

GREATER MANCHESTER

DOING THINGS DIFFERENTLY FOR THE ENVIRONMENT

Greater Manchester 5 Year Environment Plan

2025-2030

To ensure everyone in Greater Manchester has a healthy, low carbon, nature-rich environment in which to live-well, prosper and grow



(Draft V11)

Contents

Contents.....	2
Mayor’s Foreword.....	3
1.0 Introduction.....	4
2.0 The Journey to a Nature-rich and Carbon Neutral City-region.....	8
3.0 Structure of the Plan.....	13
4.0 Vision, Aims & Objectives.....	17
Aim 1: Our energy infrastructure is smart, flexible, and fit for a low carbon future.....	20
Aim 2: Our buildings are sustainable and energy efficient.....	26
Aim 3: Our transport system is reliable, integrated, inclusive, affordable and enables sustainable travel.....	35
Aim 4: Our natural environment is enhanced providing benefits for people, economy and nature.....	44
Aim 5: Our city region transitions to a circular economy and our waste is reduced, reused, recycled or recovered.....	52
Aim 6: Our city-region is better adapted and more resilient to the increasing impacts of climate change.....	61
Aim 7: Our air quality enhances the health, well-being and quality of life our residents.....	69
Aim 8: Our economy will grow sustainably because of the interventions we make, benefiting our residents and businesses.....	76
5.0 Emissions Pathway.....	84
6.0 Governance and Performance Monitoring.....	88
7.0 Communications and Engagement.....	91
8.0 Financing our Plan.....	94
9.0 Abbreviations, Acronyms & Definitions.....	97
Appendix 01: Progress since 2019.....	98
Appendix 02: Technical Details to support prior sections.....	102

Mayor's Foreword

To be completed once the plan is finalised

DRAFT

1.0 Introduction

In 2019, Greater Manchester declared a climate emergency, launched its first 5 Year Environment Plan (2019-2024) and set a target to become a carbon neutral city region by 2038. In 2022, Greater Manchester also declared a biodiversity emergency. Although a significant amount has been achieved in the last 5 years, there remains far more still to do. Our carbon emissions are falling too slowly to align with our science based target, aligned to the Paris (COP21) Climate Agreement, and our natural environment is still in decline. Urgent and accelerated action is needed by all of us to reduce our carbon emissions and reverse the decline in biodiversity by 2030.

Although our science based carbon budget may soon be exceeded, we have laid a strong foundation on which to build and accelerate our progress to a low carbon economy. We believe that achieving carbon neutrality by 2038, whilst very challenging, is still achievable, especially if national measures are accelerated to align with the Climate Change Committees carbon budget.

This 5 Year Environment Plan (2025-2030) creates a framework for all decision makers to take the next actions required to progress towards our long-term environmental vision and ensure everyone in Greater Manchester has a healthy, low carbon, nature-rich environment in which to live-well, prosper and grow. Whilst national and local government have a role to play in enabling and encouraging action, it is the decisions that we all take as citizens, businesses, communities, investors, home and car owners that will determine whether we will achieve our shared goals.

Our environment and why we need to act

Our environment is essential to all aspects of our daily life: the air we breathe, the food we eat, the water we drink and the green spaces we spend time in. A thriving environment is fundamental to our health and well-being and the prosperity of the city region. By taking action to improve our environment, we can create: a city region with abundant, attractive, nature-rich green spaces in both our urban and rural areas, a place where all citizens live and work in energy efficient, climate-resilient homes and buildings, with an integrated, accessible, active and public transport system – all powered by low carbon energy.

Greater Manchester is already experiencing the impact of climate change and extreme weather events will increasingly cause damage to people and infrastructure. Average GM temperatures have increased by 0.75°C (1961-1990) and the 2022 summer heatwave saw temperatures of 40°C recorded for the first time. Average annual summer rainfall has decreased by between 10-25% and average annual winter rainfall has increased by between 10-50% since 1961. Without adaptation, these trends have the potential to have wide ranging consequences for our people and businesses, from increasing incidence of heatwaves, droughts, floods and wildfires. Without mitigating action, our businesses may experience price shocks through potential impacts on global supply chains. Our citizens will increasingly suffer from adverse health impacts, particularly those people who are already most vulnerable.

At the same time, the abundance and diversity of wildlife in Greater Manchester continues to decline, with nature under increasing pressure and less able to provide us with the benefits that are fundamental to our citizens and businesses. This plan outlines actions to not only mitigate our carbon emissions and become more resilient to the impacts of climate change, but also actions to create nature-rich, sustainably managed green and blue spaces, to create a more circular economy to

reduce waste and actions to reduce poor air quality from domestic, industrial and travel emissions which will also enhance the quality of life of all residents.

It is intended that this plan will fully align with Greater Manchester's emerging Local Growth Plan, particularly by stimulating growth on the region's clean growth sectors. Fulfilling the actions in this plan will require a wide spectrum of roles, including well-skilled technical jobs, that are growing now and will provide long-term employment opportunities for residents. The plan promotes more sustainable lifestyles and business models which, if implemented carefully, will save people and companies money from their bills, improve the health and quality of life of our people and stimulate innovation and growth in the green economy. Convincing all decision makers to act now will depend on us realising these wider social and economic benefits, as well as the environmental improvements that are at the core of this plan.

Building on a Strong Foundation of Action

The last 5 Year Environment Plan has resulted in significant action as evidenced by Greater Manchester making the Carbon Disclosure Project's (CDP) 'A List' for three consecutive years, despite a two year global Covid pandemic. The CDP score reflects the level of transparency, action and progress an organisation is taking to reduce their greenhouse gas (GHG) emissions.

A full list of our accomplishments is provided at Appendix 01 however some key achievements include:

- a) **Investing in infrastructure programmes** – Over £123m invested in retrofitting nearly 10,000 homes, over £120m invested in retrofitting 225 public buildings; £26m invested in delivering 18MW of 80MW identified renewable energy capacity; over 750,000 trees planted, 100km of new cycling infrastructure developed; more than 100 zero emission buses in operation plus expansion of Metrolink and facilitated over 2000 publicly available electric vehicle charging connectors.
- b) **Creating Enabling Facilities** - establishing a Renew hub and recycling shops across GM; supporting a nature-based solution 'living lab' and Energy House 2 at Salford University and the Hydrogen Fuel Cell Centre at Manchester Metropolitan University; supporting the plans for a (up to 200MW) hydrogen electrolyser at Trafford Energy Park.
- c) **Strategies and Plans** – developing and commencing delivery of detailed plans for each Aim of the Plan (see Fig 2), including being the first city region to adopt Local Area Energy Plans.
- d) **Establishing Funds** – creation of the Greater Manchester Environment Trust to establish and manage the Mayor's Green Spaces Fund (£3.4m) and the Recycle for GM Community Fund (£800k).
- e) **Promoting Innovation** – establishing the Greater Manchester Energy Innovation Agency and InnovationGM (IGM) demonstration projects to support over 100 innovators
- f) **Engaging with people and business** – establishing the Bee Net Zero business support gateway, the Local Energy Advice Demonstrator and the Your Home Better retrofit advice service, launch of the Bee Network app plus multiple public information campaigns.

Whilst these achievements are comparatively significant, they have not resulted in the scale of change required to meet our science based carbon budget for the period.

What Have we Learnt?

Whilst most of the actions set out in the previous Plan have commenced delivery and Greater Manchester's carbon emissions continue to decrease, it is not at the scale nor pace required. Carbon emissions did decrease significantly during the Covid pandemic, bounced back and have since reduced to just below pandemic levels (See Fig.1).

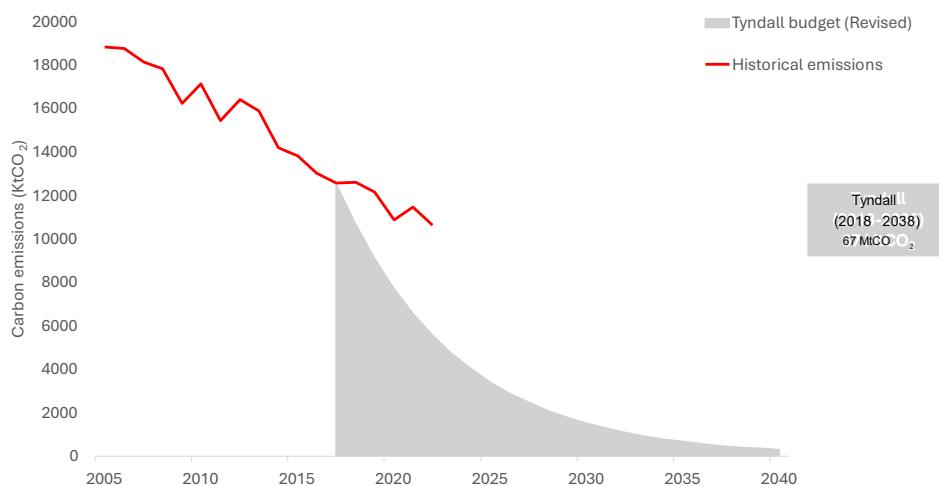


Fig.1 Graph of historical carbon emissions relative to our science based target¹.

In delivering the last 5 Year Environment Plan, we have learnt that:

- Staying within our previous science based carbon budget, which reflects our fair and equitable share of global carbon emissions, is now unlikely, however we still need to strive towards limiting the emissions that exceed that budget
- By going beyond national ambitions, we believe that achieving carbon neutrality by 2038 is still possible, however we will require the support of progressive national policies and funding.
- In addition to national measures, the rate of carbon emission reduction will largely be determined by the choices that GM businesses and individuals make, increasing engagement will be essential
- Our Mission Based Approach to delivery was largely successful in convening expertise, identifying and addressing systemic challenges, however it clearly did not deliver the scale of change needed. We need to expand this approach to allow more and varied voices to be heard.
- Having accurate, replicable local data is essential to both plan future priorities and monitor our progress
- Establishing and scaling infrastructure change programmes takes time, capacity and significant finance – truly innovative finance mechanisms remain elusive

¹ Revised Tyndal (Science based target) curve - The value for the baseline year (where the curve starts) was changed to match revisions to the historical data provided by DESNZ

In recognition of these lessons, we have structured this 5 Year Environment Plan to focus more on the decision makers and how public bodies and our partners can enable them to make more sustainable choices. We will need a step-change in how we think, talk and act to embed sustainability principles into everything we do.

Rather than focusing on targets to stay within a fixed carbon budget, we have adopted challenging but achievable targets for each of our Aims for the next 5 years that can be regularly monitored and our progress reported upon. These targets set a clear pathway for GM for the short term, recognising what we have influence to deliver and what is under the influence of others, and therefore less certain. The UK energy system is changing rapidly, and our longer term trajectory will significantly depend upon consistent national actions to decarbonise the electricity grid, encouraging model shift in transport and innovations to reduced energy demand.

To accelerate our activity, we will need greater access to investment, increased delivery capacity in the local supply chain, committed political leadership, alongside strong and aligned support from national government. The scale of the challenges we face cannot be under-estimated. At a time when finances are constrained, finding the level of funding that will be required to deliver this plan will be challenging (see Section 8) and may require difficult choices to be made by us all. The cost of 'good growth' may sometimes exceed that of 'business as usual' and this additional investment needs to be weighed against the future costs of dealing with more severe impacts of climate change and biodiversity decline.

Engaging with People

Achieving our Plan will not be possible without the support and engagement of the people of Greater Manchester. We know that people's attitudes and behaviours are shaped by multiple contexts²:

- **Individual:** Factors such as values, attitudes, skills, and calculations about costs and benefits
- **Social:** Factors such as social norms, networks, trusted relationships, and institutions
- **Material:** Factors such as infrastructures, technologies, regulations, time, and schedules

Each of these factors need to be considered when developing more effective policies and interventions, identifying options and shared solutions to deliver the actions contained in this plan. To be successful, we need to put people at the heart of our plans and help develop the skills, knowledge and leadership that will enable them to support our pathway to 2038 and benefit from it. This will encompass everything from basic day-to-day carbon literacy of all our citizens, to the specialist skills needed to design, deliver and maintain more sustainable infrastructure and services. Greater focus will therefore be placed on engaging with the people and businesses of Greater Manchester (see Section 7) on our shared vision for the future, listening to their concerns and aspirations and giving them the support and encouragement they need on the journey towards a nature rich and carbon neutral city region.

Note: Include an infographic on the progress to date Fig. 2

² Southerton et al (2011)

2.0 The Journey to a Nature-rich and Carbon Neutral City-region

Achieving a low carbon energy system:

In Greater Manchester, we want to create a 'Manchester-Energy Model', a low carbon energy system, that other places will aspire towards, and which will meet our target of being carbon neutral by 2038. Reaching this target remains challenging and will require accelerated and scaled up action across all aspects of society - residents, public and private sector organisations and, importantly, national government.

Such a system will be based around the three pillars of energy efficiency, energy generation and smart energy innovation:

Energy Efficiency - Where our homes and buildings are improved to use as little energy as possible, using the most efficient insulation and cost-effective, low carbon appliances and heating systems.

Energy Generation - Where our homes, businesses and transport are all powered through affordable renewable energy, built all over Greater Manchester, including local heat networks, onshore wind and solar panels on roofs, to reduce transmission losses and give people more control over their energy bills.

Smart Innovation - Where this is all integrated by embracing the latest developments in technology and energy innovation to allow people to smartly store and control their energy use, adapting to their individual requirements and benefiting financially from being able to manage when they buy, sell and use energy.

Greater Manchester was a pioneer of the industrial revolution. We can now drive the green industrial revolution too. Our largest carbon emission challenges arise from private road transport and domestic buildings. Reducing these emissions at the necessary pace will require a significant scale up of current domestic retrofit work and a continued focus on low carbon mobility – through a reliable, integrated, inclusive and affordable public transport system, active travel and transitioning to Zero Emission Vehicles.

By setting out our systemic approach, utilising Local Area Energy Planning to guide our prioritisation, we are sending a clear signal that Greater Manchester is the place for businesses to develop, invest and grow as we embrace the opportunities from the race to net zero. Our new devolution deal will give us increased flexibility to plan and invest in decarbonising our local infrastructure, and our Net Zero Accelerator programme aims to develop an initial pipeline of up to £1bn of low carbon infrastructure projects to take to the investment market by April 2026. It will also benefit our residents as a local, place-specific approach to tackling climate change can deliver double the energy savings and wider social benefits for less than half of the investment costs than a national approach.

Electrification of heating in most buildings remains the most cost-effective pathway to carbon neutral – either through property level solutions or heat pump led heat networks. To avoid expensive electricity network upgrades, we will also need to smooth 'peak heat' demand through creating a smart and connected zero carbon energy system, improving the fabric and energy efficiency of our buildings and improving heating and storage controls. This transition away from natural gas in the longer term must be carefully planned and managed.

Achieving carbon neutrality will therefore require consumer engagement and support for residents and businesses to actively manage and reduce their energy demand and unlock flexibility in 'when' and 'how' energy is used. Compelling consumer facing solutions for different customer segments,

including low income and vulnerable households, will be critical. We must also utilise planning and building regulations to deliver a step change in the quality of new development.

Although much can be achieved through local leadership, Greater Manchester will still require national policy, funding and support to attain our carbon reduction goals. We need the rapid development and deployment of both mature and novel low carbon technologies, including onshore wind and solar; electrification and smart control of heating in our homes and buildings; as well as significant and rapid deployment of heat networks in our urban centres.

Whilst the city region can generate more local renewable electricity and low carbon heat, we will require national action to support our ambition through decarbonising the electricity grid with more renewable and low carbon power and stimulating low carbon hydrogen and bioenergy production. In addition, innovations around negative emissions and carbon capture and storage technology options are emerging and will need to be supported at the national scale – although we may capture many the economic benefits locally.

Low carbon hydrogen has a key role to play in the decarbonisation of UK industry, particularly for heat intensive businesses. Industrial decarbonisation must be accelerated, however local levers to enable this are limited. Strategic coordination of national and local hydrogen infrastructure as part of wider energy system planning, alongside demonstration and acceleration of hydrogen production, storage and application technologies across sectors will be essential. Hydrogen will likely be utilised in areas close to industrial clusters and potentially to supply energy centres connected to large heat networks, alongside its role in power and transport. Whilst Greater Manchester can help stimulate local demand for low carbon hydrogen, the development of the production and distribution infrastructure must be a national priority.

Achieving a nature-rich city-region:

The Greater Manchester 'State of Nature' Report (2024) highlights both the scale of challenge and the opportunities of tackling the biodiversity emergency. Our aim is to halt and reverse biodiversity loss, mirroring the national commitment to halt the loss in species abundance by 2030. We want to restore healthy ecosystems across the city-region, so that these can continue to provide our residents and businesses with the benefits we rely on for our health, well-being and economic prosperity.

We will be detailing our approach to this in 2025 in our Local Nature Recovery Strategy – our statutory strategy for how we will support nature's recovery in the city-region. Over the next 5-years, this means making more space for nature through the creation of a Greater Manchester Nature Network which will:

- Expand our best existing areas for nature – those that are already protected and designated, bringing more of them under active management.
- Better connect these areas, through focussing creation and restoration efforts on the places that will best join up these existing areas.
- Reduce the pressures on nature, particularly on our water environment, through more integrated and sustainable water management.

Prioritising available public funding and focussing opportunities for private investment on these outcomes (e.g. through Biodiversity Net Gain) will provide a focus for collective action where it will have the biggest impact on nature recovery.

At the same time, we need to integrate nature into our cities and town centres – into how we regenerate them, how we develop infrastructure that is climate resilient and fit for the future, how we bring nature into our parks and public spaces and how we connect more people with nature, particularly those with physical, geographical or social barriers to accessing it. This has already begun, with new city parks integrated into large-scale regeneration and infrastructure projects, rain gardens and street trees alongside new walking and cycling routes and a movement of community-led projects creating and enhancing green spaces. Mainstreaming these initiatives over the next 5 years will bring nature into our urban areas, improving the benefits for our residents' health and wellbeing and for our businesses' resilience to the impacts of a changing climate.

To support this, we need national government to provide a long-term, stable policy and funding framework for the natural environment to enable action. In particular, this needs to support the growth in markets for ecosystem services in order to increase the growth in private sources of funding into the natural environment.

Achieving a circular economy, where all resources are valued:

90% of global biodiversity loss is caused by resource extraction and processing, with up to 80% of a product's environmental impacts determined at the design stage. To support our move to a nature-rich, carbon neutral city region, we need to embrace a culture where all resources are valued, and energy consumption is reduced through reducing resource extraction and use and adopting more low carbon, energy-efficient technologies and processes. Through sustainable product design and repurposing end of life products we can create new circular innovation that enables new skills and economic prosperity within the conurbation.

We need our businesses and residents to support the journey by valuing existing resources and considering whether products could be reused, repurposed or repaired, before they enter into the waste system. This change has already started to happen through new our Renew Hub and shops, hire shops such as 'Library of Things' and repair cafes. Valuing resources and mainstreaming these circular economy ventures over the next 5 years will create the step-change required to reduce the volume of resource extraction and waste currently generated.

Access to good quality and reasonably priced food is essential to enable residents to live well. Food is essential not only to fuel our bodies and vital to health, but also plays a key part in our family, community and economic wellbeing. We need to move to a more sustainable food system that delivers food security and nutrition for all without compromising the economic, social and environmental bases to generate these. This approach will build economic growth and resilience within our supply chains, increase food security and nutritional well-being and also enable environmental benefits, by focusing on carbon reduction in the food system and by reducing food waste.

To support the transition to a circular economy, Government support is required to strengthening producer responsibility so that industry is accountable for the full life cycle costs of the products

created. Whilst England's Resource and Waste Strategy sets a clear vision for future, further clarity on how the strategy will be implemented along with the resources available to ensure that successful delivery of the strategy is required.

A Sustainable Transport System:

To meet GM's ambition of reaching carbon neutrality by 2038, we need a fundamental shift in attitudes towards car journeys, alongside a major shift to sustainable transport modes, as both are essential to reduce the number and use of fossil fuel vehicles. As well as delivering a major shift to electric vehicles, which will need to use electricity from renewable sources, we also need viable options besides private cars to enable the required shift from high carbon transport modes to more sustainable modes. We need to plan for growth in a way that minimises reliance on the car by ensuring that communities have easy and local access to amenities such as education, food, healthcare etc. while encouraging, where possible, flexible working to reduce the need to travel unsustainably.

There has been a slow decrease in transport carbon emissions compared to other high emission sectors. Whilst there has also been steady progress in manufacturers improving vehicle efficiency, this is offset by continually increasing vehicle mileage (particularly vans), increasing market share of larger, heavier vehicles and only marginal shifts to low emission modes. A slower than expected rate of electric vehicle adoption has also contributed to relatively static transport emissions since 1990, despite there being over 2,000 public EV Connectors available across the city region. Achieving our transport goals will require an increase in the innovation and adoption of new transport technologies and practices that can enhance efficiency, reliability, safety and sustainability of transport systems including smart mobility and low carbon vehicles.

Although the Right Mix (i.e. the target to reduce the share of total trips made by car to no more than 50%, with the remaining 50% made by public transport, walking and cycling) takes us some way towards Greater Manchester's carbon neutral goal, more challenging reductions in car travel are likely to be necessary.

We also need to accelerate innovation in the decarbonisation of heavy vehicles, trains, aviation and freight, which may need a reprioritisation of policy and investment at the national level. More urgent and clearer national incentives and standards to stimulate innovation and market creation for these technologies will be needed. Nationally, the UK has a 2050 net zero goal. Some studies estimate that, even with optimistically high levels of electric vehicle uptake, the number of vehicle kilometres travelled will still need to be 20% lower in 2030 (in line with Scotland's strategy) if the transport sector is to meet the Committee on Climate Changes (CCC) 6th carbon budget.³ If Greater Manchester is to achieve those major changes in travel behaviour, we will need central government to take the lead. To date, there are no national targets or policies to reduce car dependency and car journeys.

Improving Air Quality

In our city region, the main sources of air pollution are road transport, industry and domestic heating. Whilst air quality has generally been improving, particular pollutants remain a serious

³ <https://www.theccc.org.uk/publication/sixth-carbon-budget/>

concern in many urban areas, including across Greater Manchester. There are areas in our city region where the NO₂ levels exceed the legal limit, especially near busy roads. Although Greater Manchester is currently meeting legal targets for PM_{2.5}, we need concerted efforts to reduce this further and to work towards the WHO guideline values by 2030.

Delivering significant improvements in Greater Manchester's air quality will require a strong and inclusive partnership between the public, private sectors and academic community; one that can foster innovation, collaboration, engagement with residents and co-creation of solutions to address specific challenges and opportunities. A robust and reliable financing mechanism that can support the implementation of low-emission technologies and infrastructure, such as electric vehicles, public transport, renewable energy, and green spaces will also be needed, together with a skilled workforce that can design, install, operate, and maintain the low-emission solutions and adapt to the changing needs and demands of the market and the environment.

Greater Manchester's Clean Air Plan has been submitted to government. Continued implementation of the plan will improve air quality across the city region and bring Nitrogen Dioxide level to within legal limits to match our current compliance with PM_{2.5} levels. Government can support local efforts by providing incentives and guidance for local and regional authorities to achieve them. Government's clear expectations is for local authorities to effectively use their powers to reduce PM_{2.5} emissions from sources which are within their control. We need national government to aid local efforts by providing incentives and guidance and allocating additional resources to local governments for effective enforcement of clean air.

Note: Include an infographic on the pathway Fig. 3

3.0 Structure of the Plan

This Plan is set out as follows:

Vision	What the longer-term vision for a greener GM looks like
Aims	The key long-term results required to achieve that vision for a greener GM
Objectives	The shorter term, specific results required to achieve our aims
Actions	The practical actions to be taken over the next 5 years that will contribute to delivering on our objectives.
Enabling Actions	The practical actions to be taken over the next 5 years that will facilitate the delivery of the above actions, through engagement, influencing and support

We have dedicated one section in the Plan for each of our 8 Aims. The Aims build upon and extend those in the last 5 Year Environment Plan. A small number of objectives are defined for each Aim, most of them quantifiable. Where a quantifiable target has been set, they are intended to be challenging but achievable and will be used to monitor our future progress annually.

For each Objective, the Actions are directed towards the decision makers who are empowered to make a choice, or a change happen. 'Enabling actions' have also been included which are intended to enable or support the decision maker to choose a positive environmental outcome.

Links to other plans

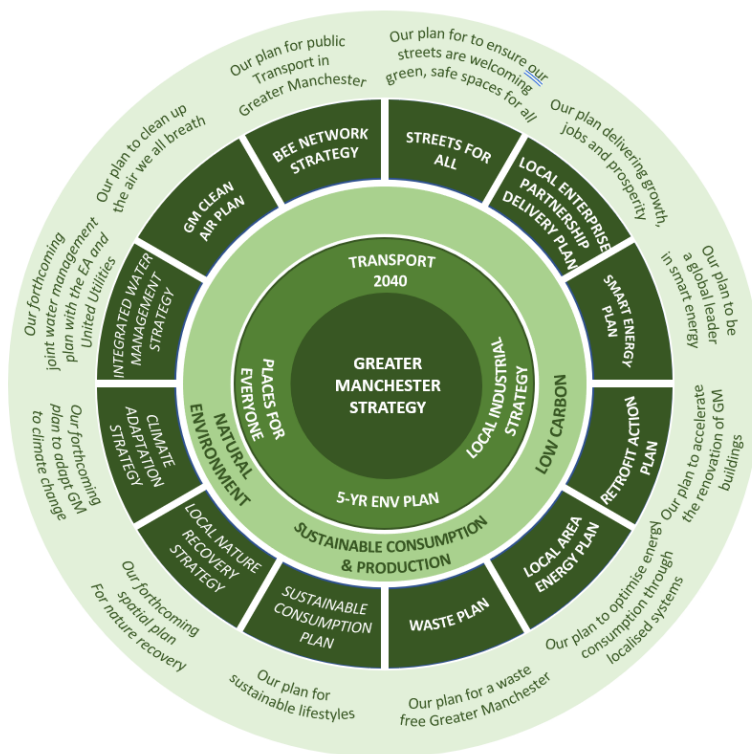


Fig 4 – Diagram showing different GM plans and how they relate to each other and the environment

The Plan should not be read in isolation (see Fig. 4), it sits below the Greater Manchester Strategy (GMS) published in 2022 (soon to be refreshed) which sets out the economic plan for the city-region, with a headline of delivering 'greener, fairer, and more prosperous city region'. The Five Year Environment Plan mainly delivers on the greener element of this plan and sits alongside other strategic plans including the Local Industrial Strategy, Places for Everyone⁴, the GM Transport Strategy 2040 – Our Local Transport Plan (2017)⁵, and emerging Local Growth Plan. Places for Everyone includes many policies which affect the Aims of this Environment Plan, a summary of these is provided in Appendix 02.

The Government has asked all Mayoral Combined Authorities to produce a 10-year Local Growth Plan. It is intended that the plans will be a locally owned, long-term strategic plans for how we will support the shared national growth mission and deliver the national industrial strategy. The Growth Plan will provide a framework that helps inform priorities for public and private investment, and guides intervention to drive sustained and inclusive growth. This is underpinned by Places for Everyone which is a joint plan of nine Greater Manchester districts (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan) for jobs, new homes, and sustainable growth that covers the period from 2022 up to 2039 (see Appendix 02 for further information). Stockport is developing its own Local Plan. We expect that the GM Local Growth Plan will be finalised in Spring 2025 and will cover sectoral priorities to feeding into the new national industrial strategy and focus on opportunities to unlock growth. These may cover areas like skills, housing, transport and innovation.

