidance on low-cost sensors is due to be published by DEFRA shortly, but in the meantime, careful planning is required to ensure that when deployed, the sensors provide data which has a purpose. Being able to leverage this data is important, so having widespread access to processed data will provide opportunities for research and STEM use.

Case Study: West Midlands Sensor Network

The WMCA has secured the funding to install a regional sensor network, enabling the roll out of low-cost sensors (accredited to iMCERTS) that will measure a range of pollutants, including $PM_{2.5}$ and NO_2. These will complement the existing network of both reference equivalent and low-cost air quality sensors that have been installed by the local authorities.

Importantly, we see the installation of low-cost sensors as an opportunity to be able to make 'real time' data on air quality available to everyone across the region, from local authorities, to business, to universities and communities. This will be via a dedicated web platform that will also provide information and news updates related to air quality issues.

To date, due to the high cost of reference equivalent analysers, the wider picture with regards to $PM_{2.5}$ in particular has relied on modelled data, rather than information that is being collected from locations across the West Midlands. By installing sensors and following a consistent set of standards for the network, we will be able to better understand the regional air quality issues as well as the impact that the different measures are having on improving local and regional air quality.

Case Study: Air Quality Monitoring in Schools to engage, inform and educate

In January 2022 Birmingham City Council launched its first Clean Air Strategy (CAS) for the city of Birmingham. This innovative strategy seeks to improve air quality across the city and not just in areas where air pollution concentrations are traditionally high. The launch took place at Lea Forest School and was undertaken in conjunction with the first discreet project under the CAS; Air Quality Monitoring in Schools (AQMiS).

The AQMiS project seeks to raise awareness of air pollution amongst primary and secondary school students and teachers and by extension amongst parents. The aspiration is to inspire a culture of behavioural change both in terms of influencing the choice of mode of transit to school and also in wider lifestyle choices.

Working in partnership with Airly the City Council has provided schools across the city with indicative air quality monitors. The sensors provide real-time air quality data for nitrogen dioxide, particulate and ozone. The monitors include a coloured light which provides a visual indicator of the level of pollution using an air quality index ranging from green to red.

The monitoring solution is also supported by a publicly accessible online platform https://airly.org/en/ and App (available on Apple and Android devices). The platform incorporates a location map which can be used to view the pollutant data in near real time. The project is also supported by provision of educational resources which the schools can use to promote student learning and ultimately engender behavioural change.

The first phase of the project began in early 2022 which aimed at installing 70 sensors across the city. The second phase of the project which is due to be rolled out in the latter half of 2023 aims to expand the offer to every school in Birmingham and will be funded through the Transport and Environment CAZ Programme.

This project ties in with the Council's vision for the CAS to be relevant across the wider city and to not just focus on areas where air quality is traditionally recognised to be poor. This is underpinned by the Council's pledges within the CAS around collaboration, clean air for schools, protecting the vulnerable and measuring progress.

Table 7.8.1: Monitoring and Digital Options

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
Use a centralised West Midlands air quality network website as a data store to enable various analyses such as trends and the quantification of the impact of air quality measures	1 (3.40)	Improve access to air quality data to aid areas such as research, planning and evaluation	Easy access to data from a large range of sources aids data analysis, which can enable better decisions to be made. An example where a datastore would be helpful is where it could better enable the assessment of "exposure reduction" and prioritisation of measures to reduce environmental health inequalities.	Lead	£50-100k; and <1 Year
Establish a West Midlands wide low-cost sensor network, with an associated standalone website that includes existing regional data and air quality information that is effective for behaviour change	2 (2.90)	Use low-cost sensors to gain better spatial resolution on particulate concentrations and tie them in with a centralised air quality resource to promote behaviour change	This is an in-progress option based on the back of the DEFRA funding win. This will look to both use air quality monitoring as a behaviour change tool and the groundwork for a larger-scale collaborative network. A number of local authorities already have low-cost sensors deployed and the data is spread across a number of websites. Therefore, having the data in a central location will aid public access and collaboration will aid standards, reduce costs and officer time burden.	Lead	£250-500k; and <1 Year
Understand the relative importance of within-region emissions and transported air pollution for WMCA air quality	3 (2.20)	By knowing the different contribution from within region and external pollution, it will be possible to target specific sources and seek partnerships with other regions to address specific emission sources	This work is already underway through the WM-Air project. The outcomes can be used in future decision-making when assessing the applications of options.	Enable	£50-100k; and <1 Year
Understanding real-word emissions to underpin policy, e.g. identifying largest emitters across actual WM fleet (all vehicles)	T4 (1.95)	Use real-world data to understand emissions from various sources and to target policies and interventions.	This work is already underway through the WM-Air project. The outcomes can be used in future decision-making when assessing the applications of options.	Enable	£50-100k; and 1-2 Years
Establish regional standards on air quality monitoring covering all monitoring types to ensure that the data being acquired is robust and the equipment used is to a minimum standard.	T4 (1.95)	Improve the quality of the air quality data collected throughout the West Midlands by following agreed standards/guidance.	Having set regional standards on all monitoring will help officers when making decisions on monitoring and also for developers/consultants when required. This may include considerations to make sure campaigns are more considered of outcomes and how these can be monitored/evaluated when required. At the moment there is a range of sensors that are deployed and some are not accredited to a formal standard. Therefore, they are more of a pure engagement tool, rather than both an engagement tool and allowing for some indicative data collection that can be used for other purposes. This will also be helpful when it comes to navigating the vast numbers of low-cost sensor solutions flooding the market at a very low cost.	Lead	Officer time only and/or below £50k; and 1-2 Years
Establish a pathway for streamlined procurement of air quality monitoring equipment and resources to both leverage economies of scale and ensuring that the correct equipment is purchased based on the regional standards	T4 (1.95)	Reduce costs, officer and lead time through a streamlined procurement process which allows access to the equipment that is needed and compliments the existing monitoring operations	This option should ideally be combined with governance reforms, however it is something that has been requested multiple times so could be done as a standalone option. One reason for this is that procurement is sometimes local authority procurement processes are too focused on price and not on getting what is genuinely the right solution for the task. Another is to leverage economies of scale to get a better deal and the ability to negotiate specifics such as KPIs in a better way if there is collaboration on what is required etc. when going out to tender.	Lead	Officer time only and/or below £50k; and 1-2 Years

7.9 Climate and Net Zero Considerations

Tackling air quality and climate change are not the same, but there are clear synergies in measures that might be put in place to address them/their causes. In particular, they are both the result of fossil fuel combustion (through transport, power generation, heating and industrial processes) as well as some agricultural activity. Further, research is indicating a clear correlation between health impacts where both temperature and $PM_{2.5}$ are raised and work is continuing to understand this in more detail through a study that will be taking place in the West Midlands, funded by the Wellcome Trust, over the next few years. What is clear is that air quality should be included in 'whole system' approaches to tackling climate change; the WMCA-led Net Zero Neighbourhood programme is taking this approach as part of its delivery.

Case Study: Improving air quality in Brockmoor through the Net Zero Neighbourhoods Programme

Brockmoor, Dudley is set to be the first Net Zero Neighbourhood in the West Midlands. This is part of a place-based approach being piloted by the Energy Capital team at the WMCA that aims to test if a neighbourhood approach could be successful at helping to increase the scale of engagement in Net Zero.

Dudley MBC and partners will spend the next two years working closely with the people of Brockmoor to co-produce low-carbon and sustainability interventions to enable a Just Transition in Brockmoor. These will include:

Extensive community engagement work, led by project partners Keele University aims to promote resident participation and collective ownership in encouraging behaviour change to improve neighbourhood air quality and related health outcomes.

Energy Capital and Dudley MBC will be baselining, monitoring and evaluating the impact of the Net Zero Neighbourhood on Brockmoor amongst which will be measuring the impact of the approach on local air quality and associated changes in behaviours and travel patterns.

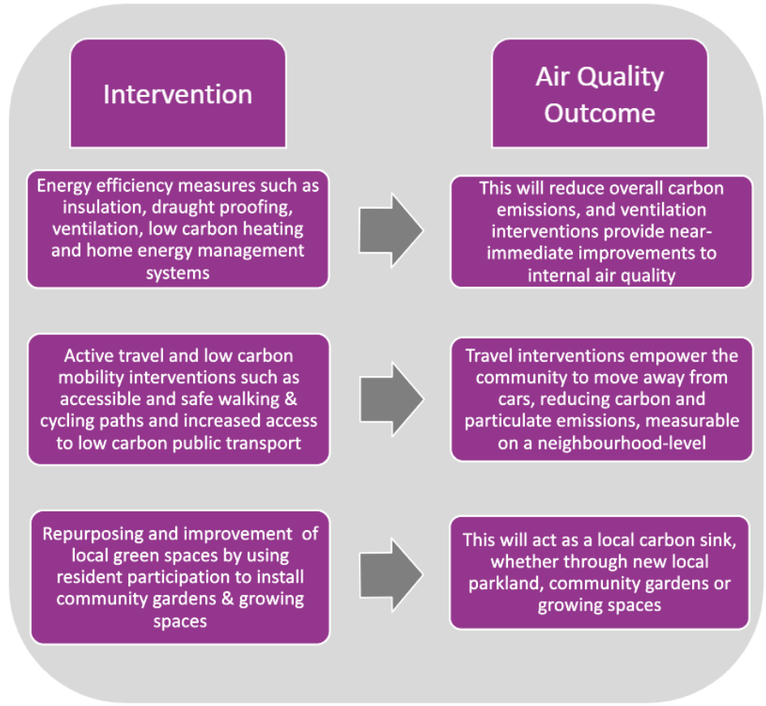


Table 7.9.1: Climate and Net Zero Options

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
Air quality innovation zones to sit alongside other programmes such as net zero neighbourhoods and industrial decarbonisation programmes	1 (4.35)	Leverage other established/proposed programmes with complimentary air quality actions to test out interventions and the impact coordinated measures can have	Tying in with measures such as net zero neighbourhoods will allow for a test bed for both measures which have air quality as an added benefit and pure air quality measures which have an added net-zero benefit. The trialling of such schemes will allow for the monitoring and assessment of the impacts which will be valuable when it comes to more regional application.	Lead	>£1m; and 3-4 Years

Option	Theme Rank (Weighted Score)	Targeted Outcome	Potential Approach	Proposed WMCA Role	Estimated Initial Costs and Timescales
Provide guidance on how the changing climate will affect air quality (and potentially other areas) and how this can be mitigated and be a co-benefit	2 (3.30)	Provide guidance on how to incorporate air quality within net zero and climate resilient designs to account for the changing climate	A changing climate in the UK has the potential to have a major impact on air quality, especially when it comes to chemistry processes and mechanisms. The potential outcomes vary depending on the climate changes that occur; however, it can include more PM and O_3 episodes during heatwaves; increased secondary PM formation; reduced removal of PM with reduced rainfall; potential for more wildfires to contribute to regional pollution; and many more complex chemistry interactions. There will be increased clashes between different requirements such as ventilation and acoustics that may need different mitigation to that needed to fulfil air quality requirements (i.e. in the case of openable windows).	Enable	£50-100k; and 2-3 Years
Metrics for improving air quality, capturing co-benefits from net zero actions and for policy to reduce regional health inequalities	3 (2.50)	Appraise the potential for net zero actions to improve air quality and potentially prioritise measures which have co-benefits	This could be carried out at the same time as other policy reviews so that such metrics could be published and included with any guidance which can then be supported by the relevant policies.	Lead	£50-100k; and 2-3 Years

8. Next Steps

There are a series of identifiable next steps for the Air Quality Framework.

