

GREATER MANCHESTER SPATIAL FRAMEWORK

Strategic Options Background Paper 4
Infrastructure and Environment
November 2015

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1. PURPOSE

- 1.1 This paper is divided into two parts: Part A (Critical Infrastructure) and Part B (Environment) and is the start of a process to identify and draw out the key strategic issues that the GMSF should consider as the broad growth options are translated into a draft plan.
- 1.2 The issues identified complement those already highlighted in the Integrated Assessment Scoping Report produced to inform the strategic environmental assessment, sustainability appraisal, equality impact assessment and health impact assessment of the GMSF¹ and the more extensive Integrated Greater Manchester Assessment² produced by New Economy in 2014 as a shared evidence base.

2. SCOPE OF THE GMSF

- 2.1 The previously agreed scope³ of the GMSF in relation to critical infrastructure, transport and the environment is set out below.

Critical Infrastructure

- Broad location of strategic schemes for water, waste water, gas, electricity and heat to deliver the proposed scale and distribution of development;
- overall strategy for delivering low carbon energy and any GM wide significant opportunities;
- overall strategy for managing flood risk and broad location of any strategic infrastructure required;
- role of social infrastructure and the implications of growth ‘opportunity areas’ on current infrastructure (e.g. health or education);
- strategically or internationally important facilities e.g. for sports and leisure; and
- Infrastructure implications of ‘strategic opportunity areas’.

Transport

- Broad location of strategic schemes required to deliver the proposed scale and distribution of development;
- explain essential role of key transport infrastructure such as Manchester Airport

Environment

- Climate change will be part of the overall spatial strategy, and a consistent theme through the GMSF, with a broad approach to maximising economic opportunities whilst reducing emissions and enhancing resilience/adaptation;

¹ See: http://archive.agma.gov.uk/what_we_do/planning_housing_commission/greater-manchester-spatial-framework/consultation-on-scoping-report/index.html

² See: <http://neweconomymanchester.com/stories/1986-2014-integrated-greater-manchester-assessment>

³ See: http://archive.agma.gov.uk/cms_media/files/phc_14_1_15_agenda_and_reports_merged.pdf

- overall strategy for GMs green and blue assets and the role of a quality environment in meeting the vision for GM;
 - the strategic green and blue infrastructure network in GM and any key gaps in it that need to be addressed (broad locations); and
 - overall strategy for addressing poor air quality and reducing air quality management areas
- 2.2 For the purposes of this report in section 3 onwards these issues have been restructured into two themes; Critical infrastructure ((5 topics) and Environmental Capacity (8 topics) for further exploration:

Waste and Minerals Planning

- 2.3 Infrastructure and environment issues associated with minerals and waste planning are already addressed at Greater Manchester scale through the Joint Waste Development Plan Document (2012)⁴ and the Joint Minerals Development Plan Document (2013)⁵. As such, it is not proposed to explore Waste and Minerals in detail as part of this GMSF development process, as processes to review and maintain these as part of an overarching framework are already in place.
- 2.4 The purpose of the Waste Plan is to set out a waste planning strategy which enables the adequate provision of waste management facilities in appropriate locations for municipal, commercial and industrial, construction and demolition and hazardous wastes. A review of the waste plan would be initiated by a significant change arising from national/European legislation, significant issues emerging through an update to the Waste Needs Assessment or non-delivery of sites in the waste plan. All of these points are picked up as part of the monitoring arrangements of the plan, with the recycling targets being examined through the 2 yearly review of the needs assessment. Should monitoring identify significant issues then this would initiate the need for a review of the plan.
- 2.5 The primary objective of the Minerals Plan is the achievement of the annual aggregate apportionment and the maintenance of an appropriate land bank of at least 7 years for sand and gravel and at least 10 years for crushed rock, whilst ensuring that the capacity of operations to supply a wide range of materials are not compromised. This information is reviewed annually as part a national requirement to monitor the managed aggregate supply system (MASS). This process is now also linked to the preparation of the Local Aggregate Assessment (LAA) which looks at past sales of aggregates and seeks to predict future requirements based on level of expected growth and past sales. The 2014 LAA⁶ concludes that a sufficient land bank is in place.

⁴ <http://www.gmwastedpd.co.uk/>

⁵ <http://www.gmmineralsplan.co.uk/>

⁶ http://www.gmmineralsplan.co.uk/docs/LAA_2014_Final_November_2014.pdf

- 2.6 If future monitoring indicates that the land bank is insufficient then this information will feed into the LAA and this could inform a need for a revised figure to be taken forward for the setting of future apportionment. If this occurred then, as stated by the NPPF, this would require a review of the Minerals Plan to identify a revised apportionment figure.

PART A - CRITICAL INFRASTRUCTURE

3. INTRODUCTION

- 3.1 All cities rely on their critical infrastructure. We are committed to the preparation of a Spatial Framework and uplift in housing delivery, creation of new jobs and improvements to productivity. Infrastructure is the physical and related organisational structures needed for society to operate. It provides the energy and water resources that society needs to function and enables people, information and goods to move efficiently and safely. There is also a strong economic case for infrastructure investment. A number of economic studies⁷ report that infrastructure has a significant positive effect on output, productivity, and growth rate and is a key driver of jobs throughout the economy. As such, it is a key element of the government's long-term economic plan⁸. The role of infrastructure within the development plan process is outlined in the National Planning Policy Framework (NPPF)⁹.
- 3.2 Infrastructure is a critical ingredient to supporting growth and one of the priorities in the Greater Manchester Strategy (GMS) 2013 is to “master plan and deliver the investment necessary in the existing and critical infrastructure required to support growth”. This is in recognition that infrastructure investment is driven by a range of factors and its timely delivery is essential as insufficient infrastructure capacity can not only stall or prevent development but is often identified by existing communities as a reason for objecting to new development.
- 3.3 For the purposes of the Spatial Framework, infrastructure will include the physical aspects of the sectors that are covered in the National Infrastructure Plan produced annually by HM Treasury with the addition of social infrastructure, these sectors are:
- Transport infrastructure – air (Manchester), rail, port (Salford) tram (metrolink), road, walking and cycling
 - Utilities infrastructure – gas, electricity, heat, digital connectivity, water and waste water
 - Social infrastructure – schools and education, health services, community facilities, recreation provision and green infrastructure

⁷ <http://www.cbi.org.uk/business-issues/infrastructure/how-infrastructure-drives-growth-in-the-uk/> & <http://www.lse.ac.uk/researchAndExpertise/units/growthCommission/documents/pdf/SecretariatPapers/Infrastructure.pdf>

⁸ National Infrastructure Plan (2014)

⁹ Planning should.... proactively drive and support sustainable economic development to deliver the homes, business and industrial units, infrastructure and thriving local places that the country needs.”

- 3.4 It is estimated that the UK will spend more than £400bn¹⁰ on Infrastructure in the next 20 years alone. Most of this will be focussed on the built environment of cities, their transport connectivity and physical fabric. Whilst the total sums may be substantial, three key questions will be explored as the GMSF is progressed, these are:
- How much of the national infrastructure budget can be devolved to Greater Manchester to support delivery of the GMSF?
 - Does an infrastructure gap remain? And
 - If there is a gap how can this be closed?
- 3.5 Funding of the infrastructure required to deliver the GMSF will be considered in a future assessment. It is likely that this assessment will differentiate between four different types of infrastructure costs:
- Standard costs (apply to all developments i.e. drainage connections);
 - abnormal developments costs (contaminated and derelict land);
 - socialised costs (schools, transport, green space, flood defence works); and
 - maintenance and renewal of existing infrastructure.
- 3.6 The costs will depend on a number of factors, such as:
- Growth – population and timing of new development: Some of our infrastructure is many decades old and operating at capacity or not available close to new growth areas. The impact on infrastructure will depend on the timing, scale, density, location and development use class and the head room provided by existing utility asset management plans;
 - risk and resilience – the likely effects of a changing climate on infrastructure and communities¹¹, with increased flooding the greatest direct risk to Greater Manchester;¹²¹³
 - the impact of technology changes e.g. electrification of transport and heating of new homes;
 - the interdependencies between the types of infrastructure deployed, their running costs and implications for household and business costs – i.e. cheaper infrastructure may result in higher bills; and
 - regulatory changes: requiring improvements to water (i.e. EU Water Framework Directive) and air quality targets¹⁴.

¹⁰ National Infrastructure Plan (2014)

¹¹ See: <http://www.climatejust.org.uk/map>

¹² Evidencing and Spatially Prioritising Weather and Climate Change Risks in Greater Manchester (University of Manchester for GMCA, 2013)

¹³ Sitting at the top of the GM Community Risk Register (of relevance) are: flooding and severe weather.