In advance of publishing the Local Growth Plan, this Environment Plan clearly sets out both the co-benefits (additional indirect benefits) and co-enablers (factors that enable delivery) of each of its Aims with a focused on the areas where national government support is required to unlock our ambitions. We have also included a specific aim (Aim 8) to sustainably grow our economy because of the interventions we make.

Underneath the Five Year Environment Plan sit multiple documents that cover in more detail the delivery for the different elements of work required to deliver our environmental goals. The Five Year Environment Plan provides the strategic link between the overall plan for the city region and the detailed delivery plans. Key documents related to this plan include:

- GM Air Quality Action Plan, TfGM (2016)⁶
- [RetrofitGM](#), GMCA (2021)
- [Local Area Energy Plan](#), GMCA (2022)
- [Greater Manchester NHS Green Plan](#) (2022)
- [Sustainable Consumption and Production Plan](#), GMCA (2023)
- [Integrated Water Management Plan](#), GMCA (2023)
- Local Nature Recovery Strategy, GMCA (2025)
- GM Transport Strategy 2040 (Local Transport Plan) (2025)
- Climate Adaptation Strategy, GMCA (2025)
- Clean Growth Sector Development Plan, GMCA (2025)
- Employment Work and Skills Strategy, GMCA (2025)

⁴ Places for Everyone (adopted 2024)

⁵ Being refreshed

⁶ In agreement with Defra, the decision to review the current GM Air Quality Action Plan is being delayed until the outcome of the new GM CAP is determined.

Addressing Inequalities

Ensuring everyone in Greater Manchester has a healthy, nature-rich, low carbon environment in which to live-well, prosper and grow will require a transformational shift in society that has the potential to address wider inequalities. For example, improving damp and cold homes through retrofit, increasing the number of green spaces and reducing air pollution can bring health and wellbeing benefits, particularly for older people and those with pre-existing health conditions. The most deprived communities in GM own the fewest cars and face issues accessing quality green space. An improved, more accessible, inclusive and affordable public and active transport network can support social mobility for everyone in Greater Manchester, encouraging those with cars to make more sustainable travel choices and providing sustainable access to increased opportunities for those without. Additionally, accessibility, safety concerns and digital exclusion can prohibit the use of public and active transportation.

We must also ensure that the transition does not leave more vulnerable sections of our society behind. Many of the actions needed from residents can be cost prohibitive such as purchasing an electric car, retrofitting your home and buying eco-products. Without strong public sector leadership, those most vulnerable could be left behind, unable to afford currently prohibitive commercial solutions. Compelling consumer facing solutions for different customer segments, including low income and vulnerable households, will be critical to this and to ensuring existing inequalities are reduced, not exacerbated.

We need to take our communities and businesses with us as we make this transition. For them to fully engage, we need to address the financial barriers and demonstrate the benefits of a low carbon future to their quality of life e.g. through the creation of new jobs and growth and providing secure, affordable energy. Some “sunset” jobs will inevitably disappear as a result of the low carbon transition, but these will be more than offset by new jobs created which could be used as a mechanism to reduce wider labour market and pay inequality and legacy skills can be redeployed.

The specific ‘co-benefits’ associated with delivery of the Actions in this plan, together with the bespoke challenges to delivery, are explored in more detail under each of the thematic Aims sections of the plan.

Community Wealth Building

Community wealth building is an approach to economic development that changes the way that our economy functions, retaining more wealth and opportunity for the benefit of local people. The Environment Plan recognises the important role community wealth building can play in contributing to green growth, and will look, where possible, to redirect wealth back into the local economy through progressive procurement of goods and services, which support the development of good social enterprises and shorter supply chains. There are also activities which can be directly delivered by communities including: increasing community energy and retrofit and making improvements to local green spaces.

Our Values

As the convening body for the GM Environment Plan, GMCA will work with our partners, business and wider communities to ensure it is implemented in line with our mission and values. GMCA’s

mission 'Making Greater Manchester a better place for all' and values are intrinsic to how we intend to deliver this plan through collaboration, empowering and delivering:

- **Collaborating:** Bringing together people and organisations from our city region and beyond, forming strong and trusting partnerships which achieve more than any of us could do alone
- **Empowering:** Championing and supporting people and partners, ensuring everyone is able to contribute to and benefit from Greater Manchester's ambitions
- **Delivering:** Taking positive and innovative actions with purpose, achieving a better future with our people, partners and communities

Our mission and values are key to us delivering our core and devolved services for the public:

- Secure, and manage, funding and investment at Greater Manchester level for agreed activity
- Work with the 10 local authorities to drive collective activity that puts Greater Manchester at the forefront of tackling social, economic and environmental issues
- Ensure Greater Manchester is speaking with one voice – developing, leading & implementing our evidence-based strategies, building our networks and partnerships and influencing policy

4.0 Vision, Aims & Objectives

Our Vision

Greater Manchester will be a nature-rich and carbon neutral city region where all citizens have access to affordable renewable energy, warm climate resilient homes, high quality blue and green spaces, healthy and locally produced food, and a reliable, integrated, inclusive, sustainable and affordable transport system, where avoidable waste is significantly reduced.

Greater Manchester will lead the way in becoming an innovative, circular and resource efficient green economy with thriving sustainable businesses, secure and well-paid green jobs and an active local supply chain. Increased prosperity will also bring benefits for nature with increased urban greening and investment in the natural environment.

Greater Manchester's urban environments will be cleaner and greener containing more trees and green spaces and providing environments for nature to thrive. Buildings will be energy efficient and powered by renewable energy. Rural environments will be managed for nature recovery and to protect wildlife. Across the city region air and water quality will be cleaner due to reduced emissions and pollution.

This transition will reduce inequalities across the city region and both citizens and businesses will be actively engaged in creating and maintaining a thriving biodiverse and carbon neutral city region.

Aims

To support the achievement of the vision for Greater Manchester we have set out eight key aims for the city-region. The action needed to achieve these aims is outlined further in the chapters of this plan highlighting the key objectives for the next five years for all sectors of society.

1. Our **energy infrastructure** is smart, flexible and fit for a low carbon future.
2. Our **buildings** are sustainable and energy efficient.
3. Our **transport** system is reliable, integrated, inclusive, affordable and enables sustainable **travel**.
4. Our **natural environment** is enhanced, providing benefits people, economy and nature.
5. Our city region transitions to a **circular economy** and our **waste** is reduced, reused, recycled or recovered.
6. Our city-region is better **adapted** and more **resilient** to the increasing impacts of climate change .
7. Our **air quality** enhances the health, well-being and quality of life of the city region.
8. Our **economy** will grow sustainably because of the interventions we make to benefit both our residents and businesses.

Fig 5: Summary of the Aims and Objectives

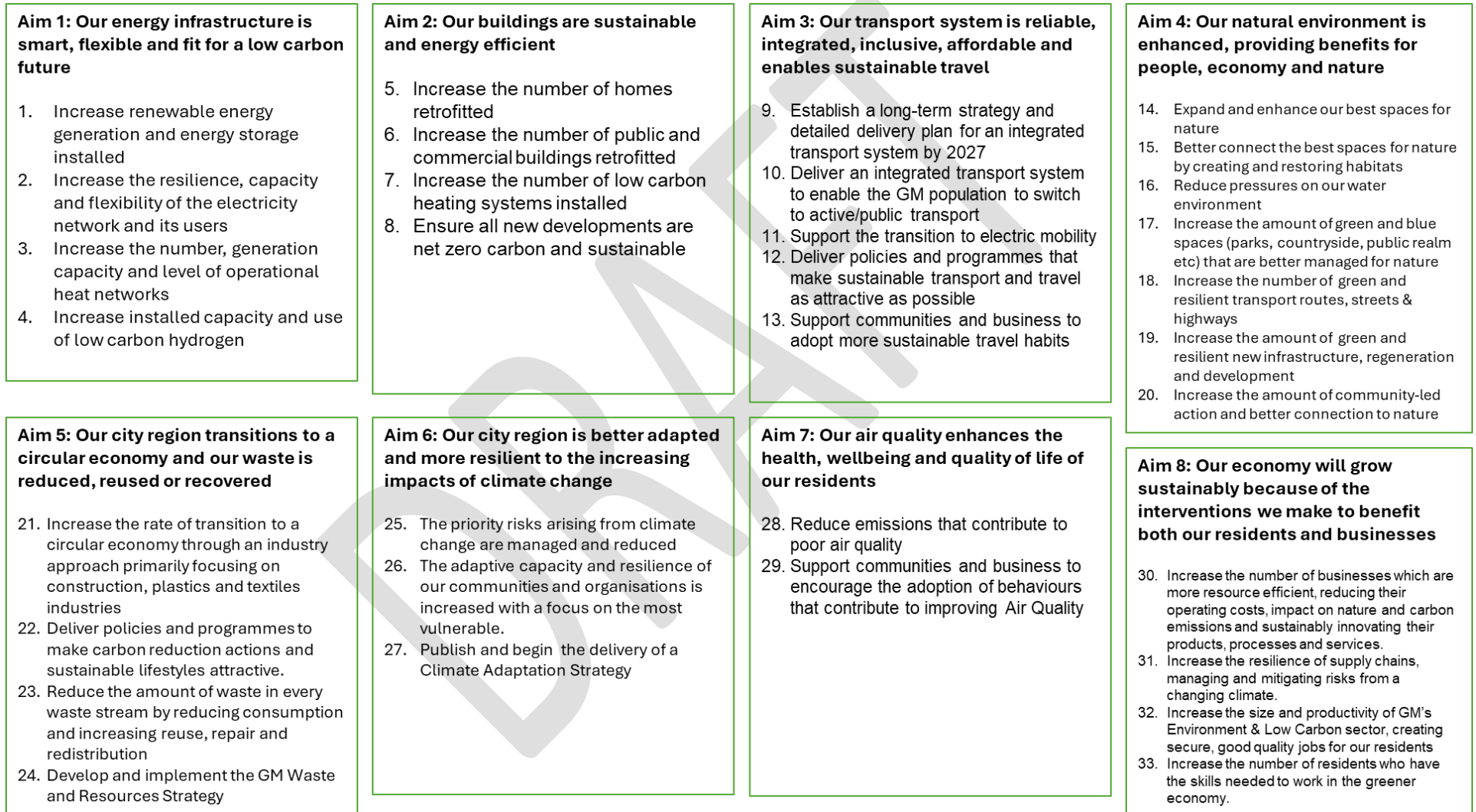
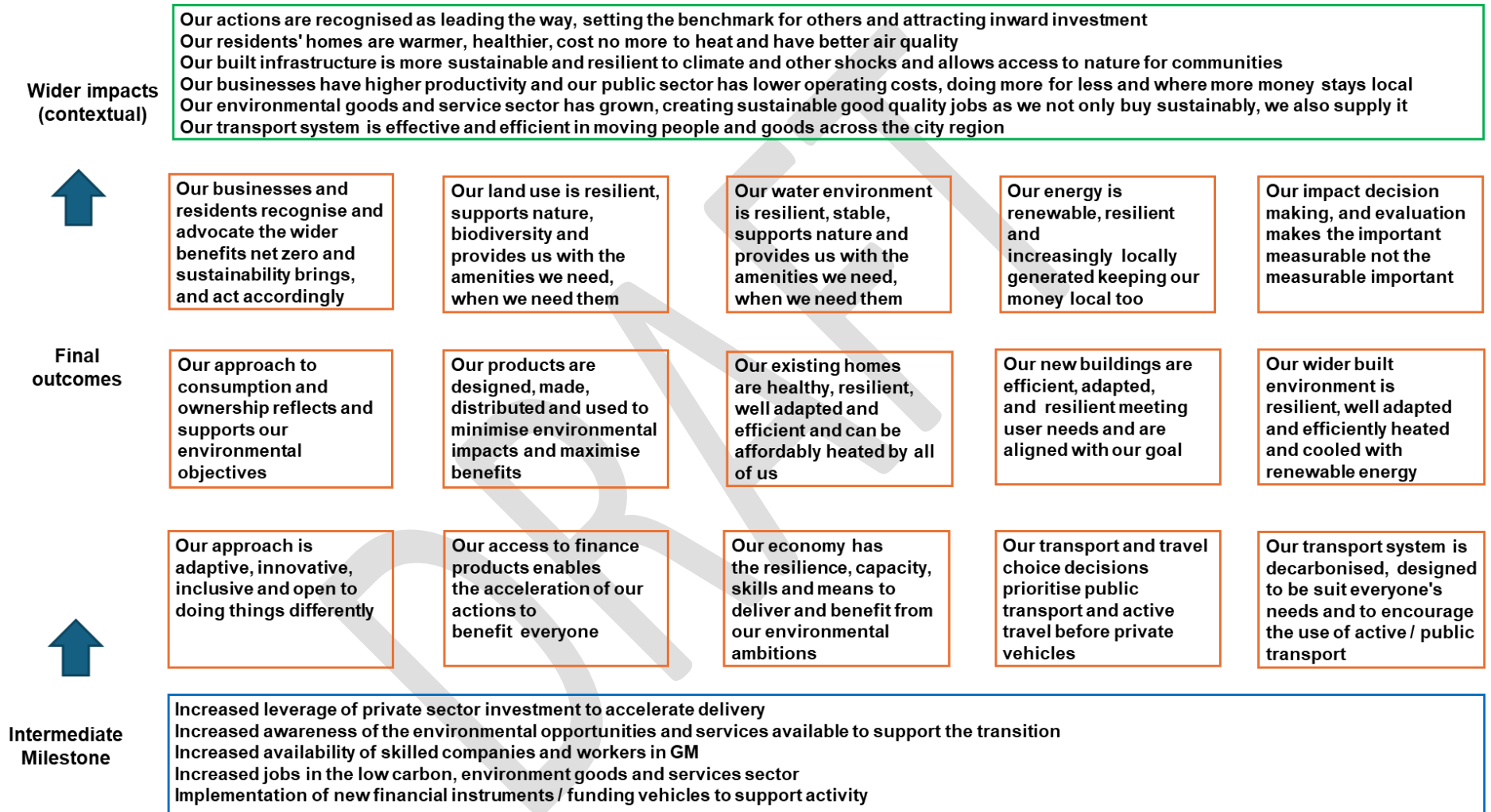


Fig. 6: What will it look like if we succeed?



Aim 1: Our energy infrastructure is smart, flexible, and fit for a low carbon future.

Objectives:

- Increase renewable energy generation and energy storage installed.
- Increase the resilience, capacity and flexibility of the energy electricity network and its users.
- Increased number, generation capacity and level of operational heat networks.
- Increase installed capacity and use of Low Carbon Hydrogen.

Targets for 2030:

- Add 375MW renewable energy generation (153.9 mtCO_{2e})
- Add 95MWh energy storage capacity (excluding large battery storage facilities) (61.6 mtCO_{2e})
- 90 GWh capacity of low carbon heat networks active (791.3 mtCO_{2e})
- 800GWh of Low Carbon Hydrogen production (2926.3 mtCO_{2e})

These targets align with the graphs in Section 5 (Emissions Pathway) of the report. The carbon savings shown above represent the total lifetime emission savings.

The Challenge

Currently, Greater Manchester's energy infrastructure is highly centralised. This needs to transition to support a smart, flexible, increasingly decentralised, connected system with electricity grid infrastructure adapting to meet increasing energy demand, generation, and storage needs. We need to build on our Local Area Energy Plans (LAEPs), with utility and public sector partners, and through the emerging Regional Energy Strategic Plan (RESP) process to plan for this transition. In GM, we have begun this process with almost 40,000 renewable energy installations supplying over 250MW of power, mainly from solar power. Although this appears significant, it is only 0.5% of the renewable energy generated nationally, when we have 4% of UK households.

There will need to be an increased deployment of roof-top and large-scale energy generation and storage assets, including: solar PV, onshore wind, green hydrogen, heat networks and battery and cryogenic storage. Generating more local renewable energy generation and storage will not only help control operating costs but also help meet the expected increased demand for electricity for heating and transport. In addition to the development of new energy infrastructure, a reduction in energy consumption and increased flexibility will also be required to meet our 2038 carbon neutral target and help balance demand with supply.

The decarbonisation of industry is another key area to address when considering the challenge of transitioning Greater Manchester's energy infrastructure. Greater Manchester's industry currently emits ~19% of the region's greenhouse gas emissions from the processes they conduct. Supporting a reduction of their energy consumption and the demonstration of alternative clean energy generation and storage, including Low Carbon Hydrogen, will be essential to meeting the emissions reduction targets for the city-region, alongside cutting costs.

Actions Required to Deliver Objectives

1) Increase renewable energy generation and energy storage installed - We will need to see a step change in the deployment of renewable energy and storage in order to meet both our local and national targets and support GB Energy. Greater Manchester has significant potential to contribute towards this, capturing the economic and financial benefit locally, especially through community energy, and other innovative finance solutions. Our primary opportunities are in the large scale deployment of solar and onshore wind to support the local and national grid and also utilising on-site and roof-mounted on homes, commercial and public buildings to directly benefit our businesses and communities.

2) Increase the resilience, capacity and flexibility of the electricity network and its users - Our grid is one of the most vital parts of our infrastructure; we will rely upon it even more as we move away from fossil fuels. We will work with our energy infrastructure partners locally and nationally to ensure our future grid supports both our decarbonisation and growth ambitions whilst supporting a just transition. We will maximise energy efficiency and use of renewables through increased capacity, greater flexibility, and adoption of innovative and smart solutions from our businesses. We will continue to explore the potential for local energy markets to maximise flexibility and the benefit locally.

3) Increase the number, generation capacity and level of operational heat networks - low carbon heat will also play an important role in our ambition, both through property level retrofit and through the establishment of heat networks in our urban centres. We will work to increase the scope and scale of low carbon heat networks across Greater Manchester. This will focus on strategic priority zones, building on existing networks where possible and utilising waste heat where we can.

4) Increase installed capacity and use of Low Carbon Hydrogen - there is a role for generating hydrogen and potentially biogas from renewable sources, both as a way of maximising the use of renewable energy through storage and direct deployment to assist with industrial decarbonisation. We will work with local and national partners to develop the supply and distribution of hydrogen, including through fuel cells and capitalise on other innovative uses for transport and heat as they emerge.

Links to other 5YEP aims

The availability of decentralised low carbon energy supports all of our decarbonisation ambitions across the built environment and transport, including our wider ambitions to retrofit buildings and improve the quality and health of our homes through electrification of heat. It will also enable mobility, accessibility and improved air quality through powering sustainable, low carbon transport and heating. In delivery, we will need to factor in wider environmental impacts and biodiversity gain opportunities of any new energy infrastructure. An increasingly localised, diverse and robust energy supply can also improve resilience to climate impacts for our communities.

Co-benefits (e.g. health, cost saving etc.)

Our smart, flexible, low carbon energy infrastructure underpins our ambitions for economic growth across Greater Manchester, ensuring that our businesses and communities are resilient to increases in future energy prices and supply shocks. Customers need confidence that they will have the energy they need in the right place and at the right time. Developing our own energy generation will not only help secure good quality green jobs of the future, but also encourage innovation and market

growth for our low carbon companies. Increasing the electrification of domestic heat and improving ventilation will also improve indoor air quality and reduce health impacts of cold damp homes.

Co-enablers (factors that will enable delivery e.g. finance, skills, national government)

There are a range of co-enablers needed for the delivery of our energy ambitions. We will require funding for regional and national energy networks to be increased and aligned. We will need our Network Operators to work with us to invest strategically to support changing demands, increased renewables and heat network, local energy markets and flexible grid connections. We will also need to use public sector assets, such as land or buildings, as off-takers. GB Energy is also likely to be a key co-enabler; we will need to work closely with government to coordinate local and national action and lever additional funding. We will also need to explore new financial models for delivery and catalyse private sector investment, skills and capacity.

Case Study 1 - Go Neutral

Since the launch of the first Five Year Environment Plan, Greater Manchester's public sector has been determined to take a leading role in our green revolution, including changing how they produce and consume energy locally to benefit their communities. The Unlocking Clean Energy in Greater Manchester (UCEGM) Project was conceived of as part of this vision.

Five local authorities – Manchester, Rochdale, Stockport, Salford and Wigan, secured £8.6m from European Regional Development Funding and leveraged a further £8.6m of match funding to deliver the UCEGM project. This resulted in 10MW of new renewable solar energy capacity and flexible battery storage on local authority owned buildings, car parks and land assets. This includes GM's first public sector owned solar farms in Rochdale and Salford, which were energised in early 2024.

The three-year, £17.2m project has delivered a significant contribution towards GM's environmental goals, including 22% of the 45 MW renewable energy generation target (by 2024).



Fig. 7 Rochdale Council's 5.5MW Chamber House Solar Farm will provide enough electricity that could power 2,000 homes.

Renewable and flexible energy supplies are the critical infrastructure that will unlock new models for using, selling and purchasing energy. The pioneering project has identified new business models and routes to market to maximise the

value from the electricity generated. This provides a blueprint that can be replicated across GM and nationally.

Aim 1: Our energy infrastructure is smart, flexible and fit for a low carbon, sustainable future

Key: Cost £ = £1-10k, ££ = £10-100k, £££ = £100k - £1m, ££££ = £1m-£10m, £££££ = >£10m Impact (on the Objective) H = High, M = Medium, L = Low

Direct Action	Lead	Enabling Actions	Lead	Cost	Impact
1. Objective: Increase renewable energy generation and energy storage installed					
Increase the capacity of local energy generation and storage across all domestic tenures	Social landlords, GMCA, LAs	Regional solar PV and battery offers deployed for all non-social housing settings and marketed to all	GMCA, LAs	££	M
		Develop financial mechanism and models to support the uptake of low carbon technology across social housing stock	GMCA, Social landlords, National Govt.	££	M
		Work with partners to actively review technological developments and legal barriers for all renewable energy and battery technologies.	GMCA	£	M
Increase the capacity of large scale renewable energy generation and storage including Solar PV and onshore wind.	ENWL, GMCA, LAs, Business	Undertake a rapid review of local bottlenecks for the deployment of low carbon technologies e.g. grid capacity and connections, planning constraints etc	National government, GMCA, LAs	££	H
		Review public sector opportunities for large scale grid connected renewable energy and storage and progress delivery models	GMCA, LAs	£££££	H
		In those areas where large scale renewables are viable, ensure that the public and landowners are engaged and informed	GMCA, LAs	£	L
Consider maximisation of onsite renewable energy generation and storage	Public bodies, Business, NGOs	Encourage and accelerate the integration of property level renewable energy and battery storage for business, community and public buildings (including schools)	GMCA, LAs	£££	H
	Business NGOs	Further roll out and increase awareness of the Bee Net Zero and Community Energy Funding programmes	GMCA	£££	M
Increase the retention of renewable energy generation profits in the region.	Business NGOs	Further capacity, technical and coordination support required on community energy projects providing more understanding, facilitation and exemplars	GMCA, LAs	££	M

2. Objective: Increase the resilience, capacity and flexibility of the electricity network and its users					
Embed Local Area Energy Plans into all relevant Local Plans, aligning to Climate Action Strategies/Plans	GMCA, LAs	Test the integration of Local Area Energy Plans into Local Plans and use learning to develop guidance for LAs on developing a Local Area Energy delivery plan	GMCA	££	H
Ensure that the electricity grid is able to meet the increasing demands resulting from electrification and increasing renewables and storage, in a timely and transparent way	ENWL	Work with the Regional Energy System Planner, National Energy System Operator and GB Energy to align action across multiple energy vectors	NESO, ENWL, SPEN, GMCA, Ofgem	£	H
		Invest in the electricity network & procure flexible services to ensure ENWL network has capacity to enable low carbon technologies, such as heat pumps, EV chargers, Solar PV & batteries to be connected	ENWL	£££££	H
		Increase stakeholder engagement and collaboration across Growth and Investment Zones, Net Zero Accelerator asset deployment and Places for Everyone to ensure that opportunities to embed low carbon growth and co-benefits are maximised	GMCA, LAs, DNOs, NESO	££	M
		Continue to explore the role that Local Energy Markets can play in providing flexibility and benefit locally.	GMCA, LAs, DNOs,	££	M
Promote the development of a connected, smart energy system with demand-side management and response	GMCA	Improve the connectivity of homes to enable participation in a smart energy system, for example through the roll out of local public/private networks	GMCA, LAs, Businesses, Social Landlords	£££	M
Inform and support residents to reduce costs by energy load shifting and exporting electricity at times when the local or national grid needs consumers to use more/less	ENWL	Procure 'flexible services' to incentivise households and businesses to use or export their electricity at times when the local electricity networks need less / more electricity to balance supply & demand	ENWL/SPEN	££	M
		Raise awareness to residents of energy tariffs that can take advantage of energy load shifting	GMCA, LAs	£	M
Support and enable the creation and rapid adoption of innovative solutions and technologies to accelerate decarbonisation.	Business, GMCA, LAs	Promote the Energy Innovation Agency to raise awareness and the grow end user pool, encouraging public and private stakeholders to use their assets to support trials and commercialisation	Public/Private Stakeholder	££	M

3. Objective: Increase the number, generation capacity and level of operational heat networks					
Finalise heat network zoning policy approach and agree local GM delivery method for this.	National Govt, GMCA, LAs	Work with Government to include Heat Networks within the devolution agreement	GMCA, National govt.	£	H
		Review and implement the heat zoning policy once finalised by central Government, putting in place the resource/team needed to deliver the Zone Coordinator role	GMCA	££	H
Facilitate and support the development of the heat network pipeline and delivery of heat network schemes.	GMCA, LAs	Conduct concept/ feasibility studies to identify the potential for heat networks. Identify and progress suitable delivery models to deliver priority schemes	GMCA, LAs	£££££	H
Heat intensive industries need to consider use of their waste heat for utilisation in heat networks	Business	Identify and support the integration of waste heat sources as part of heat network infrastructure development	Government, LAs and Businesses	££	M
4. Objective: Increase installed capacity and use of low carbon hydrogen					
Support the generation, distribution and usage of low carbon hydrogen, following the 'hydrogen use hierarchy'	Business, GMCA, LAs	Support the development of a pipeline of low carbon hydrogen demand for Phase 1 of Trafford Energy Park	GMCA, LAs	£	L
		Investigate, identify and support the development of suitable test sites for low carbon hydrogen off-take usage	GMCA, Businesses, LAs, H2 suppliers	£££	L
		Promote, support and encourage the roll out of low carbon hydrogen infrastructure and supply, subject to viability tests	GMCA, LAs	££££	L
		Investigate and support feasibility pilots for hydrogen fuel cell deployment on suitable sites and assess the feasibility for wider roll out.	GMCA, Businesses, Universities, MIDAS	££££	L

Aim 2: Our buildings are sustainable and energy efficient

Objectives:

- Increase the number of homes retrofitted.
- Increase the number of public and commercial buildings retrofitted.
- Increase the number of low carbon heating systems installed.
- Ensure all new developments are net zero carbon and sustainable.