1. **Immediate delivery.** The Framework identifies the measures that could and should be delivered straight away (in Section 7.0). Some of these could be put in place quickly, with minimum cost, whilst others might need more detailed consultation and policy change. The DEFRA Air Quality grant secured in March 2023 will support the implementation of some of these, especially in relation to behaviour change and establishment of a low-cost sensor network, and availability of data to support decision-making across the region. The measures sitting outside the remit of the grant will need to be picked up separately and is dependent on point 2 - Resourcing.
2. **Resourcing.** In order to drive the delivery of measures in the Framework forward, we have secured initial funding from DEFRA to put in place an Air Quality Lead. This role will work across all the local authorities to support roll out of a low-cost sensor network and implementation of behaviour change programmes. To deliver on framework measures outside of this project, as well as attract additional funding for ongoing delivery across WMCA area, a dedicated Air Quality Programme Lead would be required.
3. **Governance.** To ensure that the Framework is delivering for the whole WMCA, we will establish a Framework Delivery Group. This is something that has been flagged in conversations with local authority partners as a helpful route to continue coordination. This will also facilitate engagement with air quality partners (as identified in the Environment Act, 2021) as well as bringing additional expertise on board to support different air quality issues that are common to all partners. The Framework Delivery Group membership would comprise the 7 constituent local authorities as well as other relevant partners with a focus on public health, environment, research and innovation.
4. **Framework updates.** The measures identified in the Framework are comprehensive, and we do not expect them to become out of date in the short-term. However, we would expect to build in a review process every five years to ensure that they are still supporting regional ambition to reduce air pollution in total, and inequality of exposure overall. We would also want to make sure that the Framework is taking account of innovations in technology, as well as national policy. Annual progress reports on the Framework delivery will be brought to the Environment and Energy Board annually.

Technical Appendices

Appendix A – Glossary

Table A.1 – Glossary of Terms

Term	Meaning
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
ASR	Annual Status Report
BEV	Battery electric vehicle
BCC	Birmingham City Council
CWC	City of Wolverhampton Council
CAS	Clean air strategy
CAZ	Clean air zone
CNZ	Climate and net zero
CCC	Coventry City Council
DEFRA	Department of Environment, Food and Rural Affairs
DMBC	Dudley Metropolitan Borough Council
EV	Electric vehicle
EHO / EPO	Environmental health officer / environmental protection officer
EU	European Union
GLA	Greater London Authority
HGV	Heavy duty vehicles
ICE	Internal combustion engine
LDV	Light duty vehicles
LAQM	Local air quality management
LA	Local authority
LEZ	Low emission zone
MCDA	Multi-criteria decision analysis
NAEI	National Atmospheric Emissions Inventory
NZ	Net zero
NO_2	Nitrogen dioxide
PM	Particulate matter
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10 micrometres
$PM_{2.5}$	Particulate matter with an aerodynamic diameter of less than 2.5 micrometres
RAG	Red, amber, green
SaMBC	Sandwell Metropolitan Borough Council
SoMBC	Solihull Metropolitan Borough Council
ULEZ	Ultra-low emission zone
UK	United Kingdom
WC	Walsall Council
WMCA	West Midlands Combined Authority

Appendix B - Key Air Quality Information and FAQs

Table B.1 – Key Pollutants and Air Quality Information

Pollutant	Key information	Sources and formation	Short-term impacts	Long-term impacts	Links with other pollutants
Nitrogen Dioxide – NO_2	A gas which is a by-product of combustion.	Burning of fuel (cars, HGVs, buses, power plants). Formed from reaction between nitrogen oxides (NOx) and other chemicals in the air.	Short-term exposure can lead to irritation of airways, respiratory symptoms such as coughing and difficulty breathing, particularly for people that have asthma.	Long-term exposure to high levels of NO_2 can lead to development of asthma and other respiratory diseases, reduced lung function and reduced lung development in children.	Ozone precursor through photolysis
Particulate Matter – PM_{10}	Particles with less than 10µm in aerodynamic diameter.	Combustion (industry and domestic), road transport. Can be directly emitted or formed in the atmosphere (secondary).	Short-term exposure can lead to irritation of the eyes, nose and airways, respiratory symptoms such as coughing and difficulty breathing, particularly for people that have asthma.	Long-term exposure to high levels of PM_{10} is linked to respiratory and cardiovascular morbidity, increase of mortality from cardiovascular and respiratory diseases, and lung cancer.	Ammonia/secondary aerosol formation
Particulate Matter – $PM_{2.5}$	Particles with less than 2.5µm in aerodynamic diameter.	Combustion (industry and domestic), road transport. Can be directly emitted or formed in the atmosphere (secondary).	Short-term exposure can lead to irritation of the eyes, nose and airways, respiratory symptoms such as coughing and difficulty breathing, particularly for people that have asthma.	Long-term exposure to high levels of $PM_{2.5}$ is linked to respiratory and cardiovascular morbidity, increase of mortality from cardiovascular and respiratory diseases, and lung cancer.	Ammonia/secondary aerosol formation
Ozone – O_3	A gas formed in the atmosphere.	Secondary pollutant, created by chemical reactions between other pollutants. Formed through chemical reactions between nitrogen oxides and VOCs in presence of heat and sunlight.	Short-term exposure can cause respiratory symptoms such as coughing, throat irritation, wheezing, shortness of breath and discomfort when taking deep breaths.	Long-term exposure to ozone can cause worsening of asthma and can cause asthma development.	NOx/NO_2

Pollutant	Key information	Sources and formation	Short-term impacts	Long-term impacts	Links with other pollutants
Volatile organic compounds – VOCs	Gases emitted from natural and human sources.	Vegetation, paints, aerosol sprays, disinfectants, air fresheners, engines. Emitted from natural sources (vegetation) or human made.	Dependent on the VOC, but impacts include irritation to eyes, skin and respiratory tract, headaches and dizziness.	Dependent on the VOC, but long-term effects can include neurological effects (changes in hearing, balance), liver and kidney damage.	Ozone precursor, PM reactions
Ammonia – NH_3	A gas emitted from primarily agriculture, so a pollutant that us more prevalent in rural areas.	Agriculture (spreading of manure, slurries and fertilisers), waste and to a lesser extent road transport. Can also be released from other sources such as industrial processes and biomass	Primarily a concern for ecological impacts, however higher levels of ammonia may cause irritation to the eyes, nose and throat. High levels of ammonia may cause burns and swelling in the airways, lung damage and can be fatal.		PM/secondary aerosol formation
Sulphur Dioxide – SO_2	A colourless gas with a strong odour.	Power generation, industry and domestic heating. Formed through burning of fuel (or material) containing sulphur	Short term exposure to SO_2 can cause respiratory problems and difficulty breathing, particularly for people with asthma.	Long-term breathing problems can be cause by long term inhalation exposure to SO_2.	

Q: What is outdoor air quality and how does it affect health?

Outdoor (or ambient) air quality is the measure of the condition of the air outdoors and is determined by the presence of various pollutants. The key pollutants within the West Midlands are particulate matter (PM_{10} and $PM_{2.5}$), nitrogen dioxide (NO_2) and ozone (O_3). These pollutants can originate from both natural and human-made sources, including industrial emissions, household emissions, vehicle exhausts, construction activities and agricultural practices. Some of the ways that outdoor air quality can affect humans include:

- Respiratory Issues: Air pollution can cause or worsen respiratory conditions, such as asthma, bronchitis, and chronic obstructive pulmonary disease (COPD). The pollutants irritate the respiratory system, leading to symptoms like coughing, wheezing, shortness of breath, and increased susceptibility to respiratory infections.
- Cardiovascular Problems: Long-term exposure to air pollution has been linked to an increased risk of cardiovascular diseases, including heart attacks, strokes, and hypertension. The pollutants can enter the bloodstream, causing inflammation, oxidative stress, and damage to blood vessels.
- Impaired Lung Development: Children exposed to air pollution may experience impaired lung development, which can have long-lasting effects on their respiratory health and lung function throughout their lives.
- Increased Mortality: Long-term exposure to high levels of air pollution has been associated with increased mortality rates, particularly due to respiratory and cardiovascular diseases. The pollutants can contribute to the development of chronic illnesses and exacerbate existing health conditions. There is increasing evidence that long-term exposure to pollution can lead to certain types of cancer.
- Reduced Quality of Life: Poor air quality can lead to a decrease in overall well-being and quality of life.

It should be noted that the that the severity of health effects depends on several factors, including the concentration and duration of exposure, individual susceptibility, and the specific pollutants present in the air. Vulnerable populations, such as the elderly, children, pregnant women, and individuals with pre-existing health conditions, are generally more susceptible to the adverse effects of air pollution.

Q: What is indoor air quality and how does it affect health?

Indoor air quality is the air quality within and around buildings and structures, especially as it relates to the health and comfort of building occupants. Poor indoor air quality can have serious impacts on human health and well-being. Some of the ways that indoor air quality can affect humans include:

- Respiratory problems: Exposure to airborne pollutants, such as mould, combustion particulates, dust mites, and volatile organic compounds, can cause or worsen respiratory issues such as asthma, bronchitis, and allergies.
- Cardiovascular problems: Exposure to certain indoor air pollutants, such as fine particulate matter, carbon monoxide, and nitrogen oxides, can increase the risk of heart disease, stroke, and other cardiovascular problems.
- Cognitive and neurological problems: Certain indoor air pollutants, such as lead and carbon monoxide, can affect cognitive function and cause neurological problems.

- Cancer: Long-term exposure to certain indoor air pollutants, such as radon and formaldehyde, can increase the risk of cancer.
- Eye and skin irritation: Exposure to certain indoor air pollutants, such as pet dander and cleaning chemicals, can cause eye and skin irritation.

It is important to maintain good indoor air quality to protect human health and well-being. This can be achieved through regular ventilation, using air filters, reducing indoor pollution sources, and using non-toxic cleaning and building materials.

Q: What are the economic benefits of improving outdoor air quality?

Improving ambient air quality can bring a range of economic benefits, including:

- Increased productivity: Improved air quality can lead to better health and increased productivity among workers, reducing absenteeism and increasing economic output.
- Improved public health: Reducing exposure to air pollution can lower the cost of healthcare, as fewer people will require medical treatment for conditions caused or exacerbated by air pollution.
- Attraction of investment: Good air quality can make a region more attractive to investment and tourism, boosting local economies.
- Reduced energy costs: Improved air quality can lead to reduced energy consumption and lower energy costs, as energy-efficient systems and technologies are adopted.
- Job creation: Where emissions reductions don't result in the required improvements, this can include the installation of emissions control systems or retrofitting buildings, can create new jobs in industries such as construction and manufacturing.
- Increased property values: Improved air quality can increase property values in a region, as people are willing to pay more for cleaner and healthier living environments.
- Protection of natural resources: Improving air quality can help to protect natural resources, such as water and land, by reducing the levels of pollutants that can harm ecosystems and wildlife

Appendix C – Framework Contributors and Consultees

Table C.1 - Core Contributors and Consultees (to date)

Organisation	WMCA	TfWM	Birmingham University/WM-Air	Constituent Local Authorities (Air Quality)	WSP
Members	Alex Jones *(WMCA Air Quality Framework Lead/WSP)*, Jackie Homan *(Head of Environment)* and Mike Webb *(Natural Capital Programme Manager)*	Jake Thrush *(Associate Policy Adviser)*	William Bloss *(WM-Air Lead)* and Joe Acton *(WM-Air Impact Fellow)*	**Birmingham:** Mark Wolstencroft *(Operations Manager Environmental Protection)*, Paul Burns *(Environmental Protection Officer)* and Peter Mackintosh *(Air Quality Projects Officer)* **Coventry**: Neil Chaplin *(Principal Environmental Protection Officer)* and Steve Dewar *(Environmental Health Officer)* **Dudley**: Ruth Burgin *(Pollution Control Officer)* and Ian Grove *(Principal Environmental Health Officer)* **Sandwell**: Elizabeth Stephens *(Senior Environmental Health Officer)* and Sophie Morris *(Public Health Specialist- Air Quality and Climate Change)* **Solihull**: Nick Laws *(Senior Public Health Specialist)* and Amanda Clover *(Senior Development Officer)* **Walsall**: John Grant *(Environmental Protection Manager)* and Curtis Dean *(Environmental Protection)* **Wolverhampton**: Shaun Walker *(Service Lead – Environmental Crime)*	**Air Quality**: Bethan Tuckett-Jones *(Head of Profession for Air Quality)*, Joanna Rochfort *(Air Quality Team Lead)*, Peter Walsh *(Technical Director)*, Andy Talbot *(Associate Director)*, Sioni Hole *(Principal Consultant)* and Lee Shelton *(Principal Consultant)* **Behaviour Change:** James Knoll-Pollard *(Behavioural Design Lead)* **Planning:** Michael Wood *(Technical Director)* **Ecology:** Joe Franklin *(Associate Director)*, Vaughn Lewis *(Consultant)*
Framework working group	✓	✓	✓	✓	
Option Pre-Screen	✓				
Optioneering and Advisory	✓	✓	✓	✓	✓
RAG	✓	✓			
MCDA	✓	✓	✓	✓ (Represented by Sophie Morris)	✓ (Represented by Andy Talbot)
Option Preferences	✓				