¹⁴ http://uk-air.defra.gov.uk/assets/documents/National_air_quality_objectives.pdf

4. URBAN FORM, INFRASTRUCTURE AND CITY RESILIENCE

- 4.1 Urban areas provide the places for people to live and for businesses to function. Within town and city centres and surrounding catchment areas populations come and go, change in composition, develop new patterns of working and communicating and so on. Businesses evolve, their space and mobility requirements change, and capital is invested and withdrawn with significant spatial impacts.
- 4.2 In this context, the interrelationship between 'urban form' and 'flows' is critical to understanding infrastructure needs. The physical infrastructure is 'fixed'. The transport networks, power stations and sewer systems are the result of significant historical investment: they can have life-spans and a set geography of hundreds of years. Yet these systems need to provide reliable and high quality services within both relatively 'slow' changing urban forms and the rapidly shifting 'flows' within certain geographical areas.
- 4.3 The future form, functionality, appearance, ambience and resilience of Greater Manchester will have a direct impact on people's lives, whether or not residents and businesses choose to live and invest in a city or not. The relationship between the existing urban form and how this will change as a direct result of the GMSF is critical to understanding future infrastructure requirements and any capacity 'pinch point's. Furthermore the GMSF will have to strike a balance between the provision of new development land required to accommodate new homes or businesses and additional land required to accommodate infrastructure such as new schools, energy and greenspaces required to support an active and healthy population.
- 4.4 The Future of Cities working papers produced by Foresight (Government Office for Science, 2014), provides an analysis of the relationship between urban form and infrastructure. This highlights that urban areas (cities, towns and conurbations) can be seen as systems in which relatively slow-changing urban forms provide the setting for more rapidly changing 'flows' of capital, people, pollutants, cultures and technologies.
- 4.5 Taking town centres as an example, the retail focus of centres has shifted as the growth of internet purchases has resulted in some town centres struggling to adapt – and this trend is set to continue and accelerate. In fact, the amount of retail space required within town centres is set to contract by nearly a third by 2020. As concentrations of people, jobs and hubs for transport connectivity, town centre locations are important physical spaces with evidence¹⁵ suggesting that town centres remain a source of employment within GM:
- Across GM the principal town centres (therefore excluding Manchester City Centre) account for 15% of employment within the districts;

¹⁵ Data supplied by Javelin Group (June 2015) www.javelingroup.com

- the main source of employment within the principal town centres is public administration, primarily associated with council offices and education (with the exception of Altrincham);
- commuting and travel to work patterns highlights the localised role of the principal town centres within their districts and the immediately adjoining areas and
- a number of schemes underway would broaden and increase town centre employment in some town centres.

4.6 Resilience looks at long term factors including for example, climate change, urbanisation, energy supply, security issues and anti-microbial resistance and explores how a city can meet its ambitions whilst ensuring it is safe and secure and is addressing key vulnerabilities. In 2014 Greater Manchester became the first UK city to join the UN's Making Cities Resilient Campaign and has been recognized by the United Nations as a "Role Model for Total Resilience" because of its focus on implementing the Campaign's entire ten-point checklist for building resilience to disasters¹⁶. The design process is being utilised to mitigate factors that could disrupt or harm the conurbation, making it a place where investments are protected and a place defined by growth and competitive advantage.

4.7 This continued capacity to not only meet but to embrace economic, social, technological and environmental change, defines the resilience of the conurbation. Greater Manchester has always looked to and built for the future and it continues to do so, investing in the capabilities to react effectively to unavoidable or unpredictable events and then to build back better afterwards. Through understanding risks and addressing them can derive multiple benefits from its investments; considering resilience enables single interventions to address multiple vulnerabilities.

4.8 Divining the future and likely technological and economic change is challenging and it's difficult to predict how urban areas and infrastructure will become more efficient and "smarter" through the use of "big data"¹⁷ or connected in the "internet of things"¹⁸. But we need to lay a solid foundation for the future by developing the deepest possible understanding of the present and how this functions. From this understanding a strategy for future growth can then revolve around the vision and principles for Greater Manchester in terms of place making, liveability, wellbeing and resilience and not just housing numbers.

5. TRANSPORT

5.1 Alongside other investment strategies the Greater Manchester Transport Strategy will be closely aligned to the GMSF. The Greater Manchester Transport Strategy 2040: Our Vision published during the summer of 2015¹⁹

¹⁶ See: <http://www.unisdr.org/archive/39268>

¹⁷ <https://www.gov.uk/government/publications/emerging-technologies-big-data>

¹⁸ <https://www.gov.uk/government/news/digital-economy-investing-in-the-internet-of-things>

¹⁹ <http://www.tfgm.com/2040/Pages/default.aspx>

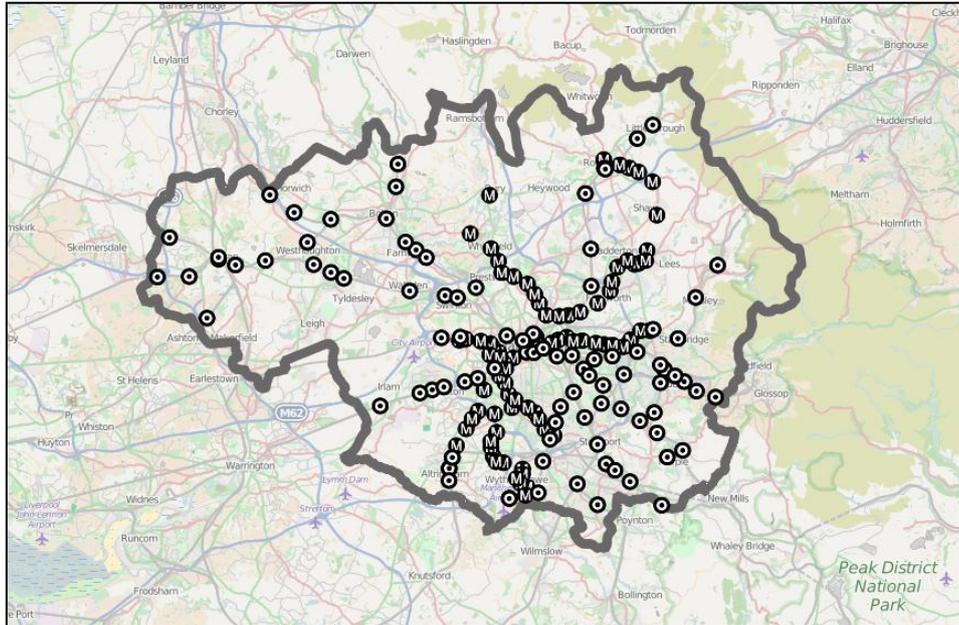
seeks public and stakeholder views on a vision for the transport network that we believe Greater Manchester needs by 2040 to deliver “world class connections that support long-term sustainable economic growth and access to opportunities for all”. The document does not include details on transport schemes or investment priorities at this stage, but provides a vision of what a successful transport system might look like in 2040, to support Greater Manchester’s wider economic, social and environmental ambitions.

- 5.2 The vision is supported by five complementary ‘spatial themes’, which are: A globally connected city, city-to-city links (focusing on inter-city rail and road connectivity in particular), getting into and around the regional centre, travel across the wider city region, and connected neighbourhoods. The Transport Strategy that will be published in 2016 will therefore identify interventions targeted at different types of travel, from global connectivity to support overseas trade and leisure markets, right down to the critical local trips that people make on a daily basis from their homes to work, school, shops, services, and local transport interchanges. The 5 year delivery plans will set out detailed schemes and proposal to support the delivery of both the GMSF and Transport Strategy.
- 5.3 The Greater Manchester Transport Strategy 2040 will be supported by an extensive evidence base which will be published alongside the transport strategy in 2016. The transport strategy the associated 5 year delivery plans will provide the opportunity to support the any additional requirements that emerge through the GMSF process.
- 5.4 The importance of relating future transport choices to likely demographic changes in Greater Manchester was illustrated by the Independent Transport Commission, 2015²⁰ which examined attitudes to transport choices and concluded that:
- There are major differences between age groups but urban/suburban/rural and socio-economic factors provide the most influential variables. As the proportion of urban area population increases, car ownership and use is expected to decline;
 - the car is increasingly unlikely to be considered an automatic default choice. The link between use and ownership is beginning to be broken, and reducing the status of cars;
 - there is a cumulative picture showing public support for moving towards more sustainable patterns of travel. This includes a strong indication of wider modal choices, and lower car trip rates; and
 - the above trends are not indicative of less travel. With population growth, it is anticipated there will be higher travel demand. In the survey, a

²⁰ <http://www.theitc.org.uk/wp-content/uploads/2015/07/ITC-ORR-Road-Rail-Attitudinal-Report-Final.pdf>

growing proportion of people judged they had travelled more, and would need to travel more for work and leisure in future.

Figure 1. Metrolink and rail stations



5.5 Transport issues have been outlined in the Integrated Greater Manchester Assessment (2014)²¹ and the GMSF specific Integrated Assessment Scoping Report (2015)²². From these reports the main issues that the GMSF will have to address can be summarised as:

- The number of people living and working in Greater Manchester is at the highest level since 1971;
- while rail and Metrolink patronage continues to grow, commuting to work by car increased by 75,000 trips between 2001-2011 and now accounts for 66% of all work journeys;
- car ownership within Greater Manchester has increased between 2001 and 2011 census years;
- the flow of daily commuting trips is expected to increase in line with employment projections;
- motorway traffic has grown over the last ten years and this is forecast to continue. Key parts of the motorway network are now congested and this

²¹ See: <http://neweconomymanchester.com/stories/1986-2014-integrated-greater-manchester-assessment>

²² See: http://archive.agma.gov.uk/cms_media/files/2015_07_09_gmsf_ia_scoping_for_consultation_issue.pdf?static=1

will need to be an important consideration in the location of new development. However, traffic growth is not evenly spread, and there is considerable variation across Greater Manchester, with traffic levels falling on some roads;

- a future which includes more people and jobs will increase demand on all forms of transport;
- ONS released the latest (August 2015) travel to work areas (TTWAs) based on the 2011 census. This concludes that with the exception of Wigan, which is in a different TTWA, since 2001 Greater Manchester has become more integrated and is now wholly within a single travel to work area;
- 72% of trips to Manchester city centre in the morning peak are by non-car modes. Growth in Manchester city centre is forecast to add 30,000 trips over the next ten years during the morning peak. Accommodating this without increasing car traffic will require a major shift to public transport, walking and cycling;
- accommodating these without increasing car traffic or exacerbating the already poor air quality will require a major shift away from the car and onto public transport;
- residents choose where they live based on a range of factors: the quality of place, schools and family connections, lifestyle alongside considerations such as commuting times / routes to work, public transport connectivity²³;
- almost 88% of commuters who live in Greater Manchester also work in the sub-region, and more than 85% of all commuters who work in Greater Manchester also live in the sub-region;
- while central Manchester is the main focus of commuting journeys, there is a highly complex pattern of travel to work flows within Greater Manchester;
- the rail and Metrolink networks focus on delivering people into the city centre and, to a lesser extent, town centres and employment areas along the routes. Other movements are served only by bus. Whilst overall bus patronage is static TfGM are shaping new approaches to bus travel through bus priority schemes, improving performance standards, investing in low-emission vehicles and by considering options for bus market reform;

²³ Sources GMSF: Objectively Assessed housing Need Paper.