Targets for 2030:

- Retrofit 60,000 homes (491 mtCO₂e)
- Retrofit 650 public sector buildings (347 mtCO₂e)
- Retrofit 11,000 commercial buildings (154 mtCO₂e)
- Install 64,000 low carbon heating systems across GM (54,000 domestic, 10,000 public/commercial) (3,626 mtCO₂e)

These targets align with the graphs in Section 5 (Emissions Pathway) of the report. The carbon savings shown above represent the total lifetime emission savings.

The Challenge

Greater Manchester's buildings currently emit 42% of the city region's total emissions with ~30% coming from homes and a further ~12% from how businesses heat and cool their buildings. Improving the energy efficiency and reducing the energy demand from heating and cooling buildings will be critical to meeting our carbon neutral goal. It will also be a significant contributor to our Housing First work on standards to ensure that everyone in Greater Manchester has a home they can afford, which is safe, healthy and environmentally sustainable. To meet this aim, we will need to significantly scale up the retrofit of existing homes and buildings enabling property owners and landlords to invest. We also need to deliver operational net zero new build, as outlined in Places for Everyone and future national net-zero standards, alongside developing Truly Affordable Net-Zero Housing (TANZ). It is important to consider embodied carbon and the wider environmental impacts of our buildings through the planning system, particularly on air quality, water consumption, biodiversity and the move towards a circular economy.

Out of the 1.2m homes in Greater Manchester the Local Area Energy Plans identify that 887,000 will require some form of retrofit. Approximately, 250,000 of these are social homes and 63,000 of these need to be elevated to at least an EPC C by 2030. Commercial and public buildings are also a significant part of the buildings that need decarbonising. Of the 2,700 public buildings in GM, most will require some form of retrofit but around 13% have already been tackled. There are almost 50,000 commercial buildings across Greater Manchester which will all need some form of retrofit, but the largest 7% make up over half of all emissions. There is a significant scale of funding needed to tackle the retrofit challenge, with an estimated £27bn needed for homes and a further £24bn for commercial properties. Our targets reflect the projected investment primarily across the public and social housing stock; to meet the challenge we will need to enable and encourage significant activity by property owners, landlords and businesses.

Actions Required to Deliver Objectives

5) Increase the number of homes retrofitted - Improving our housing stock to be more energy efficient remains our priority for action. The scale of the challenge is considerable so there is a need to focus our investment on the worst performing homes and those most in need, particularly in the rented sector, whilst also embedding climate resilience and enabling able-to-pay homeowners to invest in their property with confidence. We will work across tenures to enable greater energy efficiency for fossil fuel free heating systems to work efficiently and encourage the uptake of energy efficient appliances by households.

6) Increase the number of public and commercial buildings retrofitted – there is still a lot to do to ensure that the public estate is fit for the future. We will work with our Local Authorities and wider public sector building owners to plan and prioritise the worst performing buildings, encourage the removal of fossil fuel heating systems and the adoption of low carbon heating systems, including connections to new heat networks.

Many commercial landlords are already seeing the benefits of improving the energy efficiency of their buildings. We need to build on this to accelerate the adoption of higher standards and enabling financial mechanisms, particularly for our largest and worst performing buildings. We need to help SMEs to access impartial, tailored support to help them to decarbonise their buildings and use energy more efficiently.

7) Increase the number of low carbon heating systems installed – Transitioning away from fossil fuel heating is a priority as it overcomes a key challenge to decarbonisation through both retrofit and new build. In areas where district heat networks are unlikely to be prioritised, this will need to be delivered through individual low carbon heating installations, especially air source heat pumps. We will work with residents and social landlords and public sector owners to promote and enable low carbon heating, and work with the supply chain to ensure that a range of solutions are available to suit different needs.

8) Ensure all new developments are net zero carbon and sustainable – to ensure we do not have to retrofit new buildings; we will continue to use the Planning and Building Control system to accelerate the adoption of high standards for new and refurbished buildings. We will also use our influence and lead by example in new public buildings and in our growth priority areas through working with developers to adopt higher sustainability standards (e.g. PAS2080), including the delivery of Truly Affordable Net-Zero Housing. We also need to better understand and factor in embodied carbon in new and refurbished developments.

Links to other 5YEP aims

This aim links strongly to Aim 8 in supporting sustainable growth through local supply chain and skills development to meet the scale of the retrofit and low carbon new build opportunity. Whilst improving energy efficiency homes and buildings, there is also the opportunity to address other aims of the Five Year Environment Plan. Biodiversity can be increased through measures such as green roofs and green walls on buildings, waste from building materials can be reduced by moving to a circular economy model. In the retrofitting of properties, there are also opportunities to and increase energy generation through rooftop renewables and linking to heat networks. Replacing natural gas and other fossil fuels as a heat source will contribute towards the improvement in both indoor and outdoor air quality.

Co-benefits (e.g. health, cost saving etc.)

Improving the energy efficiency of housing is a core element of our ambition to provide safe, secure, healthy and more affordable homes across Greater Manchester. This ambition, in turn, provides the foundation for improving the health of residents and the well-being of our communities. Insulated, warm homes which are well ventilated will help reduce the health burden from damp and mould in homes. Energy efficiency is also important in tackling the cost of living for residents, reducing energy costs for businesses, and minimising the renewable generation required for the transition. Reducing energy use in public buildings will also have benefits for public service delivery costs across Greater Manchester.

Co-enablers (factors that will enable delivery e.g. finance, skills, national government)

Access to finance, developing the supply chain, and consumer awareness and confidence are the key enablers of the retrofit challenge. We will need to leverage significant funding above the level currently provided by government, energy companies and matched funds from our social landlords to achieve the scale of retrofit activity required. We will also need to provide confidence and encouragement to homeowners and the private property sector, including developing innovative delivery and financial models to assist. The cost of retrofit needs to decrease through innovation of technology, new business models and increased competition. The retrofit supply chain needs to be supported for growth and training in new technologies. The government could further support our ambitions through embedding higher standards into planning, building regulations, and minimum energy efficiency standards and enforcement in the rented sector.

Case Study 2 – Social Housing Decarbonisation Scheme

A major milestone was passed at the end of 2023, as energy saving home upgrades were completed to over 1,000 social homes across Greater Manchester, helping make them warmer, cheaper to heat and less harmful to the environment. The 1,000th home to receive improvements was managed by Six Town Housing in Bury. The property is now benefiting from a variety of measures, including cavity wall insulation, loft insulation and an insulated loft hatch, smart ventilation to tackle damp and mould, LED lighting, roof-mounted solar PV, and battery storage, all helping ensure residents have a warm and comfortable home.

Over 6,300 social homes in total across Greater Manchester are receiving energy efficiency improvements through the Social Housing Decarbonisation Fund, after the city-region was granted secured £45m from the first two waves of the fund. The Government funding – granted by the Department for Energy Security and Net Zero (DESNZ) – is in addition to a further £68m match funding from partners.

These works will lead to estimated benefits including:

- Annual energy savings of 30,973,737 kWh for the city-region
- Average annual bill saving of £276.78 per home
- Over 3,500 jobs and 60 apprentices supported in Greater Manchester



Fig 8. Six Town Housing Retrofit

Six Town Housing are one of 19 Housing Provider partners of the GMCA-led consortium working on the Social Housing Decarbonisation programme. All homes will be completed by September 2025, with improvements being made to social housing in every district of Greater Manchester.

DRAFT

Aim 2: Our buildings are sustainable and energy efficient

Key: Cost £ = £1-10k, ££ = £10-100k, £££ = £100k - £1m, ££££ = £1m-£10m, £££££ = >£10m Impact (on the Objective) H = High, M = Medium, L = Low

Direct Action	Lead	Enabling Action	Lead	Cost	Impact
5. Objective: Increase the number of homes retrofitted					
Improve the energy performance of social housing focusing on the worst performing	Social landlords	Work with social landlords to access government and private finance for retrofitting social homes	GMCA, LAs	££££	H
		Establish grant schemes from a devolved integrated settlement fund for retrofit, which also aligns with our Housing First and health priorities locally.	GMCA	££££	H
		Support social landlords to agree a uniform specification for key technologies, underpinning the potential for collaborative or forward procurement exercises	GMCA, LAs	££	M
		Complete research into how more benefit can be secured from EPC data	Academia	££	L
		Support large-scale housing retrofit projects to connect to the network	ENWL	£££££	H
		Expand the Feel the Benefit Portal and online advice to include procured and quality assured retrofit delivery partners	GMCA	££	M or H
		All residents should consider investing in actions which enable fossil fuel free heating systems to work efficiently	Residents	Work with employers to promote and support their staff to reduce their home energy bills, incorporating it into wider staff benefit schemes.	Businesses, LAs, GMCA
Support residents to invest in properties by expanding 'Willing to Pay' retrofit service	GMCA, LAs			££	H
Deliver warm home prescriptions to households most in need.	NGOs			££	L

		Ongoing consumer research into household preferences and choices and implementation of support schemes underpinned by this evidence	Academia, GMCA	££	L
		Upskill retrofit assessors and installers to provide enough supply to meet demand	Colleges & Training Providers	££££	M
All residents should consider upgrading to more energy efficient products when replacing household appliances.	Residents	Raise awareness and deliver marketing to educate residents on the scope and benefits of energy efficient appliances	Businesses	£££	M
Support the creation of a range of retrofit finance offers to support property owners to retrofit their homes.	GMCA, LAs	Pilot projects to develop or trial offers and green finance support mechanisms with willing public and private stakeholders and roll out more widely if feasible	GMCA, LAs	£££	M
		Work with Government, GB Energy, and High Street and institutional lenders to identify and support private investment	National govt., GMCA	££	H
Improve the energy efficiency of the private rented sector	GMCA, LAs, Private landlords	Establish the ability for setting higher Minimum Energy Efficiency Standards	National govt., GMCA	££	H
		Explore the potential for the Good Landlord Charter to influence residential landlords to increase energy efficiency standards.	GMCA	£	L
6. Objective: Increase the number of public and commercial buildings retrofitted					
Remove fossil fuel heating systems from the public estate	GMCA, LAs, GMP, GMFRS, NHS & wider public bodies	Pilot the creation of a costed estates wide plan to decarbonise all assets under direct GM local government influence	GMCA, LAs	££	M
		Pilot the creation of a costed plan for replacing any fossil fuel heating systems which are approaching their end-of-life with a low carbon system, for owned public buildings	GMCA, LAs	££	M
		Facilitate willing public bodies to adopt and implement estate wide decarbonisation plans	GMCA, LAs	£££££	H

		committing to operational carbon neutral by 2030			
		Pilot the creation of a costed plan for implementing enabling works to prepare for a future low carbon heating system (for buildings whose boilers are not end of life)	GMCA, LAs	££	M
All public building with an EPC/DEC below a C to consider energy efficiency improvements by 2028	GMCA, LAs, GMP, GMFRS, NHS	Research and develop an approach to retrofitting LA-controlled schools of DEC/ EPC of D or below, considering existing frameworks and approaches	National govt.	££	H
		Establish a GM-wide Retrofit Framework for procurement to the delivery of public sector building retrofit measures considering inclusion of smaller suppliers	GMCA, LAs	££	M
All new buildings should have low carbon heating systems installed	GMCA/LAs	Prior to the Future Buildings Standard being implemented, establish a plan for no more fossil fuel heating systems to be installed in all new public buildings and for all new development to consider a connection to a heat network.	GMCA, LAs	£	M
All building retrofit activity should be designed to avoid future over-heating risks	GMCA/LAs	Consider cooling (passive and active solutions) as part of all building retrofit works to avoid future over-heating risks	GMCA, LAs	£	L
All commercial buildings with an EPC/DEC below a C to consider energy efficiency improvements by 2028	Business	Provide support through the Bee Net Zero programme	Business Board, Growth Company	££	L
		Develop a cohort of willing public bodies, to commit to transition their leased estate to buildings being DEC/EPC C and above from 2028	GMCA, LAs	£	M
Work with existing and new Business Improvement Districts to sign up to a voluntary improvement standard (e.g. NABOR).	Business	In areas where there is need and viability to require development to enhance environmental and low carbon building standard, establish voluntary enhanced building standards to be signed up to as part of Business improvement Districts	GMCA, LAs	££	M

Facilitate the creation of financial models to enable buildings to be retrofitted	Business	Embed the requirements for commercial sector and public sector buildings into the financial and delivery models of the net zero accelerator	GMCA, National govt., private sector	££	H
7. Objective: Increase the number of low carbon heating systems installed					
All residents with fossil fuel heating systems should consider replacement with a heat pump or low carbon heating system.	Residents	Promote national incentives, such as the Boiler Upgrade Scheme	GMCA	££	M
		Consider the impact of the Clean Heat Market Mechanism, if implemented, and work with market actors to promote heat pump deployment.	GMCA, LAs, Businesses	££	M
		Provide support and guidance for householders on ASHP installations and for Environmental Health Officers to use in Planning Permission/Permitted Development.	GMCA	£	M
All landlords providing social rented property develop and implement plans to move towards only replacing high carbon heating sources with low carbon heating sources.	Social landlords	Support those LAs and landlords who are currently not willing move away from fossil fuel heating systems, to catalyse this move using the learning from those that have adopted low carbon heating, including lived experience of residents.	GMCA, LAs	££	H
		Work with willing social landlords and LAs with social housing stock to agree an immediate policy shift away from the installation of fossil fuel heating in social homes and raise awareness of the benefits of doing so.	GMCA/RPs/LAs	££££	H
		Continue to build, test and deploy innovative low carbon technologies and market offerings to encourage take-up.	GMCA	££	M
Where feasible, replace end of life heating systems in schools with low carbon heating.	LAs, Schools	Create forward replacement plans and identify funding streams to cover additional cost where needed, including potential devolved funding.	LAs, Schools, GMCA	££££	H

8. Objective: Ensure all new developments are net zero carbon and sustainable					
Use the Planning and Building Control system to accelerate the adoption of high standards for new development and refurbished buildings.	LAs, GMCA	Support the environmental policies in Places for Everyone, through producing additional guidance for planners and developers on embodied and operational net zero, water and resource efficiency, and sustainable construction.	GMCA, LAs	££	H
		Use our influence and lead by example in our growth priority areas through working with developers to adopt higher standards.	GMCA, LAs	££	H
		Deliver 10,000 truly affordable net zero homes (TANZ) as part of our Housing First agenda.	GMCA, LAs	£££££	H
		Explore the potential to incorporate PAS2080 standards, carbon management plans, and other environmental standards into all public investment		££	M
		Use the Embodied Carbon Calculator developed for GMCA by UoM to specify and procure retrofit and new build materials with the least embodied carbon impact.	GMCA, LAs	££	H

Aim 3: Our transport system is reliable, integrated, inclusive, affordable and enables sustainable travel.

Objectives

- Establish a long-term strategy and detailed delivery plan for an integrated transport system by 2027.
- Deliver an integrated transport system to enable the GM population to switch to active/public transport.
- Support the transition to electric mobility.
- Deliver policies and programmes that make sustainable transport and travel as attractive as possible.
- Support communities and business to adopt more sustainable travel habits.

Targets to 2030

- LTP (Local Transport Plan) Delivery Plan and Local Implementation Plan formal adoption by Dec 26 followed by annual progress reports
- Increase GM population with GM Accessibility Level (GMAL) 4 or better
- 50% of all journeys in GM are made by Public Transport/Active Transport by 2040 (no net-growth in motor vehicle traffic over that period)
- Increase the % of journeys that do not emit any greenhouse gases or air pollutants from their use
- Increase % of people find it easy to use different forms of transport in one journey in GM

Note: Transport measures, KPIs and targets will be revised via the 2040 refresh process through 2024 and 2025.

The Challenge

In Greater Manchester, surface transport is responsible for about 31% of greenhouse gas emissions, and most of that (98%) comes from the internal combustion engines of cars, vans, heavy goods vehicles (HGVs) and a relatively small amount from buses. The replacement of fossil fuelled buses with Zero Emission Buses (ZEBs) in Greater Manchester will reduce emissions from buses to zero at the exhaust and eventually zero carbon as the national grid and local generation decarbonises. Rail and Metrolink trips account for a fraction of the total (<2%) due to high (or full) levels of electrification with Metrolink trips being the most carbon efficient public transport mode.

In 2023, the total number of trips made by GM residents across all types of travel was 5.6m per day and each GM resident made 2.0 trips per day. Whilst this is lower than the 2.3 trips per day between 2017-2019, it represented a continued recovery from the record lows at the height of the pandemic. Early indications for 2024 indicate that the total trips made per day per GM resident will exceed the 2.0 recorded in 2023.

The greatest challenge is in reducing emissions from private vehicles. The number of daily car/van trips by GM residents in 2023 was broadly in line with the period 2017-19 (2.2m daily car/van trips). The mean length of car/van trips by GM residents has increased to 8.5km in 2023, up 5% from the 2017-2019 period. This has led to GM resident car/van person kms over 2023 reaching 103% of the

2017- 2019⁷ level. There is no clear evidence to suggest that the total daily car/van person kms associated with GM residents is about to decline. The lower median length of car/van trips by GM residents of 3.7km in 2023 indicates that there are a large volume of short car/van driver trips that make up a comparatively small proportion of the overall distance travelled. Trips of 2km or less have the most potential to be completed by sustainable modes.

Since the early 2010's there has been a series of projects to electrify rail lines in Greater Manchester, which allows the conversion of diesel traction to electric. The government plans to phase out diesel only trains by 2040, the expectation is this will drive investment in new train fleets that utilise alternative technologies such as battery, hydrogen, and bi-mode capability to operate on non-electrified lines.

Actions Required to Deliver Objectives

9) Establish a long-term strategy and detailed delivery plan for an integrated transport system by 2027 - Our Local Transport Plan (LTP) is a statutory document that sets out our long-term ambitions for transport. It includes the Greater Manchester Transport Strategy 2040 (GMTS2040) which sets out our ambitions, policies and interventions to deliver our vision for transport in 2040 and our Five-Year Transport Delivery Plan (2021-2026) which sets out more detailed delivery proposals, a spending plan and monitoring of the performance of transport delivery programmes. A refresh of the GM Transport Strategy 2040 and a new Delivery Plan for 2027-2032 is underway. The latter will be the mechanism by which limited funding for transport initiatives will be prioritised. At the same time, we will lobby Government for additional funds and national measures which generate accelerated change.

10) Deliver an integrated transport system to enable the GM population to switch to active/public transport - A major part of achieving a carbon neutral city region by 2038 and reducing our operational carbon footprint, will be moving to a public transport fleet (e.g. buses, trams, and public maintenance vehicles) with zero emissions from tailpipes. We will grow and improve the existing Bee Network and work with local partners to improve local rail stations and services. GMTS (Greater Manchester Transport Strategy) 2040 sets out our ambition for a world-class integrated transport network and covers how we will:

- improve walking, wheeling, cycling and public transport;
- support the transition to electric mobility;
- manage traffic and parking;
- collaborate with developers to integrate new developments into the sustainable transport network;
- support economic growth and social inclusion; and
- reduce air pollution and greenhouse gas emissions.

11) Support the transition to electric mobility - One of the key strategies to decarbonise transport is to promote the switch to electric vehicles (EVs), enabled by the deployment of electric charge points across the region. Electric charge points are essential to support the growth of EVs and to ensure that drivers have convenient and reliable access to charging facilities. A lack of charging points has been cited⁸ as a key barrier for businesses and individuals in switching to an electric vehicle. An

⁷ TfGM, GM TRADS 2017-19, 2023)

⁸ (GM Clean Air Plan Conversation May/June 2019)

acceleration of the transition to EVs is therefore more likely to be delivered if vehicle owners are confident that they will have access to electric vehicle charging infrastructure (EVCI).

Rail Operators have plans for the replacement of the old diesel trains used on local services which are between 30-40 years old, and both Northern and TransPennine Express are looking for new bi-mode trains. Some freight operators are introducing bi-mode and tri-mode locomotives, but the lack of full electrification is a barrier to faster adoption of sustainable traction. GM will continue to encourage the rail industry to decarbonise its fleet through investment in electrification, replacing diesel trains through bi- or tri-mode trains and removing diesel operation under electrified lines. This will include working with and seeking opportunities for promoting and facilitating initiatives to move freight from road-to-rail, such as National Rail's 'Express Freight'.

12) Deliver policies and programmes that make sustainable transport and travel as attractive as possible - Achieving carbon reduction in the transport sector will require a major shift in attitudes towards car use, and improved options for public transport and active travel that enable permanent changes in travel choices. The GMTS (Greater Manchester Transport Strategy) 2040 seeks to enact this shift by creating and delivering policies that make sustainable transport and travel as attractive as possible, such as improving infrastructure and services. Improved travel choices also cover public awareness and educational or training programmes that enable individuals to adopt more sustainable travel habits such as cycling, walking, using public transport and car-pooling. We need as many businesses as possible to adopt policies to encourage their customers and employees to use sustainable transport modes and, in particular, our logistics companies to reduce the environmental impact of their sector.

13) Support communities and business to adopt more sustainable travel habits - As part of our vision for transport we have set a 'Right Mix' target to reduce the share of total trips made by car to no more than 50%, with the remaining 50% made by public transport, walking and cycling. This will mean approximately one million more trips each day using sustainable transport modes in Greater Manchester by 2040 enabling us to deliver a healthier, greener and more productive city-region. Listening and responding to what communities and business feel about and need from sustainable transport modes is a key part of enabling the required levels of behaviour change and TfGM's process of network reviews will help to facilitate this.

Links to other 5YEP Aims

Transport and transport infrastructure requires energy to process and transport people, goods and materials and to construct and run facilities and assets. Carbon associated with transport infrastructure can be mitigated through intelligent design, selection of sustainable materials and improving the efficiency of construction and operational processes. Additionally, the risk of flooding can be reduced by embedding sustainable drainage into its design. Green infrastructure and biodiversity can also be increased through measures such as greening walk routes and cycleways. Transport is a source of air pollution which is discussed at Aim 7.

Co-benefits (e.g. health, cost saving etc.)

Our transport system has a major impact on people's health. Our network provides access to healthcare and other services, to visit friends and family and reduce social isolation, and links them with green spaces. Transport interventions can improve the health of Greater Manchester's residents by:

- Increasing levels of physical activity
- Reducing pollution from motor vehicles
- Reducing road traffic collisions
- Improving access to health care and reducing social isolation.

The transport system also plays a vital role in creating a fairer and more prosperous GM. For those without access to a car, the availability of public transport or active travel may determine whether they can access jobs or training or attend medical appointments without having to use more costly individual travel options. This can be a particular issue for people working in the night-time economy. An improved, more accessible, inclusive and affordable public transport network can support social mobility for everyone in Greater Manchester, encouraging those with cars to make more sustainable travel choices and providing sustainable access to increased opportunities for those without.

Co-enablers (factors that will enable delivery e.g. finance, skills, national government)

Achieving carbon reduction in the transport sector will not be easy and will require:

- Stable and sufficient funding to support the planning, implementation and maintenance of transport infrastructure and services.
- Coordination and collaboration among different transport stakeholders to align their goals, interests and expectations and resolve potential conflicts.
- Innovation and adoption of new technologies and practices that can enhance the efficiency, reliability, safety and sustainability of transport systems, such as smart mobility, low-carbon vehicles, digital platforms and data analytics.
- Capacity building and skills development for the transport workforce and users, to enable them to adapt to changing transport needs and demands, and to foster a culture of active travel and social inclusion.

To date, the government has not set any targets or policies to reduce car dependency and car journeys.

Case Study 6 of Existing Projects – Bee Network

Greater Manchester is rolling out the Bee Network – a joined up, sustainable transport network helping people rethink the way they travel. By better connecting people with places, we're reducing congestion and carbon emissions, improving air quality, health and well-being – and supported the local economy.



Fig. 9 – Bee Network ULEV

As of January 2025, all buses in Greater Manchester are under local control as part of the Bee Network. Journeys by bus, tram and active travel – walking, wheeling and cycling – are already much better connected. And we're running more zero and low emission buses across Greater Manchester, with plans for a zero-emission bus fleet by 2030.

Key local rail services are set to join the Bee Network by 2028, while Metrolink trams run to 99 stops, carry millions of people every month and emitting no local air pollution. We're also building the largest active travel network in the UK to make walking and cycling the first choice for shorter journeys, with a growing bike hire scheme.

By making it easier for people to reduce car use, Greater Manchester is aiming for 50% of trips to be made by public transport, walking and cycling by 2040. That's around one million more trips each day using sustainable transport on the Bee Network.

DRAFT

Aim 3: Our **transport** system is reliable, integrated, inclusive, affordable and enables sustainable **travel**.