Table C.2 - Additional Contributors and Consultees (to date)

Organisation	Members	Roles
WMCA	Alex Jones *(Air Quality Programme Lead – on secondment from WSP),* Katie Jepson *(Environment Behaviour Change Project Officer)*, Ed Cox *(Executive Director - Strategy, Integration and Net Zero)* Richard Rees *(Senior Programme Manager – Environment)*, Tatum Matharu *(Strategic Lead for Health Inequalities)*	Regional insight and leadership to prepare the Air Quality Framework and ensure its effective delivery.
WMCA Panels/Groups	Transport Support Group *(TSG - Heads of Service of the local authority transport departments and TfWM policy officers)*, Strategic Transport Officers Group *(STOG - Directors of Transport Departments and TfWM Policy, Strategy and Innovation Department Director) and* Transport Delivery Committee (TDC) Air Quality, Congestion and Environmental Sustainability Member Engagement Group, West Midlands Environmental Protection Group (WM-EPG)	Strategic oversight into the Air Quality Framework as it has progressed. These groups will be important consultees as the Framework, and associated projects, is delivered
TfWM	David Harris *(Transport Strategy and Place Manager)*, Alex Greatholder *(Principal Policy and Strategy Officer)*, Liam Edge *(Transport Data Researcher)*, Claire Williams *(Head of Cycling and Walking)*, Mitchell *Robinson (Cycling and Walking Development Officer)*, Stuart Lester *(Head of Transport Data)*, Helen Osborn *(Travel Behaviour Specialist)* and Gill Hunt *(Travel Behaviour Specialist)*	Provided route to engage with the regional transport leads and input into the Local Transport Plan. Will be a critical partner in delivering the transport-related elements of the programme.
Birmingham University/WM-Air	William Bloss *(University of Birmingham Professor of Atmospheric Science),* Joe Acton *(WM-Air Impact Fellow),* Catherine Muller *(WM-Air Project Manager)*, Suzanne Bartington *(WM-Air Health Effects Strand Lead)*, Jian Zhong *(WM-Air Model Development).*	Provided access to data, mapping and detailed knowledge of air quality in the West Midlands; this expertise will continue to be important through Framework delivery.
Constituent Local Authorities - Other	**Birmingham:** Maria Dunn *(Head of Development Policy)*, Sarah Scannell *(Planning Assistant Director),* Uyen-Phan Han *(Planning Policy Manager),* Chris Baggot *(Public Health Service Lead) and* Claire Humphries *(Senior Public Health Officer)* **Coventry**: Alicia Phillips *(Programme Manager for Inequalities in Built Environment)*, Emily Stewart *(Programme Officer for Inequalities in Built Environment)* and Angelia Baker *(Consultant in Public Health and Inequalities)* **Dudley**: Joanne Todd *(Development Manager)* **Solihull**: Mark Andrews *(Head of Planning, Design and Engagement Services)*	Local authorities are the main bodies accountable for air quality delivery. They also have responsibility for planning, which will be critical for reducing air pollution across the region. Each local authority has had opportunity to contribute to the

Organisation	Members	Roles
	Wolverhampton: Michelle Ross *(Lead Planning Manager)* and Perminder Balu *(Head of Green Cities and Circular Economy)*	Framework, and assess the measures suggested.
External Local Authorities	Coventry and Warwickshire Air Quality Alliance	Consultee
External Organisations	Asthma and Lung UK, Clean Air Justice Network, EarthSense	External organisations will be a key part of supporting and providing input from specific areas of expertise to deliver the Framework.
Greener Together Citizens' Panel	The West Midlands Combined Authority established a Greener Together Citizens' Panel to provide a representative voice to influence the delivery on key issues in the environment and energy programme.	TBC

Appendix D – Option Appraisal

Table D.1 – RAG Rating Matrix

RAG	Within Framework scope and/or directly implementable by WMCA, partners or constituent local authorities	Funding and resourcing	Air quality, health and inequality	Co-benefits	Objections to inclusion
Green	The measure is within Framework scope - i.e. is actionable/implementable by one or more of: WMCA/TfWM, more than one LA or another partner within existing legislation/powers	The measure is likely to be able to be funded through available through existing streams, other sources (CAZ/S106 etc.) and/or able to utilise existing resources with limited constraints	There is a clear positive impact (with no disbenefits) on any of: emissions, exposure, health/health-cost benefit and inequality	There is at least one co-benefit (with no disbenefits) regarding one or more of: the natural environment, regional economy or GHG/climate	No objection(s) based on professional judgement, officer opinion or other justifiable reason
Amber	The measure potentially within Framework scope - i.e. is actionable/implementable by one or more of: WMCA/TfWM, more than one LA or another partner but may need slight modification to existing legislation/powers	Potential to be covered through existing/well known funding streams, other sources (CAZ/S106 etc.) and/or with potential long term resourcing constraints resolvable through funding etc.	There is a negligible, unknown or mixed positive/negative impacts on emissions, exposure, health/health-cost benefit and inequality	There are no clear co-benefits, or there are mixed positive/negative impacts regarding the natural environment, regional economy or GHG/climate	Reservations on inclusion based on professional judgement, officer opinion or other justifiable reason
Red	The measure is likely to be outside of Framework delivery scope - i.e. is not actionable by any of: WMCA/TfWM or a partner, or it applies to just one LA. This includes measures which cannot be delivered without central government intervention or significant change in legislation/national political policy	Would require significant external funding which has not been realised to date and/or additional resourcing constraints not being covered/resolved by the measure/funding.	There is a clear negative impact (with no positives) on any of: emissions, exposure, health/health-cost benefit and inequality	There are clear disbenefits (with no co-benefits) regarding one or more of: the natural environment, regional economy or GHG/climate	Objection(s) based on professional judgement, officer opinion or other justifiable reason

Table D.2 – RAG Rating Summary

Theme	Category	Measure	RAG						
			Within Framework Scope and/or Directly Implementable by WMCA or Constituent LAs	Funding and resourcing	Air quality, health and inequality	Co-benefits	Objections to inclusion	Proceed?	Objection rationale/ comment
Engagement and Behaviour Change (EBC)	Domestic Emissions and Indoor Air Quality	To raise awareness of specific air quality issues and potential solutions associated with the use of log burners, fireplaces and bonfires.	Green	Green	Green	Green	Green	PROCEED	
		Raise awareness of air quality issues and potential solutions associated with general domestic combustion.	Green	Green	Green	Green	Green	PROCEED	
		Raise awareness for when solid fuel combustion is required, to ensure the correct fuels are used (i.e. dry seasoned wood)	Green	Green	Green	Green	Green	PROCEED	
		Raise awareness of wider general indoor air quality issues, how to manage and potential solutions	Green	Green	Green	Green	Green	PROCEED	
		Engage with estate, letting agents to increase market awareness of indoor air quality issues	Green	Amber	Amber	Amber	Green	PROCEED	
		Engage with council and private housing organisations to increase awareness of indoor air quality issues and the actions that need to be taken to reduce the impacts	Green	Green	Green	Amber	Green	PROCEED	
		Promote good practice with heating the home and drying clothing	Green	Green	Green	Green	Green	PROCEED	
		Coordination of approaches to solid fuel combustion (domestic, industry), including guidance for retailers, wholesalers.	Amber	Amber	Amber	Green	Green	PROCEED	
		Use low-cost sensors to capture high level domestic combustion data to be used in effective behavioural change advertisement and create real life stories/ case studies.	Green	Amber	Amber	Green	Green	PROCEED	
	Transport	Leverage campaigns for public transport, walking and cycling to promote the various co-benefits (including emissions and health) along with exposure mitigation	Green	Green	Green	Green	Green	PROCEED	
		Providing a region wide driver training module to incorporate eco-driving messaging (including idling)	Green	Amber	Green	Green	Green	PROCEED	
		Consistent anti-idling campaigns across the West Midlands	Green	Green	Green	Green	Green	PROCEED	
		Incorporate air quality aspects into existing and future school/workplace/development travel plans to reduce emissions and exposure to pollutants	Green	Amber	Green	Green	Green	PROCEED	
		Promote vehicle sharing	Green	Green	Green	Green	Green	PROCEED	
		Promotion of best driving practices, including supporting on driving techniques for hybrid and electric vehicles; and ensuring correct tyre pressures and wheel alignment	Green	Amber	Green	Green	Green	PROCEED	

Theme	Category	Measure	RAG						
			Within Framework Scope and/or Directly Implementable by WMCA or Constituent LAs	Funding and resourcing	Air quality, health and inequality	Co-benefits	Objections to inclusion	Proceed?	Objection rationale/ comment
		Use existing training mechanisms to inform professional drivers (both road and rail) of the relevant best practice measures and techniques to reduce emissions where possible	Amber	Amber	Green	Green	Green	PROCEED	
		Roadside vehicle emissions tests and checks for defective Diesel Particulate Filters (DPF)	Red	Red	Green	Green	Amber	STOP	
		Promote biofuels in passenger vehicles	Amber	Amber	Red	Green	Red	STOP	Potential worsening of AQ related to biofuels and no clear benefit
		Promotion of home working and reducing commuting related trips	Amber	Amber	Green	Amber	Green	PROCEED	
		Use portable and fixed signage to highlight air quality issues and why actions (such as speed limit reductions) are in place	Green	Amber	Amber	Amber	Green	PROCEED	
		Promote abatement retrofit	Amber	Amber	Amber	Amber	Red	STOP	Defra advising some that abatement retrofit is not being recommended
	Natural and Built Environment	Provide advice on how residents can utilise green spaces to improve health and reduce pollution exposure during exercise	Green	Green	Green	Green	Green	PROCEED	
		Provide information on how residents can use planting and green infrastructure to reduce pollutant exposure and improve health/wellbeing.	Green	Green	Green	Green	Green	PROCEED	
	Commercial, Industrial and Agriculture	Engage and inform the public on key commercial, industrial and agricultural issues	Green	Amber	Green	Green	Green	PROCEED	
		Behaviour change in food consumption	Amber	Amber	Amber	Green	Green	PROCEED	
		Training for behavioural changes in construction management, processes and methods	Amber	Amber	Green	Green	Green	PROCEED	
		Promote the benefits to changes in livestock diet	Amber	Amber	Amber	Green	Amber	PROCEED	
	Public Health	Provide information on how to reduce personal exposure to poor air quality outside of the home and what can be benefits can be	Green	Green	Green	Green	Green	PROCEED	
		Develop a small public health toolkit between stakeholders which standardises air quality communications and phrases across the West Midlands to ensure that communications are consistent and effective.	Green	Green	Green	Green	Green	PROCEED	
		Use health professionals to educate and disseminate targeted air quality information to vulnerable and at risk patients	Green	Amber	Green	Green	Green	PROCEED	
		Develop and deliver a consistent regional schools engagement programme across the West Midlands, with flexibility to account for variations across the area (such as city vs suburban locations)	Green	Amber	Green	Green	Green	PROCEED	