- most of the trips people make in GM are for non-work purposes and most trips for day-to-day activities are of five miles or less. However more than half of these short trips are made by car;
- Greater Manchester is one of a number of major UK conurbations where nitrogen oxide (NO₂) limits are exceeded. Transport is the main source of NO₂ emissions and the air quality management area (AQMA) reflects the location of motorways, major roads and urban areas²⁴²⁵. The main source of transport NO₂ emissions is from lorries, followed by cars, but the former make a disproportionately large contribution, as do buses in urban areas;
- the term of the Transport Plan and GMSF will see a major transition in how transport is fuelled, shifting from fossil fuels to electricity and other low carbon sources for rail, tram and road travel; and
- the ability to provide new public transport infrastructure and services to support growth depends on the location, scale and density of development.

6. UTILITIES

6.1 As reported to the Greater Manchester Local Enterprise Partnership in 2014²⁶ the headline infrastructure issue is the market failure relating to land use planning, infrastructure planning and investment. This relates to the way regulated monopolies work within their own regulations etc and also the first mover 'disadvantage' created by the current funding / regulation system. More specific issues are:

- A major transformation of the UK energy system is underway with a shift to dynamic, smart energy networks, embedded generation at the building and community scale, and active, two way flows of demand and response. This alters the amount of capacity existing infrastructure is capable of delivering and requires a more integrated approach to spatial, building design, servicing and consents;
- Developing a shared understanding of issues and solutions remains a challenge. There is an abundance of data available and applying this in an integrated way is one area where further work is required;
- There is a need to provide better co-ordination and alignment of utility planning with GM development and growth plans to reduce the risk of the untimely identification of constraints that could delay or even stop development / growth proposals;
- there is often a "first mover" disadvantage with the first developer / investor incurring the greatest costs and risks in an area of potential development;
- integration of information at a geographical basis is useful and helps reduce the risk of development and growth proposals being unattractive,

²⁴ Source: Greater Manchester Emissions Inventory

²⁵ The AQMA area can be viewed at: <http://www.mappinggm.org.uk/gmodin/>

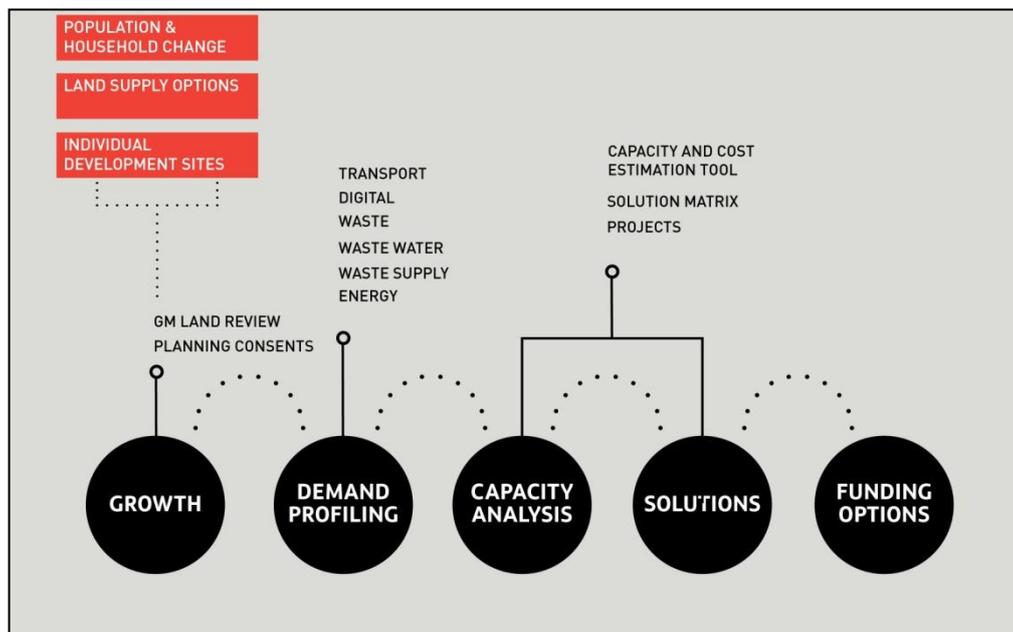
²⁶ See: http://archive.agma.gov.uk/cms_media/files/lep_agenda_and_papers_16_1_14.pdf

delayed or made unviable through constraints being identified late in the development process and

- some strategic issues (e.g. electricity capacity) illustrate how the simple integration of datasets on a 'place' basis leads to a clearer identification of challenges (electricity sub stations in flood risk areas; capacity in electricity substations supplying strategic sites and town centres, flood risk to major transport infrastructure) and vehicle for identifying solutions.

6.2 To help address these issues and advise the LEP and the Combined Authority on strategic infrastructure matters the Greater Manchester Infrastructure Advisory Group was established in June 2014. The group includes representatives from the following utility companies and infrastructure providers: United Utilities, BT, Electricity North West, National Grid UK Gas Distribution; Environment Agency, Highways England and Transport for Greater Manchester. Figure 2 provides an illustration of the infrastructure planning process and how it relates to the GMSF.

Figure 2. Infrastructure Planning Process



6.3 To date the group has overseen:

- The examination of infrastructure issues relating to strategic development sites
- Development of an open data infrastructure map available at: <http://www.mappinggm.org.uk/gmodin/>

6.4 The infrastructure map encompasses major local social and physical infrastructure with the aim of supporting better informed decision making during the pre-planning phase by identifying the strengths and weaknesses in infrastructure provision. For the purpose of the GMSF the Open Data Infrastructure Map provides a powerful tool in assessing whether growth areas are constrained by the lack of utilities or social infrastructure. However, additional data such as capacity issues would be required in order to inform

decisions relating to growth areas and whether any network reinforcements or additional facilities are now required.

- 6.5 A pilot project is under way to examine how infrastructure capacity, connectivity and constraints and the GMSF growth options can be aligned. This work builds upon the Infrastructure Map and is being supported through collaboration with the main utility providers and the Future Cities Catapult²⁷. An energy-specific piece of work is being undertaken with the ETI and Energy Systems catapult²⁸ to develop a masterplanning approach to energy infrastructure.

7. SOCIAL INFRASTRUCTURE

- 7.1 The scope of the GMSF will be limited to setting out the role of social infrastructure and consideration of the likely spatial implications of growth on current infrastructure in particular: school places, health and recreation provision. These are addressed in turn below.

School Places

- 7.2 Ensuring that children have access to a choice of high quality schools within their local area is central to achieving the GMSF vision. The existing demand for additional school places is being driven by demographic change as a result of increased birth rates since 2001 international migration and the exchange of population between areas. An additional component of this is the significant planned housing growth across Greater Manchester. Therefore, the GMSF is likely to have significant implications for school place planning and additional work will be required to understand the spatial implications of growth across Greater Manchester on pupil places.
- 7.3 An assessment was undertaken recently by Edge Analytics for the Greater Manchester authorities²⁹ and identified the following:

Reception Year Intake

- 7.4 There is a surplus at the aggregate GM level with +390 surplus places by 2018/19. However, this figure conceals the spatial differences in the SCAP: PAN³⁰ (School Capacity Collection Data: Pupil Admission Number) ratios between local authorities.
- 7.5 Over this five year period half of the Greater Manchester authorities forecast that the reception year forecast will not exceed the PAN – Bury, Oldham, Stockport, Trafford and Wigan. In the remaining five authorities reception

²⁷ The Future Cities Catapult (FCC) are a part of a network of nine Catapult centres established by Innovate UK - an executive non-departmental public body, sponsored by the Department for Business, Innovation & Skills. Further information please see: <https://futurecities.catapult.org.uk/>

²⁸ <https://es.catapult.org.uk/>

²⁹ The Greater Manchester Pupil Place Planning Report, see:

http://archive.agma.gov.uk/cms_media/files/item_11b_scrutiny_pool_mins_12_12.pdf?static=1

³⁰ Admission Number (PAN) and the School Capacity Collection Data (SCAP)

year forecasts will exceed the PAN over five year period – Bolton, Manchester, Rochdale, Salford and Tameside.

- 7.6 What is more notable is the significant discrepancy between reception year forecasts and PAN in Manchester and Tameside with a -893 and -285 shortfall in places respectively. This is in contrast to the forecast surplus of places in Stockport and Trafford with +480 and +462 places respectively.
- 7.7 Within individual districts hot-spots of growth are forecast with future growth pressure being particularly severe in Manchester and the neighbouring areas of Rochdale, Salford, Stockport and Tameside. Outside of this main concentration other high forecast areas exist around Wigan North and North West and the Daubhill area of Bolton.