Key: Cost £ = £1-10k, ££ = £10-100k, £££ = £100k - £1m, ££££ = £1m-£10m, £££££ = >£10m Impact (on the Objective) H = High, M = Medium, L = Low

Direct Action	Lead	Enabling Action	Lead	Cost	Impact
9. Objective: Establish a long-term strategy and detailed delivery plan for an integrated transport system by 2027					
Develop an updated Greater Manchester Local Transport Plan (LTP) and supporting strategies	TfGM/LAs	Refresh the GM Local Transport Plan (LTP) (including Transport Strategy 2040)	TfGM, LAs	£££	H
		Develop the next LTP Transport Delivery Plan (2027-2032)	TfGM, LAs	£££	H
		Develop GM plan for Northern Powerhouse Rail and high-speed rail	TfGM	£££	M
		Develop School Travel Strategy.	TfGM	££	M
Secure funding to support the planning, implementation and maintenance of transport infrastructure and services	GMCA/ TfGM	Secure revenue development funding (e.g. City Region Sustainable Transport Settlement (CRSTS), Trailblazer, Single Settlement) development funding	TfGM	££	H
		Prepare infrastructure pipeline proposals for the 2027-2032 investment period	TfGM	£££	H
Lobby government for national policies that generate change	TfGM/LAs	Develop national policies that introduce economic incentives for businesses and individuals to reduce their carbon emissions	National Government	£££££	H
10. Objective: Deliver an integrated transport system to enable the GM population to switch to active / public transport					
Grow the Bee Network so that more people in GM have access to quality public transport and active travel	TfGM	Extend Metrolink Trafford Park line service through the city centre	TfGM	£££	M
		Deliver Nighttime transport pilot	TfGM	££££	M
		Produce Bike Hire development and expansion plan.	TfGM	£££	M
		Deliver Bee Active Routes, Bee Network crossings and walking and wheeling improvements at junctions	TfGM, LAs	£££££	H
Improve the Bee Network	TfGM	Add passenger information displays to interchanges and bus stops and audio-visual announcements on buses.	TfGM	££££	M

		Implement multi modal fare capping, flattened fares and hopper fares.	TfGM	£££££	H
		Strategy, planning and development for the short, medium and long-term future of Metrolink. This includes new stops, lines and extensions, the next generation vehicle fleet to follow on from our M5000 trams, the tram-train Pathfinder, and examining underground metro options	TfGM	£££££	L
		Provide journey planning tools and information to encourage mode shift in order to make the most efficient use of available capacity (particularly during peak periods).	TfGM	£££	M
		Complete Metrolink city centre track renewals, tram management system server renewal, fibre optic network renewal, and customer-facing asset renewals (lifts etc.) Enhancements / upgrades at some stops	TfGM	£££££	L
		Deliver highways works that will improve bus performance.	TfGM	£££££	M
		Deliver bus stop enhancements programme to improve waiting facilities at stops	TfGM	££££	H
		Integrate Travel Safe Support and Enforcement Officers (TSEO) across Bee Network.	TfGM	££££	H
Work with GM local authorities and partners to improve local rail stations and services	TfGM	Deliver two accessible rail stations.	TfGM	£££	M
		Incorporate agreed commuter lines into the Bee Network, introduce Pay-As-You-Go capabilities along some rail routes, co-branding GM rail stations.	TfGM	££££	H
11. Objective: Support the transition to electric mobility					
Make the switch to electric vehicles (EVs)	Business/ Residents /Public bodies	Develop a fleet decarbonisation plan	GMCA, GMFRS, GMP, LAs	££	H
		Work with electricity suppliers and network operators to assess demand and capacity	TfGM	££	M

		Aim for 100% of company cars to be EVs	Business	£££££	H
Increase deployment of electric charge points (ECPs) across the region	Business	Deliver programmes for publicly accessible EV chargers, on-street charging e.g. LEVI	TfGM/LAs	£££££	H
		Install EV chargers in all company car parks	Business	£££££	M
Electrify the rail fleet	Rail industry	Invest in electrification, replacing diesel trains and removing diesel operation under electrified lines	Rail industry	£££££	H
12. Objective: Deliver policies and programmes that make sustainable transport and travel as attractive as possible					
Make our streets safe and accessible for all	TfGM/LAs	Vision Zero Strategy Published (approach to road danger reduction)	TfGM	££	L
		Vision Zero Action Plan developed. (approach to road danger reduction)	TfGM	£££££	H
		Investigate enhanced roadworks permit scheme for greater coordination and control	TfGM, LA's	££££	H
		Develop highway design through our Streets for All Strategy to ensure the integration of green and biodiverse assets into our streets	TfGM, GMCA	£££	H
GM logistics companies, businesses and other organisations to reduce the environmental impact of logistics.	Business	Advocate, support and facilitate GM logistics move to zero emissions fleets.	large orgs and retailers	££	H
		Consider consolidating deliveries/trips to reduce distance travelled and to switch to cleaner vehicles or cargo bikes for last mile deliveries or short journeys, keeping HGV's out of the district centres	Businesses	£££££	M
Businesses to enable and encourage their consumers and employees to use sustainable transport modes.	Business	Encourage cycle to work scheme take up and improve active travel facilities	Businesses	££	M
		Prioritise access and parking points for those using sustainable modes	Businesses	£	L
		Reduce business travel by using online opportunities wherever possible	Businesses	£	L
		Consider parking policies in areas well served by public transport	Businesses, Universities, LA's	££££	H

13. Objective: Support communities and business to adopt more sustainable travel habits					
Individuals to adopt more sustainable travel habits	Residents	Ensure communities are aware of the changes they can make to adopt sustainable lifestyle choices	GMCA, TfGM	££	L
Businesses to enable and encourage their consumers and employees to use sustainable transport modes.	Business	Support messaging around sustainable travel benefits on leisure journeys.	TfGM	££	L
		Promote the use of cleaner travel by employees, by subsidising the cost of or promoting public transport and active travel.	Businesses	£	L
		Reward customers/members who travel sustainably through ticket prices, perks (e.g. fast track entry) or conversely charge for parking when alternatives are available.	Businesses	££	M
Improve our understanding of the diverse needs of Greater Manchester residents, visitors and businesses are considered in the delivery of an integrated transport system to reduce transport inequality	GMCA/TfGM/LAs	Gather data and feedback from and enable diverse communities to co-design and influence the transport system.	TfGM, LAs	£££	M
		Address the barriers that may make it hard to participate	TfGM, LAs	£££	H
		Conduct research and evaluation activity and share insight from these to develop our integrated transport system	TfGM	££	M

Aim 4: Our natural environment is enhanced providing benefits for people, economy and nature.

Objectives

- Expand and enhance our best spaces for nature
- Better connect our best spaces for nature by creating and restoring habitats
- Reduce pressures on our water environment
- Increase the amount of green and blue spaces (parks, countryside, public realm etc.) that are better managed for nature
- Increase the number of green and resilient transport routes, streets & highways
- Increase the amount of green and resilient new infrastructure, regeneration and development
- Increase the amount of community-led action and better connection to nature

Targets by 2035

- Increase the amount of land designated for nature from 11% to 15%
- Bring 50% of our Local Wildlife Sites into active management
- Work towards the restoration and creation of 1,800ha of wildlife-rich land
- Increase our tree canopy cover from 16.5% to 18.5%
- Target the delivery of new wildlife-rich land and tree planting within the Nature Network
- Increase the number of residents living within 15mins of a decent green space

Note: Targets are subject to agreement of the Local Nature Recovery Strategy which is currently out for consultation.

The Challenge

Greater Manchester is facing a biodiversity emergency. Individual bird species have declined by up to 40% over the last 40 years and populations of common mammals have dropped by between 20-40% since 1995, mirroring national declines. Despite providing important refuges for wildlife, areas designated and protected for nature only cover 11% of the city-region's land area and these spaces are fragmented and not in as good a condition as they could be. This means nature is confined to smaller parts of Greater Manchester and does not have the space to recover. It also means people have fewer opportunities to connect with nature. Once published, our statutory Greater Manchester Local Nature Recovery Strategy will set out our long-term approach to halting and reversing these declines, and at the same time providing wider benefits for our residents and businesses. The Strategy will set out our ambitions for creating a Nature Network in Greater Manchester, making space for nature to recover.

Nature is also under increasing pressure. Over 80% of our waterbodies have been changed by human activities – being buried or built over and now running below our streets – and there are over 1000 barriers to fish movements along them. None of our waterbodies are in good ecological condition, despite improvements made over the past 40 years. Invasive plant species are also causing problems along the banks of our rivers, streams and canals. Nearly 800 storm overflows cause water pollution when they spill, an issue exacerbated by drainage infrastructure having to deal with the increased volumes and speed of run-off of water as our city-region's changing land use has made it more impermeable to rainfall. Unavoidable climate change will exacerbate these issues and add to these pressures. All this means that the benefits people, businesses and our communities get from the natural environment are under increasing threat.

Many Greater Manchester residents lack access to high quality green spaces and an estimated third do not live within 15 minutes of green space (a national standard for green space access). There is also a disparity in access with people who experience multiple inequalities tending to live in areas with less green space, making it harder for them to benefit from nature. Even where people live close to green space, there may be other social barriers to people using these spaces. Redressing these disparities will lead to more health and wellbeing benefits from nature in the communities that most need them.

There are opportunities to create more space for nature, and at the same time bring benefits to people and our economy. This includes the following:

- Creating more nature-rich green spaces - integrating nature into land used for amenity and recreation (including parks and green spaces, playing fields and golf courses) provides opportunities to connect more people with nature, bringing more health and wellbeing benefits.
- Greening streets - 13% of land in GM forms transport routes, like train/Metrolink lines and streets. These provide opportunities to integrate nature alongside new and existing infrastructure, and to use nature to help us adapt to climate change by slowing the flow of water through Sustainable Drainage Systems or provide shading through street trees, making them better places to walk and cycle.
- Greening gardens – 15% of land in GM is made-up of residential gardens, although half of this space is estimated to be hard standing (i.e. paved or concreted over), which as well as being bad for wildlife, leads to rainfall running more quickly into the drainage system. Making gardens (and also balconies, alleyways and window ledges) more wildlife friendly and able to store water has benefits for nature and can reduce the risk of flooding nearby.
- Integrating nature alongside food production – making space for nature alongside agriculture provides environmental benefits as well as diversifying income (e.g. through nature-friendly farming grants) for farmers.

Bringing nature into all these spaces is the scale of change required to halt and reverse the decline in biodiversity and safeguard the benefits our residents and economy get from the natural environment.

Actions Required to Deliver Objectives

14) Expand and enhance our best spaces for nature – we will work with landowners and partners to continue to protect and increase the 11% of our city-region that is designated in some way due to its value for nature to further enhance the condition of these areas through active management. These sites provide vital refuges for wildlife and are the core of Greater Manchester's Nature Network.

15) Better connect the best spaces for nature by creating and restoring habitats – these sites also need joining up to one another, through corridors or stepping stones for nature. We will work with landowners to restore and create habitats where they are most needed to provide more space for nature and build the resilience of our Nature Network.

16) Reduce pressures on the water environment – our rivers, canals and other waterbodies are being placed under increasing pressure, particularly from pollution, agricultural intensification and invasive species, all exacerbated by the increasing impacts of climate change. We will work with Utilities, Environment Agency and Environment Agency to deliver our Integrated Water Management Plan with a focus on engaging landowners, businesses and residents to reduce direct and diffuse pollution entering our waterbodies and reduce the risk of water shortage and flooding through improved water management measures.

17) Increase the amount of green and blue spaces (parks, countryside, public realm etc) that are better managed for nature – Residents with gardens and landowners will need to manage existing spaces that are managed for other reasons (e.g. for recreation) in a way that makes them more nature-friendly, whilst still allowing them to perform their primary purpose. Increasing the advice and support available to them will enable and encourage this measure.

18) Increase the number of green and resilient transport routes, streets & highways – streets provide routes to bring nature into our cities and towns and bring nature closer to people. Transport infrastructure providers will need to increase features like street trees and Sustainable Drainage Systems also help adapt our streets to the impact of climate change, particularly flooding and extreme heat.

19) Increase the amount of green and resilient new infrastructure, regeneration and development – Landowners and land managers need to integrate nature and water management into how the city region develops and grows through integration into regeneration projects and business plans. Providing homes and employment sites with well-planned, functional green and blue spaces will bring benefits for residents and the economy, as well as nature.

20) Increase the amount of community-led action and better connection to nature – supporting communities to lead and drive change in their neighborhoods will bring benefits for residents' health and wellbeing, as well as improving people's connection with the natural environment and their local green spaces. We will support local projects and encourage local volunteering initiatives that support community food growing and enhance the local natural environment.

Links to other 5YEP Aims

Nature based solutions can facilitate the carbon capture and sequestration of carbon from the air, improve air quality through removal of particulates and increase our resilience to climate change through reducing the risk of flooding and increasing shade. An improved natural environment along transport corridors and public spaces may increase their attractiveness, leading to an uptake of active travel and an uplift in the economic value of surrounding buildings.

Co-benefits (e.g. health, cost saving etc.)

A healthy natural environment underpins our ambitions for a more prosperous and fairer city-region. Greater Manchester's natural environment is estimated to already provide us with over £1bn of co-benefits each year. Those that are particularly important are the physical and mental health and wellbeing benefits to our residents of access to green and blue spaces, the role of these spaces in improving our adaptation to climate change and other benefits such as providing us with food and clean air and water. Greener neighbourhoods and town and city centres also have economic advantages, creating better places for people to live and work by integrating nature into how we grow our city-region.

Co-enablers (factors that will enable delivery e.g. finance, skills, national government)

Delivering these actions requires several co-enablers. Broadening the sources of funding into improvements to our natural environment is key, as these actions cannot be achieved with public funding alone. Action from government to support the development of nature markets is required to support this, facilitating the growth in investments in the natural environment. Delivering improvements will also require skills across a range of professions, from on the ground skills (e.g. in habitat creation and maintenance) to integrating nature into other professions (e.g. engineering) and in supporting sectors (e.g. legal, financial). Tackling inequalities in access to green space and the

physical and other barriers in doing so is crucial so that everyone can benefit, particularly in their health and wellbeing, from improvements to the natural environment.

Case Study 3 of Existing Project – Mayors Green Spaces Fund

Awarded £13,000 in Round One of the Greater Manchester Green Spaces Fund, the Ardwick Stepping Stones Project has shown the power of local communities in greening their neighbourhoods and the benefits this can bring. Ardwick is one of the most deprived areas in the country, and according to the project, has seen a loss of around 65% of its local biodiversity. Ardwick Climate Action's aims are to regenerate and rewild areas for the community, offering a series of green spaces that serve to educate and engage local people.

Ardwick Stepping Stones has established connected green spaces between the city centre and the University of Manchester, creating new and improved habits for nature and people. The project has seen residents and local groups engaged in a series of events which also highlight wider environmental concerns and raise awareness of the climate emergency.

Using support from partners involved in the Green Spaces Fund (including Sow the City and City of Trees) and the funding provided, 10 sites have benefited from improvements, with interventions including:

- Communal composting stations at each site – providing material for growing and also helping mitigate travel emissions incurred by taking waste off site.
- A tool hire shop, allowing the community to get involved in nature by eliminating a key hurdle to local participation.
- Wildflower meadows at various points in Ardwick and Brunswick.
- Bird and bat boxes in the shape of iconic Manchester buildings will be placed at all sites to encourage wildlife, further boosting local biodiversity. This will be done with advice from the Eden Project, helping ensure these sites are utilised year on year.
- Working with City of Trees and Festival Manchester to plant trees that will have a great impact on biodiversity and climate change through providing shade and habitats for all.
- Raised vegetable and fruit beds showcasing tailored, seasonal produce that can be collected once mature.
- Regenerating the St. Saviour's Church site with support from the Museum of Manchester's botany department, utilising planting that illustrates the warming of the planet, with a focus on foliage that would not have survived as little as a decade ago.
- A world record attempt for most bulbs planted and most people gathered to plant bulbs, all working to create beautiful spaces that generations will be able to enjoy.
- Digitally interactive and educational signage, including signs that illustrate what has been planted and the effects on local biodiversity.



Fig 10. Green Spaces Fund Project in Ardwick

Aim 4: Our natural environment is enhanced, providing benefits for people, economy and nature.

Key: Cost £ = £1-10k, ££ = £10-100k, £££ = £100k - £1m, ££££ = £1m-£10m, £££££ = >£10m Impact (on the Objective) H = High, M = Medium, L = Low

Direct Action	Lead	Enabling Action	Lead	Cost	Impact
14. Objective: Expand and enhance our best spaces for nature					
Increase the area of Greater Manchester that is protected and designated for nature to 15% by 2035	LAs, Natural England, Landowners	Work with landowners and partnerships to support more land being protected and designated for nature (e.g. the proposals for a new National Nature Reserve in the mosslands)	GMCA, LAs, GMEU, Natural England	££££	H
Improve the condition of land protected and designated for nature, by bringing 50% of sites into active management by 2035 and implementing management plans	LAs, Natural England, Landowners	Work with landowners and partnerships to support bringing land into active management and implement management plans	GMCA, LAs, GMEU, Natural England, NGOs	£££	M
15. Objective: Better connect the best spaces for nature by creating and restoring habitats					
Restore and create 1800ha of habitat for nature by 2035, through funding routes such as Biodiversity Net Gain and Environmental Land Management Schemes	Landowners	Publish a Local Nature Recovery Strategy to identify areas to focus habitat restoration and creation	GMCA, LAs, Natural England	££	M
		Work with environmental NGOs and landowners to bring forward land for habitat creation, including to overcome funding barriers	GMCA, LAs, NGOs	££	M
		Work with districts to ensure the Local Nature Recovery Strategy is reflected in all relevant Plans, Policies and decision making tools.	GMCA, LAs	£	H
		Support the increased uptake of Environmental Land Management Schemes	GMCA, LAs, NGOs, NE	£	M
		Support the growth of a local market for Biodiversity Net Gain and explore further market	GMCA, LAs	££	M

		development, focussing on carbon and water markets.			
16. Objective: Reduce pressures on our water environment					
Encourage public and private organisations to assess, report and reduce direct and indirect impacts on nature.	Business, GMCA	Promote the uptake of UK Sustainability Disclosure Standards, once published, and ensure they promote nature related disclosure	GMCA, National govt	£	L
		Work with United Utilities and key stakeholders to support water saving messaging to residents and business	UU, GMCA, LAs	££	M
Reduce the impact of wastewater on watercourses by meeting storm overflow reduction targets for 35% of high priority sites.	United Utilities	Work with United Utilities to deliver this, particularly in supporting the £250m of investment in rainwater management through United Utilities' Advanced WINEP.	GMCA, LAs, EA, Landowners	£££££	H
Through the Integrated Water Management Plan, deliver improvements in the sustainable management of water	GMCA, EA, United Utilities	Deliver an annual programme of initiatives to develop more integrated approaches to managing water sustainably across the city-region	GMCA, EA, United Utilities	££	M
17. Objective: Increase the amount of green and blue spaces (parks, verges, gardens etc.) that are better managed for nature					
Residents should use their outdoor space (garden, yard or balcony) in a way that benefits nature and increases resilience.	Residents	Engage with horticulture bodies to promote more sustainable ways of gardening	GMCA	££	M
		Engage with and provide advice to residents about how to make their gardens more friendly for wildlife, use less water and manage water in their gardens learning from the Unpave the Way initiative.	NGOs, businesses, United Utilities	££	M
		Implement a voluntary phase out of peat compost in absence/advance of any national ban	Garden centres	£	L
		Implement a voluntary phase out of the sale of and use of astro-turf in domestic gardens and promote permeable alternatives	Garden centres	£	L

Manage shared gardens and spaces in a way that's nature-friendly, uses less water and manages water sustainably.	Social Landlords, Buildings Managers	Continue to engage with and provide advice and guidance to social and private landlords about how to make their gardens more friendly for wildlife, use less water and manage water in their gardens	NGOs	£	M
Manage areas of parks and green spaces for nature for example through wildflower meadows, tree planting and woodland management and ponds	LAs	Support local authorities with funding and capacity to assess tree planting opportunities and bring sites forward	GMCA/City of Trees	££	M
Manage areas outside of parks and existing green space to ensure benefits for wildlife	LAs	Review and update Planning Policy guidance to ensure new developments maximise the biodiversity and resilience benefits	GMCA, National govt	££	H
18. Objective: Increase the number of green and resilient transport routes, streets and highways					
Manage areas alongside transport routes for nature, for example through wildflower areas on verges and tree planting	LAs, Network Rail, National Highways	Support local authorities with funding and capacity to assess planting opportunities and bring sites forward	GMCA, City of Trees	££	M
Implement green and blue infrastructure in all transport schemes	TfGM, LAs	Support the use of the SuDS Design Guide, part of Streets for All, including through training and sharing best practice	GMCA, TfGM	£	M
19. Objective: Increase the amount of green and resilient new infrastructure, regeneration and development					
Further integrate nature into the way land is used and managed, using grants and other sources of funding and investment to do so	Landowners, land managers, Business	Integrate greening into regeneration projects, to bring nature into town centres	LAs	£	M
		Work with businesses to encourage and incentivise the creation and enhancement of nature-based solutions on and around their buildings and into their business plans	United utilities, LA, EA, Business	£	M
		Work with businesses to embed nature-based solutions into business plans	GMCA, Growth Company	£	L
		Consider setting a mandatory level of green cover through new development via setting an Urban Greening Factor	GMCA, LAs	££	M

20. Objective: Increase the amount of community-led action and better connection to nature					
Support projects in the local area (e.g. funding or corporate volunteering initiatives) that create or enhance green spaces and access to them	Business	Provide opportunities for local businesses to donate and participate in projects that enhance the natural environment, and link to business objectives (e.g. social value)	NGOs	££	L
Encourage local volunteering initiatives that improve the local natural environment	Residents	Provide funding to community groups to create or improve green spaces, including through funding 100 Green Spaces Fund projects	GMCA, LAs	££	L
Grow the number of referrals to and uptake of green social prescribing activities	GPs, GM ICP, NGOs	Support the GM extension to the national GSP programme, particularly in addressing gaps and barriers to the mainstreaming of GSP in GM.	GMCA, LAs, ICP, NGOs	££	L
Support community food growing initiatives to increase local food production	LAs, NGOs	Work with local communities to remove the barriers to food growing initiatives	LAs	££	L

Aim 5: Our city region transitions to a circular economy and our waste is reduced, reused, recycled or recovered.

Objectives

- Increase the rate of the transition to a circular economy through an industry approach primarily focusing on construction, plastics and textiles industries
- Deliver policies and programmes to make carbon reduction actions and sustainable lifestyles attractive
- Reduce the amount of waste in every waste stream by reducing consumption and increasing reuse, repair and redistribution
- Develop and implement the GM Waste and Resources Strategy

Targets

- Launch new Circular Economy business platform in 2025
 - Year on year increase of number of companies using the platform
 - Year on year increase on CO₂ savings
- 5% Increase of number of companies on the Refill waste app
- Increase number of schools/community groups engaged in sustainable lifestyle programmes (baseline 2024: 10 schools) (performance indicators for each programme will be published on SCP page on [Green Cities Website](#))
- Development of the GM Waste Strategy – targets will be published within the Strategy and will be subject to ongoing review to take account of the effects of implementation of the various elements of the National Resources and Waste Strategy (e.g. Extended Producer Responsibility (EPR) and the Deposit Return Scheme (DRS)) and increases in population and housing growth. Targets may include the following with others to be added once all elements of the National Resources and Waste Strategy have been published and assessed:
 - % household recycling rate – baseline 50% 2024
 - Capture rate kg/hh/yr of the core recyclable materials specified in the Simpler Recycling Regime
 - Number of items sent for re-use

The Challenge

The current economic model is heavily based on the continued extraction and consumption of natural resources. This linear economy requires the extraction, transportation, processing and consumption of energy and natural resources, often for only brief periods of use, before being discarded. This results in considerable environmental damage and is a contributing factor to the climate and biodiversity emergencies. Globally, we are currently extracting 3 times the number of natural resources than we did 30 years ago, and this figure is expected to more than double by 2060. To address this, we need to both change the way that goods and services are produced and enable consumers to have more sustainable purchase options.

Research shows that 80% of the damage done to our environment by excessive amounts of waste could be avoided if more sustainable decisions were made at the design and production stage of products. We need to enable and adopt new business models that minimise the use of finite materials, use recycled resources, and ensure that products are durable, repairable and can be easily recycled. Our industry needs to innovate by designing new products which are lighter, made from recycled materials, and designed for easy repair and disassembly. We need to move from the sale of

products to the provision of a function or service e.g. how music has moved from CD ownership to streaming, or new car ownership to leasing.

Over the duration of the plan, our focus will be on production and consumption in four key sectors: Construction, Food, Plastics (including Packaging) and Textiles to explore circular economy business models and carbon reduction pathways. To further understand the full potential, we need a comprehensive analyses of material flows, greenhouse gas emissions (including embedded carbon) and levers for climate action within Greater Manchester.

Construction: embedded carbon within construction currently accounts for around 11% of greenhouse gas emissions, however with the projected increase of construction initiatives over the coming decades, it is believed that embodied and operational carbon emissions will be equal by 2050. To prevent this potential increase, we need to reuse buildings where possible, reuse material, use low carbon concrete mixes, and use carbon-intensive materials. Working with academia and industry to research and pilot new low carbon, circular economy initiatives.

Plastics & Packaging: Globally the use of plastics has quadrupled in the last 30 years, with 31% being found in packaging. Whilst there are sustainable solutions for plastic bottles and market for plastic pots, tubs and trays and flexible plastics is less developed, therefore innovation will not only be critical to developing sustainable solutions to increase the use of more recyclable plastics with product design, but also on developing advanced sorting solutions to be able to recognise and separate plastics products reach their end of life. Additionally, and following on from the Single Use Plastic Pact, work will continue to reduce and, where possible, eradicate single use plastics within GM.

Textiles: Within the UK the textile sorting sector manages approximately 469,000 tonnes of end-of life textiles, the majority of which (421,000 tonnes) are exported for reuse/recycling and only 34,000 tonnes is kept within the UK. Additionally, there is over 750,000 tonnes of textiles in household waste which is disposed of through waste disposal contracts. The need to create a circular economy within this sector will not only provide resilience with the textile waste market but will also create jobs, skills and growth opportunities within the UK.

Food: In 2021, the Greater Manchester Good Food Vision was produced which sets out the ambition for a sustainable food system which is based on the following general principles that food should be ecologically responsible, fair and accessible, local (where possible), healthy and no waste is produced. Recent research into the GM's foodprint of food waste within the system shows that we have over 388,000 tonnes, which equates to 1,327,000tCO₂e, of which 113,000 tonnes occurs within the supply chain. With the increase of families living in food insecurity, its vital that we explore all opportunities to access edible food which can go for redistribution to food banks within the conurbation.

To tackle these issues at scale we need our waste regulatory system to expand to include producer responsibility across a wider range of products. This will enable consumers to access more sustainable purchasing options, provide the drivers and financial resources needed to create a supportive infrastructure, maximises the value of recyclates and ensures reusability. A simple and consistent waste management collection system in Greater Manchester is essential, whether for businesses or households, but this can only be achieved if the Government requires uniform requirements on both.

Actions Required to Deliver Objectives

21) Increase the rate of transition to a circular economy through an industry approach primarily focusing on construction, food, plastics (including packaging) and textiles - By moving to circular economy business models, we can reduce use of raw materials through the increasing of recycled materials in products. Our public sector and businesses need to adopt the circular/waste hierarchy procurement principles, and our manufacturing businesses need to review processes to reduce raw material consumption, reduce the environmental impact of their products and seek, through innovation, new processes and business opportunities to grow a zero-waste economy.

22) Deliver policies and programmes to make carbon reduction actions and sustainable lifestyles attractive - Our residents need to actively align their purchasing habits with sustainability principles and be willing to consider moving from buying new products to repairing and purchasing used items and prioritising quality over quantity. Effective communication and engagement are required to encourage residents to move towards sustainable lifestyles, providing people with information to make informed choices which not only benefit the environment but also provide additional benefits to their lives such as health, well-being and financial savings. By utilising behaviour insights to target programmes, policy initiatives and training to raise awareness we will enable residents to reduce their carbon footprints and enhance the environment.

23) Reduce the amount of waste in every waste stream by reducing consumption and increasing reuse, repair and redistribution - To transition to a circular economy we need to support and adopt new business models through procurement mechanisms and strategies, that consider the full life cycle of products and consider new service models which encourage reuse and repair of goods to protect natural resources. Businesses need to consider offering consumers sustainable alternatives to purchasing, supporting package reduction through 'refillable' products and taking a full lifecycle approach particularly within the food system to maximise redistribution and minimise waste.

24) Develop and implement the Greater Manchester Resource and Waste Strategy – We need to make it easier for residents and business to recycle and improve the quality and quantity of recyclable materials in our waste stream. Upon clarity of implementation of England's Resource and Waste Strategy and the publication of the new Government Circular Economy Strategy a Greater Manchester Waste Strategy will be developed to maximise resources through our waste disposal infrastructure.

Links to other 5YEP Aims

Valuing resources and reducing consumption supports all aspects of the 5YEP; by taking a sector approach to move businesses to circular economy business models, businesses will reduce carbon emissions. Additionally, residents taking more sustainable actions by reducing consumption and adopting more sustainable lifestyles, such as switching to active travel rather than using/owning a car, reducing food waste and home/community growing of food can contribute to increasing our resilience to climate change and reduce our carbon emissions.

Co-benefits (e.g. health, cost saving etc.)

Moving to more sustainable practices within the home and workplace can improve both health and financial well-being. Reducing waste, particularly food and energy waste, can save an average of £730 and £1300 per family per year respectively. Reducing utility bills can have positive health benefits including on nutrition e.g. how well a family can afford to eat and mental well-being through less stress over the financial burdens of household bills and expenses. The economic benefits include developing new business opportunities in repairing, upcycling and renting products. Moving

to circular economy business practices can also reduce production costs as waste is minimised. In addition, continued dependency on sourcing goods and materials through complex multinational supply chains creates risk to security of supply for our businesses and our economy.