Theme	Category	Measure	RAG						
			Within Framework Scope and/or Directly Implementable by WMCA or Constituent LAs	Funding and resourcing	Air quality, health and inequality	Co-benefits	Objections to inclusion	Proceed?	Objection rationale/ comment
		Work with existing public health channels to deliver consistent messaging across the West Midlands	Green	Green	Green	Green	Green	PROCEED	
	Planning, Policy, Governance and mechanisms for change	Provide a centralised online public resource and/or platform for engagement and behaviour change co-ordination across the West Midlands	Green	Amber	Green	Green	Green	PROCEED	
	Monitoring and digital	Use a regional air quality website to deliver key air quality information and effective information to facilitate behavioural change through a single point for the West Midlands	Green	Amber	Green	Green	Green	PROCEED	
		Interactive online resources to demonstrate air quality issues	Green	Amber	Green	Green	Green	PROCEED	
	General	Use public engagement panels (such as the Greener Together Citizens Panel) to test communication and messaging where possible to get feedback on how campaigns will be perceived.	Green	Amber	Amber	Amber	Green	PROCEED	
		Use trusted advisors to disseminate air quality messaging (including faith leaders, GPs, nurses, fire service etc).	Green	Amber	Green	Green	Green	PROCEED	
		Undertake advertisement campaigns when interventions are ongoing to raise awareness and to co-promote at the time, rather than afterwards	Green	Amber	Amber	Amber	Green	PROCEED	
		Prominent signage in key areas/hotspots to display air quality information	Green	Amber	Amber	Green	Green	PROCEED	
		Investigate how air quality can be made tangible (unlike other issues such as noise) through measures such as temporary street closures (using street party regulations) so that people can see the difference when action is taken.	Green	Amber	Amber	Amber	Green	PROCEED	
		Ensure that air quality communication and engagement are consistent and inclusive across the West Midlands (and modified where necessary) to make messaging as clear as possible with the best chance of behavioural change.	Green	Green	Green	Green	Green	PROCEED	
		Have an open route for communication and co-ordination between comms teams at the WMCA and local authorities to be able to effectively co-ordinate and deliver air quality communications	Green	Green	Amber	Amber	Green	PROCEED	
Domestic Emissions and Indoor Air Quality (DOM)	Supporting Actions	Reduce Fuel Combustion by Improving home Energy Efficiency	Green	Amber	Green	Green	Green	PROCEED	
		Use the planning process to restrict the installation of new solid fuel appliances in the cases where planning consent is required	Green	Green	Green	Amber	Green	PROCEED	
		Enforce and expand restrictions on domestic use of solid fuels from existing appliances	Amber	Amber	Amber	Green	Green	PROCEED	
		Supporting the transition from gas central heating	Green	Amber	Green	Green	Green	PROCEED	

Theme	Category	Measure	RAG						
			Within Framework Scope and/or Directly Implementable by WMCA or Constituent LAs	Funding and resourcing	Air quality, health and inequality	Co-benefits	Objections to inclusion	Proceed?	Objection rationale/ comment
		Undertake audits of the local authority school and housing stock to determine what measures can be implemented. Promote co-working with housing teams to improve indoor air quality outcomes.	Amber	Amber	Amber	Green	Green	PROCEED	
		Support landlords and homeowners in accessing grants to retrofit	Green	Amber	Green	Green	Green	PROCEED	
	Policy	More stringent requirements within the planning process for expediting the transition from gas central heating	Amber	Amber	Green	Green	Green	PROCEED	
		Smoke control area expansion	Green	Amber	Green	Green	Green	PROCEED	
		Log burner scrappage scheme	Red	Red	Green	Green	Red	STOP	Advised this is not feasible from a planning perspective (overreach of planning), difficult to enforce and not supported by central government
		Revisions to garden waste collections to reduce the instances of bonfires within urban areas	Amber	Amber	Green	Green	Amber	PROCEED	
Transport (TRN)	Policy and interventions	Ensure that there is sufficient assessment/integration of transport plans and projects (such as area local transport plans and mitigation schemes) to ensure that the air quality impacts are quantified and where necessary, mitigated.	Green	Green	Green	Green	Green	PROCEED	
		Taxi driver licencing change to enforce low emissions vehicles	Amber	Amber	Green	Green	Green	PROCEED	
		Additional Clean Air Zones/congestion charge zones which consider other pollutants	Amber	Red	Amber	Green	Green	PROCEED	
		Introduction of new low traffic neighbourhoods	Green	Red	Amber	Amber	Green	PROCEED	
		Improved anti-idling enforcement	Amber	Red	Green	Green	Green	PROCEED	
		For new developments where local services are not available, ensure that transport needs are addressed and are improved in the local area.	Green	Green	Green	Green	Green	PROCEED	
		Support and accelerate transition to zero-emission bus fleet	Amber	Amber	Green	Green	Green	PROCEED	
		Enforcement of zero-emission bus fleet	Red	Red	Green	Green	Green	STOP	No mechanism for enforcement and plans already in place for viable transition
		Prioritise newer buses used for most polluted routes	Amber	Red	Green	Green	Green	PROCEED	
		Designating new & priority bus measures	Amber	Amber	Green	Green	Green	PROCEED	
		Park and ride schemes	Amber	Amber	Amber	Green	Amber	PROCEED	
		Workplace charging levies	Amber	Amber	Amber	Amber	Green	PROCEED	

Theme	Category	Measure	RAG						
			Within Framework Scope and/or Directly Implementable by WMCA or Constituent LAs	Funding and resourcing	Air quality, health and inequality	Co-benefits	Objections to inclusion	Proceed?	Objection rationale/ comment
		Vehicle procurement best practice documentation and guidance	Green	Amber	Green	Green	Green	PROCEED	
		Active traffic light management to smooth traffic flows and reduce idling	Green	Amber	Green	Green	Green	PROCEED	
		West Midlands wide fleet recognition schemes to promote LEV	Green	Red	Green	Green	Green	PROCEED	
		Region wide EV charging scheme, with WMCA/TfWM providing support and local authorities investigating releasing land to enable widespread installation and adoption	Amber	Red	Green	Green	Red	STOP	Local authorities are grouping together already, so a continuous region wide solution will not happen without government intervention
		Speed limit reduction (or dynamic speed limits) on high speed roads	Amber	Amber	Green	Green	Green	PROCEED	
		Investigate the lowering and enforcement of speed limits in urban centres and residential areas.	Green	Amber	Green	Green	Green	PROCEED	
		HGV bans/restrictions in urban centres, including out of hours freight delivery	Green	Amber	Green	Amber	Green	PROCEED	
		Zero-emission final mile delivery measures	Green	Amber	Green	Green	Green	PROCEED	
		Priority parking and/or reduced charges for low emission vehicles	Green	Amber	Amber	Amber	Green	PROCEED	
		Provision of school buses	Amber	Amber	Amber	Green	Red	STOP	Not something that could be rolled out by TfWM and not likely to be funded and supported by local authorities due to costs, logistics etc.
		High occupancy vehicle lanes	Green	Amber	Amber	Green	Amber	PROCEED	
		Lorry overtaking bans on major roads	Red	Amber	Green	Green	Red	STOP	Both outside of the Framework scope and is highly unlikely to be implemented and supported
		Implement exposure reduction measures at major transport hubs	Amber	Red	Green	Green	Green	PROCEED	
		Implementation of new road surface compositions/construction methods and road treatments once research reveals effective solutions	Amber	Red	Amber	Green	Green	PROCEED	
		Redesign bus stops and other minor waiting locations (where there will be transient exposure to high concentrations)	Green	Amber	Green	Green	Green	PROCEED	

Theme	Category	Measure	RAG						
			Within Framework Scope and/or Directly Implementable by WMCA or Constituent LAs	Funding and resourcing	Air quality, health and inequality	Co-benefits	Objections to inclusion	Proceed?	Objection rationale/ comment
	Tools and digital	Create a route planning tool with modelled/real time air quality information so that people can reduce exposure when walking and/or make the decision to take public transport	Green	Amber	Green	Green	Green	PROCEED	
	Supporting research	Research and 'test-bed' implementation of new road surface composition and construction to reduce particulate emissions, particularly from battery electric vehicles (BEVs)	Amber	Amber	Amber	Green	Green	PROCEED	
		Research and 'test-bed' implementation of new tyre composition and manufacturing techniques to reduce particulate emissions, particularly from battery electric vehicles (BEVs)	Amber	Amber	Amber	Green	Green	PROCEED	
		Support and accelerate transition to zero-emission HGV fleet, especially in urban centres	Amber	Red	Green	Green	Green	PROCEED	
		Research and 'test-bed' implementation of road treatments to reduce resuspension	Amber	Amber	Amber	Green	Green	PROCEED	
Natural and Built Environment (NBE)	Policy	Leverage modified biodiversity net gain (BNG) metrics to improve urban design and reduce exposure to poor air quality	Green	Green	Green	Green	Green	PROCEED	
		Promote transport schemes and road alterations that include effective green infrastructure to reduce exposure to poor air quality	Green	Green	Green	Green	Green	PROCEED	
		Require the consideration of the co-benefits of site Masterplanning and ecological features on reducing exposure to poor air quality	Green	Green	Green	Green	Green	PROCEED	
		Use damage cost contributions to effectively improve the environment and green infrastructure around new schemes	Green	Green	Green	Green	Green	PROCEED	
		Working though the Natural Environment Plan to identify best uses of green infrastructure for air quality	Green	Green	Amber	Green	Green	PROCEED	
	Hard measures	Increase tree planting of suitable species along key road routes to reduce pollutant exposure	Green	Amber	Green	Green	Green	PROCEED	
		Increase the use of dense urban vegetation to create barriers between sources of pollution and places of exposure.	Green	Amber	Green	Green	Green	PROCEED	
		Land use planning - give preference to developments in locations that minimise the need to travel and/or propose sufficient facilities, which will therefore reduce operational impacts	Green	Green	Green	Green	Green	PROCEED	
		Creation of low traffic neighbourhoods and similar schemes for new developments	Green	Amber	Amber	Amber	Green	PROCEED	
		Use street furniture and natural features to reduce exposure and create barriers at key waiting locations	Green	Amber	Green	Green	Green	PROCEED	
		Construction of new cycle lanes and paths, especially linking new developments with key services to reduce demand on road transport.	Green	Amber	Green	Green	Green	PROCEED	

Theme	Category	Measure	RAG						
			Within Framework Scope and/or Directly Implementable by WMCA or Constituent LAs	Funding and resourcing	Air quality, health and inequality	Co-benefits	Objections to inclusion	Proceed?	Objection rationale/ comment
	Supporting research	Research on the effectiveness of new technologies for reducing pollutant concentrations in the built environment	Amber	Amber	Amber	Green	Green	PROCEED	
Commercial, Industrial and Agriculture (CIA)	General	Create an emissions 'health check'/audit programme for commercial, industrial and agricultural businesses to find out how they can reduce their emissions and what support is available	Amber	Amber	Green	Green	Green	PROCEED	
		Enforcement to prevent removal/defeat of emission control devices	Red	Red	Green	Green	Red	STOP	Would be good to do, but within the Environment Agency's remit for permitted installations and would not be feasible in terms of funding or capacity from local authorities for other cases
		Non-Domestic Buildings - Reduce fuel combustion by improving energy efficiency through grants and guidance	Green	Red	Green	Green	Green	PROCEED	
		Non-domestic buildings – Transformation of heating away from the combustion of fuels	Green	Red	Green	Green	Green	PROCEED	
		Increased scrutiny and consideration of health impacts relating to heat/power generation from biomass/waste.	Green	Amber	Green	Green	Green	PROCEED	
		Increase/establish co-working with the Environment Agency to enforce permits	Green	Amber	Green	Green	Green	PROCEED	
		Undertake audits of the local authority commercial building stock to determine what measures can be implemented	Amber	Amber	Amber	Green	Green	PROCEED	
		Development of more local sustainable energy generation capacity and associated battery storage	Amber	Red	Green	Green	Green	PROCEED	
	Commercial	Promote electric transport refrigeration units (TRUs)	Green	Amber	Green	Green	Green	PROCEED	
		Facilitate and promote access to funding for commercial retrofit of heating and cooling systems	Green	Amber	Green	Green	Green	PROCEED	
		Region wide industrial off-road mobile and stationary machinery emission controls	Green	Amber	Green	Green	Green	PROCEED	
	Industrial	Discourage investment in biomass fuelled heat/power and potential for regulating biomass combustion plants <1MW	Amber	Amber	Green	Amber	Green	PROCEED	