Year Seven Intake

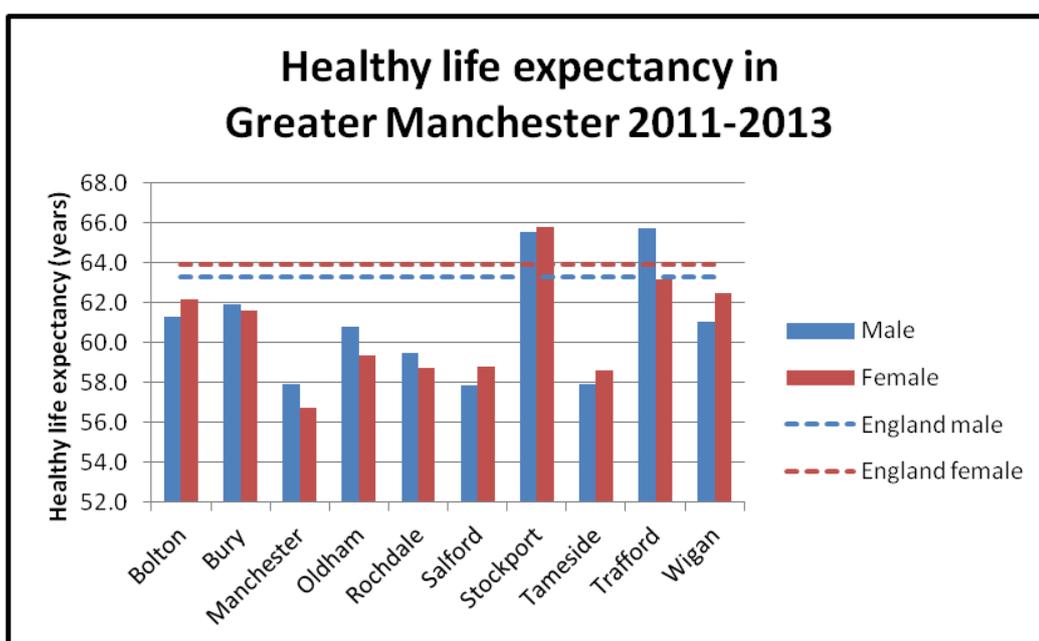
- 7.8 The report concludes that for year seven intake the discrepancies between PAN and SCAP are more substantial. All ten GM authorities have a deficit by 2020/21 which represents a cumulative shortfall estimated at -4,260, with the most substantial differences observed in Manchester (-2,122) and Tameside (-564).
- 7.9 The geography used for planning secondary school provision is less disaggregated. The main growth pressure is in Bury, Manchester and Tameside with more geographically-specific pressures estimated for the Altrincham area of Trafford, The Pennines Township in Rochdale, Salford North, Orrell and Wigan West.
- 7.10 The assessment undertaken by Edge Analytics was based on the existing position, as the GMSF will be advocating high levels of growth the implication for schools places will require additional scrutiny and analysis. To provide an integrated approach to meeting Greater Manchester's school place pressures, the GMSF spatial options will be reviewed with representatives from the relevant Local Education Authorities . This is to ensure that there is sufficient scrutiny and a consistent methodology upon which to agree projections and the assumptions used to estimate the implications of growth on pupil numbers. This will also enable better informed decisions to be made in relation to school infrastructure.

8. HEALTH

- 8.1 National Planning Guidance stipulates that Local planning authorities should ensure that health and wellbeing, and health infrastructure are considered in local and neighbourhood plans and in planning decision making. Two areas are covered on health and planning in this paper:
- Health Infrastructure; and
 - Public Health

8.2 The health of people in Greater Manchester has improved year on year for several decades,³¹ with life expectancy (LE) increasing, levels of infant mortality continuing to reduce, and overall mortality rates decreasing. However, Greater Manchester is still lagging behind other areas of the UK and Europe, indicating that there is a need to improve the health of residents further. Particular attention needs to be paid to female LE and healthy LE. A key element of improving the overall health of the population is to focus on some of the leading risk factors that influence health such as alcohol consumption, smoking, drug misuse and obesity.

Figure 3. Healthy Life Expectancy in Greater Manchester



8.3 A second area of focus is protecting the population from disease through immunisation, an area where Greater Manchester performance is better than rates seen nationally. Early identification of disease is also vital, and Greater Manchester has been successful in increasing screening and detection of blood borne viruses such as HIV and hepatitis.

8.4 A third key focus is ensuring that children receive the best start possible at home, in education and with regard to their health. This involves addressing a range of issues such as poverty, nutrition, family environment and educational achievement.

8.5 The most significant recent development in relation to health provision across Greater Manchester has been the announcement of the health and social care devolution deal. This is an element of the Greater Manchester Devolution Agreement settled with the Government in November 2014.

³¹ See: http://www.gmphnetwork.org.uk/wp-content/uploads/2015/01/IGMA_Public_Health_Evidence_Base_final_May_2014_.pdf

- 8.6 Health and social care are a significant part of this work and following the wider agreement, NHS England and the ten Greater Manchester councils, 12 Clinical Commissioning Groups and NHS and Foundation trusts developed a plan that encompassed a further joining up and integration of health and social care. From this work a Memorandum of Understanding has been agreed between the Government, the Greater Manchester health bodies and local authorities and NHS England. The aim of the MoU is to give the GM city region direct, local control over the annual health budget (£6 billion each year from April 2016).
- 8.7 The MoU covers: acute care, primary care, community services, mental health services, social care and public health. The vision and strategic objectives around health and social care devolution principally relate to improving the health and wellbeing of all Greater Manchester residents from early age to older years. This is to be achieved through a focus on the prevention of ill health and the promotion of wellbeing. There are clear links here to be forged with the GMSF as a mechanism to deliver the sustainable development that is envisaged by the NPPF in addition to playing a critical role in facilitating social interaction and creating healthy, inclusive communities.
- 8.8 Already formed as part of the devolution programme, the Greater Manchester Strategic Health and Social Care Partnership Board will oversee the strategic development of the Greater Manchester health and care economy. This board will specifically steer the development of the Strategic Sustainability Plan and related investment funding proposals, which will be underpinned through local area plans.
- 8.9 What is clear from the devolution programme is that engagement across the conurbation on health infrastructure issues will be a complex undertaking. However, the current progress offers a distinct opportunity to engage across the health sector and continued dialogue will need to take place as the GMSF evolves.
- 8.10 Public health practitioners are particularly keen to help shape the future of Greater Manchester with a focus of creating a healthy environment. At this stage work remains at an early stage but a recent report by the Directors of Public Health Group 'Greater Manchester Healthy Environment' indicates the scope of work under the healthy environment portfolio. The six environmental themes are:
1. Spatial factors;
 2. Green space;
 3. Healthy food;
 4. Housing and fuel poverty;
 5. Air quality; and
 6. Active travel.
- 8.11 Some progress has been made on coordinating work between planning and public health colleagues with an initial meeting during spring / summer 2015

that outlined the Public Health Network current work programme and the scope and progress on the GMSF. Dialogue since this meeting has been ongoing and there is potential for knowledge transfer and joint working as the GMSF proceeds. Additional work is required to identify the implications of growth in different geographical areas on health care services.

9. GREEN INFRASTRUCTURE

- 9.1 National Planning Policy describes Green Infrastructure as: “A network of multi-functional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities”.
- 9.2 If Greater Manchester is to be a place where people actively want to live, work and visit then it will be essential that it has a high quality network of green and blue infrastructure running throughout it. Without this, it will struggle to compete with other cities for investment and skilled labour, compromising its long-term economic growth as well as reducing the quality of life for its residents and detracting from its environmental sustainability
- 9.3 Population growth could pose significant challenges to Greater Manchester’s environment by 2035. Competition for land and the need for greater housing and commercial development are likely to place pressures upon the city’s existing green spaces, whilst potentially reducing the supply of land within Greater Manchester’s current boundaries available for creating any new green space.
- 9.4 Green infrastructure is more than parks and public spaces. It is increasingly understood as a network of interventions aimed at solving urban environmental problems by building with nature. These interventions can include efforts to increase biodiversity, improve air quality, sustainable energy production, provide natural shading, shelter and cooling, clean water and boost flood resilience.
- 9.5 Rethinking and restructuring the existing green space network as an ‘ecosystem service’ to improve its performance, and greening the built environment, would enable the conurbation to address a number of environmental and social imperatives. These range from minimum green space requirements to a host of challenges potentially presented by a changing climate, from surface water management and urban cooling to ecological resilience. It will also yield a number of social benefits, linked to health improvements and community well-being.
- 9.6 In 2011 the Greater Manchester Green Infrastructure Framework was published³², this provides both a rationale and evidence for strategic network

³² See:

http://archive.agma.gov.uk/cms_media/files/110506_final_gi_framework_may_20112.pdf?static=1

in Greater Manchester. It recognises that a strategy for growth in the sub-region also requires a positive plan for green infrastructure. The Framework identifies four Priority Investment Opportunities:

(1) The strategic green infrastructure network

The strategic green infrastructure network requires investment in safeguarding, enhancement and in the creation of new assets to improve the existing strategic network. The returns on such investment will be in health, access, amenity, biodiversity, climate and flood resilience and tourism.

(2) Economic centres and growth points

Enhancement and creation of new GI assets in urban areas, strategic sites and key transport corridors and gateways, this is in recognition that the quality of public realm is vital to economic success, health, well-being and image.

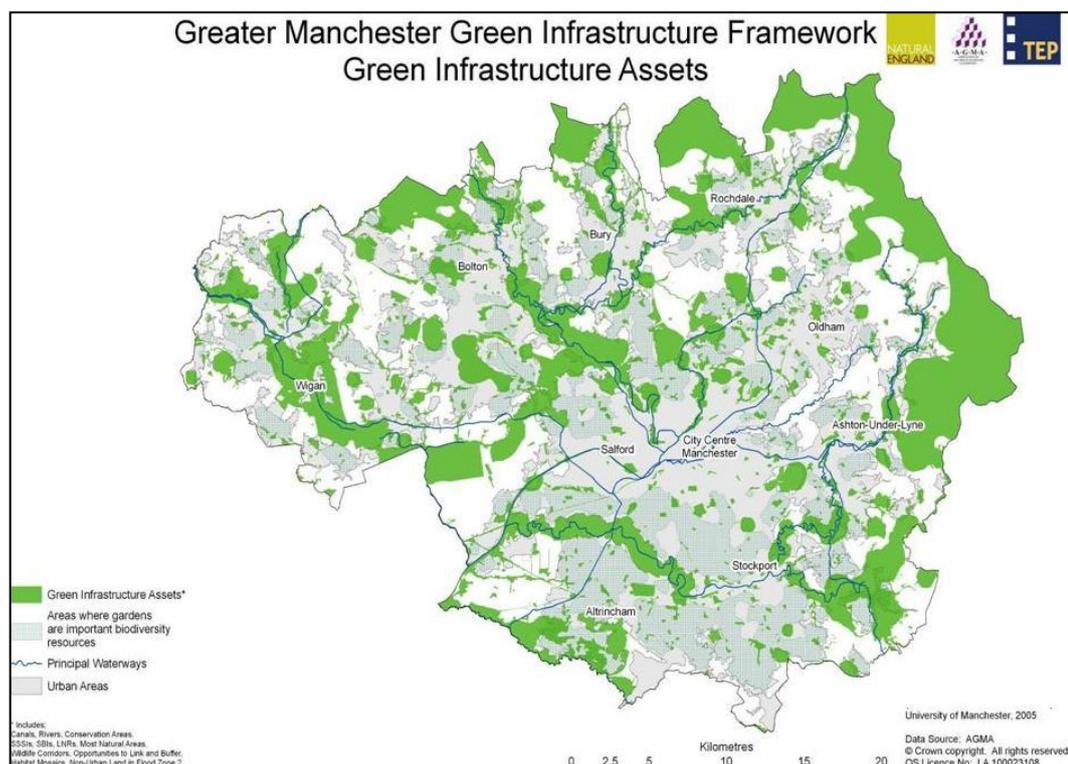
(3) Regeneration priority areas

Enhancement and creation of new assets in areas of multiple deprivation, major brownfield development sites, derelict, underused and neglected land and blighted transport corridors.