Co-enablers (factors that will enable delivery e.g. finance, skills, national government)

Transitioning to a circular economy will require sufficient funding to support the planning, implementation and maintenance of waste collection systems and infrastructure to maximise recovery, reuse, repair and recycling. Local capacity building and skills development in the green sector will also be needed to meet the changing needs and demands and support innovation. Government policy and regulatory support will be required to encourage the adoption of new practices, increase the sustainability of products throughout their lifecycle and encourage the innovation and adoption of new technologies and practices to increase waste minimisation.

Case Study 4: Renew Hub in Greater Manchester – A GMCA and Suez Partnership

The Renew Hub in Greater Manchester is a testament to the power of collaboration and innovation in sustainable waste management. This pioneering initiative is a partnership between the Greater Manchester Combined Authority (GMCA) and Suez and aims to change how we think about and manage our waste.

Located in Greater Manchester, the Renew Hub tackles the pressing issue of waste by promoting the principles of the circular economy. The facility focuses on the recovery, refurbishment, and resale of items that would otherwise go to waste. By doing so, it not only reduces waste but also generates economic and social benefits for the community.

The hub focuses on reusing items that people would normally throw away. It collects them, cleans them up, and fixes them if needed. Items like furniture, electrical appliances, bicycles, and other household goods are given a new lease of life. These refurbished items are then sold at affordable prices in Renew shops, making them accessible to everyone and supporting the local economy.

The environmental benefits are significant. By keeping items in use for longer, the hub helps reduce greenhouse gas emissions and saves valuable resources. This supports Greater Manchester's goal of becoming a zero-waste city-region by 2038. The hub also educates the public about the importance of reusing and recycling, helping people understand how they can contribute to a more sustainable future.



Fig 11. Up-cycling of bicycles at RENEW

Socially, the Renew Hub creates jobs and supports the local community. It employs a diverse group of people, including individuals who may face barriers to employment. Through training and skills programmes, employees gain valuable experience and contribute to the hub's success. The hub also works with local charities and community groups, donating items and supporting various social initiatives.

The partnership between GMCA and Suez has been key to the hub's success. By combining GMCA's strategic vision and Suez's expertise in waste management, the Renew Hub has achieved impressive results. It serves as a model for other regions, showing how public-private partnerships can create innovative and sustainable solutions to environmental challenges.

DRAFT

Aim 5: Our city region transitions to a **circular economy** and our **waste** is reduced, reused, recycled or recovered.

Key: Cost £ = £1-10k, ££ = £10-100k, £££ = £100k - £1m, ££££ = £1m-£10m, £££££ = >£10m Impact (on the Objective) H = High, M = Medium, L = Low

Direct Action	Lead	Enabling Action	Lead	Cost	Impact
21. Objective: Increase the rate of transition to a Circular Economy through an industry approach focusing primarily on Construction, Food, Plastics and Textiles industries					
Reduce the weight of raw materials used in production, through lightweighting and the use of innovative materials	Manufacturing	Support innovation for sustainable alternatives and business model change on circular economy and resource efficiency	Academia, Businesses	£££	L
Encourage businesses to adopt waste hierarchy, focusing on high impact	GMCA	Identify and promote local exemplars of companies who are already doing this	GMCA, Business Board	££	L
Incorporate environmental considerations into procurement strategies	Business, Public Sector	Provide support to business on how to use procurement to drive forward their environmental agendas.	GMCA, LAs, NHS, Business Board	££	L
		Investigate how small business can access municipal waste recycling infrastructure	GMCA	££	M
Reduce the use of single use items where appropriate	Business	Lobby Government to include more single use materials covered by the Extended Produce Responsibility regulations	National Government	£	H
Increase the consumption of recycled materials	LAs	Provide guidance, support and an evidence base for the inclusion of circular economy planning principles, with an aim to include in Local Plans and procurement	GMCA, LAs	££	H
		Consider incorporating minimum levels of recycled content (up to 100%) and report reuse of materials in tender specifications and reward higher level content in the scoring system.	GMCA, LAs	££	H
Reduce embedded carbon within the built environment	Construction Industry	Consider incorporating whole lifecycle carbon assessments and carbon reduction reporting on residential and non-residents construction projects	GMCA, LAs	£	M
Use public sector procurement to incentivise business to	GMCA, LAs, NHS	Explore a GMCA-led approach to introducing a mandate for including carbon assessment in public procurement for major schemes over £1m in value from 2025 onwards, based on LA	GMCA, LAs	£	L

reduce carbon emissions and wider environmental impacts		backing, with clear guidance over exactly what to ask for in such an assessment.			
Promote and encourage the transition to circular business models	GMCA, LAs, Business Board	Provide businesses with support and incentives to transition to a circular economy business model	GMCA, LAs, Business Board	££	M
22. Objective: Deliver policies and programmes to make carbon reduction actions and sustainable lifestyles attractive					
Help residents understand how they cause carbon emissions and what they can do to reduce them	Public Business, National Govt.	Lobby Government to implement Carbon emission labelling	GMCA, LAs	£	L
		Support the uptake of carbon literacy, climate change and sustainable lifestyles training by public and private organisations	GMCA, LAs	££	L
		Use behavioural insights to create effective engagement strategies which increase positive environmental behaviours	GMCA	££	L
Encourage the formation and growth of a less linear buy-use-throw away-buy again economy	Residents,	Encourage residents to support community/grassroot circular economy projects such as repair cafes and reuse shops within communities.	GMCA, LAs	££	M
23. Objective: Reduce the amount of waste in every waste stream through reducing consumption and increasing reuse, repair and redistribution					
Reduce the amount of waste created by offering alternatives to purchasing products such as hire/lease	Business	Provide guidance and support on 'Library of Things' offer to assist community-led delivery of such schemes e.g. tool hire.	GMCA, LAs	££	M
		Create business platform to enable distribution of no longer needed items.	GMCA, LAs	£	L
Support the uptake and use of "refillable" to reduce packaging and other single use waste	Business	Work with retailers and hospitality venues to encourage the use of innovative reusable solutions	GMCA, Marketing Manchester	££	M
		Continue to support residents through education awareness programmes and communication campaigns	GMCA, LAs	££	M
Reduce food waste throughout the value chain	GMCA, LAs, Business	Develop and implement a food waste action plan	GMCA	££	M
		Implement actions arising from the food waste action plan	Businesses	£££	M
		Promote redistribution of surplus food to ensure no food is wasted	Retail sector GMCA, LAs	££	L

		Optimise production processes to minimise food waste in hospitality and enact food distribution channels.	Hospitality sector	£££	L
		Reduce the amount of food wasted in the home through discouraging multi-buy deals	Retail sector	£	M
Make it easier for businesses to recycle	Business	Work with businesses to ensure they have waste collections services for all recyclable materials	Business Board, LAs	££	M
Reduce the climate impact of Greater Manchester's waste and support aviation decarbonisation by consigning non-recyclable biogenic waste to be used as feedstock for sustainable aviation fuel where technically and economically viable.	National Government, Manchester Airport supported by GMCA	Work with regional and national partners to support SAF production in the north west.	GMCA, National Government, Manchester Airport	££	L
		Launch an incentive to encourage airlines to use more than mandated levels of SAF at Manchester Airport.	Manchester Airport	£££	L
Improve the efficiency of waste collection system and infrastructure of municipal, commercial and industrial waste.	Business, Waste Industry	Review waste infrastructure for reduce direct carbon emissions and from direct and indirect fossil fuel displacement	GMCA	££	L
		Promote services and support businesses	GMCA, LAs	£££	M
		Instigate a programme of pilot resource management projects to improve the quality and rate of recycling with willing LAs and roll out more widely when feasible	GMCA, LAs	£££	M
		Continue to support residents through education awareness programmes and communication campaigns	GMCA, LAs	££	M
24. Objective: Develop and implement the Greater Manchester Resource and Waste Strategy					
Improve the quality, consistency and amount of recycled materials	GMCA, LAs	Instigate a programme of pilot resource management projects to improve the quality and rate of recycles with willing Local Authorities and roll out more widely when feasible	GMCA	?	?
		Continue to support residents through education awareness programmes and communication campaigns	GMCA, LAs	££	L
		Harmonise bin infrastructure across the UK to support more consistent household messaging and behaviours	National govt.	££££	H

		Collaborate with Collection authorities on the range of waste streams collected	GMCA, LAs	£££	H
Make it easier for residents to recycle	LAs	Change planning policy to mandate sufficient storage room for communal recycling facilities in new build apartment blocks	GMCA, LAs	££	H
Maximise resources through waste disposal infrastructure	GMCA	Explore feasibility of optimising existing infrastructure or commission new facilities to maximise capture of recyclable materials	GMCA, LAs	££££	M

DRAFT

Aim 6: Our city-region is better adapted and more resilient to the increasing impacts of climate change.

Objectives

- The priority risks arising from climate change are managed and reduced
- The adaptive capacity and resilience of our communities and organisations is increased, with a focus on the most vulnerable.
- Publish and begin the delivery of a Climate Adaptation Strategy.

The Challenge

Greater Manchester is already experiencing the impacts of climate change, and the likelihood of extreme weather events will continue to increase. The consequences of these events will be felt across all aspects of society, damaging infrastructure and the natural environment, and impacting the health and wellbeing of residents, particularly those already experiencing multiple inequalities. Its impacts beyond our city-region will also affect us – for example, disruption to food supply chains. There needs to be improved preparedness for the range of potential impacts of climate change, with Greater Manchester becoming a resilient and well-adapted city-region.

The climate in Greater Manchester has already changed; 5 of the warmest years on record have occurred since 2006,⁹ and the most recent decade (2012 to 2021) was on average 1.0°C warmer than the 1961 to 1990 average.¹⁰ Seasonal rainfall has also changed significantly, with decreasing summer rainfall and increasing winter rainfall.¹¹ These changes are already having an impact in Greater Manchester: the flooding and extreme heat events experienced over recent years, such as the 2015 Boxing Day floods, and the July 2022 extreme heatwave, have been made more likely because of climate change.¹² These events are projected to become more frequent and intense over the coming decades.

Climate projections¹³ show that, for Greater Manchester, we can expect to see:

- Warmer, wetter autumns and winters
- Hotter and drier summers
- More frequent and intense extreme weather events, including extreme rainfall and extreme heat events
- More severe drought events
- Impact on our supply chains as a result of global climate change.

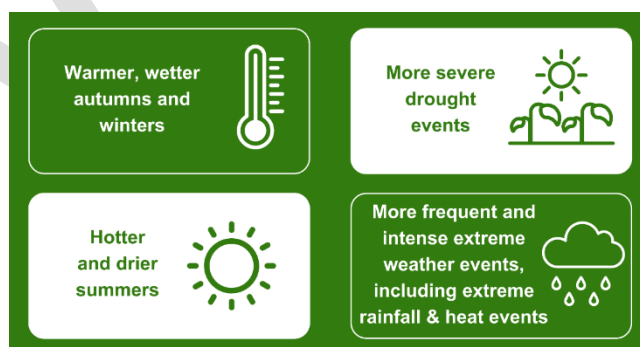


Fig 12: Predicted climate impacts

Further evidence on the above is set out in the [Greater Manchester Climate Change Risk Assessment](#).

⁹ Climate Stripes, National Centre for Atmospheric Science, University of Reading, [link](#)

¹⁰ UK Government Department for Energy Security and Net Zero (2023) Climate Change Explained, [link](#)

¹¹ Jenkins, G.J., Perry, M.C., and Prior, M.J. (2008). The climate of the United Kingdom and recent trends. Met Office Hadley Centre, Exeter, UK, [link](#)

¹² Friederike E L Otto et al 2018 Environ. Res. Lett. 13 024006, [link](#); Met Office (2020) Chances of 40°C days in the UK increasing, [link](#); Met Office (2022) UK and Global extreme events – Heatwaves, [link](#)

¹³ Met Office UK Climate Projections data, [link](#)

Actions Required to Deliver Objectives

25) The priority risks arising from climate change are managed and reduced – given the impacts climate change is already having on our city-region, and will continue to have in the future, action is needed by our public and private sector, particularly infrastructure owners and developers, to manage and reduce climate risks, particularly where the city-region is most vulnerable to them e.g. flooding. Providing advice and guidance, including through the planning process, will support this.

26) The adaptive capacity and resilience of our communities and organisations is increased, with a focus on the most vulnerable – in order to reduce the risks where we are most vulnerable, we need our public sector, businesses and VCSE groups to increase the capacity of our communities and organisations to adapt and become more resilient to the impacts of climate change, helping us to better cope with a more extreme and variable climate through risk assessments, awareness raising campaigns and provision of cool spaces.

27) Publish and begin delivery of a Climate Adaptation Strategy – Longer term actions to deliver system-level adaptation and resilience to climate change will take longer than the duration of this Plan to deliver, but actions need to be taken today to help achieve this in the future. The publication of a [Greater Manchester Climate Change Risk Assessment](#) in 2024, which will be used to underpin the development of a Climate Adaptation Strategy and Implementation Plan for Greater Manchester, will support strategies and planning at a local authority and organisation level to deliver adaptation action.

Links to other 5YEP Aims

Progress in other areas of the plan, particularly natural environment, can form an important part of climate mitigation *and* adaptation i.e. Sustainable Drainage Systems (SuDS) reducing flooding impact, and tree cover and green and blue space reducing localised air temperatures during heat waves.

Co-benefits (e.g. health, cost saving etc.)

There is a strong body of evidence to suggest that there are potentially high economic benefits from further adaptation for many climate-related risks and opportunities, with many early adaptation investments delivering high value for money. This includes investments in heatwave alerts and plans, surveillance and monitoring for pests and diseases, early warning systems, climate smart agriculture, climate resilient infrastructure, and upland peatland restoration (See Fig 13).¹⁴

Importantly, there are often significant co-benefits from adaptation actions, such as through reducing risks to health from over-heating, or reducing the significant impacts (both physical and mental) experienced by communities during and after a flood event.

¹⁴ Watkiss P, Cimato F and Hunt A (2021) Monetary Valuation of Risks and Opportunities in CCRA3. UK Climate Risk

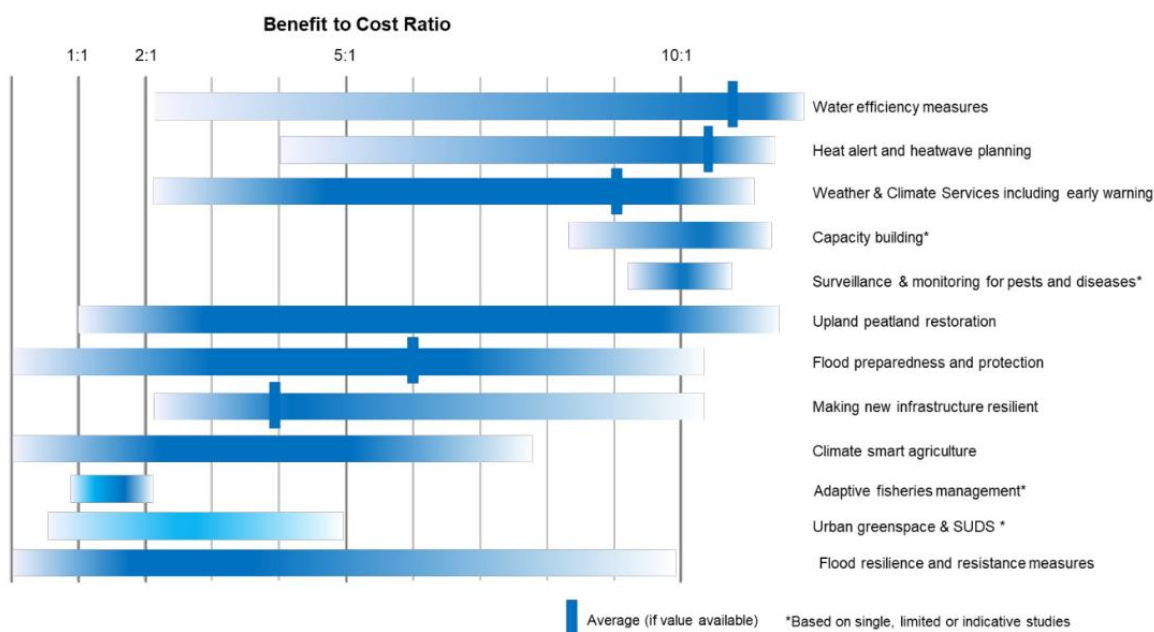


Figure 13. Benefit to Cost ratios for Adaptation for selected measures.

Co-enablers (factors that will enable delivery e.g. finance, skills, national government)

Financing adaptation is a challenge. Broadening the sources of funding is key, as these actions cannot be achieved with public funding alone. Action from business and government to support the development of adaptation measures is required to support this, facilitating the growth in investments in nature based and mechanical solutions. Delivering improvements will also require skills development across a range of professions, from on the ground skills (e.g. in SuDs creation and maintenance) to integrating adaptation into other professions (e.g. engineering) and in supporting sectors (e.g. legal, financial).

Case Study 4 of Existing Project – Sustainable Drainage Systems to support climate adaptation and resilience

[Natural Course](#) was a significant project that aimed to understand and overcome the barriers to achieving “good ecological status” under the EU Water Framework Directive across the North West River Basin District. It brought together Greater Manchester Combined Authority, Salford City Council, Environment Agency, Natural England, United Utilities, and the charitable network of River Trusts across North West England, to work on over 50 actions in more than 100 waterbodies. One such project made use of nature based solutions (actions that help both people and nature by protecting, managing, and restoring natural and modified ecosystems) to deliver multiple benefits and help reduce impacts from flooding in [Dales Brow, Salford](#).

This project utilised an informal green space which was vulnerable to flooding and transformed the area with the installation of two swales (a sunken, marshy ditch), the creation of a new 64sqm wetland area and a 40m long beech hedge as well as planting of a wildflower meadow, wetland plants, and 15 new trees.



Figure 14 - Main swale and check dam flow control feature

The system is designed to intercept rainwater that runs off the Dales Brow and Folly Lane Road surfaces, diverting it away from highways drainage and combined sewers into the swales. In heavy rainfall events the rainwater travels along the swales and into a temporary wetland area, providing emergency storage. Water moving

around the swale system is slowed by a series of check-dams, cleaned by biofiltration, before being allowed to return to the Deans Brook via a pipe connection.

The swales and the wetland area now contain a variety of different vegetation types able to cope with wet conditions. Microbes in the soil and vegetation will trap and help to break down pollutants into harmless compounds.

The project has been designed to deliver a number of benefits. It not only helps to reduce surface water flooding at a local level, but it also eases pressure on the drainage infrastructure - as well as providing costs savings with respect to water treatment and reduces the likelihood of pollution incidents in watercourses from overflowing sewers.

Alongside these nature-based interventions, other measures include a new footpath, tree planting, and the creation of low maintenance 'biodiverse' planting areas which greatly enhance the site for the benefit of both residents and wildlife.

Aim 6: Our city-region is better **adapted** and more **resilient** to the increasing impacts of climate change

Key: Cost £ = £1-10k, ££ = £10-100k, £££ = £100k - £1m, ££££ = £1m-£10m, £££££ = >£10m Impact (on the Objective) H = High, M = Medium, L = Low

Direct Action	Lead	Enabling Action	Lead	Cost	Impact
25. Objective: Priority risks arising from climate change are managed and reduced					
Over-heating risks in residential buildings (new and existing properties) are reduced through the development of spatial planning policy and retrofit guidance	LAs, GMCA	Explore and assess potential to implement The Cooling Hierarchy planning approach for new major developments (as in The London Plan)	GMCA	£££	M
		Ensure effective coordination between decarbonisation and adaptation activities for homes to better understand any potential for over-heating risks, for example from district heat networks	GMCA Environment	££	M
Flood risks in buildings are reduced through the development of spatial planning policy and delivery of flood risk programmes	EA, GMCA, LAs	Nature based Solutions, natural flood management schemes, flood management schemes, and planning policy are used to help reduce flood risks for residential properties	EA, GMCA, LAs	£££££	H
Over-heating risks and flood risks in hospitals and social care settings are reduced	NHS GM, LAs, GMCA	Engage with hospitals, social care, care homes and other residential settings to raise awareness of the UK Gov Heat-Health Alert action card guidance and increase the uptake of recommended actions	GMCA	£	H
		Health and Social Care services encouraged and supported to develop organisational Climate Change Risk Assessments and action plans, using the GM Climate Change Risk Assessment as a starting point	NHS GM, GM NHS Trusts, LAs, GMCA	££	M
Increase in the number of installations of passive cooling measures in public sector and commercial buildings	GMCA, LAs, Business	Incentivise or encourage the implementation of green roofs on publicly owned buildings and commercial buildings	GMCA, LAs, Businesses	£££	L
		Include green roof installation as a package of measures, especially alongside rooftop solar panel installation	GMCA, LAs, Businesses	£££	L
Develop a systematic city-region assessment of interdependency and cascading risk, and a framework to	GMCA, Infrastructure providers	Explore developing an integrated cascading risk management plan for the city-regions' critical	GMCA, Infrastructure providers	£££	H

improve infrastructure resilience at the city-region scale		infrastructure, including assets for the GM 2040 Infrastructure Plan			
		Interdependent and cascading risks are considered in climate change risk assessments and action plans for infrastructure providers	GMCA, GMRU, Infrastructure providers	££	M
		Assess and explore potential for new infrastructure developments, and for the renewal/upgrade of existing infrastructure assets, to use common formalised standards of climate resilience	GMCA, Infrastructure providers	££££	H
		Increase the evidence base on the risk and vulnerability of digital assets, recognising that digital infrastructure underpins the operation of most other forms of infrastructure, and therefore there is high potential for significant cascading impacts	Academia, Digital providers	££	H
		ICT infrastructure owners including data centres, base stations and network connections, to develop comprehensive climate change risk assessments and climate adaptation plans	Digital providers	££	H
		Better understand the risks to the energy sector from extreme weather events, including the risks of passing specific thresholds that affect energy supply.	ENWL, Energy providers	££	H
Support businesses to understand their potential risks from climate-related disruption to supply-chains, distribution networks, and business premises	Business, Green Economy, LAs, GMCA	Supply-chain risks are identified and managed	GMCA, Green Economy	£££	H
		Consider commissioning research to support business scenario planning for extreme weather events	GMCA	££	H
		Incorporate climate risks into risk registers and management programmes, and include supply chain partners in risk assessment, planning, and communication	GMCA, Green Economy	££	M
		Improve adequate insurance coverage for flood risks, particularly for SMEs	Green Economy	£££	M

		Raise awareness of low and medium-cost measures and other practical advice (uptake of flood protection insurance, raising awareness of flood warnings, etc.) to increase resilience of businesses to flood events	EA, LAs	££	H
26. Objective: The adaptive capacity and resilience of our communities and organisations is increased, with a focus on the most vulnerable					
Increase uptake of Property Flood Insurance and installation of Property Flood Resilience measures	LAs, GMCA, EA	Support the delivery of messages and communications aimed at residents to better understand their personal need for flood insurance, and the importance of adequate buildings insurance for households in flood zones, to increase its uptake.	LAs, GMCA, GMRU, EA	££	M
		Support the delivery of messages and communications on the availability of Property Flood Resilience measures and how to access these.	LAs, GMCA, GMRU, EA	££	H
Support residents to prepare for and respond to extreme heat events	LAs, GMCA	Awareness campaigns aimed at residents to better understand effective actions to take to reduce risks from over-heating in their homes, including vulnerable populations	LAs, GMCA	££	M
		Continue to work with Voluntary and Community Sector Groups to raise awareness on how they can support communities during extreme heat events, and include the Voluntary and Community Sector's response to events in local authority plans	GMRU, LAs, VCSE sector	££	M
Information and guidance produced for businesses and employees on risks around over-heating at work during extreme heat periods	GMCA, LAs and Business	Explore the potential of using the Good Employment Charter as a tool to support this	GMCA, LAs	£	L
Increase in number of businesses and organisations that offer Cool Spaces in time of extreme heat, in a similar way to the offer of warm spaces in extreme cold events.	LAs and Business	Work closely with key partners including GM Resilience Unit, GM Ageing Hub and GM Business Board to encourage roll-out of Cool Spaces during heat periods across GM, building on the pilot project between GM Resilience Unit and Manchester City Council	GMCA, GMRU	£	M

		Explore the potential of using the Good Employment Charter as a tool to support this	GMCA, LAs	£	L
27. Objective: Publish and begin the delivery of a Climate Adaptation Strategy					
Develop a Greater Manchester Climate Adaptation Strategy and Implementation Plan	GMCA	Work closely with key stakeholders to help embed climate adaptation and resilience across organisations	GMCA	££	M
GM-level, strategic governance structures are put in place for climate adaptation and resilience	GMCA	Explore the convening of an Extreme Heat and Cold Strategic Group to better understand how to address extreme temperature risks strategically throughout GM.	GMCA, LAs, NHS, GMRU	£	M
		Raise awareness of guidance on the use of Nature based Solutions to reduce flood risk and increase resilience to drought, relating to the Integrated Water Management Plan	GMCA	££	M
Better developed evidence base for climate adaptation	GMCA	Explore the use of analysis tools that help better quantify the range of co-benefits delivered through climate adaptation and sustainability interventions, to support their business case.	GMCA	£	L
		Explore and assess options for measuring and monitoring the urban heat island effect in GM	GMCA	££	M
Relevant climate risks identified in the GM or LA CCRA are embedded within local government	LAs	Local Authorities are encouraged to develop district-level Climate Change Risk Assessments and action plans.	GMCA	££	M
		GMCA Directorates are encouraged to embed relevant climate risks into their risk registers and business plans	GMCA	£	M
Vulnerable populations exposed to high risk of extreme heat and flood risk are identified and prioritised in terms of investment in adaptation and resilience measures.	GMCA	Using existing tools that map social vulnerability and exposure to climate hazards (i.e. the Climate Just Mapping Tool), identify priority areas for intervention	GMCA	££	M

Aim 7: Our air quality enhances the health, well-being and quality of life our residents.

Objectives

- Reduce emissions that contribute to poor air quality
- Support communities and business to encourage the adoption of behaviours that contribute to improving Air Quality

Targets:

- 22% reduction in PM2.5 exposure by January 2028 compared to 2018 (measured using Defra's Criteria).
- zero exceedances of the NO₂ of the legal limit by 2026 (measured using CAP criteria).
- % of monitoring sites that meet WHO interim Target 2 (30ug/m³), Target 3 (20ug/m³) and the Guideline value (10ug/m³) Annual Mean for NO₂.

The Challenge

Poor air quality is the largest environmental risk to the public's health¹⁵. Taking action to improve air quality is crucial to improve the health of the general population. Whilst air quality has been generally improving over time, particular pollutants remain a serious concern in many urban areas, including across Greater Manchester. There are areas in our city region where the NO₂ levels exceed the legal limit, especially near busy roads and although Greater Manchester is currently meeting legal targets for PM2.5 there is concerted efforts to reduce this further and to work towards the WHO guideline values by 2030.

In our city region, the main sources of air pollution are road transport, industry and domestic heating. It is also influenced by weather patterns and atmospheric circulation, which can transport pollutants over long distances - we can be affected by pollution from other areas within the UK and across international borders e.g. dust storms and volcanos. Similarly, ozone and aerosols from urban and industrial sources can travel across regions and oceans and affect the climate and health of many miles from the source.