Theme	Category	Measure	RAG						
			Within Framework Scope and/or Directly Implementable by WMCA or Constituent LAs	Funding and resourcing	Air quality, health and inequality	Co-benefits	Objections to inclusion	Proceed?	Objection rationale/ comment
		Monitoring and improved fugitive emissions capture	Red	Red	Green	Green	Red	STOP	Would be good to do, but within the Environment Agency's remit for permitted installations and would not be feasible in terms of funding or capacity from local authorities for other cases
		NOx, SO2, VOC, PM abatement guidance and providing support on how this can be achieved/funded	Amber	Amber	Green	Green	Green	PROCEED	
	Agriculture	Provide advice on best practice regarding the use of fertilisers and what can easily be changed to reduce emissions of pollutants and secondary aerosol formation	Amber	Amber	Green	Green	Green	PROCEED	
		Promoting low emission spreading	Amber	Amber	Green	Green	Green	PROCEED	
		Advice/guidance on fuel choice and usage for farm equipment	Green	Green	Green	Green	Green	PROCEED	
	Construction	Consistent advice, policy and enforcement of dust abatement measures	Green	Amber	Green	Green	Green	PROCEED	
		Region wide NRMM emission standards (such as stage V NRMM retrofit/Provisional GB Type Approval Scheme)	Green	Green	Green	Green	Green	PROCEED	
		Promote electric and/or hydrogen powered NRMM	Green	Green	Green	Green	Green	PROCEED	
		Precision equipment for improving construction efficiency	Red	Red	Amber	Amber	Green	STOP	Not within the remit the Framework or actionable by local authorities or partners
		Promote the use of hybrid generators	Green	Green	Green	Green	Green	PROCEED	
		Promote off-site construction and manufacturing	Green	Green	Green	Green	Green	PROCEED	
	Research	Research the sources and methods for effective secondary aerosol formation reduction and how these can be implemented across commercial, industrial and agriculture	Amber	Amber	Amber	Green	Green	PROCEED	
Public health (PH)	Tools and information	Roll out tools to warn and update residents of poor air quality and supported by regional/local healthcare system	Green	Amber	Green	Green	Green	PROCEED	
		Develop tools to reduce exposure to poor air quality outside of the home, such as journey planners linked to pollution modelling and real time data	Green	Green	Green	Green	Green	PROCEED	

Theme	Category	Measure	RAG						
			Within Framework Scope and/or Directly Implementable by WMCA or Constituent LAs	Funding and resourcing	Air quality, health and inequality	Co-benefits	Objections to inclusion	Proceed?	Objection rationale/ comment
		Develop a toolbox of measures that local authorities can easily implement and have pre packaged communications packages that local authorities can use to promote the measures	Green	Green	Green	Green	Green	PROCEED	
		Introduce a West Midlands schools accreditation and education scheme for air quality	Green	Amber	Green	Green	Green	PROCEED	
	Research	Research into the real world exposure of West Midlands residents (including the differences in exposure based on age and socio-economic situation) and what measures can be effectively implemented based on the findings.	Green	Amber	Amber	Green	Green	PROCEED	
Planning, Policy, Governance and mechanisms for change (PPG)	Regional planning and policy	Establish a region wide planning and design for air quality best practice document which will be kept updated with local, regional and national changes in guidance and legislation	Green	Amber	Green	Green	Green	PROCEED	
		Introduce air quality neutral and/or air quality positive assessments into the planning process across the West Midlands	Green	Green	Green	Green	Green	PROCEED	
		Provide centralised support for local authorities in areas such as local plan policy to promote consistency and dealing with more complex air quality assessment methodologies	Green	Amber	Amber	Green	Amber	PROCEED	
		Use mechanisms (such as future local plans) to enforce more stringent regional air quality limits/compliance timescales.	Green	Green	Green	Green	Green	PROCEED	
		Scope for a “Net Health Gain” principle	Green	Green	Green	Green	Green	PROCEED	
		Develop guidelines for best practices for procurement that will support air quality improvements (e.g. use of Non-Road Mobile Machinery)	Green	Amber	Green	Green	Green	PROCEED	
		Integrate AQ considerations (evaluated as population health benefit) into WMCA policy where relevant.	Green	Green	Green	Green	Green	PROCEED	
		Installation emission concentration limits: Cost Benefit Analysis (CBA) based-permitting	Red	Red	Green	Green	Red	STOP	Would be good to do, but within the Environment Agency's remit
		Air quality emission trading schemes	Red	Red	Amber	Amber	Red	STOP	Would likely need to be nationally led, however the West Midlands could do a pilot at some point.
		Including Health Impact Assessments (HIA) in planning applications and containing air quality	Green	Green	Green	Green	Green	PROCEED	
		Promote district heat networks (using heat pumps) for large developments	Green	Amber	Green	Green	Green	PROCEED	

Theme	Category	Measure	RAG						
			Within Framework Scope and/or Directly Implementable by WMCA or Constituent LAs	Funding and resourcing	Air quality, health and inequality	Co-benefits	Objections to inclusion	Proceed?	Objection rationale/ comment
		Set minimum environmental requirements for each Local Plan site allocation, which sets out requirements well in advance of the planning stage	Green	Green	Green	Green	Green	PROCEED	
		Move away from the IAQM assessment criteria to both more stringent thresholds for detailed assessment and using health based assessment for the quantification of impacts	Amber	Green	Amber	Green	Green	PROCEED	
		Use planning conditions/S106 for new developments to reduce the number of car trips near schools restricting access to staff during certain times.	Green	Green	Green	Green	Green	PROCEED	
		Provide guidance on how planning will consider the air quality and climate/net zero co-benefits and disbenefits within the planning process and are addressed in a joined up way by officers	Green	Amber	Green	Green	Green	PROCEED	
		Pilot school streets programme to reduce traffic and emissions in the vicinity of schools when there is transient exposure.	Green	Amber	Green	Green	Green	PROCEED	
	Governance and mechanisms for change	Have a centrally managed regional air quality assembly to provide support, guidance and co-ordination for local authorities and to ensure where possible, there is consistency, open communication channels and leveraging opportunities for funding etc.	Green	Amber	Amber	Green	Green	PROCEED	
		Coordinate regional approaches to government on policy and resources to tackle air quality challenges (DEFRA, HMT and key partners, e.g., Environment Agency, National Highways)	Green	Amber	Green	Green	Green	PROCEED	
		Have a platform for WMCA and local authority officers to share ideas and plans for engagement to ensure that regional roll outs can happen, facilitate knowledge sharing and leverage combined procurement where applicable	Green	Amber	Amber	Green	Green	PROCEED	
		Provide grant and project co-ordination through the WMCA to ensure that there is consistency across the West Midlands and procurement is effective.	Green	Amber	Amber	Green	Green	PROCEED	
	Skills and training	Provide training for members/decision makers through a standalone air quality literacy training programme to ensure they are up-to-date on air quality matters	Green	Amber	Amber	Green	Green	PROCEED	
		Co-ordinate regional air quality upskilling and knowledge share for air quality officers	Green	Amber	Amber	Green	Green	PROCEED	
Monitoring and digital (MON)	Monitoring and Data	Establish a West Midlands wide low-cost sensor network, with an associated standalone website that includes existing regional data and air quality information that is effective for behaviour change	Green	Amber	Amber	Green	Green	PROCEED	

Theme	Category	Measure	RAG						
			Within Framework Scope and/or Directly Implementable by WMCA or Constituent LAs	Funding and resourcing	Air quality, health and inequality	Co-benefits	Objections to inclusion	Proceed?	Objection rationale/ comment
		Establish regional standards on air quality monitoring covering all monitoring types to ensure that the data being acquired is robust and the equipment used is to a minimum standard.	Green	Amber	Amber	Green	Green	PROCEED	
		Establish a pathway for streamlined procurement of air quality monitoring equipment and resources to both leverage economies of scale and ensuring that the correct equipment is purchased based on the regional standards	Green	Amber	Amber	Green	Green	PROCEED	
		Use a centralised West Midlands air quality network website as a data store to enable various analyses such as trends and the quantification of the impact of air quality measures	Green	Amber	Amber	Green	Green	PROCEED	
	Research	Understand the relative importance of within-region emissions and transported air pollution for WMCA air quality	Amber	Amber	Amber	Green	Green	PROCEED	
		Understanding real-word emissions to underpin policy, e.g. identifying largest emitters across actual WM fleet (all vehicles)	Amber	Amber	Amber	Green	Green	PROCEED	
Climate/Net Zero Considerations (CNZ)		Metrics for improving air quality, to capture co-benefits from net zero actions and for policy to reduce regional health inequalities	Green	Amber	Amber	Green	Green	PROCEED	
		Provide guidance on how the changing climate will affect air quality (and potentially other areas) and how this can be mitigated and be a co-benefit	Green	Amber	Amber	Green	Green	PROCEED	
		Air quality innovation zones to sit alongside other programmes such as net zero neighbourhoods and industrial decarbonisation programmes	Amber	Red	Green	Green	Green	PROCEED	

Table D.3 – Multiple-criteria Decision Analysis (MCDA) Matrix

Grouping	Group Weighting	Qualitative Criteria	Score to be applied						
			-3	-2	-1	0	1	2	3
Health (H)	40%	Improvement to human health - Air quality benefit (H1)	Large negative impact on human health	Moderate negative impact on human health	Slight negative impact on human health	Neutral impact on human health	Small positive impact on human health	Moderate positive impact on human health	Large positive impact on human health
		Exposure and /or emission reduction and /or promote long term behaviour change (H2)	Large increase in emissions and/or exposure and/or behaviour change to facilitate the aforementioned	Moderate increase in emissions and/or exposure and/or behaviour change to facilitate the aforementioned	Slight increase in emissions and/or exposure and/or behaviour change to facilitate the aforementioned	Neutral impact on in emissions and/or exposure and/or behaviour change to facilitate the aforementioned	Small reduction in emissions and/or exposure and/or behaviour change to facilitate the aforementioned	Moderate reduction in emissions and/or exposure and/or behaviour change to facilitate the aforementioned	Large reduction in emissions and/or exposure and/or behaviour change to facilitate the aforementioned
		Protect and enhance social and health equality (H3)	Large negative impact to the protection and enhancement of social and health equality	Medium negative impact to the protection and enhancement of social and health equality	Small negative impact to the protection and enhancement of social and health equality	Possible/neutral/unknown	Small benefit to the protection and enhancement of social and health equality	Moderate benefit to the protection and enhancement of social and health equality	Large benefit to the protection and enhancement of social and health equality
Spatial Impact (SI)	10%	Scale of benefit within WMCA (SI1)		Applicable and actionable in 1 LA	Applicable and actionable in 2 LAs	Applicable and actionable in 3-4 LAs	Applicable and actionable 4-5 LAs	Applicable and actionable in all LAs	
		Address hotspots/areas of existing and future exceedance (SI2)		Worsen hotspots/areas of existing and future exceedance		Unlikely to address hotspots/areas of existing and future exceedance - Possible/ neutral/ unknown		Potential to address hotspots/areas of existing and future exceedance	
Alignment with Local and National measures/ policy (P)	15%	Compatible with achieving Environment Act 2021 $PM_{2.5}$ targets (P1)	No			Possible/neutral/unknown			Yes
		Accelerate local authority Air Quality Action Plan measures (P2)	Negative impact on AQAP measures			Possible/neutral/unknown			Positive impact on AQAP measures
Cost, implement-ation and timescales (CIT)	25%	Implementation feasibility (CIT1)	Not feasible - Typically outside of the framework scope, not aligned or incompatible with national policy etc.	Unlikely to be feasible - Examples of feasibility issues: Weaker support, significant obstacles to implementation such as finances or policy		Unknown feasibility, but there is the potential that the option could be appraised in detail and be feasible		Feasible - Some support with some obstacles. May be a concept which is not as well established elsewhere or within the West Midlands	Certain/almost certain - Strong support with limited obstacles. Likely to be a well-established concept which has been implemented elsewhere or within the West Midlands Area
		Timescales for effective first implementation (CIT2)	>15 years	10-15 Years	5-10 years	3-4 Years	2-3 Years	1-2 Years	<1 Year
		Indicative implementation cost (CI3)	>£5m	>£1m	>£500k	£250-500k	£100-250k	£50-100k	Officer time only or below £50k
		Health cost-benefit (CIT4)	Negative health cost-benefit			Neutral health cost-benefit or unknown			Positive health cost-benefit
Co-Benefits (CO)	10%	Accelerate transition to a low emission economy (including GHG and climate co-benefits) (CO1)		Detracting/slowing transition		Possible/neutral/unknown		Yes	
		Facilitate regional economic growth and ambition (CO2)		Hampering Growth and ambition		Possible/neutral/unknown		Yes	