(4) An active travel network

Investment to protect, enhance and create new GI assets as part of an active GM public and active travel network e.g. are required; footpaths, cycle ways, canal towpaths and bridleways which link assets to each other and to residential and employment areas.

Figure 4. Green Infrastructure network



- 9.7 More recently individual districts have produced more detailed strategies for both managing and integrating green infrastructure into the future development of places. Recent examples include Rochdale and Manchester. The role of green infrastructure in providing resilience against a more volatile and extreme climate is well understood, and work to apply this knowledge to Greater Manchester's Plans and programmes is a key part of Greater Manchester's EU RESIN and LIFE+ Integrated programmes.
- 9.8 As the GMSF is progressed, a refresh of the existing Green Infrastructure framework will be required to ensure that it remains central to the planning of future growth. Consideration will also be given to the application of standards such as the Woodland Access Standards promoted by the Woodland Trust and Accessible Natural Greenspace Standards (ANGSt) published by Natural England which advocate that everyone, wherever they live, should have accessible natural greenspace:
- of at least 2 hectares in size, no more than 300 metres (5 minutes walk) from home;
 - at least one accessible 20 hectare site within two kilometre of home;
 - one accessible 100 hectare site within five kilometres of home; and
 - one accessible 500 hectare site within ten kilometres of home; plus
 - a minimum of one hectare of statutory Local Nature Reserves per thousand population.

10. PART B – ENVIRONMENTAL CAPACITY

10.1 The environmental capacity section considers the following issues:

- Landscape Character
- Biodiversity and Ecosystems
- Soils
- Flood Risk Management
- Carbon Emissions
- Air Quality
- Historic Environment

10.2 A baseline of environmental issues is also outlined in the GMSF Integrated Appraisal Scoping Report³³.

11. LANDSCAPE CHARACTER

11.1 One of the core principles in the National Planning Policy Framework is that planning should recognize the intrinsic character and beauty of the countryside. Local plans should include strategic policies for the conservation and enhancement of the natural environment, including landscape. This includes designated landscapes but also the wider countryside.³⁴ The GMSF is primarily concerned with land for growth rather than land management albeit the two are complementary and contribute to successful places.

11.2 The national character areas³⁵, were published last year and are a valuable source of environmental information relevant to Greater Manchester. They also provide a useful biogeographic / character area context to inform the development of spatial options and are utilized by the Department of Environment Food and Rural Affairs (Defra) as the basis for Agri-Environment (AE) schemes³⁶ which provide funding to farmers and land managers in England to help them deliver effective environmental management on their land. It is therefore proposed that the national LCA are utilized as a basis for informing the strategic approach in the GMSF for the conservation and enhancement of the natural environment, including landscape.

11.3 For Greater Manchester the applicable character areas are:

³³ See:

http://archive.agma.gov.uk/cms_media/files/2015_07_09_gmsf_ia_scoping_for_consultation_issue.pdf?static=1

³⁴ NPPG - Paragraph: 001 Reference ID: 8-001-20140306

³⁵ <https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making>

³⁶ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/396192/landscape-character-assessment.pdf

- Area 36 - The Southern Pennines are part of the Pennine ridge of hills, lying between the Peak District National Park and Yorkshire Dales National Park. This is a landscape of large-scale sweeping moorlands, pastures enclosed by drystone walls, and gritstone settlements contained within narrow valleys. The area contains internationally important mosaics of moorland habitats which support rare birds such as merlin, short-eared owl and twite.
- Area 51 - The Dark Peak is a landscape of large-scale sweeping moorlands, in-by-pastures enclosed by drystone walls, and gritstone settlements, within the Pennine chain. It falls almost entirely within, and forms a large part of, the Peak District National Park. Approximately 46 per cent of the area has been designated as a Special Protection Area and Special Area of Conservation, both being the highest forms of environmental protection afforded by European Law.
- Area 54 - The Manchester Pennine Fringe occupies the transitional zone between the open moorlands of the Dark Peak and Southern Pennines and the densely populated urban conurbation of Manchester. The area wraps around Greater Manchester from Bolton in the north-west to the edge of Hazel Grove in the east, and includes the industrial towns of Bury, Bolton, Rochdale, Oldham, Dukinfield and Glossop.
- Area 55 Manchester Conurbation – a number of settlements have grown and come together to form the Manchester conurbation, including Manchester, Salford, Stockport, Sale, Ashton-under-Lyne, Swinton, Altrincham, Stretford, Prestwich, Cheadle Hulme, Denton and Droylsden.

The area is characterised by dense urban and industrial development, commercial, financial, retail and administrative centres, commuter suburbs and housing, interspersed with a network of green infrastructure. The conurbation is centred on low hills, crossed by several river valleys that thread through the urban fabric. The geology is dominated by sandstones, overlain by thick deposits of glacial till. The underlying Permo-Triassic sandstones provide an extensive aquifer, contributing groundwater for a large number of industrial users as well as public water supply.

River valleys form important corridors of semi-natural habitats and natural greenspace – with open grassland, woodland and wetland – linking urban centres with open countryside. The industrial heritage now provides sites of wildlife interest in the urban environment. Canals that weave through the conurbation not only offer opportunities for access and recreation, but also form a network of wetland habitats. Sections of the Rochdale Canal, in particular, have been designated as being of international importance as a Special Area of Conservation (SAC). Woodland cover is generally low, but variable – and significant for such a heavily urban location.

- Area 56 - The Lancashire Coal Measures surrounds the towns of St Helens and Wigan, and extends from the Mersey Valley NCA in the south to the Lancashire and Amounderness Plain NCA in the north-west. Rocks from the Carboniferous Coal Measures underlie most of the area, giving rise to a varied topography of gentle hills and valleys, with patchy layers of glacial deposits.

This fragmented landscape rises to 179 m at the summit of Billinge Hill on the western boundary, and then falls abruptly to the Lancashire and Amounderness Plain and Merseyside Conurbation to the west, and the Mersey Valley to the south. Views of the foothills of the southern Pennines can be seen to the east. The area is dominated by its industrial heritage, long associated with mining activity. The resulting landscape is a complex mosaic of farmland, scattered urban centres, industry, active mineral sites and derelict or reclaimed workings, giving this area a strong and distinctive identity.

- Area 60 – Mersey Valley consists of a wide, low-lying river valley landscape focusing on the River Mersey, its estuary, associated tributaries and waterways. It is a varied landscape that extends from the mosslands near the Manchester Conurbation NCA in the east, to the Merseyside Conurbation NCA and the wide estuary with intertidal mudflats/sand flats and salt marsh in the west. The River Mersey is tidal from Howley Weir in Warrington.

The area encompasses a complex mix of extensive industrial development and urban areas, with high-quality farmland in between. Farmland in the north of the Mersey Valley NCA is predominantly arable, while in the south there is a mix of arable and pasture. Field pattern is regular and large scale, often defined by degraded hedgerows with isolated hedgerow trees. In the east, open, flat farmland is found on the rich, dark peaty soils of the former mosses, with a complex network of drainage ditches.

Urban and industrial developments line the banks of the River Mersey. Industrial infrastructure is often prominent, with large-scale, highly visible development including chemical works and oil refineries. The Manchester Ship Canal links the estuary to the heart of Manchester, perpetuating the industrial development of the area. There is a dense communication network of major roads, railways, canals and transmission lines. The urban and suburban areas provide housing for those working in neighbouring conurbations, as well as in the industries of the Mersey Valley.

12. BIODIVERSITY

12.1 There is a statutory basis for planning to seek to minimize impacts on biodiversity and provide net gains in biodiversity where possible³⁷. National Planning Policy identifies the minimum requirements as:

- plan for biodiversity at a landscape-scale across local authority boundaries;
- identify and map components of the local ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them and areas identified by local partnerships for habitat restoration or creation;
- promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations;
- aim to prevent harm to geological conservation interests; and
- where Nature Improvement Areas are identified, consider specifying the types of development that may be appropriate in these Areas.

12.2 An analysis undertaken by the Greater Manchester Ecology Unit (GMEU) has concluded that:

- The system of European and nationally designated wildlife sites (Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Ramsar (internationally important wetlands) and Sites of Special Scientific Interest (SSSIs) is robust and well-established and comprehensive information regarding nationally designated sites is readily available;
- a robust system of Local Wildlife Sites (Sites of Biological Importance, SBIs) is in place and is well established. The Guidelines for Site Selection are up-to-date and regularly reviewed. The Guidelines have been thoroughly tested through the land-use planning system and through Public Inquiry. 20% of SBIs are re-surveyed each year so every SBI is reviewed every five years. Comprehensive information regarding SBIs is readily available;
- a robust system of Local Nature Reserves is in place across all Districts, largely based on SBI boundaries;
- there is one locally agreed Nature Improvement Area - the Greater Manchester Wetlands (covering Salford, Wigan and parts of Bolton and Trafford);
- protected sites receive a relatively high degree of protection through statutory controls or through the land-use planning system, however a high proportion of them are not currently in favourable management regimes so it is possible the number of protected sites may reduce;
- there is a high level of public awareness concerning protected site designations, particularly amongst developers and their agents; and

³⁷ <http://www.legislation.gov.uk/ukpga/2006/16/section/40>

- provision for re-surveying larger areas outside of currently protected sites is limited; therefore the potential for adding new sites to the network is very limited. Currently no sites are designated on the basis of their geological interest, although progress towards such designations is being made.