Note: potentially turn these stats into a table.

Road transport accounts for 32% of NO_x and around 12% of PM10 and 14% of PM2.5 (particulate matter). For road transport, 16.5% of GM residents' trips are less than 2km in distance, 34% of GM residents' car (driver or passenger) trips are less than 2km in distance. Trips of 2km or less have the most potential to be completed by sustainable modes and therefore the greatest potential to more immediately reduce local air pollution. Greater Manchester is committed to delivering compliance with nitrogen dioxide through an investment-led, non-charging Greater Manchester Clean Air Plan that cleans up the air without harming livelihoods, jobs and businesses helped by investment in zero emission bus. In 2022, in GM, car was the dominant mode of transport, accounting for 60% of all trips, 15% of all car trips were 1km or less, equating to 150 million annual car journeys which could have been walked in less than 15 minutes or cycled in around 4 minutes¹⁷. To help reduce air

¹⁵ [Health matters: air pollution - GOV.UK \(www.gov.uk\)](https://www.gov.uk/health-matters/air-pollution)

¹⁶ [Transport and environment statistics: 2023 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/transport-and-environment-statistics-2023)

¹⁷ [Greater Manchester Travel Diary Surveys | Bee Network | Powered by TfGM](#)

pollution from travel, residents and businesses should choose public transport or active travel over a private car, especially for short journeys.

Industrial combustion accounts for approximately 10% of NO_x, 10% of PM_{2.5} and 5% of PM_{2.5} (Particulate matter)¹⁸. Considerable decreases in emissions from some sectors have been largely offset by increases in emissions from solid fuel burning by industry (particularly the burning of biomass). Industrial combustion of biomass based fuels contributed less than 1 per cent of total PM_{2.5} emissions in the years prior to 2009 but has since risen to represent 6 per cent of total PM_{2.5} emissions in 2022. Industrial processes contribute 16% PM_{2.5} 38% of PM₁₀ in 2022.

Domestic combustion covers households burning a variety of fuels including wood, coal, solid smokeless fuels, and fuels derived from waste such as coffee logs. This was a major source of PM emissions in 2022, as it contributed 29 per cent of total PM_{2.5} emissions and contributed 15 per cent of total PM₁₀ emissions. Most emissions from this source come from households burning wood in stoves and open fires. The use of wood as a fuel contributed 75 per cent of both total PM_{2.5} and PM₁₀ emissions from domestic combustion in 2022. Domestic combustion of wood contributed 22 per cent of overall PM_{2.5} emissions and contributed 11 per cent of overall PM₁₀ emissions in 2022. Emissions of PM_{2.5} and PM₁₀ from domestic wood burning increased by 56 per cent between 2012 and 2022.¹⁹ Additionally, poor indoor air pollution is a risk to health. Exposure to formaldehyde, damp and mould has been associated with 5000 new cases of asthma and 8500 new cases of respiratory infections.²⁰ Homes which are insulated and warm with adequate ventilation will help reduce this health burden.

The WHO (World Health Organisation) recognise that their 2021 air quality guideline levels are challenging to meet immediately and have provided interim targets 1-4 to aim for in achieving them. Defra took into consideration the WHO guideline levels when setting the 2022 PM_{2.5} targets for England²¹, and acknowledged that the guideline value of 5 µg/m³ is below the background level which is affected by natural sources and pollution from other countries²². In working towards the guideline values, Greater Manchester will need to concentrate on reducing particulate matter and nitrogen dioxide. Currently GM is attaining the interim target level 4 for both PM_{2.5} and PM₁₀ particulate matter, but at interim level 1 for NO₂ (nitrogen dioxide). GM will continue to work with government to achieve the new England target levels for PM_{2.5} of 10µg/m³ and exposure reduction of 35% by 2040 compared to a 2018 baseline.

Actions Required to Deliver Objectives

28) Reduce emissions that contribute to poor air quality - Greater Manchester, as a Breathe Life City, has stated our intention work towards the WHO air quality guidelines. 9 of the 10 Greater Manchester authorities have adopted them in the Places for Everyone Plan. The government expects local authorities to support the delivery of the national PM_{2.5} targets by taking action to reduce emissions from sources within their control, such as domestic burning, transport, and industry. Actions that residents can take which will help reduce the emissions of PM_{2.5} include avoid burning

¹⁸ [Emissions of air pollutants in the UK – Particulate matter \(PM₁₀ and PM_{2.5}\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/statistics/emissions-of-air-pollutants-in-the-uk-particulate-matter-pm10-and-pm25)

¹⁹ [Emissions of air pollutants in the UK – Particulate matter \(PM₁₀ and PM_{2.5}\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/statistics/emissions-of-air-pollutants-in-the-uk-particulate-matter-pm10-and-pm25)

²⁰ [The Burden of Respiratory Disease from Formaldehyde, Damp and Mould in English Housing — UK Health Security Agency \(ukhsa.gov.uk\)](https://www.ukhsa.gov.uk/health-topics/air-quality/the-burden-of-respiratory-disease-from-formaldehyde-damp-and-mould-in-english-housing)

²¹ The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023

²² [Environmental Improvement Plan \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/111111)

solid fuels and only in compliant stoves, not burning garden waste and keeping smoke to a minimum when BBQing. Local authorities can support this by enforcing existing legislation. Businesses can also support improved air quality through using alternatives to fossil fuel generators and plant equipment and switching to clean emission vehicles when replacing fleets.

29) Support communities and business to encourage the adoption of behaviours that contribute to improving Air Quality - there are many sources of PM, NO_x and VOC's (e.g. formaldehyde), from within the home, which affect indoor air quality and can contribute to impacts on health including burning candles, plug in air fresheners, sprays, smoking and vaping, in addition to combustion sources such as solid fuel stoves, gas ovens and fires– reducing the use of these sources will improve indoor air quality. Improvements to outdoor air quality can also be assisted by choosing sustainable travel choices and, if there are no suitable alternatives, choosing a less polluting vehicle for transporting goods and people.

Links to other 5YEP Aims

Our air quality affects the health and well-being of our residents, especially vulnerable groups such as children, elderly, and people with chronic conditions. It also reduces the attractiveness and competitiveness of our city region as a place to live, work, and visit. Natural environment enhancements can reduce poor air quality through redesigning spaces prone to pollution from roads i.e. with green barriers etc.

Co-benefits (e.g. health, cost saving etc.)

Between 2017 and 2025, the combined total cost of PM_{2.5} and NO₂ to our health service is estimated to be £1.6 billion. The Environment Audit Committee has estimated that total health costs as a result of air pollution range between £8.5 billion and £20.2 billion a year. Poor air quality can also have an economic impact by reducing productivity among people of working age. Defra estimated that in 2012, poor air quality cost the economy £2.7 billion through productivity loss.

Physical inactivity costs the NHS up to £1bn each year with additional costs of £8.2bn according to a report by the Department of Transport²³. According to the NHS²⁴, exercise can also protect against anxiety and depression, with outdoor exercise being the most beneficial. Moving towards a more active travel focused mode of transport can help improve wellbeing and lift some of the burden off the NHS in addition to improving air quality.

Co-enablers (factors that will enable delivery e.g. finance, skills, national government)

Delivering significant improvements in air quality will require a strong and inclusive partnership between the public, private sectors and academic community; one that can foster innovation, collaboration, engagement with residents and co-creation of solutions to address specific challenges and opportunities. A robust and reliable financing mechanism that can support the implementation of low-emission technologies and infrastructure, such as electric vehicles, public transport, renewable energy, and green spaces will also be needed, together with a skilled and trained workforce that can design, install, operate, and maintain the low-emission solutions and adapt to the changing needs and demands of the market and the environment. National government can also

²³ [DfT publications template - colour \(Word 2013\) \(publishing.service.gov.uk\)](#)

²⁴ [Benefits of exercise - NHS \(www.nhs.uk\)](#)

support local efforts by creating a supportive and coherent national policy framework that sets clear and ambitious targets and standards for air quality and emissions reduction and provides incentives and guidance for local and regional authorities to achieve them.

Case Study 5 of Existing Projects - Greater Manchester Domestic Burning Campaign

Greater Manchester is playing a leading role in tackling air pollution from the increasing popularity of domestic burning, including use of open fires, woodburning stoves and garden bonfires.

The smoke from solid fuel contains fine particulate matter (PM2.5) which poses significant health risks, including respiratory conditions and more severe ailments.

In a collaborative effort coordinated by Transport for Greater Manchester, the region's 10 local authorities have partnered with the University of Manchester to investigate the use of log burners and solid fuel fires and their consequent impact on air pollution. Funded by a Defra Air Quality Grant, this initiative aims to uncover the reasons behind the prevalence of solid fuel burning in homes and gardens.

The research not only seeks to enhance community knowledge but also strives to alter behaviours that adversely affect public health. The University's study will inform a public health campaign geared towards raising awareness about the harmful effects of domestic burning.

Greater Manchester has also launched an Information Hub on the Green City website to educate residents about health impacts and regulations. Additionally, over 40 air quality monitors are being installed across the region to closely monitor the connection between domestic burning and PM2.5 pollution.



Fig 15. Urban site close to potential sources of domestic burning

Aim 7: Our air quality enhances the health, well-being and quality of life of our residents.

Key: Cost £ = £1-10k, ££ = £10-100k, £££ = £100k - £1m, ££££ = £1m-£10m, £££££ = >£10m Impact (on the Objective) H = High, M = Medium, L = Low

Direct Action	Lead	Enabling Action	Lead	Cost	Impact
28. Objective: Reduce emissions that contribute to poor air quality					
Reduce emissions from domestic heating and burning	Residents, Business	Comply with smoke control legislation. Avoid burning solid fuel unless absolutely necessary, only burn authorised fuel in an authorised appliance. Compost rather than burning garden waste.	Residents	£	H
		Support LAs with the resources to enforce existing legislation.	National Govt.	£££	H
		Enforce the existing smoke control legislation	LAs	££	H
		Support LAs with health messaging around domestic solid fuel burning	UKHSA	££	L
		Regularly report on the impact of domestic solid fuel burning on the AQ in GM, using outputs of DEFRA funded particulate campaign (to 2026)	LAs	££	L
		Complying with the supply of fuels legislation for smoke control areas.	Business	£	H
Reduce emissions from industry / business / construction	Business	Develop an electrification strategy to reduce reliance on fossil fuels through alternative sources of power and backup in the event of outages	Business	£	L
		Utilise buying power (procurement) to influence the supply chain and emissions associated with services, materials and equipment including fleet. Business can use this to motivate suppliers to switch fleet to zero emission / cleanest vehicles.	Public and private sector	£	M
		When renewing or replacing NRMM (non-road mobile machinery) choose either battery powered/gas powered/or the latest engine standard available.	Construction Industry	£££	M
		The development of supporting tools and clear guidelines for businesses to calculate their impact on air quality and giving transparency for customers.	Government	£££	M

		Assessing methods of work to help reduce emissions to the air from work activities, plant and equipment and the proper use and maintenance of extraction equipment to capture emissions.	Businesses	££	M
		Wherever possible substitute products used within the manufacturing process to reduce emissions to the air and use the Best Available Techniques to reduce emissions.	Businesses	££	M
Reduce emissions from transport	LA's, Business, All vehicle owners	Reviewing manufacturing processes to understand where efficiencies can be made, or processes changed to less polluting methods and ensure compliance (plus) with pollution emission legislation.	Businesses	££	M
		Choose plugin refrigeration units for HGV's or if necessary, those which run off LPG rather than diesel.	Businesses	££	M
		When renewing fleet vehicles Switch to zero emission / cleanest vehicles where possible.	Businesses	££	M
		Ensure that engines are not idling when stopped unnecessarily. Turn engines off when not needed.	All vehicle owners/drivers	£	H
		Look for opportunities to consolidate deliveries to reduce distance travelled and use zero emission vehicles where logistically possible, especially for the last mile in built-up areas.	Businesses	££	M
		Work with businesses and vehicle owners to deliver compliance with NO ₂ legal limit, through an investment-led, non-charging Greater Manchester Clean Air Plan that cleans up the air without harming livelihoods, jobs and businesses	LA's & TfGM	£££££	H
29. Objective: Support communities and business to encourage the adoption of behaviours that contribute to improving Air Quality					
Support residents to make sustainable lifestyle choices.	GMCA, TfGM	Significant improvements in air quality can be achieved through compliance with air quality legislation. Remind residents of the legislative requirements regarding domestic burning and the health impacts of not doing so.	National Government, LAs	££	L
		Improvements in air quality can be made by choosing active travel such as walking, cycling and wheeling, public transport or by car-sharing rather than relying on private vehicles.	Residents	£	H
		If there are no other alternatives choosing a less polluting car such as an EV, or hybrid vehicle can help improve air quality.	Residents	££	M

		Subscribe to the Daily Air Quality Index (DAQI) available for Greater Manchester, to receive forecasts of expected air quality, and recommended actions and health advice https://cleanairgm.com/data-hub/forecast-and-alerts/	Residents	£	L
		Considering how online purchases are made and the potential to reduce the number of deliveries received, or through better decisions the number of returned packages.	Residents	£	L

DRAFT

Aim 8: Our economy will grow sustainably because of the interventions we make, benefiting our residents and businesses

Objectives

- Increase the number of businesses which are more resource efficient, reducing their operating costs, impact on nature and carbon emissions and sustainably innovating their products, processes and services.
- Increase the resilience of supply chains, managing and mitigating risks from a changing climate.
- Increase the size and productivity of GM's Environment & Low Carbon sector, creating secure, good quality jobs for our residents
- Increase the number of residents who have the skills needed to work in the greener economy.

Target 2030:

- At least 7% annual growth in total revenue/output from GM businesses in the sector
- 50% increase in businesses engaged on resource efficiency by GM programmes
- 50% increase in students completing training in relevant courses (baseline 2025)
- 15% of adult citizens with Carbon Literacy qualifications

The Challenge

Our transition to a sustainable, carbon neutral city region will require significant long term investment by our businesses, public bodies and residents. Our Local Area Energy Plans suggest that, for carbon reduction alone, £64bn of investment will be needed to transform our infrastructure from what we have today to what will be required to get to carbon neutrality (70% of this would be invested under business as usual). This level of investment is without precedent in modern times in terms of scale, scope and duration. It will create new industries, grow and diversify existing ones and challenge those businesses who's traditional markets increasingly cease to exist. We need to give confidence to Greater Manchester green sector business to innovate and invest in scaling up to meet this future demand and support businesses in 'sunset' industries to diversify and retrain their employees. To achieve this, we need to give local businesses, training providers and our residents the certainty they require, in terms of what transitions will happen and when, to give them confidence to invest in growing their careers and their businesses respectively.

Greater Manchester's Low Carbon Environment Goods and Services (LCEGS) Sector generated sales of over £8.6Bn in 2020. It comprised 3,144 companies employing 58,736 full time equivalent employees. The LCEGS sector represents 14.5% of the business base (based on GVA) and 3.2% of Greater Manchester's employment. Greater Manchester green sector is a national leader in carbon capture & storage, energy management and renewable energy consultancy and ranks second in the UK (behind London) for alternative fuel vehicles and carbon finance. The Sector Development Plan also identifies Waste, Recycling & Circular Economy as being areas of current strength and potential growth areas. The fastest growing sub-sectors by sales are Carbon Capture & Storage, Building Technologies, Alternative Fuel Vehicles and Wind. The fastest growing sub-sectors by employees are Geothermal, Carbon Capture & Storage, Alternative Fuel Vehicles and Wind. Some of the sub-sectors identified as expecting to see future growth include Building Technologies (Low Carbon), Geothermal and Wind (Renewable Energy) with high forecast sales growth rates. The opportunity for the Greater Manchester sector to grow is now.

These seismic changes will not be limited to the low carbon and environmental goods and services (LCEGS) sector, all Greater Manchester companies and organisations will need to become more energy and resource efficient which may require new business models. Across all of this Plan's Aims, there is a need for innovative products, services and business models, which enable the rapid adoption of the actions we need to take, together with a suitably sized and skilled workforce to deliver them. Increasingly linking innovative green sector businesses with our academic institutions and research facilities will also drive growth in the sector, especially where local anchor institutions can coordinate skills development with research for innovation e.g. through a Centre of Excellence.

The requirement for a larger, suitably qualified workforce has been identified in several of the Aims of this plan as a required co-enabler. This will require both upskilling of the existing workforce and encouraging more people into the sector for a wide spectrum of roles from entry level to post graduate, harnessing the interest amongst young people for more sustainable careers. The transition creates a real opportunity to better connect learners with work (e.g. traineeships, apprenticeships) and to create more inclusive employment. Those without university degrees have been disproportionately affected by the move away from a manufacturing economy. This highlights the importance of formalised pathways such as the Manchester Baccalaureate (MBacc) to support a wider range of learners, but also the need to align the qualification with policies that will support the renewal and green shift of the manufacturing sector.

Actions Required to Deliver Objectives

30) Increase the number of businesses which are more resource efficient, reducing their operating costs, impact on nature and carbon emissions and sustainably innovating their products, processes and services. – We will scale up the business support activity already available through the Bee Net Zero programme and Energy Innovation Agency, alongside embedding sustainability into core business support programmes. This will afford more GM businesses a supportive ecosystem to set carbon targets to decarbonise their activities and innovate their goods and services. As part of the North West Industrial Cluster, Greater Manchester will with neighbouring authorities and industrial partners to support industry's journey to net zero, and to maximise the opportunities for growth and jobs locally.

31) Increase the resilience of supply chains, managing and mitigating risks from a changing climate - Greater Manchester's businesses need to have an improved understanding of climate risks associated with local supply chains. We will ensure that GM businesses comprehend potential implications and adopt necessary mitigation measures to limit economic impact. Where feasible, we will encourage shortening of supply chains to minimise potential climate risks.

32) Increase the size and productivity of GM's Environment & Low Carbon sector, creating secure, good quality jobs for our residents– We will create surety of demand for green products through establishing a robust pipeline of delivery projects. We will leverage the existing Green Growth sector development programme to support GM's green sector to enhance competitiveness by improving the cost/quality of products, bidding for and securing new contracts and working alongside academia to accelerate the delivery of net zero solutions by integrating assets and specialisms. Additionally, we will further analyse and align the local manufacturing sector to support diversification into the green economy. We also will seek to attract more green companies to GM, expanding local supply chains to position Greater Manchester as a centre for excellence a green workforce and green technology.

33) Increase the number of residents who have the skills needed to work in the greener economy–

We will create formalised pathways such as the Mbacc, other applied technical/occupational qualifications and apprenticeships to support a wider range of learners into green sector jobs, aligning the courses and qualifications with the skills required to meet projected future vacancies and support ‘on the job’ training through continuous professional development. More broadly, we will work with employers to embed carbon literacy in the workforce to increase understanding of more sustainable and responsible business practices and better connect major environmental employers to schools and colleges.

Links to other 5YEP Aims

The growth of the green economy in Greater Manchester will stimulate demand for a larger skilled workforce to support delivery of all the Aims in this Plan.

Co-benefits (e.g. health, cost saving etc.)

Securing well paid jobs which come with such focused economic growth have the opportunity to transform the lives of those who hold them for the better. Being innovative will enable us to move faster at less cost and gain broader and deeper local benefits from the actions we take. To achieve this, we need to be open to the idea of doing things differently, quickly assessing what works and what is scalable and then take them forward as fast and as far as we can. This approach has the added benefit of stimulating and supporting innovative organisations who can then grow and flourish. This will require our Universities, our Businesses and our Public institutions to collaborate, and as residents, we will need to be welcoming of change. A focused effort on decarbonising industrial clusters will attract new green manufacturing businesses, encourage existing manufacturers to transition to green industries and make GM a more attractive base to retain existing operations.

Co-enablers (factors that will enable delivery e.g. finance, skills, national government)

Whilst many of the actions needed to achieve these aims are tried and tested, with solutions, finance and local supply chains in place, for others this is not the case. Actions to drive demand for low carbon goods and services through infrastructure investment need to be funded, so we will need access to a broad spectrum of financial products and services which encourage and enable all of us to turn our plans into reality. The final key component to realising our plans is to have a suitably sized and skilled local supply chain, to ensure we can undertake the work that needs to be done. If we want to maximise the environmental and economic benefits this transition can deliver, ideally that supply chain should be local, training people for and employing them in good well paid secure jobs. If managed correctly, the investment needed for this transformation also can transform the lives of our residents. Given the likely contraction of those ‘sunset’ sectors that rely on carbon intensive processes that can't be mitigated, there will be a need to offer replacement livelihoods, and opportunities for those affected as an integral part of the necessary business transformation. Identifying re-deployable skills and having a plan to achieve them will be a key focus for the Plan.

Case Study 6 of Existing Projects – Bee Net Zero Programme

The GMCA and GM Business Board launched Bee Net Zero (“BNZ”) in Autumn 2021, a public-private partnership with the mission to make GM the easiest place in the UK to become a net-zero business. Containing 20 partner organisations with a combined 1.1m social media followers and 45k newsletter subscribers, BNZ provides a comprehensive network of localised business decarbonisation support, providing a one-stop-shop for the city-region. BNZ itself has c.600 social media followers, and over

the last 18 months launched thematic campaigns relating to green finance, rooftop solar PV, and electric vehicles, generating a combined 350,000 impressions.

BNZ also plays a key networking and enabling role in the city-region, and in March 2024 launched 'Bee Net Zero Trafford Park', bringing together the GMCA, Trafford Council, and The Growth Company to create a suite of business support offerings tailored for and aimed specifically at business on Trafford Park, which is responsible for half of Trafford's total emissions. 65 businesses have been directly engaged to date, with plans in place to launch a platform to enable wide-scale cross-business collaboration.

BNZ is also helping address industry-specific decarbonisation issues, working with partners to launch events and collaborations in respect of the hospitality, professional services, and commercial retrofit sectors.



Fig 16. Bee Net Zero Business Engagement Event

Future plans include launching a specific pledge (the BNZ Commitment) to drive awareness and action amongst the city-region's businesses, and a GM-wide campaign focused on how companies can work with their employees on business decarbonisation, with the aim for GM to have the greenest workforce in the UK.

Aim 8: Our **economy** will grow as a result of the interventions we make to benefit both our residents and businesses.

Key: Cost £ = £1-10k, ££ = £10-100k, £££ = £100k - £1m, ££££ = £1m-£10m, £££££ = >£10m Impact (on the Objective) H = High, M = Medium, L = Low

Direct Action	Lead	Enabling Action	Lead	Cost	Impact
30. Objective: Increase the number of businesses which are more resource efficient, reducing their operating costs, impact on nature and carbon emissions and sustainably innovating their products, processes and services.					
Set a target date to become carbon neutral, develop and deliver a plan for achievement	Business	Engage with GM businesses to support them to become carbon neutral through the effective targeting of support programmes e.g. Bee Net Zero	GM Business Board, Growth Company	£££	M
		Regularly engage with place-based business (e.g. Trafford Park, Atom Valley) and individual sectors (e.g. hospitality, digital, waste management etc) to enable bespoke, high impact, peer-peer support and signpost businesses to available resources	GM Business Board, GMCA, LAs	£££	M
		Engage and support client businesses on the risks, opportunities and financial incentives of a net zero carbon economic transition	Business Intermediaries	£££	M
		Identify and make available to Industry support from investors, national programmes and initiatives from other city regions (e.g. NW Industrial Cluster Programme including Hynet) to help drive investment in industrial decarbonisation	GMCA	££	M
Assess the potential for innovation in products, processes and service models	Business	Provide businesses with advice and access to innovative technology solutions (e.g. Made Smarter)	Growth Co	£££	L
		Support GM environmental technology business to accelerate the commercialisation of their innovative products and services through linking to anchor research facilities and exploring the potential for a centre of excellence approach.	Academia, Growth Co, Energy Innovation Agency	££	M
		Signpost GM businesses to innovation funding (from public sector programmes) and finance (from private sector) to support uptake of renewable energy solutions,	Growth Co GMCA	£	M

		energy management and efficiency solutions, retrofit solutions, etc			
		Utilise and expand existing programmes e.g. Innovation Navigator to support GM businesses in enhancing their products and services through collaboration with the city-regions leading R&D assets.	Growth Company – GM BGH	£££	M
31. Objective: Increase the resilience of supply chains, managing and mitigating risks from a changing climate.					
Undertake a climate change risk assessment to understand the implication and exposure to climate change risks to supply chains, customers, and place of business and commence mitigation activity for the highest identified risks	Business	Produce information and guidance on low and medium-cost measures and other practical advice (uptake of flood protection insurance, raising awareness of flood warnings, etc.) to increase resilience to flood events	Green Economy	££	M
		Engage large-scale event organisers and venues on the need for risk assessments to include over-heating risks for events in the summer months	Events industry, Marketing Manchester	?	?
		Interdependencies and cascading risk failure identified and managed, including assets for the GM 2040 Infrastructure Plan. Relevant actors work together to address the potential interacting/cascading risks	Infrastructure providers, GMCA, LAs	££	M
		Undertake research to understand which critical infrastructure sectors and supply chains would have the most cascading impacts if they were to fail, and prioritise improving their resilience to bring wider benefits from the avoidance of such cascading impacts and identify opportunities for green shoring	GMCA	££	M
		Assess and explore potential for all new key infrastructure developments, and for the renewal/upgrade of existing key infrastructure assets, to use common formalised standards of climate resilience	Infrastructure providers	££	M

32. Objective: Increase the size and productivity of GM's Environment & Low Carbon sector, creating secure, good quality jobs for our residents					
Create good well paid jobs in the Green Economy	Public sector, Business	Utilise the increased demand for low carbon and environment goods and services to grow and expand workforce in sector businesses	Business	££££	H
		Support the Environmental Goods and Services sector to grow, through targeted intervention and procurement opportunities.	Growth Company	£££	M
		Explore the opportunity to grow circular economy businesses e.g. battery recycling aligned to GM's advanced manufacturing capabilities	GMCA	£	L
		Create demand for GM Low Carbon Goods and Services providers through the creation of aggregated, robust and certain pipelines of delivery projects	GMCA, LAs	££	M
		Where appropriate, support the diversification of companies into the green economy.	Growth Co	££	M
More GM based green economy companies developed or supported to relocate to GM.	Business MIDAS	Create a conducive environment and support services to encourage Low Carbon & Environment businesses to locate in GM	MIDAS	££	M
		Use Good Employment Charter to promote good employment practices across the green economy	GMCA Growth Co	£	L
		Utilise existing academic infrastructure and assets to encourage more University spinouts to develop new products and services here.	Academia, EIA	£	L
33. Objective: Increase the number of residents who have the skills needed to work in the greener economy.					
Support skills development for a low carbon economy	GMCA	Embed climate knowledge in all jobs and wider society	Carbon Literacy Trust, NGOs, Chartered Institutes	£££	L
		Provide suitable adult skills courses and training to train new entrants and retrain people from 'sunset' other sectors to join the Green Economy	Universities and Colleges, Training Providers, GMCA	££££	H

		Embed the environmental outcomes required by this plan into the MBacc gateways and support alternative qualification routes to access to the job market for young people	GMCA	££	H
		Connect major environmental employers in the region to schools and colleges to streamline routes to work, provide careers inspiration and stimulate interest in green skills	Major Environment Employers GMCA	££	M
		Test innovative models of upskilling and training utilising enhanced devolution powers.	GMCA	££	M

DRAFT

5.0 Emissions Pathway

In 2018, to support our initial 5 Year Plan, GMCA commissioned research Setting City Area Targets and Trajectories for Emissions Reductions (SCATTER)²⁶ to understand potential carbon reduction pathways for Greater Manchester. This work identified that the original plan would deliver considerable carbon reduction, but that further work would be required at local and national level to meet our 2038 target and our ambition to keep within the envelope of carbon needed to keep the UK on track to meet the Paris Agreement goals of limiting global warming to ‘well below 2C with efforts to limit to 1.5C’ – our Tyndall budget.