Table D.4 – Multiple-criteria Decision Analysis (MCDA) Summary

Option	Theme and Sub-Category	Qualitative Criteria													Criteria Totals and Weighted Scoring						Ranking		
		H1	H2	H3	SI1	SI2	P1	P2	CIT1	CIT2	CIT3	CIT4	CO1	CO2	H	SI	P	CIT	CO	Weighted Score	Intra-theme Subcategory	Theme Rank	Full Rank
Prioritise newer buses used for most polluted routes	TRN - Policy and interventions	2	2	3	2	2	3	3	2	2	2	3	2	2	7	4	6	9	4	6.75	1	1	1
To raise awareness of specific air quality issues and potential solutions associated with the use of log burners, fireplaces and bonfires.	EBC - Domestic Emissions and Indoor Air Quality	2	2	1	2	0	3	3	3	3	2	3	2	0	5	2	6	11	2	6.05	1	1	2
Leverage campaigns for public transport, walking and cycling to promote the various co-benefits (including emissions and health) along with exposure mitigation	EBC - Transport	1	2	2	2	2	3	3	3	2	1	3	2	2	5	4	6	9	4	5.95	1	2	3
Introduce air quality neutral and/or air quality positive assessments into the planning process across the West Midlands	PPG - Regional planning and policy	2	2	2	2	2	3	3	2	1	2	3	2	0	6	4	6	8	2	5.9	1	1	4
Raise awareness of air quality issues and potential solutions associated with general domestic combustion.	EBC - Domestic Emissions and Indoor Air Quality	2	2	0	2	0	3	3	3	3	2	3	2	0	4	2	6	11	2	5.65	2	3	5
Raise awareness for when solid fuel combustion is required, to ensure the correct fuels are used (i.e. dry seasoned wood)	EBC - Domestic Emissions and Indoor Air Quality	1	2	1	2	0	3	3	3	3	2	3	2	0	4	2	6	11	2	5.65	2	3	5
Support landlords and homeowners in accessing grants to retrofit	DOM - Supporting Actions	2	2	3	2	0	3	0	3	1	0	3	2	2	7	2	3	7	4	5.6	1	1	7
Scope for a “Net Health Gain” principle	PPG - Regional planning and policy	2	1	2	2	2	3	0	3	2	3	3	0	0	5	4	3	11	0	5.6	2	2	7
Establish a region wide planning and design for air quality best practice document which will be kept updated with local, regional and national changes in guidance and legislation	PPG - Regional planning and policy	2	2	1	2	2	3	3	2	1	2	3	2	0	5	4	6	8	2	5.5	3	3	9
Including Health Impact Assessments (HIA) in planning applications and containing air quality	PPG - Regional planning and policy	2	1	2	2	2	0	3	3	2	2	3	0	0	5	4	3	10	0	5.35	4	4	10
Use health professionals to educate and disseminate targeted air quality information to vulnerable and at risk patients	EBC - Public Health	2	2	3	2	0	0	0	3	2	1	3	0	0	7	2	0	9	0	5.25	1	5	11
More stringent requirements within the planning process for expediting the transition from gas central heating	DOM - Policy	3	2	3	2	0	3	0	0	-1	2	3	2	2	8	2	3	4	4	5.25	1	2	11
Use low-cost sensors to capture high level domestic combustion data to be used in effective behavioural change advertisement and create real life stories/ case studies.	EBC - Domestic Emissions and Indoor Air Quality	1	2	1	2	0	3	3	3	2	2	3	0	0	4	2	6	10	0	5.2	4	6	13
Engage with council and private housing organisations to increase awareness of indoor air quality issues and the actions that need to be taken to reduce the impacts	EBC - Domestic Emissions and Indoor Air Quality	2	1	3	2	0	0	0	2	2	3	3	0	0	6	2	0	10	0	5.1	5	7	14
Speed limit reduction (or dynamic speed limits) on high speed roads	TRN - Policy and interventions	2	3	2	2	2	0	3	2	1	-1	3	2	0	7	4	3	5	2	5.1	2	2	14

Option	Theme and Sub-Category	Qualitative Criteria													Criteria Totals and Weighted Scoring						Ranking		
		H1	H2	H3	SI1	SI2	P1	P2	CIT1	CIT2	CIT3	CIT4	CO1	CO2	H	SI	P	CIT	CO	Weighted Score	Intra-theme Subcategory	Theme Rank	Full Rank
Use a regional air quality website to deliver key air quality information and effective information to facilitate behavioural change through a single point for the West Midlands	EBC - Monitoring and digital	0	1	2	2	0	3	3	3	3	2	3	0	0	3	2	6	11	0	5.05	1	8	16
Interactive online resources to demonstrate air quality issues	EBC - Monitoring and digital	0	1	2	2	0	3	3	3	3	2	3	0	0	3	2	6	11	0	5.05	1	8	16
Reduce Fuel Combustion by Improving home Energy Efficiency	DOM - Supporting Actions	3	2	3	2	0	3	0	2	1	-3	3	2	2	8	2	3	3	4	5	2	3	18
Supporting the transition from gas central heating	DOM - Supporting Actions	3	2	3	2	0	3	0	2	1	-3	3	2	2	8	2	3	3	4	5	2	3	18
Promote district heat networks (using heat pumps) for large developments	PPG - Regional planning and policy	1	1	2	2	0	3	0	2	2	2	3	2	2	4	2	3	9	4	4.9	5	5	20
Support and accelerate transition to zero emission bus fleet	TRN - Policy and interventions	2	2	2	2	2	3	3	2	1	-3	3	2	2	6	4	6	3	4	4.85	3	3	21
Land use planning - give preference to developments in locations that minimise the need to travel and/or propose sufficient facilities, which will therefore reduce operational impacts	NBE - Hard measures	1	2	2	2	0	3	0	2	1	2	3	2	0	5	2	3	8	2	4.85	1	1	21
Move away from the IAQM assessment criteria to both more stringent thresholds for detailed assessment and using health based assessment for the quantification of impacts	PPG - Regional planning and policy	2	2	2	2	2	0	0	2	1	2	3	0	0	6	4	0	8	0	4.8	6	6	23
Use trusted advisors to disseminate air quality messaging (including faith leaders, GPs, nurses, fire service etc).	EBC - General	1	1	2	2	0	3	0	3	2	2	3	0	0	4	2	3	10	0	4.75	1	10	24
Ensure that air quality communication and engagement are consistent and inclusive across the West Midlands (and modified where necessary) to make messaging as clear as possible with the best chance of behavioural change.	EBC - General	0	1	2	2	0	0	3	3	2	3	3	0	0	3	2	3	11	0	4.6	2	11	25
Promote transport schemes and road alterations that include effective green infrastructure to reduce exposure to poor air quality	NBE - Policy	2	2	2	2	0	0	0	2	1	2	3	0	0	6	2	0	8	0	4.6	1	2	25
Require the consideration of the co-benefits of site Masterplanning and ecological features on reducing exposure to poor air quality	NBE - Policy	2	2	2	2	0	0	0	2	1	2	3	0	0	6	2	0	8	0	4.6	1	2	25
Use damage cost contributions to effectively improve the environment and green infrastructure around new schemes	NBE - Policy	2	2	2	2	0	0	0	2	1	2	3	0	0	6	2	0	8	0	4.6	1	2	25
Incorporate air quality aspects into existing and future school/workplace/development travel plans to reduce emissions and exposure to pollutants	EBC - Transport	1	1	1	2	0	0	3	3	2	2	3	2	0	3	2	3	10	2	4.55	2	12	29
Provide a centralised online public resource and/or platform for engagement and behaviour change co-ordination across the West Midlands	EBC - Planning, Policy, Governance and mechanisms for change	1	1	1	2	0	0	3	3	2	2	3	2	0	3	2	3	10	2	4.55	1	12	29

Option	Theme and Sub-Category	Qualitative Criteria													Criteria Totals and Weighted Scoring						Ranking		
		H1	H2	H3	SI1	SI2	P1	P2	CIT1	CIT2	CIT3	CIT4	CO1	CO2	H	SI	P	CIT	CO	Weighted Score	Intra-theme Subcategory	Theme Rank	Full Rank
Smoke control area expansion	DOM - Policy	1	1	0	1	2	3	3	2	2	3	3	2	-2	2	3	6	10	0	4.5	2	5	31
Ensure that there is the sufficient assessment/integration of transport plans and projects (such as area transport strategies and mitigation schemes) to ensure that the air quality impacts are quantified and where necessary, mitigated	TRN - Policy and interventions	0	1	3	2	2	0	3	2	1	2	3	0	0	4	4	3	8	0	4.45	4	4	32
Promote good practice with heating the home and drying clothing	EBC - Domestic Emissions and Indoor Air Quality	1	1	1	2	0	0	0	3	3	3	3	0	0	3	2	0	12	0	4.4	6	14	33
Provide advice on how residents can utilise green spaces to improve health and reduce pollution exposure during exercise	EBC - Natural and Built Environment	0	1	2	2	0	0	0	3	3	3	3	0	0	3	2	0	12	0	4.4	1	14	33
Provide information on how residents can use planting and green infrastructure to reduce pollutant exposure and improve health/wellbeing.	EBC - Natural and Built Environment	0	1	2	2	0	0	0	3	3	3	3	0	0	3	2	0	12	0	4.4	1	14	33
Increase the use of dense urban vegetation to create barriers between sources of pollution and places of exposure.	NBE - Hard measures	2	2	2	2	0	0	0	2	1	1	3	0	0	6	2	0	7	0	4.35	2	5	36
Air quality innovation zones to sit alongside other programmes such as net zero neighbourhoods and industrial decarbonisation programmes	CNZ - General	3	3	3	-1	0	3	0	2	0	-2	0	2	2	9	-1	3	0	4	4.35	1	1	36
Coordination of approaches to solid fuel combustion (domestic, industry), including guidance for retailers, wholesalers.	EBC - Domestic Emissions and Indoor Air Quality	1	1	1	2	0	3	0	2	2	2	3	2	0	3	2	3	9	2	4.3	7	17	38
Use the planning process to restrict the installation of new solid fuel appliances in the cases where planning consent is required	DOM - Supporting Actions	2	2	2	2	0	3	0	0	1	1	3	2	-2	6	2	3	5	0	4.3	4	6	38
Leverage modified biodiversity net gain (BNG) metrics to improve urban design and reduce exposure to poor air quality	NBE - Policy	1	1	2	2	0	0	0	2	2	3	3	0	0	4	2	0	10	0	4.3	4	6	38
For new developments where local services are not available, ensure that transport needs are addressed and are improved in the local area.	TRN - Policy and interventions	2	2	1	2	2	0	3	0	1	0	3	2	2	5	4	3	4	4	4.25	5	5	41
Provide centralised support for local authorities in areas such as local plan policy to promote consistency and dealing with more complex air quality assessment methodologies	PPG - Regional planning and policy	1	1	1	2	2	3	3	2	1	0	3	2	0	3	4	6	6	2	4.2	7	7	42
Use mechanisms (such as future local plans) to enforce more stringent regional air quality limits/compliance timescales.	PPG - Regional planning and policy	1	1	1	2	2	3	3	0	0	3	3	2	0	3	4	6	6	2	4.2	7	7	42
NOx, SO2, VOC, PM abatement guidance and providing support on how this can be achieved/funded	CIA - Industrial	1	2	1	2	2	3	0	0	1	2	3	2	0	4	4	3	6	2	4.15	1	1	44
Provide information on how to reduce personal exposure to poor air quality outside of the home and what can be benefits can be	EBC - Public Health	1	2	0	2	0	0	3	3	3	3	0	0	0	3	2	3	9	0	4.1	2	18	45