12.3 The Greater Manchester Ecological Framework³⁸ was developed on the basis of well documented nature conservation challenges, these are:

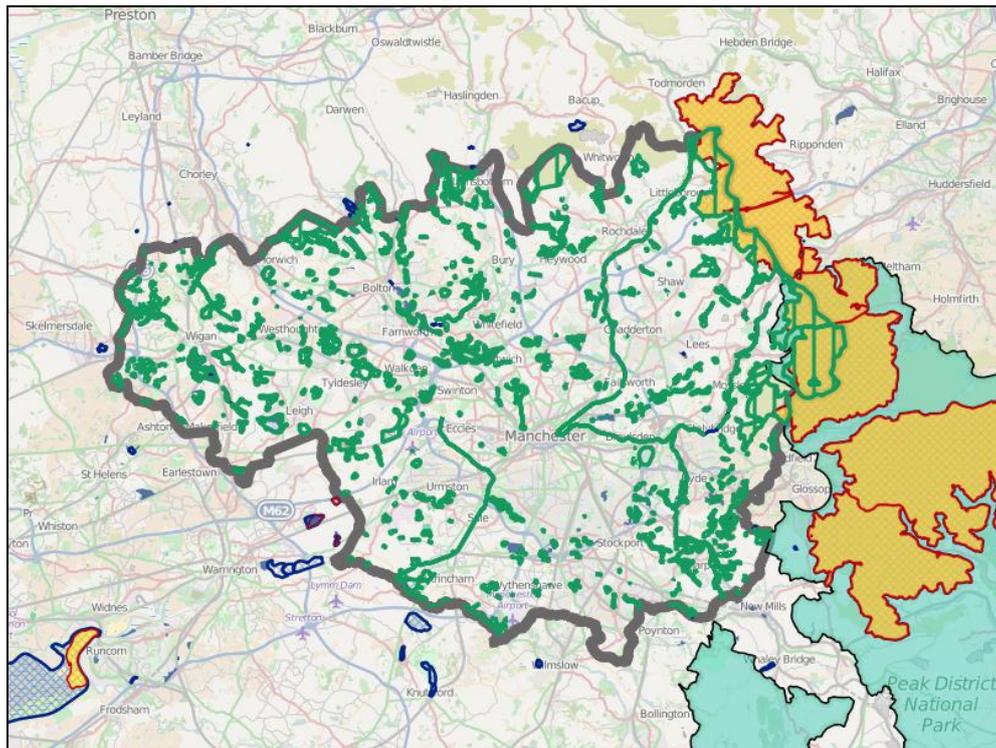
- Many of the designated sites are small and fragmented. The movement of many types of species between these sites is restricted. This means that important species can easily be lost from sites but cannot be easily replaced;
- the small size of many sites also leads to pronounced 'edge effects' where the boundaries of sites suffer encroachment and degradation from surrounding land uses;
- designated sites can only ever cover a relatively small proportion of the landscape, and most species are found outside designated sites where they experience lower levels of protection and inappropriate land management practices;
- people view nature conservation as being 'taken care of' in designated sites and therefore put less effort into nature conservation in the wider landscape;
- the designated sites can only be properly protected from damaging operations that can be controlled through the land-use planning system;
- increasingly, strategic, holistic approaches are being taken to the creation, protection and management of greenspace; and
- these approaches maximize the idea that green spaces can deliver multi-functional benefits and should not be seen as 'single use' spaces. For example, a nature reserve can also be used as a recreational space, as a flood defense mechanism or as a carbon store. Multiple-function greenspaces together make up the 'Green Infrastructure' of a particular area or locality.

12.4 The framework concludes that taking a Green Infrastructure approach to the creation, enhancement and management of greenspace will benefit nature, since many spaces (and particularly urban spaces) can be improved for wildlife as part of a strategy for maximizing greenspace multi-functionality.

12.5 An Ecological Framework can be viewed as an element of a wider Green Infrastructure strategy, since a Framework can be used to inform the creation and management of green space.

³⁸ Report by Greater Manchester Ecology Unit (2008)

Figure 5. Designated Sites

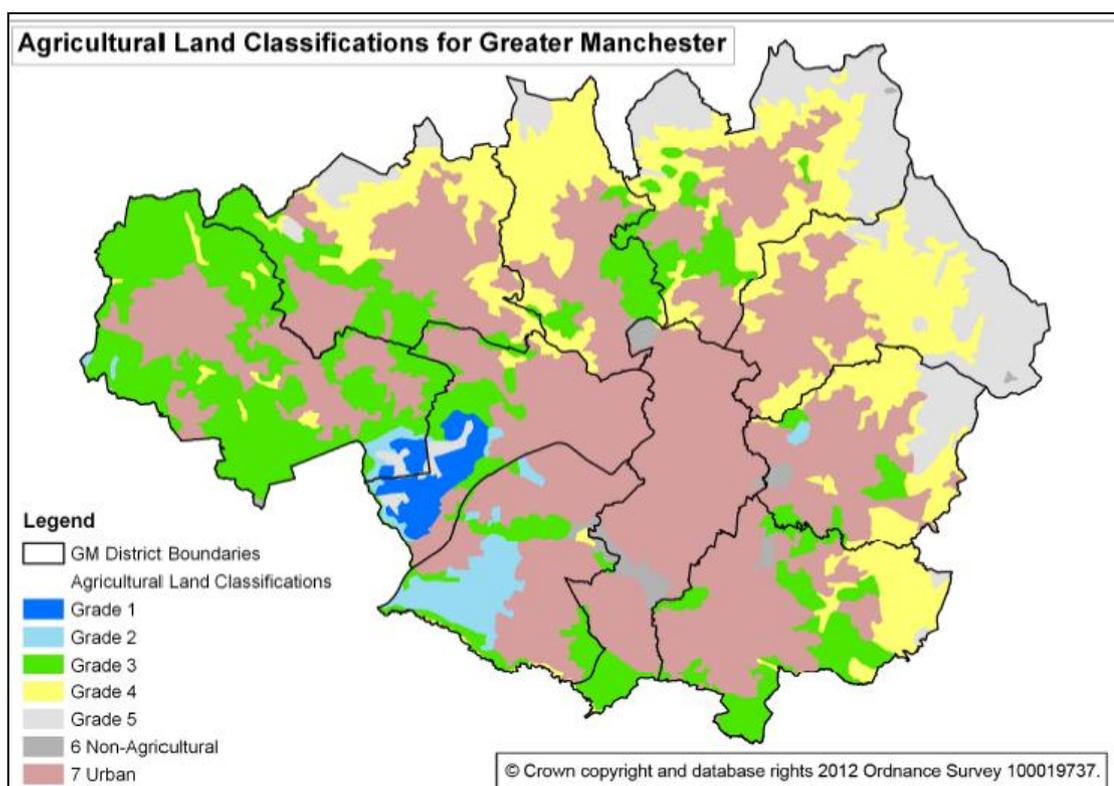


13. SOILS

- 13.1 The National Planning Policy Framework expects local planning authorities to take into account the economic and other benefits of the best and most versatile agricultural land. This is particularly important in plan making when decisions are made on which land should be allocated for development. Where significant development of agricultural land is demonstrated to be necessary, local planning authorities should seek to use areas of poorer quality land in preference to that of a higher quality.

- 13.2 The agricultural land classification provides a method for assessing the quality of farmland to enable informed choices to be made about its future use within the planning system. The Agricultural Land Classification system classifies land into five grades, with Grade 3 subdivided into Sub-grades 3a and 3b. The best and most versatile land is defined as Grades 1, 2 and 3a and is the land which is most flexible, productive and efficient in response to inputs and which can best deliver food and non food crops for future generations. In Greater Manchester the best and most versatile agricultural land is concentrated in south west of the conurbation.

Figure 6. Agricultural Land Classifications



14. PREVIOUSLY DEVELOPED LAND

- 14.1 The National Land Use Data Base³⁹ provides statistics on the amount of previously developed land that may be available for development in England including figures for Greater Manchester (see table 1). This statistical release is intended to present a record of all previously developed land and buildings in England that may be available for development, whether vacant, derelict, or still in productive use. The data release comes with the following caveat that the:

“rate of return from local authorities for 2012 was low at around 50%. This raw, site-level data reported to the Homes and Communities Agency (HCA) by local authorities has been collated into the above site list with no validation. Being on the dataset does not necessarily mean that a site is available for development. The data provided should be treated with caution. No indication of potential constraints to development is factored into the figures; for example flood risk and contamination could rule out certain types of development such as housing or employment floor space. Further

³⁹ See <https://www.gov.uk/government/collections/national-land-use-database-of-previously-developed-land-nlud-pdl>

viability considerations such as location and local market conditions are also important in interpreting the data”.