Five years on, we have commissioned further work to understand emissions projections given our progress to date, and so we can clearly understand the challenges we face over the next five years to inform this action plan. The work helps understand what GM’s emissions reductions are likely to be over the duration of this plan, accounting for both national action and local action (Figure 17).

Figure 17 shows two main pathways. First, the ‘No further action’ pathway which assumes emission reductions in GM occur only as a result of currently committed UK Government policy and action (as of July 2024), and no additional activity is undertaken within GM. In other words, this is the projection without considering the impacts of policies proposed in this plan.

The ‘No Further Action Pathway’ does consider anticipated growth in future energy demand and some decarbonisation of the wider energy system, but does not take into account recent government proposals to bring forward the full decarbonisation of the electricity grid to 2030, to ban installation of gas boilers in new buildings from 2027 and bringing forward the Internal Combustion Engine Vehicles (ICEV) ban for new sales from 2030. Nor does it currently account for Government’s recent announcement to set a new target for 81% net zero emissions by 2035. These changes can be incorporated into future iterations of the model.

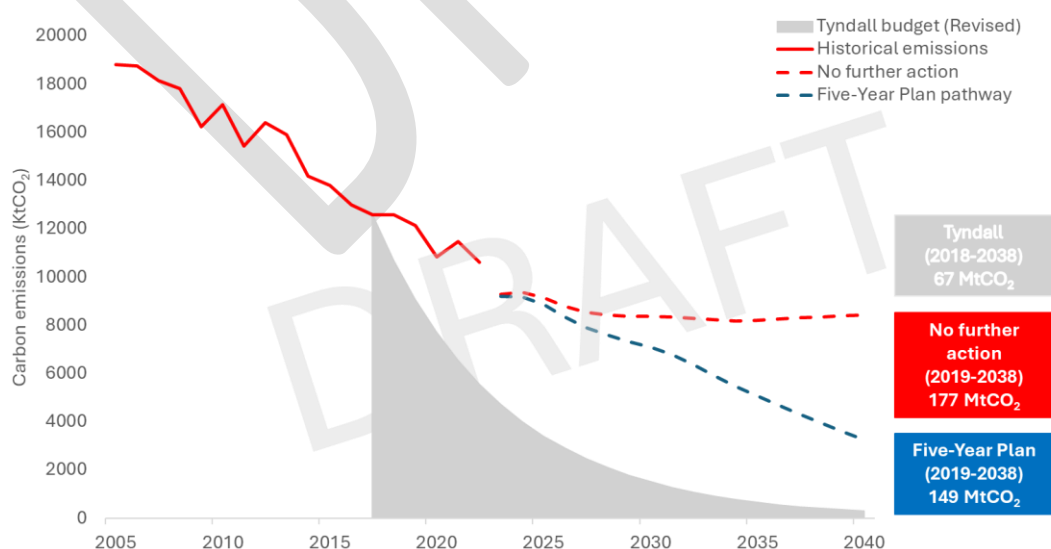


Figure 17 – Pathway projections for the current plan through to 2040, and revised¹ Tyndall budget.

The second pathway, the ‘Five-Year Plan’ pathway, takes this national position, and applies the impact of additional activities within GM that are included within this plan.

This modelling demonstrates that, through the actions identified in this plan, there will be a significant reduction with emissions reducing to 7.3MtCO₂ by 2029, and 3.9MtCO₂ by 2038, a 79% reduction from 2005. This identifies that whilst we are making considerable progress, there is still work to do at local and national level to meet our 2038 carbon neutrality target. Delivering that target will require us to scale up the level and pace of delivery, working to achieve a step-change in low carbon investment through consumer behaviour, enabling private and community investment, and working with government to put in place the support and incentives.

As we are also seeing at the UK national and the global scale, emission reduction is behind that needed to meet the Paris Agreement goals. We know that every year and every tenth of a degree matters (IPCC 2018), therefore it is critical that we continue to reduce emissions at the fastest rate we can to limit further climate change, alongside ensuring that we are increasingly prepared for climate risks.

Figure 18 shows the breakdown of emissions savings that results from the actions proposed in this plan based on emissions category (as reported in the DESNZ Local Authority emissions estimates annual dataset), as well as by the actor(s) responsible for those emissions in Figure 19. The emissions saved through actions proposed in the plan occur mostly from residential buildings and transport, with some contribution from commercial and public sector buildings.

Responsibility for delivering the actions within the plan lies across several different actors. Whilst GM citizens have a responsibility for delivering a large proportion of emissions reductions, National Government, businesses and the public sector all have a role to support and enable delivering these reductions, alongside delivering those reductions they are directly responsible for.

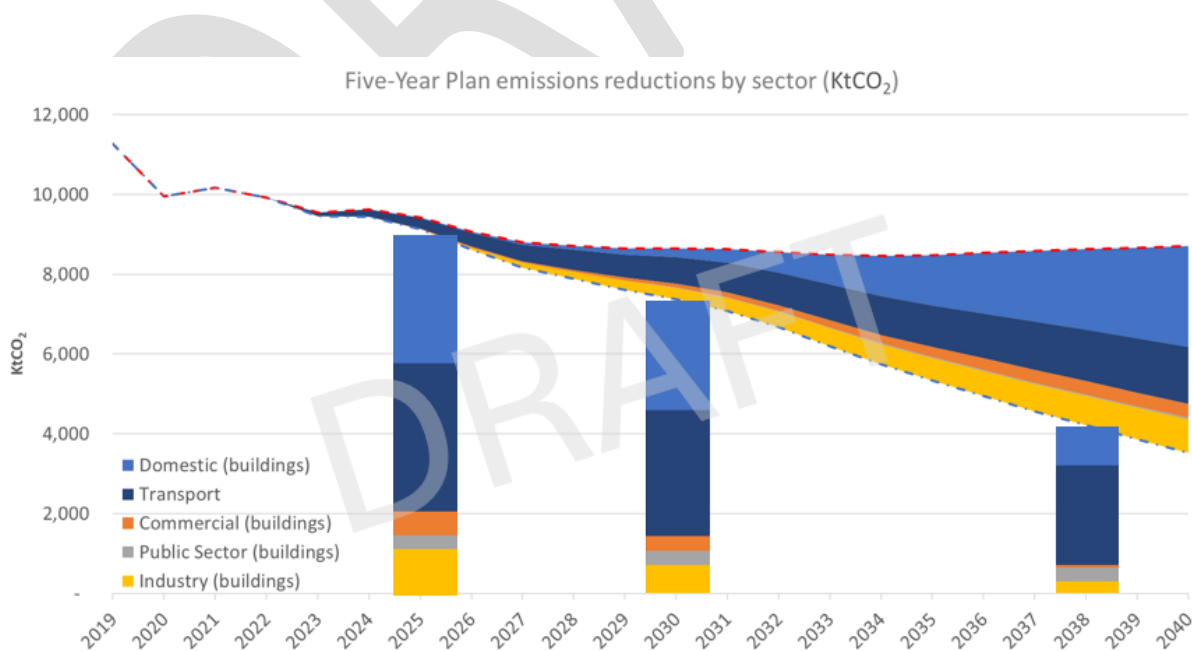


Figure 18 – Five-Year Plan emission reductions by sector (KtCO₂)

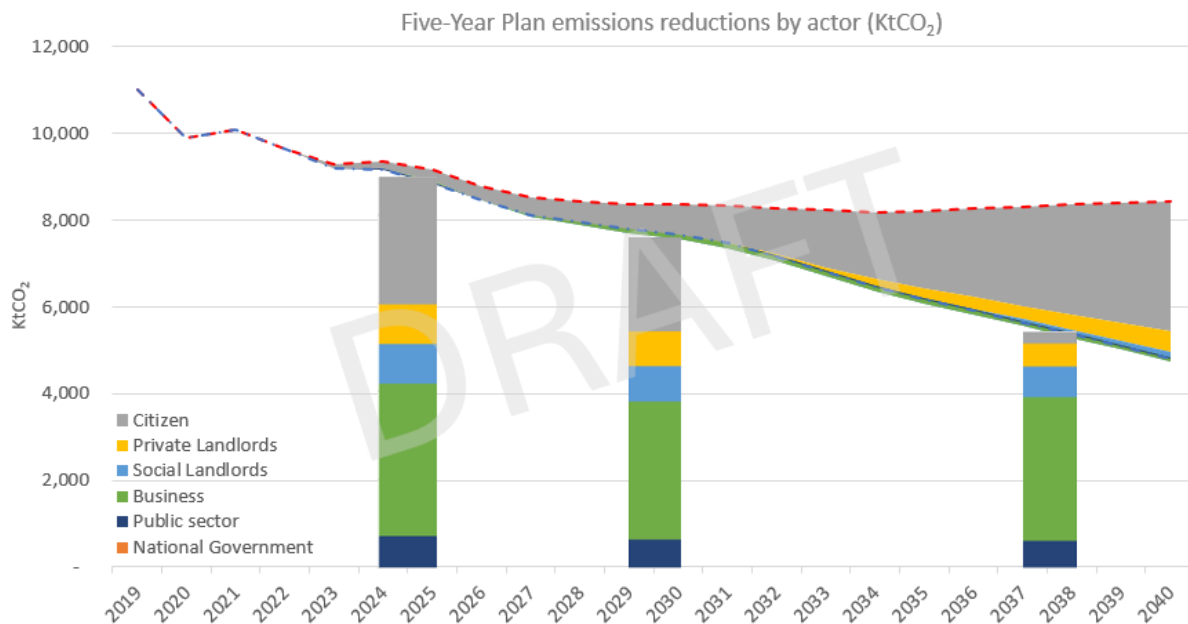


Figure 19 – Five-Year Plan emission reductions by actor (KtCO₂)

Ground Transport Emissions

The transport data illustrates the potential carbon reduction achievable through the 'Right Mix' transport vision. The Right Mix aims to enhance Greater Manchester's transport system such that by 2040, car journeys account for no more than 50% of trips, with the remaining 50% consisting of public transport, walking, and cycling.

Using Greater Manchester's adaptive and vision-led methodology in transport planning, the Local Transport Plan (LTP) Greater Manchester's 2040 Transport Strategy will identify, monitor and adjust the steps required to realise our 'Right Mix' vision. While the overarching goal of the Right Mix remains consistent, adaptations prompted by external factors like COVID-19 or population growth may necessitate modifications to the interventions outlined in Greater Manchester's transport strategies. This adaptability is why the suite of documents comprising the Greater Manchester Transport Strategy 2040 is regularly updated.

Aviation Emissions

Aviation emissions, including take-off and landing, are part of the UK carbon budget, rather than local carbon budgets and are therefore not within the scope of this plan. Manchester Airport has a long-standing commitment to decarbonisation and positive environmental stewardship. In 2007, the airport became the first in the UK to target carbon neutrality – which it achieved in 2015. Since 2007, a combination of efficiency programmes and renewable electricity have helped the airport reduce its own market-based emissions by over 80%. In 2020, the airport's parent company – Manchester Airports Group (MAG) – committed to reduce its remaining emissions and achieve net zero carbon by 2038 – aligning with Greater Manchester's own ambitions. It set out plans to transition to an ultra-low emission vehicle fleet and to eradicate fossil fuel use in its fixed assets by 2030. In 2024, MAG committed to the Science-Based Targets Initiative, pledging to reduce its remaining emissions by 46.2% between 2019 and 2031. MAG publish detailed progress reports each year which are independently audited.

In 2020, MAG led the UK aviation industry to become the first in the world to commit to net zero aviation by 2050. MAG is the current Chair of Sustainable Aviation and MAG CEO is also a member of the Jet Zero Taskforce. MAG is committed to playing its full part in decarbonising aviation, including through:

- Fleet modernisation - Modern aircraft are typically 15-20% more fuel efficient than the models they replace; Manchester Airport works closely with its partners to promote the use of the latest generation of aircraft. To incentivise the use of zero emission aircraft, MAG will provide free landing fees for five years to the first zero emission commercial aircraft to be based at one of its airports and the first aircraft to operate zero emission transatlantic services from its airports.
- Future airspace - Manchester Airport will bring forward consultation on its proposals for airspace modernisation to increase the efficiency of routing, enabling aircraft to fly more direct routes, climb and descend continuously, and so burn less fuel.
- Sustainable aviation fuel (SAF) – MAG has committed to introduce an incentive for airlines who increase their use of SAF at its airports and exceed the mandated levels set by UK government.
- Carbon removals – MAG is working with the aviation industry to support the development of UK carbon removals. In 2025, as part of its next sustainability strategy, MAG will publish details of its plans to transition from carbon offsets to carbon removals.

Actions to reduce aviation emissions provide benefits beyond reducing aviation's climate impacts. These include realising the economic and social benefits of a green economy, including from the production of sustainable fuels in the north west, and minimising the impact of airport activities on local air quality. More information about MAG's sustainability initiatives can be found on its website: www.magairports.com.

6.0 Governance and Performance Monitoring

Mission Based Approach

In 2019, Greater Manchester trialled a Mission Based Approach to delivering our first Five Year Environment Plan. This involved establishing several cross-sectoral Challenge Groups, each tasked with the role of identifying and delivering solutions to the issues identified in the first 5 Year Environment Plan. The Challenge Group Structure has been largely successful over the last five years, however progress in some areas has plateaued in the final year.

The overall Governance Structure for the GM Green City Region portfolio is shown in Figure 20. The Challenge Groups report into the Green City Region Partnership who, in turn report into GMCA. There is also a Green City Region Board, comprised only of elected Members of the 10 GM Local Authorities, which considers issues of specific interest to local government, all of which have independently declared Climate Emergencies.

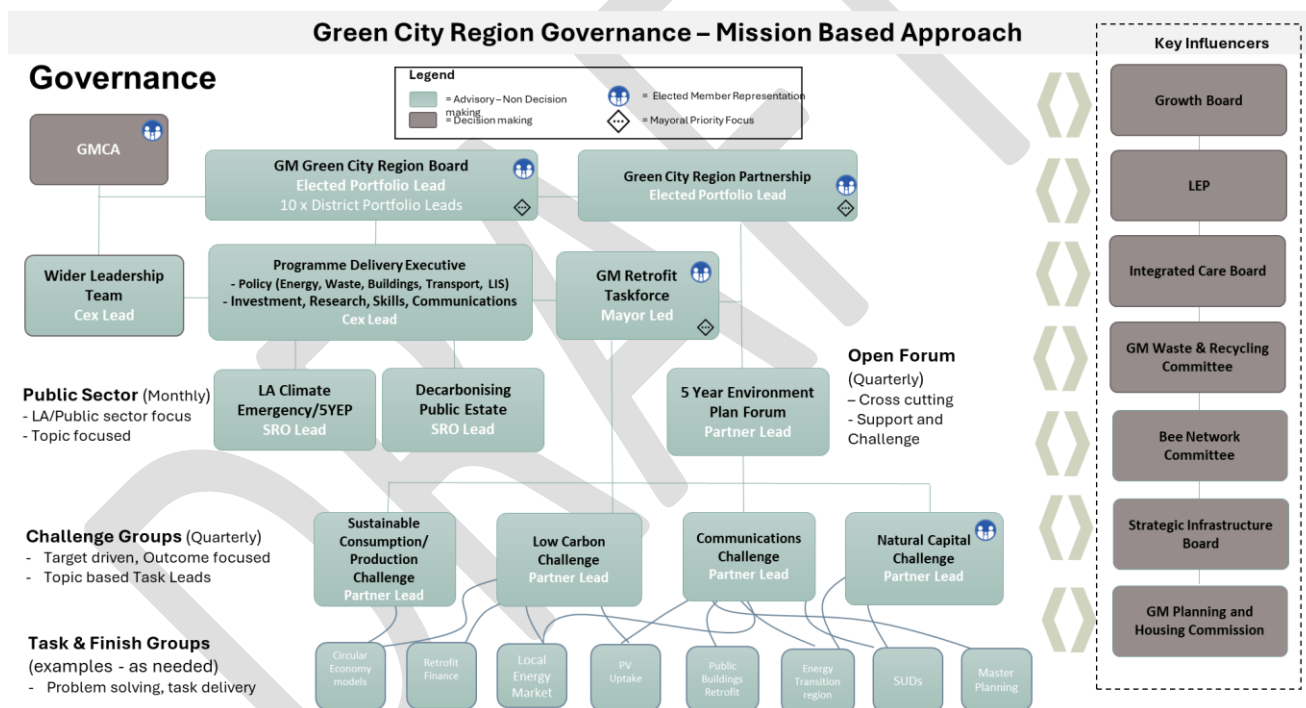


Fig. 20 – diagram of the GM Green City Region Governance Structure

It is proposed that the existing governance structure is largely maintained, however we intend to experiment with different ways to deliver the Mission Based Approach to allow more and diverse voices to be heard and to attract more partners with the skills and capacity to support delivery of the new 5 Year Environment Plan.

Performance Monitoring

Quarterly Performance Monitoring reports are provided to the Green City Region Partnership and Board every quarter. The purpose of these reports is to support the Partnership and Board i.e. to provide strategic oversight of the delivery of the Greater Manchester 5 Year Environment Plan and the development and implementation of delivery programmes which contribute to achievement of

Greater Manchester's environmental priorities. An on-line dashboard, which can be filtered by local authority area, infrastructure type and KPI has also been produced to aid clarity and communication of progress ([Five Year Environment Plan \(2019-24\) Progress \(gmtableau\)](#)).

Note: Potentially turn this into a table

Energy Generation

Targets for 2030:

- Add 375MW renewable energy generation
- Add 95MWh energy storage capacity (excluding large battery storage facilities)
- 90 GWh capacity of low carbon heat networks active
- 800GWh of Low Carbon Hydrogen production

Homes and Buildings

Targets for 2030:

- Retrofit 60,000 homes
- Retrofit 650 public sector buildings
- Retrofit 11,000 commercial buildings
- Install 64,000 low carbon heating systems across GM (54,000 domestic, 10,000 public/commercial)

Air Quality

Targets:

- 22% reduction in PM2.5 exposure by January 2028 compared to 2018 (measured using Defra's Criteria).
- zero exceedances of the NO₂ of the legal limit by 2026 (measured using CAP criteria).
- % of monitoring sites that meet WHO interim Target 2 (30ug/m³), Target 3 (20ug/m³) and the Guideline value (10ug/m³) Annual Mean for NO₂.

The 10 GM Local Authorities submit an Annual Status Report (ASR) to Defra at the end of June. The report details the actions taken to improve the quality of the air across the region. GM has submitted a combined ASR since 2015, detailing the improvements made in AQ. Details can be found at [Data Hub | Clean Air Greater Manchester \(cleanairgm.com\)](#).

Transport

The Greater Manchester Transport Strategy 2040 (GTMS) measures performance through a series of key performance indicators (KPIs) in the Appendix of the latest GMTS 2040 Progress Report (LTP Supporting Documents). Indicators of particular interest for the 5 Year Environment Plan include:

Targets by 2030

- LTP (Local Transport Plan) Delivery Plan and Local Implementation Plan formal adoption by Dec 26 followed by annual progress reports
- Increase GM population with GM Accessibility Level (GMAL) 4 or better
- 50% of all journeys in GM are made by Public Transport / Active Transport by 2040 (no net-growth in motor vehicle traffic over that period)
- Increase the % of journeys that do not emit any greenhouse gases or air pollutants from their use
- Increase % of people find it easy to use different forms of transport in one journey in GM

Note: Transport KPIs and targets will be revised via the 2040 refresh process through 2024 and 2025.

Natural Environment and Climate Adaptation

Targets for natural environment are encompassed within the Local Nature Recovery Strategy which is currently subject to public consultation.

Targets by 2035

- increase the amount of land designated for nature from 11% to 15%
- bring 50% of our Local Wildlife Sites into active management
- work towards the restoration and creation of 1,800ha of wildlife-rich land
- increase our tree canopy cover from 16.5% to 18.5%
- target the delivery of new wildlife-rich land and tree planting within the Nature Network
- increase the number of residents living within 15mins of a decent green space

Circular Economy & Waste

Targets to 2030

- Launch new Circular Economy business platform in 2025
 - Year on year increase of number of companies using the platform
 - Year on year increase on CO₂ savings
- 5% Increase of number of companies on the Refill waste app
- Increase number of schools/community groups engaged in sustainable lifestyle programmes (baseline 2024: 10 schools) (performance indicators for each programme will be published on SCP page on [Green Cities Website](#))
- Development of the GM Waste Strategy – targets will be published within the Strategy and will be subject to ongoing review to take account of the effects of implementation of the various elements of the National Resources and Waste Strategy (e.g. Extended Producer Responsibility (EPR) and the Deposit Return Scheme (DRS)) and increases in population and housing growth. Targets may include the following with others to be added once all elements of the National Resources and Waste Strategy have been published and assessed:
 - % household recycling rate – baseline 50% 2024
 - Capture rate kg/hh/yr of the core recyclable materials specified in the Simpler Recycling Regime
 - Number of items sent for re-use

Economic Growth

Target 2030:

- At least 7% annual growth in total revenue/output from GM businesses in the sector
- 50% increase in businesses engaged on resource efficiency by GM programmes
- 50% increase in students completing training in relevant courses (baseline 2025)
- 15% of adult citizens with Carbon Literacy qualifications

Communications & Engagement

Communications and campaigns are monitored and evaluated to demonstrate their effectiveness and to adjust them if the campaign isn't reaching the intended audience. KPIs are set according to the aims and objectives. Self-evaluation surveys and engagement data are excellent tools used to gather feedback from the audience which can demonstrate changes in audience understanding and potential changes in behaviour.

7.0 Communications and Engagement

This 5 Year Environment Plan creates a framework for all decision makers to take the next actions required to progress towards our long-term environmental vision. It is the decisions that we all take as residents, businesses, communities, investors, home and car owners that will determine whether we will achieve our shared goals.

Therefore, one of the most important and cross-cutting objectives arising from this Plan is the need for increased focus on communication and engagement with these decision makers to inform, educate and encourage positive action. Communication and engagement play a key role in ensuring we build trust and confidence in our ability to deliver the objectives set out in this plan. Working collaboratively with our councils, NHS, TfGM, our waste contractor (SUEZ), businesses, voluntary sector, education sector, academia and other key organisations, we will build trust by being clear and honest about our activities, plans and purpose, creating genuine and meaningful connections with individuals and organisations across our city region.

Gaining insight and ideas from residents and stakeholders based on their personal experience and expertise will help us create better priorities, policies and actions, as well as helping identify more effective ways to engage our audiences and inform a continuously improving response to people’s ideas and expectations.

We know from recent behavioural insights research that people’s attitudes towards the environment vary considerably. We are therefore committed to introducing new approaches, tailored and targeted for their intended audience, utilising language, topics, arguments and engagement methods which are most appropriate to them (See Fig. 21).

SUSTAINABILITY SEGMENTS

Segmentation based on attitudes towards the environment and climate change. We have identified 7 segments:

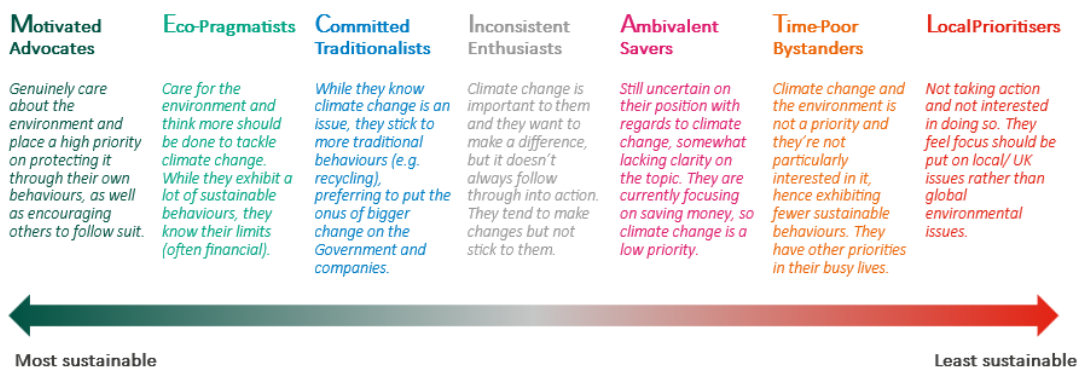


Fig.21 Impact’s Sustainable Customer Segmentation

Our campaigns and communications will further build residents' and businesses' capabilities, opportunities and motivations to take individual actions which together will make a significant contribution to our environmental ambitions. We will continue to harness the power of communications and engagement, as part of a mix of interventions, to enable the required changes in behaviour. This will be informed by population segmentation research, other participatory activities and drawing on evidence of what has worked in Greater Manchester and elsewhere.

Additionally, we recognise that delivery of this plan is predicated on our businesses taking actions which are specific to their sector. We will therefore prioritise targeted support to those businesses that have the opportunity to make the greatest environmental impact. We will also work with our 'business voice' organisations to gain further insights into the barriers and drivers that business face and identify where policy interventions and initiatives could be used to accelerate change towards more sustainable business practices (See Fig. 22).

Fig.22 Mechanisms to track sustainable business practices

SUSTAINABLE BUSINESS PRACTICES



This includes a continued focus on internal engagement within our organisations – ensuring that we continue to set examples for how our people and our ways of working are helping deliver our ambitions for Greater Manchester's environment.

The excellent communications, already being delivered by our partners, are brought together through case studies, expert blogs, news items and guidance on the GM Green City website and social channels, informing our audiences and inspiring them to get involved in the push for a greener Greater Manchester. We will continue to use campaigns to promote offers and incentives that will enable decision makers to make environmentally positive changes. We will also continue to maintain the GM Green City website as a central repository for all the environmental actions and initiatives being undertaken in Greater Manchester. Regular updates on progress against the aims and objectives outlined in this plan will be communicated to key stakeholders to help to foster ongoing involvement and support.

Our communications work is led by a collaborative, multi-agency, Communications Challenge Group who meet every six weeks to share best practise, collaborate on campaign development and

coordinate communications through different channels to reach a wider audience. Our existing Green City Region communications and engagement strategy will be reviewed to explore how we can increase opportunities for community involvement utilising community groups and the VCSE and faith sectors to support environmental change within communities. This will focus on how we can continue to raise awareness and develop targeted campaigns to inspire and encourage everyone who lives, works and is educated in Greater Manchester.

DRAFT

8.0 Financing our Plan.

The scope of action within this plan is based upon the current expected resources available for delivery, this includes resources from public, private and voluntary sector stakeholders across Greater Manchester and current expectations of resources from central Government.

However, in order to achieve our ambition to reach carbon neutrality by 2038 and respond to the biodiversity emergency, we will need to grow available resources, both in terms of leveraging existing resources through prioritisation, but also through seeking additional funding and investment, particularly from the private sector, given public sector funding constraints.