Option	Theme and Sub-Category	Qualitative Criteria													Criteria Totals and Weighted Scoring						Ranking		
		H1	H2	H3	SI1	SI2	P1	P2	CIT1	CIT2	CIT3	CIT4	CO1	CO2	H	SI	P	CIT	CO	Weighted Score	Intra-theme Subcategory	Theme Rank	Full Rank
Consistent advice, policy and enforcement of dust abatement measures	CIA - Construction	1	1	1	2	2	0	0	3	2	2	3	0	0	3	4	0	10	0	4.1	1	2	45
Roll out tools to warn and update residents of poor air quality and supported by regional/local healthcare system	PH - Tools and information	1	1	1	2	0	0	3	3	2	1	3	0	0	3	2	3	9	0	4.1	1	1	45
Develop guidelines for best practices for procurement that will support air quality improvements (e.g. use of Non-Road Mobile Machinery)	PPG - Regional planning and policy	1	1	1	2	0	0	0	2	2	3	3	2	0	3	2	0	10	2	4.1	9	9	45
Provide guidance on how planning will consider the air quality and climate/net zero co-benefits and disbenefits within the planning process and are addressed in a joined up way by officers	PPG - Regional planning and policy	1	1	1	2	0	0	0	2	2	3	3	2	0	3	2	0	10	2	4.1	9	9	45
Develop tools to reduce exposure to poor air quality outside of the home, such as journey planners linked to pollution modelling and real time data	PH - Tools and information	1	2	0	2	0	0	3	2	2	1	3	2	0	3	2	3	8	2	4.05	2	2	50
Have a platform for WMCA and local authority officers to share ideas and plans for engagement to ensure that regional roll outs can happen, facilitate knowledge sharing and leverage combined procurement where applicable	PPG - Governance and mechanisms for change	0	0	1	2	0	0	3	3	3	3	3	0	0	1	2	3	12	0	4.05	1	11	50
Raise awareness of wider general indoor air quality issues, how to manage and potential solutions	EBC - Domestic Emissions and Indoor Air Quality	0	1	1	2	0	0	0	3	3	2	3	2	0	2	2	0	11	2	3.95	8	19	52
Research into the real world exposure of West Midlands residents (including the differences in exposure based on age and socio-economic situation) and what measures can be effectively implemented based on the findings.	PH - Research	1	1	3	2	0	0	0	2	1	1	3	0	0	5	2	0	7	0	3.95	1	3	52
Additional Clean Air Zones/congestion charge zones which consider NO2 and other pollutants	TRN - Policy and interventions	3	3	0	2	2	3	3	0	0	-3	3	2	0	6	4	6	0	2	3.9	6	6	54
Create a route planning tool with modelled/real time air quality information so that people can reduce exposure when walking and/or make the decision to take public transport	TRN - Tools and digital	1	2	2	2	0	0	3	2	1	-1	3	0	0	5	2	3	5	0	3.9	1	6	54
Promote off-site construction and manufacturing	CIA - Construction	1	1	1	2	0	0	0	2	2	3	3	0	0	3	2	0	10	0	3.9	2	3	54
Pilot school streets programme to reduce traffic and emissions in the vicinity of schools when there is transient exposure.	PPG - Regional planning and policy	1	1	2	2	2	0	3	2	1	-1	3	2	0	4	4	3	5	2	3.9	11	12	54
Co-ordinate regional air quality upskilling and knowledge share for air quality officers	PPG - Skills and training	1	1	1	2	0	0	0	3	3	3	0	0	2	3	2	0	9	2	3.85	1	13	58
Have an open route for communication and co-ordination between comms teams at the WMCA and local authorities to be able to effectively co-ordinate and deliver air quality communications	EBC - General	0	1	0	2	0	0	3	3	2	3	3	0	0	1	2	3	11	0	3.8	3	20	59
Increased scrutiny and consideration of health impacts relating to heat/power generation from biomass/waste.	CIA - General	1	2	1	2	0	3	0	0	1	3	3	-2	0	4	2	3	7	-2	3.8	1	4	59

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		H1	H2	H3	SI1	SI2	P1	P2	CIT1	CIT2	CIT3	CIT4	CO1	CO2	H	SI	P	CIT	CO	Weighted Score	Intra-theme Subcategory	Theme Rank	Full Rank
Introduce a West Midlands schools accreditation and education scheme for air quality	PH - Tools and information	1	1	1	2	2	0	3	2	1	1	3	0	0	3	4	3	7	0	3.8	3	4	59
Set minimum environmental requirements for each Local Plan site allocation, which sets out requirements well in advance of the planning stage	PPG - Regional planning and policy	1	1	2	2	0	0	0	2	1	2	3	0	0	4	2	0	8	0	3.8	12	14	59
Use street furniture and natural features to reduce exposure and create barriers at key waiting locations	NBE - Hard measures	1	1	3	2	0	0	0	2	1	0	3	0	0	5	2	0	6	0	3.7	3	7	63
Provide grant and project co-ordination through the WMCA to ensure that there is consistency across the West Midlands and procurement is effective.	PPG - Governance and mechanisms for change	1	0	1	2	0	3	0	3	3	3	0	0	0	2	2	3	9	0	3.7	2	15	63
Work with existing public health channels to deliver consistent messaging across the West Midlands	EBC - Public Health	1	1	1	2	0	0	0	2	2	2	3	0	0	3	2	0	9	0	3.65	3	21	65
Use planning conditions/S106 for new developments to reduce the number of car trips near schools restricting access to staff during certain times.	PPG - Regional planning and policy	1	1	2	2	2	3	0	0	0	1	3	2	0	4	4	3	4	2	3.65	13	16	65
Construction of new cycle lanes and paths, especially linking new developments with key services to reduce demand on road transport.	NBE - Hard measures	2	2	2	2	0	0	0	2	1	-2	3	0	0	6	2	0	4	0	3.6	4	8	67
Develop a toolbox of measures that local authorities can easily implement and have pre packaged communications packages that local authorities can use to promote the measures	PH - Tools and information	1	1	1	2	0	0	3	2	1	1	3	0	0	3	2	3	7	0	3.6	4	5	67
Integrate AQ considerations (evaluated as population health benefit) into WMCA policy where relevant.	PPG - Regional planning and policy	1	1	1	2	0	3	0	2	2	3	0	0	0	3	2	3	7	0	3.6	14	17	67
Develop and deliver a consistent regional schools engagement programme across the West Midlands, with flexibility to account for variations across the area (such as city vs suburban locations)	EBC - Public Health	1	1	1	2	2	0	3	2	1	0	3	0	0	3	4	3	6	0	3.55	4	22	70
Investigate the lowering and enforcement of speed limits in urban centres and residential areas.	TRN - Policy and interventions	1	2	2	2	2	0	3	0	1	-2	3	2	0	5	4	3	2	2	3.55	7	8	70
Designating new & priority bus measures	TRN - Policy and interventions	1	2	2	2	2	0	3	2	-1	-3	3	2	2	5	4	3	1	4	3.5	8	9	72
Working though the Natural Environment Plan to identify best uses of green infrastructure for air quality	NBE - Policy	0	1	1	2	0	0	0	2	2	3	3	0	0	2	2	0	10	0	3.5	5	9	72
Undertake advertisement campaigns when interventions are ongoing to raise awareness and to co-promote at the time, rather than afterwards	EBC - General	0	1	1	2	0	0	3	3	2	2	0	2	0	2	2	3	7	2	3.4	4	23	74
Enforce and expand restrictions on domestic use of solid fuels from existing appliances	DOM - Supporting Actions	2	2	3	2	0	3	0	-2	1	-3	3	2	0	7	2	3	-1	2	3.4	5	7	74
Use a centralised West Midlands air quality network website as a data store to enable various analyses such as trends and the quantification of the impact of air quality measures	MON - Monitoring and Data	0	1	2	2	0	0	0	3	3	2	0	0	0	3	2	0	8	0	3.4	1	1	74

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HGV bans/restrictions in urban centres, including out of hours freight delivery	TRN - Policy and interventions	2	2	1	2	2	0	3	0	1	-2	3	0	0	5	4	3	2	0	3.35	9	10	77
Discourage investment in biomass fuelled heat/power and potential for regulating biomass combustion plants <1MW	CIA - Industrial	1	2	1	2	0	3	0	0	1	2	3	-2	-2	4	2	3	6	-4	3.35	2	5	77
Develop a small public health toolkit between stakeholders which standardises air quality communications and phrases across the West Midlands to ensure that communications are consistent and effective.	EBC - Public Health	0	0	1	2	0	0	3	3	3	3	0	0	0	1	2	3	9	0	3.3	5	24	79
Use public engagement panels (such as the Greener Together Citizens Panel) to test communication and messaging where possible to get feedback on how campaigns will be perceived.	EBC - General	0	1	0	2	0	0	3	3	3	3	0	0	0	1	2	3	9	0	3.3	5	24	79
Vehicle procurement best practice documentation and guidance	TRN - Policy and interventions	0	1	0	2	0	0	3	3	3	3	0	0	0	1	2	3	9	0	3.3	10	11	79
Zero emission final mile delivery measures	TRN - Policy and interventions	2	2	1	2	2	0	3	0	1	-3	3	0	2	5	4	3	1	2	3.3	10	11	79
Increase/establish co-working with the Environment Agency to enforce permits	CIA - General	1	1	1	2	2	3	0	0	1	1	3	0	0	3	4	3	5	0	3.3	2	6	79
Facilitate and promote access to funding for commercial retrofit of heating and cooling systems	CIA - Commercial	1	1	1	2	0	0	0	2	2	2	0	2	2	3	2	0	6	4	3.3	1	6	79
Provide guidance on how the changing climate will affect air quality (and potentially other areas) and how this can be mitigated and be a co-benefit	CNZ - General	1	1	1	2	0	3	0	2	1	2	0	2	0	3	2	3	5	2	3.3	2	2	79
Promote vehicle sharing	EBC - Transport	1	1	0	2	0	0	0	3	3	3	0	0	0	2	2	0	9	0	3.25	3	26	86
Non-Domestic Buildings - Reduce fuel combustion by improving energy efficiency through grants and guidance	CIA - General	2	2	1	2	0	3	0	0	0	-3	3	2	2	5	2	3	0	4	3.05	3	8	87
Have a centrally managed regional air quality assembly to provide support, guidance and co-ordination for local authorities and to ensure where possible, there is consistency, open communication channels and leveraging opportunities for funding etc.	PPG - Governance and mechanisms for change	0	0	0	2	0	0	3	3	3	3	0	0	0	0	2	3	9	0	2.9	3	18	88
Coordinate regional approaches to government on policy and resources to tackle air quality challenges (DEFRA, HMT and key partners, e.g., Environment Agency, National Highways)	PPG - Governance and mechanisms for change	0	0	0	2	0	0	3	3	3	3	0	0	0	0	2	3	9	0	2.9	3	18	88
Establish a West Midlands wide low-cost sensor network, with an associated standalone website that includes existing regional data and air quality information that is effective for behaviour change	MON - Monitoring and Data	0	1	2	2	0	0	0	3	3	0	0	0	0	3	2	0	6	0	2.9	2	2	88
Prominent signage in key areas/hotspots to display air quality information	EBC - General	1	1	1	2	2	0	3	0	2	2	0	0	-2	3	4	3	4	-2	2.85	6	27	91
Undertake audits of the local authority commercial building stock to determine what measures can be implemented	CIA - General	1	1	0	2	0	3	0	2	1	1	0	2	2	2	2	3	4	4	2.85	4	9	91
Workplace charging levies	TRN - Policy and interventions	1	2	0	2	0	0	3	2	0	-2	3	2	0	3	2	3	3	2	2.8	12	13	93