Table 1. Previously Developed (ha.) Land from 2012 NLUD

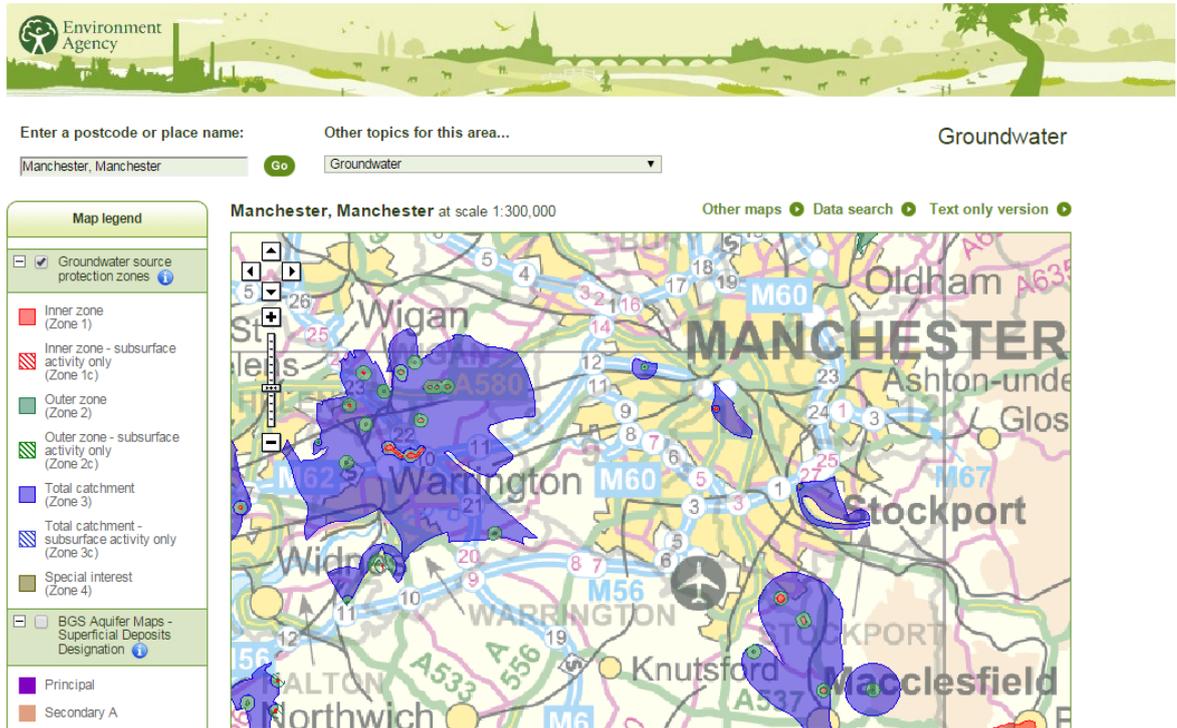
Land Type					
	A – PDL now vacant	B – Vacant buildings	C – Derelict land and buildings	D – PDL in use & allocated or with permission	Total Hectares
Bolton	19.34	12.28	48.35	98.22	178.18
Bury	112.65	23.97	97.49	61.03	295.13
Manchester	153.39	72.46	76.50	167.81	470.16
Oldham	59.39	6.78	12.76	183.22	262.15
Rochdale	50.23	35.88	2.97	87.09	176.17
Salford	238.80	14.50	146.45	80.82	480.57
Tameside	30.77	28.50	105.07	36.90	201.24
Wigan	235.73	5.40	377.48	39.10	657.71
GM Total	900.30	199.76	867.06	754.19	2721.32

- 14.2 Brownfield sites, due to previous uses, often have significant abnormal costs that need to be factored into the valuation of proposed development schemes. The most commonly discussed abnormal cost on brownfield land is site contamination. However, whilst not all brownfield sites are contaminated they can still carry abnormal costs such as the costs of removing underground obstructions, redirecting culverts, demolition of existing buildings and the poor quality of used top soil. These costs increase the need for expensive site assessments and create additional large costs for developers which can impact upon the viability of a development scheme.
- 14.3 Land contamination can be caused by many different elements and is often linked to the historical industrial use of land. It is difficult to determine how much contaminated brownfield land there is within our existing supply. However, it is reasonable to assume that a significant percentage of the supply in Greater Manchester will require some form of remediation before the site can be brought forward. A Viability Assessment of the GMSF will be undertaken to ensure that the pipeline of sites can be delivered in the first 5 years of the plan. The Homes and Community Agency (HCA) have produced guidance on “Dereliction, Demolition and Remediation Costs” (March 2015).⁴⁰ This identifies likely costs associated with different sites and development uses, including the additional costs associated with remediating land for residential development above ground water source

⁴⁰ <https://www.gov.uk/government/publications/guidance-on-dereliction-demolition-and-remediation-costs>

protection zones⁴¹ which is the case for parts of Manchester, Stockport and Wigan⁴² (see figure 7.).

Figure 7 – Source Protection Zone (extract from EA web site)



15. FLOOD RISK AND WATER MANAGEMENT

15.1 Greater Manchester consists of a complex hydrological catchment that is affected not only by natural features such as topography, watercourses and geology, but also by artificial influences such as canals, reservoirs and the built environment. As a result, there is a complex mix of varying and interlinked flood sources and associated risks. The Irwell and Mersey catchments dominate the sub-region, accounting for 78% of the total catchment area. Glaze Brook, the River Bollin, Sinderland Brook and the River Douglas make up the remainder of the fluvial catchments.

15.2 The upper regions of the catchments tend to be steeper and have less permeable geology and are therefore more susceptible to flooding from watercourses and direct runoff as a result of high intensity rainfall events. The lower areas of the catchments consist of a more shallow topography, and have more permeable geology and tend to be dominated by fluvial flooding as a result of widespread and persistent rainfall events. All

⁴¹ <http://apps.environment-agency.gov.uk/wiyby/37833.aspx>

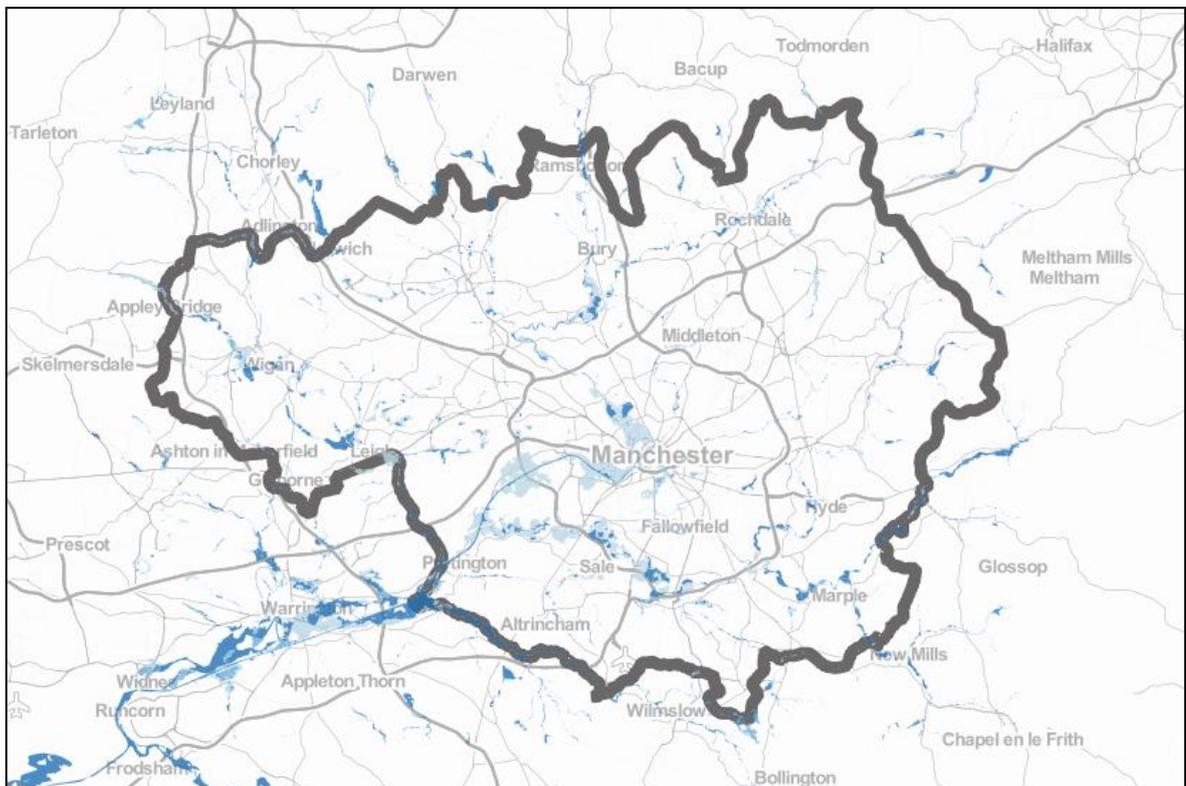
⁴² <http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=531500.0&y=181500.0&topic=groundwater&ep=map&scale=5&location=London,%20City%20of%20London&lang=e&layerGroups=default&distance=&textonly=off#x=393017&y=396580&lg=2,&scale=5>

<http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=531500.0&y=181500.0&topic=groundwater&ep=map&scale=5&location=London,%20City%20of%20London&lang=e&layerGroups=default&distance=&textonly=off#x=393017&y=396580&lg=2,&scale=5>

catchments within the sub-region, apart from the River Douglas, drain into the Manchester Ship Canal.

- 15.3 A significant amount of information exists for the main watercourses and their tributaries across the four main catchments (Irwell, Mersey, Douglas and Glaze Brook). During periods of prolonged rainfall events and sudden intense downpours, overland flow from higher ground may 'pond' in low-lying areas of land without draining into watercourses, surface water drainage systems or the ground. Surface water flooding is most likely to occur in areas of poor permeability and limited drainage and on steeper slopes; however, there is widespread potential for occurrences across the conurbation.
- 15.4 Although the risk of In some areas, surface water flooding may be more significant than river flooding such as the Irwell and Mersey in many areas, there is much less available record keeping, data and analysis in order to identify and mitigate vulnerable locations. Robust local knowledge of a locality's flood history and surface water flood modelling may be required in order to determine whether new development may be at risk, or may increase the risk to neighbouring development.