To achieve full carbon neutrality across GM we are estimated to need in excess of £64bn of investment²⁵ in low carbon technologies such as heat pumps, retrofit, EV charging, solar and wind generation and heat networks. Although it is expected that 70% of this will be delivered through usual investment cycles, this still provides a significant challenge of finding £19bn, of which £12.5bn is within the influence of the public purse, £4.65bn through to 2030.

To achieve the nature-related outcomes to tackle the biodiversity emergency, there is an estimated £56bn finance gap over a 10-year period across the UK, translating to a £130m finance gap²⁶ in Greater Manchester over the next 5 years alone. Private nature-based markets could play an important role in closing this finance gap. However, such markets are in early development and need strategic support to attract private capital; further development work is required.

To overcome these funding challenges, we will seek to work with Government through Greater Manchester's devolved Integrated Settlement process, to maximise the available funding for environmental improvements, achieve efficiency in delivery and align additional funding to gain maximum impact. In particular, Greater Manchester will engage with emerging national facilitation measures such as GB Energy and the Sovereign Wealth Fund.

To support carbon reduction measures, we will need to create innovative new financial offers and models to deliver our objectives, working with residents and the private sector to develop solutions to unlock investment by homeowners and landlords into their own properties through finance mechanisms which reflect the reduction in operational costs and increased property values. Supporting and enabling increased investment by local communities, through community retrofit and energy projects, will also enable us to meet our ambitions whilst contributing to community wealth building. Similarly, to tackle the biodiversity emergency, we will need to work with landowners, businesses and potential investors as nature-based markets develop and grow.

We will also seek to optimise available public funding for the investments required through packaging projects to make them attractive for private finance. In turn, this may release public funding to focus on the non-commercial aspects of our ambitions and achieving a just transition. To explore this, GMCA alongside Manchester City Council and Oldham Council, are working with DESNZ on the Net-Zero Accelerator. This project aims to deliver a £1bn pipeline of public sector low carbon

²⁵ GM Low Carbon Strategic Outline Business Case, GMCA (2023)

²⁶ Extrapolating figures in ["The Finance Gap for UK Nature"](#) on the basis of land area alone.

investments and the innovative financial delivery models required to lever private finance to support them.

Case Study - Greater Manchester Pension Fund

The Greater Manchester Pension Fund²⁷ has seen significantly increased levels of member engagement on climate change over recent years and has given detailed consideration to the issue, including the divestment and engagement approaches to addressing the challenge of a transition to a low carbon economy.

The Fund is operating within a clear ethical framework and seeking to change the behaviours of those companies we invest in to become carbon neutral whilst ensuring we protect the pensions of our members and reduce cost to taxpayers. The focus of the Fund's engagement to date has been on those highest emitting companies where there is the potential to have the biggest impact. The Fund is clear that 'business as usual' for fossil fuel companies is not an option, and that is why the Fund believes that challenging these companies to disclose their business models, and the assumptions that underpin their investment decisions, will lead to greater capital discipline. This could have the dual success of enhancing shareholder value, whilst also reducing greenhouse gas emissions.

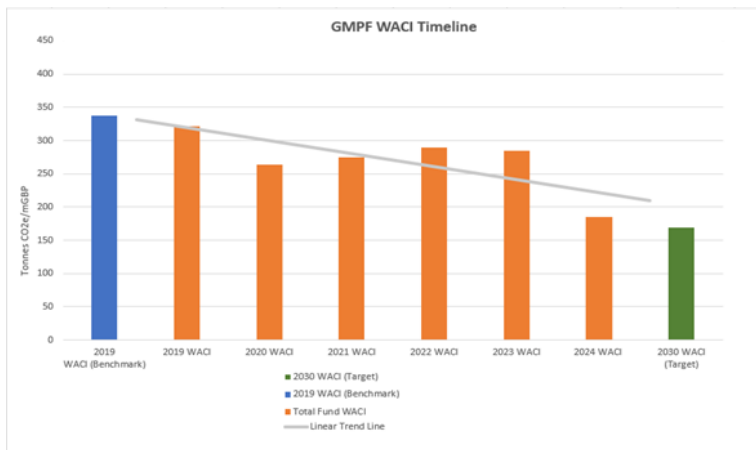
The Fund, through its asset ownership, will continue to campaign for all companies that we have an interest in to clean up their act and become carbon neutral. The fund will not shirk from its leadership role and disinvest allowing others who do not care about the environment to own those shares instead and fail future generations to come. The fund's active equity holdings were 20% less carbon intensive than the average pension fund and we are the biggest direct local government pensioner investor in renewable energy and energy efficiency, with over a £1 billion allocated in a number of areas including biomass and wind farm assets.

In March 2021, GMPF as a member of the Northern Local Government Pension Scheme (LGPS), was among 22 asset owners committed to implementing the Institutional Investors Group on Climate Change net zero framework to:

- achieve net zero alignment by 2050 or sooner, and
- halve its Weighted Average Carbon Intensity (WACI) metric from a 2019 baseline by 2030; and
- double investments in climate solutions from a baseline of \$520m as of December 2021 by 31 December 2030.

²⁷ The Greater Manchester Pension Fund is the statutory responsibility of Tameside Council and is not a function of the Mayor or the Greater Manchester Combined Authority, although it works in close collaboration with the Mayor, Combined Authority and Greater Manchester Authorities

Fig. 23 GMPF Weighted Average Carbon Intensity (WACI) over time



As of 31 March 2024, GMPF’s share of climate solutions currently stands at \$1,052m (Infrastructure portfolios only) so nearly double already and well on track to achieving our target. In 2023, Officers submitted data to sustainable1²⁸ to calculate a 2019 baseline WACI and a GMPF portfolio WACI for each year commencing from 2019 that aggregates all equities and corporate bond assets. The results of this calculation found the 2019 benchmark WACI to be 338 (tCO2e/£m). As of 31 March 2024, GMPF’s WACI was calculated to be 185 (tCO2e/£m) which equates to a 45% decrease. The chart below shows the evolution of GMPF’s WACI over time in orange bars and the blue bar represents GMPF’s 2019 benchmark WACI. Looking at this year’s result, the chart (Fig. 23) shows that GMPF has made significant progress towards halving its WACI.

The Fund is working hard to achieve carbon neutral status as quickly as possible without jeopardising the hard earned pensions of our workers and pensioners or increase the costs for hardworking taxpayers of Greater Manchester.

²⁸ <https://www.spglobal.com/esg/about/>

9.0 Abbreviations, Acronyms & Definitions

Bi Mode Trains	Trains that are capable of operation using two means of traction. This is typically electric traction supported by either a diesel, battery or hydrogen propulsion
Carbon neutral	Defined specifically for Greater Manchester as the point beyond which GM's annual carbon dioxide emissions fall below a threshold level of 0.5MtCO ₂ (i.e. over 98% lower than 1990 levels).
CO ₂	Carbon Dioxide
EV Connector	Number of EV connection points available to charge, often 2 on each charge point
DEC/EPC	Display Energy Certificates/Energy Performance Certificates. These are the current metrics by which retrofit activity is measured, through the delivery of the plan these standards may change and be strengthened, and our delivery will be adjusted to reflect that.
DESNZ	Department of Energy Security and Net Zero
DSO	Distribution System Operator - GM has two, primarily Electricity Northwest (ENWL) but also Scottish Power Energy Network (SPEN)
EV	Electric Vehicle
EVCI	Electric Vehicle Charging Infrastructure
GM	Greater Manchester
GM CAP	Greater Manchester Clean Air Plan
GMEF	Greater Manchester Environment Fund
GMTS	Greater Manchester Transport Strategy
GW	Gigawatt
GWh	Gigawatt hours
kWh	Kilowatt hours
LAs	Local Authorities
LC Hydrogen	UK Low Carbon Hydrogen Standard or any subsequent standards adopted
LTP	Local Transport Plan
MBacc	Greater Manchester Baccalaureate
MMU	Manchester Metropolitan University
MtCO ₂ e	Million tonnes of Carbon Dioxide Equivalents
MW	Megawatt
MWh	Megawatt hours
NH ₃	Ammonia
NO ₂	Nitrogen Dioxide
NRNM	Non-Road Mobile Equipment
PM _{2.5}	Fine particulate matter defined as particles that are 2.5 microns or less in diameter
PV	Photovoltaic
SCP	Sustainable Consumption and Production
SuDS	Sustainable Drainage Systems
Sunset Jobs	Jobs in sectors which may phase out of existence during a low carbon transition
TfGM	Transport for Greater Manchester - GM's strategic transport authority
Tri Mode Trains	Trains that are capable of operation using three means of traction. This is typically electric and diesel traction, supported by battery.
WHO	World Health Organisation
ULEV	Ultra Low Emission Vehicle
UoM	University of Manchester
UoS	University of Salford

Appendix 01: Progress since 2019

Since 2019 significant progress has been made to deliver our long-term environmental vision while recognising that there needs to be accelerated action to ensure the city region meets the target of carbon neutral by 2038. Our progress so far includes:

Energy

- Greater Manchester is the first and largest City Region to develop smart Local Area Energy Plans that provide a geospatial plan for where energy generation, retrofit, low carbon heat and electric vehicle infrastructure should be installed/placed.
- The Go Neutral Smart Energy framework has been launched to support decarbonising the public sector estate. £26m has been invested in delivering 18MW of an 80MW pipeline of low carbon energy opportunities on land, car parks, and building assets across Greater Manchester is being delivered.
- GMCA and LAs are supporting schools to deliver solar PV to their buildings.
- We have been supporting community focused energy projects through Net Zero NW and ENW's community energy programmes.
- GMCA in partnership with Bruntwood, Hitachi, MMU, SSE, UoM and UoS has set up an Energy Innovation Agency (EIA) that aims to deliver innovative technological solutions to help the transition to carbon neutrality. EIA now supporting over 100 innovators to commercialise and deploy their technologies across GM to accelerate decarbonisation and fill gaps not met by mature solutions.
- The Hydrogen and Fuel Cell Centre at Manchester Metropolitan University is the UK's first Fuel Cell Centre of Excellence.
- The Hydrogen Electrolyser (at up to 200MW) at Trafford Energy Park will be the UK's largest Green Hydrogen production facility and the Cryo-Battery on the same site is a world 1st using liquid air at a commercial scale.
- Energy House 2 at Salford is the world's first environmentally controllable chamber where full sized terraced houses can be constructed and tested.
- Signing MoU's with SSE, Daikin and Panasonic to support the demonstration, testing and deployment of new technologies.

Buildings

- In July 2021 the Greater Manchester Retrofit Taskforce was launched to lead the way on a 3-year programme to explore innovative finance solutions and building the supply and demand for the skills needed to grow the supply chain. In March 2022 the Retrofit Action Plan was launched which sets out the programme and delivery targets.
- Several programmes are being delivered to support domestic retrofit including:
 - **Your Home Better**, an independent service delivered by retrofit experts, providing advice, planning and support, to homeowners.
 - The **ECO4** programme that focuses on retrofitting the least energy efficient housing occupied by low income and vulnerable residents.
 - The **Local Energy Advice Demonstrator** that provides in person retrofit advice to residents.
 - The completed **Green Homes Grant Local Authority Delivery scheme** spent £11.5m on retrofitting 1,785 fuel poor homes. It supported residents with EPC rated homes D-G and a household income of less than £30,000 per annum to retrofit their homes.

- £112m of funding has been secured from the **Social Housing Decarbonisation Fund** and social housing providers to retrofit 6,125 social homes.
- The **Truly Affordable Net Zero** homes taskforce was launched to deliver 30,000 net zero social homes.
- Over £120m has been secured through the **Public Sector Decarbonisation Scheme** to retrofit 225 (~13%) of GM's public sector buildings.

Transport

- Greater Manchester is the first city region in England outside of London to take buses back under local control after nearly 40 years of deregulation. Working on behalf of Greater Manchester Combined Authority (GMCA), Transport for Greater Manchester (TfGM) is delivering a bus franchising scheme for local services across all ten districts in GM.
- The first franchised buses are now operating as part of the Bee Network, helping to fulfill GM's ambition for a fully integrated transport system joining together journeys by bus, tram, active travel (walking, cycling and wheeling) and local rail services. From January 2025, buses across GM will be part of the Bee Network.
- With a distinctive yellow colour scheme and bee logo, the Bee Network has committed to providing people with a sustainable service, enabling them to reduce their own carbon footprint.
- Progress in delivering the Bee Network includes:
 - 100km of new cycling infrastructure in the Bee Active Network.
 - Introduction of a bike hire scheme, known now as Starling Bank Bikes, and over 1,500 bikes are now available to hire.
 - More than 100 zero emission buses now operate in GM, the GM Bus Strategy aims for the full electrification of Greater Manchester's bus fleets (and supporting infrastructure) by 2032, with 50% of the fleet to be zero emission by 2027.
 - Metrolink runs on renewable energy making it one the most carbon efficient modes of transport per passenger. It has expanded to become the largest light rail network in the UK with services running on seven lines to 93 stops covering nearly 60 miles.
 - The launch of the Bee Network app to make it easier for residents and visitors to Greater Manchester to use sustainable modes of transport to get around. With almost half a million downloads since launching in late 2023, the app is helping to transform access to the network alongside low, affordable flat bus fares introduced here in GM before anywhere else in the country.
- Through GM's Streets for All Strategy, a strong emphasis is being put on reducing traffic and road danger, and on improving the street environment for everyone travelling along, spending time in or living on our streets. This has also included integrating Sustainable Drainage (SuDS) into our streets, so they support nature recovery and climate adaptation as well as active travel.
- There are now over 2000 publicly available EV connectors in Greater Manchester. There are 11,000 privately owned Electric Vehicles, and a similar number of home charging devices.

Natural environment:

- A statutory Local Nature Recovery Strategy has been drafted, setting out how we can create a greener Greater Manchester, enhancing green spaces for nature and for people.
- A Tree and Woodland Strategy – [All Our Trees](#) – has been published by City of Trees, setting out where planting trees can have the greatest benefit. Over 750,000 trees have been planted to date.

- Through the IGNITION project, a Living Lab has been established at Salford University to explore and engage businesses and residents on the benefits of nature-based solutions – including for biodiversity, water management and people on campus.
- In 2020 the Greater Manchester Environment Fund was launched to deploy funding to enhance and create new green spaces for nature and people. It has directed over £4.5m of funding into environmental projects across the city-region, including through the Green Spaces Fund. Through the GMEF, new business models are being developed to capitalize on the opportunities for private investment into the environment, which will come from demand from biodiversity net gain units and voluntary carbon offsetting.
- The Green Social Prescribing Pilot delivered activities to connect people with nature improving people's mental health and wellbeing and the natural environment at the same time.
- Through the Greater Manchester Natural Capital Investment Plan priorities for investment in the natural environment have been identified.
- Through five rounds of the Green Spaces Fund £3m has been allocated to 103 community-led projects that increase the amount and quality of accessible, nature-rich green space across Greater Manchester particularly in the areas most in need.
- The Natural Course project has worked collaboratively to design projects to address the barriers preventing the achievement of 'good ecological status'.
- In 2022, a New National Nature Reserve was declared for the Flashes of Wigan and Leigh, a vast former industrial site.
- An Integrated Water Management Plan was launched between GMCA, Environment Agency and United Utilities in 2022, setting out actions to work together collaboratively to the way we plan for and manage all elements of the water cycle across the city-region.

Circular Economy including Waste

- In 2022 the Sustainable Consumption and Production Plan was launched providing the framework for Greater Manchester's key activities in 4 priority areas: Moving to a Circular Economy, Managing Waste Sustainably, Reducing Food Waste, and Moving to Sustainable Lifestyles.
- The Recycle for Greater Manchester Community Fund, launched in 2021, has funded creative solutions to recycling, repairing and reusing household waste in Greater Manchester. So far 47 projects have been funded including cooking classes, repair cafes and educational workshops.
- The Renew Hub and Shops were launched to help build Greater Manchester's circular economy by reusing and repurposing items donated by residents, which are then sold in the three Renew shops, which has generated income in excess of £1million
- Recycle for Greater Manchester are supporting households to reduce food waste through innovative campaigns including 'Buy, Eat, Keep, Repeat' and 'Plan Your Scraps'.
- There has been work to reduce the use of avoidable single-use plastics including the Plastic Free GM campaign, GM Refill campaign, Public Sector Plastic Pact, and Academia Plastic Pledge.
- 10 schools are trialling being Eco-Refill Shops and Greater Manchester has become a Refill Destination.
- In 2022 the Textiles Circular Economy Business to Business Platform launched to develop a circular economy roadmap for textiles.
- In 2021 Bee Net Zero was launched, a collaborative Greater Manchester programme to support organisations on their journey to becoming net zero.
- A Schools Climate Action Planner has been launched to provide schools with a free, online, action planning tool to reduce their carbon footprint and environmental impact. Helping

students and staff to understand the issues surrounding the climate crisis, learn and build skills for the future.

- A Northwest Net Zero Youth Network has been established as a commitment taken by NW regional Mayors from COP26, with the first public event on 1st October 2022.
- Three phases of behaviour insights research have been completed to understand residents' opinions on climate change and the barriers and challenges that prevent them from acting.

Climate Adaptation

- A joint bid from Greater Manchester Combined Authority and Manchester City Council has been successful in securing funding from the Horizon Europe: Pathways2Resilience (P2R) Programme, which aims to increase the resilience of European regions and communities in the face of climate change. This includes the development of a Climate Adaptation Investment Plan.

Air Quality

- In October 2024 Greater Manchester submitted its investment lead Clean Air Plan (CAP) to government for approval. Progress can be followed on the GM Clean Air website.²⁹
- Since 2019 the number of exceedances of the legal limit for NO₂ has reduced,
 - for LAQM from 59 locations with a maximum annual concentration of 59µg/m³ in 2019 to 12 locations and a maximum concentration of 49.6µg/m³ in 2023.
 - For CAP from 129 location in 2019³⁰ with a maximum of 76 µg/m³ to 64 locations in 2023, with a maximum of 58.6 µg/m³.
- Since 2019 the maximum recorded annual average concentration of MP2.5 has reduced across Greater Manchester from 12 µg/m³ in 2019 to 9 µg/m³ in 2023 which is below Government's 2040 legally binding 2040 target. The minimum concentration in 2019 was 9 µg/m³-which dropped to 6 µg/m³ in 2023.

²⁹ [Greater Manchester Clean Air Plan | Clean Air Greater Manchester \(cleanaigrm.com\)](https://www.greatermanchester.gov.uk/clean-air)

³⁰ CAP monitoring expanded in 2022 to include many more sites for the assurance of modelled results.

Appendix 02: Technical Details to support prior sections

Places for Everyone Joint Development Plan

The Places for Everyone Plan was adopted by each of the 9 participating authorities (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan) and took effect on 21 March 2024. The plan and associated documents can be found on the GMCA [website](#). The Places for Everyone Plan forms part of the development plan for each of the 9 participating local authorities and is used to guide planning decisions in each of the authorities (Stockport is developing its own Local Development Plan). The plan is set out in thematic chapters, however many of the issues are cross-cutting, therefore the plan should be read as a whole.

The plan sets out:

- a spatial strategy which seeks to deliver sustainable, inclusive growth. Significant growth is proposed in jobs and housing at the core of the conurbation with the provision of significant new employment opportunities and supporting infrastructure in the northern districts and support for key economic drivers in the south of the conurbation.
- a global target for the nine authorities of just over 2 million sq.m. of new office floorspace and just over 3,500,000 sq.m. of industrial and warehousing floorspace over the plan period.
- a housing requirement of 10,305 homes per annum. The plan also continues to support Greater Manchester's commitment to deliver more affordable housing including ones for social or affordable rent. Local plans will set targets for the provision of affordable housing based on evidence relating to need and viability.

There is a strong focus in the plan on directing new development towards sites within the existing urban area, close to facilities and served by existing infrastructure.

Promoting Sustainable and Inclusive Development

The plan supports wider strategies around sustainability and resilient communities, including around clean air, resource efficiency and underpins Greater Manchester's ambition to be a carbon neutral city-region by 2038. The following policies are most relevant, however other policies in the plan, for example in relation to cycling and walking also contribute.

- JP-S1: Sustainable Development -to help tackle climate change, development should actively seek opportunities to secure net economic, social and environmental gains, utilise sustainable construction techniques and make as much use as possible of suitable previously developed (brownfield) land and vacant buildings to meet development needs
- Policy JP-S2: Carbon and Energy – measures to support our aim of delivering a carbon neutral Greater Manchester no later than 2038, with a dramatic reduction in greenhouse gas emissions
- Policy JP-S3: Heat and Energy Networks - the provision of decentralised energy infrastructure is critical to the delivery of our objectives for low carbon growth, carbon reductions and an increase in local energy generation
- Policy JP-S4: Flood Risk and the Water Environment - an integrated catchment-based approach will be taken to protect the quantity and quality of water bodies and managing flood risk

- Policy JP-S5: Clean Air - a comprehensive range of measures will be taken to support improvements in air quality, focusing particularly on locations where people live, where children learn and play, where there are impacts on the green infrastructure network and where air quality targets are not being met
- Policy JP-S6: Resource Efficiency - the achievement of a circular economy and a zero-waste economy will play a key role in meeting Greater Manchester's ambition of becoming a leading green city region by 2038

Environment

The Plan includes a range of policies designed to protect and enhance our natural environment.

- Policy JP-G1: Landscape Character - development should reflect and respond to the special qualities and sensitivities of the key landscape characteristics of its location
- Policy JP-G2 Green Infrastructure Network – take a strategic approach to the protection, management and enhancement of our Green Infrastructure in order to protect and enhance ecosystem services including flood management, climate change mitigation and adaptation, whilst supporting wider public health benefits, including promotion of active travel, food growing and recreational opportunities
- Policy JP-G3: River Valleys and Waterways - river valleys and waterways will be protected and improved as central components of our Green Infrastructure Network and a vital part of a Nature Recovery Network, making a major contribution to local identity, quality of life and the natural environment
- Policy JP-G4: Lowland Wetlands and Mosslands – protect, enhance and restore the distinctive flat, open landscape and network of habitats of ecologically valuable lowland wetlands and mosslands, with a strong emphasis on reconnecting local communities to the natural and historic environments
- Policy JP-G5: Uplands – protect, enhance and restore our upland areas which contain significant areas of blanket bog priority habitat, Sites of Biological Importance (SBIs), Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs), Special Protection Areas (SPAs), woodlands and habitats vulnerable to climate change.
- Policy JP-G6: Urban Green Space - ensure there is an appropriate scale, type, quality and distribution of accessible urban green space that can support a high quality of life and other important green infrastructure functions
- Policy JP-G7: Trees and Woodland - aim to significantly increase tree cover, protect and enhance woodland, and connect people to the trees and woodland around them
- Policy JP-G8: A Net Enhancement of Biodiversity and Geodiversity - achieve a measurable net gain in biodiversity of no less than 10%
- Policy JP-G9: The Green Belt - the Green Belt makes up a considerable proportion of land in the Plan area, and it is therefore vital that its various parts play a beneficial role that supports the environmental, social and economic wellbeing of the city region's residents

Improved Air Quality Standards:

The Places for Everyone Plan is a framework for the future development of Greater Manchester setting out the vision and policies for housing, transport, environment, and economy in the region. During the Public Hearings following representations a modification was made by the Planning Inspector to include the 2021 WHO targets for PM2.5 ($5\mu\text{g}/\text{m}^3$ by 2030), instead of the previous

10µg/m³. The plan aims to reduce the emissions of PM2.5 from various sources, such as wood burning stoves, road transport, and industry. The plan also promotes the use of green infrastructure, public transport, and active travel to improve the quality of life and health of the residents.

Other Air Quality Standards

International

The Convention on Long Range Transboundary Air Pollution's amended Gothenburg Protocol (CLRTAP) and the National Emission Ceilings Regulations (2018) (NECR) require the UK to reduce emissions of PM2.5 by 30 per cent compared to emissions in 2005 by 2020 and to stay below this level in each subsequent year until 2029. The NECR also requires the UK to reduce emissions by 46 per cent compared to emissions in 2005 by 2030. In the UK PM2.5 emissions decreased by 41 per cent between 2005 and 2022. Therefore, in 2022, the UK did meet the 30 per cent emission reduction commitment required between 2020 to 2029 as set out in the NECR¹.

Greater Manchester became the UK's first WHO and United Nations Environment Breathe Life region in 2017, showing its commitment to tackle air quality. The campaign calls for governments to achieve the WHO air quality guidelines by 2030, which would halve the number of air pollution related deaths by then. Since signing up to this commitment the WHO guidelines have been revised. The UK government has not committed to achieving the new WHO guidelines, instead in 2023 it introduced new legislation² for fine particulate matter (PM2.5), which sets an annual mean concentration target of 10µg/m³ by 2040, and a population exposure reduction target of 35% by 2040. The government has considered the WHO guidelines and the transboundary sources of PM2.5, which are estimated to contribute more than 60% of the PM2.5 levels in southern England.

National

The UK's two legal air quality regimes: The UK has two sets of air quality regulations, one at the national level and one at the local level. The national regulations follow the EU standards and set limits for several pollutants, such as nitrogen dioxide (NO₂) and particulate matter (PM).

The UK is compliant with all the national limits except for NO₂, which is mainly caused by road traffic. It is for this reason following legal action by Client Earth that Greater Manchester has been directed by the government to bring NO₂ levels within the legal limit in the shortest possible time and by 2026 at the latest.

The local regulations require local authorities to monitor and manage the air quality in their areas and declare air quality management areas (AQMAs) if the limits are exceeded.

PM2.5 targets come under the national-level regime and although not part of the Local Air Quality Management framework, local authorities are expected to support delivery of the national PM2.5 targets by taking action to reduce emissions from sources within their control.

GM's AQ management area was declared in 2016 for nitrogen dioxide and based on a modelled area with an upper limit of 35µg/m³. Since that date all 10 GM authorities have been served with a direction to reduce roadside exceedances to below the legal limit of 40µg/m³ in the shortest possible time and by 2026 at the latest. GM has, subject to government feedback, committed to deliver compliance with NO₂ through an investment-led, non-charging Greater Manchester Clean Air Plan that cleans up the air without harming livelihoods, jobs and businesses.

Ozone (O₃) is a pollutant gas which is not emitted directly from any source in significant quantities but is produced by complex chemical reactions between other pollutants such as nitrogen oxides and volatile organic compounds (NO_x & VOC's) in the presence of sunlight. O₃ is higher in the summer months and can travel long distances. NO_x and VOCs occur from both natural and manmade sources such as transport, combustion process, solvent processes and the overall trend in the rural indicator is a long-term decrease likely driven by reductions in global emissions of NO_x and VOC's³.

GM will continue to work with government to achieve the new England target levels for PM_{2.5} of 10µg/m³ and exposure reduction of 35% by 2040. For the first time in 2023 the external air quality monitoring stations across GM measured an annual mean of less than 10 µg/m³ and we need to work hard to ensure that this improvement is maintained. It is important that everyone is conscious of their contribution to the particulate matter burden in GM. Activities that contribute to the emissions of fine particulate matter to the external air include solid fuel burning stoves, garden bonfires, charcoal BBQ's and Chimineas. According to Defra in 2022 domestic combustion contributed to 29% of the total PM_{2.4} emissions with the majority coming from domestic wood burning.