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Non-domestic buildings – Transformation of heating away from the combustion of fuels	CIA - General	2	2	1	2	0	3	0	0	-1	-3	3	2	2	5	2	3	-1	4	2.8	5	10	93
Training for behavioural changes in construction management, processes and methods	EBC - Commercial, Industrial and Agriculture	1	1	1	2	0	3	3	0	1	0	0	2	0	3	2	6	1	2	2.75	1	28	95
Region wide NRMM emission standards (such as stage V NRMM retrofit/Provisional GB Type Approval Scheme)	CIA - Construction	1	1	1	2	2	3	0	0	0	2	0	2	0	3	4	3	2	2	2.75	3	11	95
Promote electric and/or hydrogen powered NRMM	CIA - Construction	1	1	1	2	2	3	0	0	0	2	0	2	0	3	4	3	2	2	2.75	3	11	95
Promote the use of hybrid generators	CIA - Construction	1	1	1	2	2	3	0	0	0	2	0	2	0	3	4	3	2	2	2.75	3	11	95
Active traffic light management to smooth traffic flows and reduce idling	TRN - Policy and interventions	1	1	0	2	2	0	3	3	2	-1	0	0	0	2	4	3	4	0	2.65	13	14	99
Creation of low traffic neighbourhoods and similar schemes for new developments	NBE - Hard measures	0	1	1	2	0	3	0	2	1	-2	3	2	0	2	2	3	4	2	2.65	5	10	99
Provide training for members/decision makers through a standalone air quality literacy training programme to ensure they are up-to-date on air quality matters	PPG - Skills and training	0	0	1	2	0	0	0	3	2	3	0	0	0	1	2	0	8	0	2.6	2	20	101
High occupancy vehicle lanes	TRN - Policy and interventions	1	1	1	2	2	0	3	2	1	-1	0	0	0	3	4	3	2	0	2.55	14	15	102
Revisions to garden waste collections to reduce the instances of bonfires within urban areas	DOM - Policy	1	1	2	2	0	0	0	-2	1	0	3	2	0	4	2	0	2	2	2.5	3	8	103
Metrics for improving air quality, to capture co-benefits from net zero actions and for policy to reduce regional health inequalities	CNZ - General	0	0	1	2	0	3	0	2	1	2	0	2	0	1	2	3	5	2	2.5	3	3	103
Undertake audits of the local authority school and housing stock to determine what measures can be implemented. Promote co-working with housing teams to improve indoor air quality outcomes.	DOM - Supporting Actions	0	0	2	2	0	0	0	2	2	1	0	2	0	2	2	0	5	2	2.45	6	9	105
Support and accelerate transition to zero emission HGV fleet, especially in urban centres	TRN - Supporting research	1	1	1	2	2	3	3	0	1	-2	0	2	0	3	4	6	-1	2	2.45	1	16	105
Redesign bus stops and other minor waiting locations (where there will be transient exposure to high concentrations)	TRN - Policy and interventions	1	1	1	2	0	0	0	2	2	0	0	0	0	3	2	0	4	0	2.4	15	17	107
Increase tree planting of suitable species along key road routes to reduce pollutant exposure	NBE - Hard measures	1	1	1	2	0	0	0	2	1	1	0	0	0	3	2	0	4	0	2.4	6	11	107
Promotion of best driving practices, including supporting on driving techniques for hybrid and electric vehicles; and ensuring correct tyre pressures and wheel alignment	EBC - Transport	1	1	0	2	0	0	0	0	2	3	0	0	0	2	2	0	5	0	2.25	4	29	109
Implementation of new road surface compositions/construction methods and road treatments once research reveals effective solutions	TRN - Policy and interventions	2	2	2	2	0	3	0	0	-1	-3	0	0	2	6	2	3	-4	2	2.25	16	18	109
Advice/guidance on fuel choice and usage for farm equipment	CIA - Agriculture	0	1	0	-1	0	3	0	2	2	2	0	0	0	1	-1	3	6	0	2.25	1	14	109

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Understand the relative importance of within-region emissions and transported air pollution for WMCA air quality	MON - Research	0	0	0	2	0	0	0	3	3	2	0	0	0	0	2	0	8	0	2.2	1	3	112
Providing a region wide driver training module to incorporate eco-driving messaging (including idling)	EBC - Transport	1	1	0	2	2	0	3	0	1	1	0	0	0	2	4	3	2	0	2.15	5	30	113
Consistent anti-idling campaigns across the West Midlands	EBC - Transport	1	1	0	2	2	0	3	0	1	1	0	0	0	2	4	3	2	0	2.15	5	30	113
Use existing training mechanisms to inform professional drivers (both road and rail) of the relevant best practice measures and techniques to reduce emissions where possible	EBC - Transport	1	1	1	2	0	0	0	0	1	2	0	0	0	3	2	0	3	0	2.15	5	30	113
Investigate how air quality can be made tangible (unlike other issues such as noise) through measures such as temporary street closures (using street party regulations) so that people can see the difference when action is taken.	EBC - General	0	1	0	2	0	0	0	2	2	2	0	0	0	1	2	0	6	0	2.1	7	33	116
Priority parking and/or reduced charges for low emission vehicles	TRN - Policy and interventions	1	1	-1	2	0	0	3	0	3	1	0	0	0	1	2	3	4	0	2.05	17	19	117
Use portable and fixed signage to highlight air quality issues and why actions (such as speed limit reductions) are in place	EBC - Transport	0	1	0	2	2	0	3	2	2	-1	0	0	0	1	4	3	3	0	2	8	34	118
Development of more local sustainable energy generation capacity and associated battery storage	CIA - General	1	1	1	2	0	3	0	0	-1	-3	3	2	2	3	2	3	-1	4	2	6	15	118
Engage and inform the public on key commercial, industrial and agricultural issues	EBC - Commercial, Industrial and Agriculture	0	0	0	2	0	0	0	3	2	2	0	0	0	0	2	0	7	0	1.95	2	35	120
West Midlands wide fleet recognition schemes to promote LEV	TRN - Policy and interventions	0	1	0	2	0	3	3	0	1	0	0	2	0	1	2	6	1	2	1.95	18	20	120
Establish regional standards on air quality monitoring covering all monitoring types to ensure that the data being acquired is robust and the equipment used is to a minimum standard.	MON - Monitoring and Data	0	0	0	2	0	0	0	2	2	3	0	0	0	0	2	0	7	0	1.95	3	4	120
Establish a pathway for streamlined procurement of air quality monitoring equipment and resources to both leverage economies of scale and ensuring that the correct equipment is purchased based on the regional standards	MON - Monitoring and Data	0	0	0	2	0	0	0	2	2	3	0	0	0	0	2	0	7	0	1.95	3	4	120
Understanding real-word emissions to underpin policy, e.g. identifying largest emitters across actual WM fleet (all vehicles)	MON - Research	0	0	0	2	0	0	0	3	2	2	0	0	0	0	2	0	7	0	1.95	2	4	120
Promotion of home working and reducing commuting related trips	EBC - Transport	0	1	0	2	0	0	0	0	3	3	0	0	-2	1	2	0	6	-2	1.9	9	36	125
Park and ride schemes	TRN - Policy and interventions	1	1	1	2	2	3	3	-2	0	-2	0	2	2	3	4	6	-4	4	1.9	19	21	125

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Create an emissions 'health check'/audit programme for commercial, industrial and agricultural businesses to find out how they can reduce their emissions and what support is available	CIA - General	0	0	0	2	0	3	0	3	2	0	0	0	0	0	2	3	5	0	1.9	7	16	125
Promote electric transport refrigeration units (TRUs)	CIA - Commercial	0	1	0	2	0	0	3	0	1	2	0	0	0	1	2	3	3	0	1.8	2	17	128
Region wide industrial off-road mobile and stationary machinery emission controls	CIA - Commercial	0	1	0	2	0	0	3	0	1	2	0	0	0	1	2	3	3	0	1.8	2	17	128
Provide advice on best practice regarding the use of fertilisers and what can easily be changed to reduce emissions of pollutants and secondary aerosol formation	CIA - Agriculture	0	1	0	-1	0	3	0	0	2	2	0	0	0	1	-1	3	4	0	1.75	2	19	130
Promoting low emission spreading	CIA - Agriculture	0	1	0	-1	0	3	0	0	2	2	0	0	0	1	-1	3	4	0	1.75	2	19	130
Introduction of new low traffic neighbourhoods	TRN - Policy and interventions	1	1	1	2	0	0	0	2	2	-3	0	0	0	3	2	0	1	0	1.65	20	22	132
Promote the benefits to changes in livestock diet	EBC - Commercial, Industrial and Agriculture	0	1	0	2	0	3	0	0	1	0	0	2	0	1	2	3	1	2	1.5	3	37	133
Taxi driver licencing change to enforce low emissions vehicles	TRN - Policy and interventions	1	1	1	1	0	3	0	-2	0	1	0	0	0	3	1	3	-1	0	1.5	21	23	133
Research on the effectiveness of new technologies for reducing pollutant concentrations in the built environment	NBE - Supporting research	0	0	0	2	0	0	3	2	1	0	0	0	0	0	2	3	3	0	1.4	1	12	135
Research the sources and methods for effective secondary aerosol formation reduction and how these can be implemented across commercial, industrial and agriculture	CIA - Research	0	0	0	2	0	3	0	2	1	0	0	0	0	0	2	3	3	0	1.4	1	21	135
Research and 'test-bed' implementation of new road surface composition and construction to reduce particulate emissions, particularly from battery electric vehicles (BEVs)	TRN - Supporting research	0	0	0	2	0	3	0	0	0	0	0	0	2	0	2	3	0	2	0.85	2	24	137
Research and 'test-bed' implementation of new tyre composition and manufacturing techniques to reduce particulate emissions, particularly from battery electric vehicles (BEVs)	TRN - Supporting research	0	0	0	2	0	3	0	0	0	0	0	0	2	0	2	3	0	2	0.85	2	24	137
Research and 'test-bed' implementation of road treatments to reduce resuspension	TRN - Supporting research	0	0	0	2	0	3	0	0	0	0	0	0	2	0	2	3	0	2	0.85	2	24	137
Behaviour change in food consumption	EBC - Commercial, Industrial and Agriculture	0	1	-1	-1	0	3	0	-2	2	1	0	2	0	0	-1	3	1	2	0.8	4	38	140
Improved anti-idling enforcement	TRN - Policy and interventions	0	1	0	2	0	0	3	-2	2	-1	0	0	0	1	2	3	-1	0	0.8	22	27	140
Engage with estate, letting agents to increase market awareness of indoor air quality issues	EBC - Domestic Emissions and Indoor Air Quality	0	1	0	2	0	0	0	-2	0	1	0	0	0	1	2	0	-1	0	0.35	9	39	142
Implement exposure reduction measures at major transport hubs	TRN - Policy and interventions	1	1	0	2	0	0	0	0	-1	-3	0	0	0	2	2	0	-4	0	0	23	28	143

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Roadside vehicle emissions tests and checks for defective Diesel Particulate Filters (DPF)	EBC - Transport														N/A	N/A	N/A	N/A	N/A	Not Appraised past RAG stage	N/A	N/A	N/A
Promote biofuels in passenger vehicles	EBC - Transport														N/A	N/A	N/A	N/A	N/A	Not Appraised past RAG stage	N/A	N/A	N/A
Promote abatement retrofit	EBC - Transport														N/A	N/A	N/A	N/A	N/A	Not Appraised past RAG stage	N/A	N/A	N/A
Log burner scrappage scheme	DOM - Policy														N/A	N/A	N/A	N/A	N/A	Not Appraised past RAG stage	N/A	N/A	N/A
Enforcement of zero-emission bus fleet	TRN - Policy and interventions														N/A	N/A	N/A	N/A	N/A	Not Appraised past RAG stage	N/A	N/A	N/A
Region wide EV charging scheme, with WMCA/TfWM providing support and local authorities investigating releasing land to enable widespread installation and adoption	TRN - Policy and interventions														N/A	N/A	N/A	N/A	N/A	Not Appraised past RAG stage	N/A	N/A	N/A
Provision of school buses	TRN - Policy and interventions														N/A	N/A	N/A	N/A	N/A	Not Appraised past RAG stage	N/A	N/A	N/A
Lorry overtaking bans on major roads	TRN - Policy and interventions														N/A	N/A	N/A	N/A	N/A	Not Appraised past RAG stage	N/A	N/A	N/A
Enforcement to prevent removal/defeat of emission control devices	CIA - General														N/A	N/A	N/A	N/A	N/A	Not Appraised past RAG stage	N/A	N/A	N/A
Monitoring and improved fugitive emissions capture	CIA - Industrial														N/A	N/A	N/A	N/A	N/A	Not Appraised past RAG stage	N/A	N/A	N/A
Precision equipment for improving construction efficiency	CIA - Construction														N/A	N/A	N/A	N/A	N/A	Not Appraised past RAG stage	N/A	N/A	N/A
Installation emission concentration limits: Cost Benefit Analysis (CBA) based-permitting	PPG - Regional planning and policy														N/A	N/A	N/A	N/A	N/A	Not Appraised past RAG stage	N/A	N/A	N/A
Air quality emission trading schemes	PPG - Regional planning and policy														N/A	N/A	N/A	N/A	N/A	Not Appraised past RAG stage	N/A	N/A	N/A