Figure 8. Main River Flood Zones

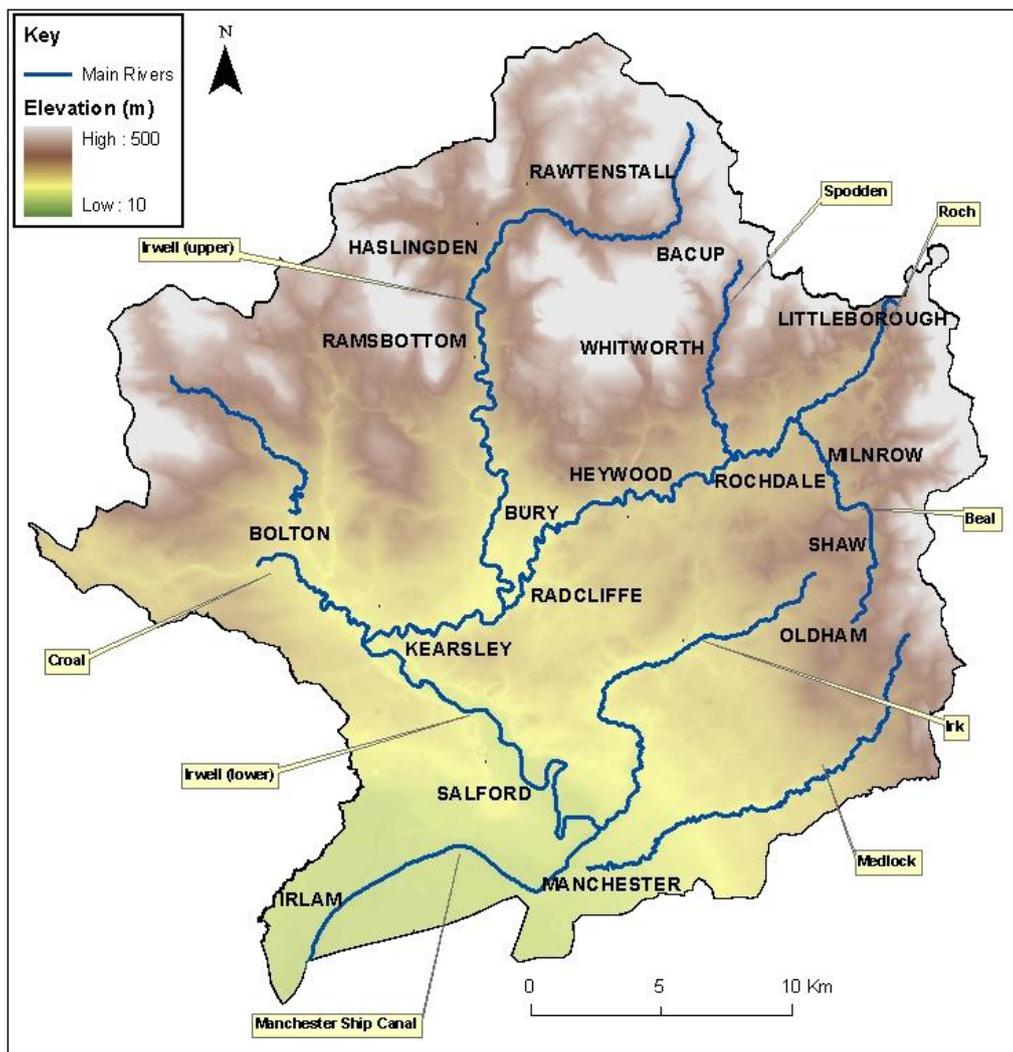


- 15.5 The development of the GMSF will require a sequential approach to growth to ensure that areas at little or no risk of flooding are developed in preference to areas at higher risk whilst also reflecting the opportunities for

the strategic management of land within the main catchments in Greater Manchester.

15.6 Catchments identified through Catchment Flood Management Plans (CFMPs) provide the strategic context for flood risk management in Greater Manchester⁴³, the relevant catchments in Greater Manchester are: the Irwell, Douglas and Upper Mersey. Land management objectives within the North West River Basin Management⁴⁴ are also relevant if the GMSFs objective is to deliver significant improvements to places where people want to live alongside economic growth. Figure 9. below highlights the strategic importance of the Irwell catchment being directly upstream from the regional centre.

Figure 9. Irwell Catchment



⁴³ See <https://www.gov.uk/government/collections/catchment-flood-management-plans#north-west-river-basin-district>

⁴⁴ See: <https://www.gov.uk/government/publications/north-west-district-river-basin-management-plan>

16. CARBON EMISSIONS

- 16.1 National Planning Policy requires that the GMSF should consider its role in reducing carbon emissions by:
- Reducing the need to travel and providing for sustainable transport
 - providing opportunities for renewable and low carbon energy; technologies and providing opportunities for decentralized energy and heating;
 - promoting low carbon design approaches to reduce energy consumption in buildings; and
 - all communities have a responsibility to help increase the use and supply of green energy but this does not mean that the need for renewable energy automatically overrides environmental protections and the planning concerns of local communities.
- 16.2 Greater Manchester is powered by a mix of gas, electricity, transport fuels and a small amount of oil, solid fuel and biomass. Only a small percentage of the energy used within Greater Manchester is generated locally. Nearly all of the electricity consumed in Greater Manchester is generated nationally and distributed through national infrastructure in a regulated, partitioned and highly complex market.
- 16.3 A major transformation of the UK energy system is already underway, with a shift to dynamic, smart energy networks, embedded energy generation at the building and community scale and active demand side management. UK Energy policy dictates that the next two decades will see a significant shift away from gas towards heat and electricity, with gas primarily being used in power stations and district energy systems.
- 16.4 Decarbonisation of the grid through development of less carbon intensive fossil fuel power stations (carbon capture; gas turbines), large scale renewable energy programmes (e.g. from on and offshore wind farms, water related power, biomass) and nuclear power will significantly reduce emissions generated from our use of electricity.
- 16.5 In the case of wind turbines, national planning guidance directs *that “a planning application should not be approved unless the proposed development site is an area identified as suitable for wind energy development in a Local or Neighbourhood Plan. Wind energy development will need to have been allocated clearly in a Local or Neighbourhood Plan. Maps showing the wind resource as favourable to wind turbines or similar will not be sufficient”*. The question for the GMSF is therefore (a) is there sufficient potential for renewable energy generation in Greater Manchester (b) should this be within the scope of the GMSF and (c) is the available evidence sufficient?
- 16.6 Opportunities exist for large energy projects to be sited within Greater Manchester but the policy levers available to local government to shape the energy system are not fully in place. This means that opportunities for

Greater Manchester centre on creating the right market conditions to deliver on energy opportunities, procuring energy from low carbon sources, and taking steps to reduce and manage our energy demand.⁴⁵

Figure 10. Potential Heat Networks

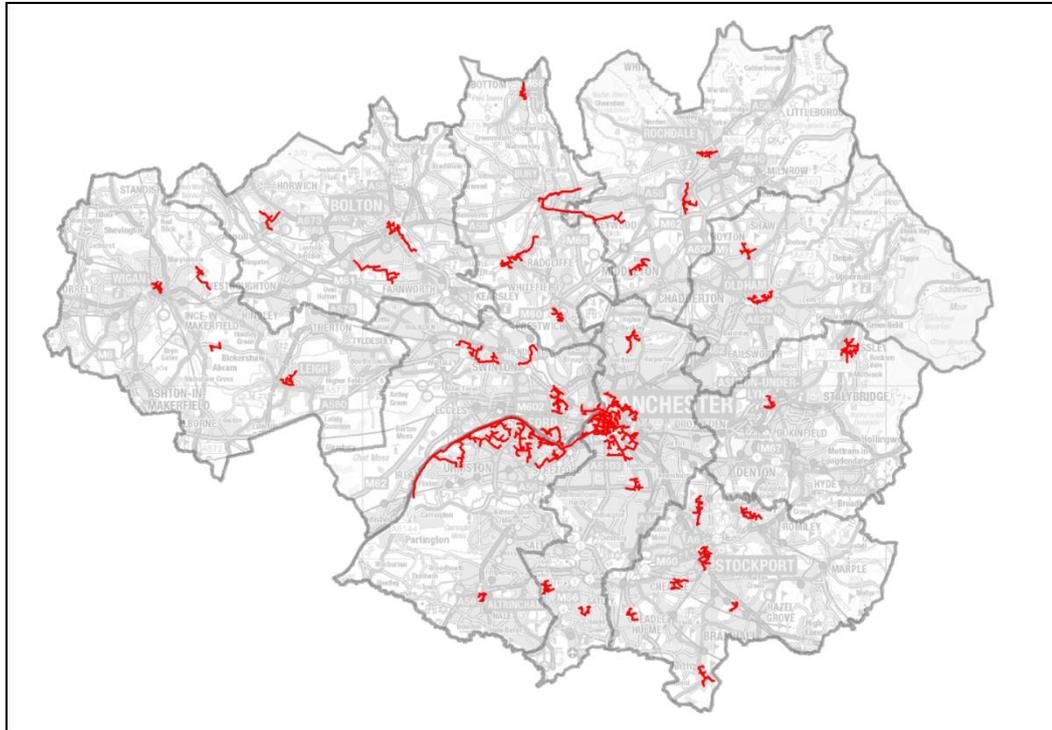


Figure 10 shows a map of short to mid-term opportunities (2015-22) for heat networks in Greater Manchester identified in 2013.

16.7 The Combined Authority has adopted a carbon target to deliver a 48% reduction or 11 million tonnes by 2020. New targets for beyond 2020 are being established in parallel with this work as part of the development of a Climate Change Implementation Plan for 2016-20 The Low Carbon Wedges work^l predicts that between now and 2020 the following reductions will be achieved:

- National policy will deliver 2.54m
- National policy (with local influence) 0.38m
- Local Initiatives need to deliver 2.24m
- Estimated impact of existing projects 0.28m
- Estimated Impact of potential pipeline 0.27m
- Estimated gap (projects as yet unidentified) 1.68m

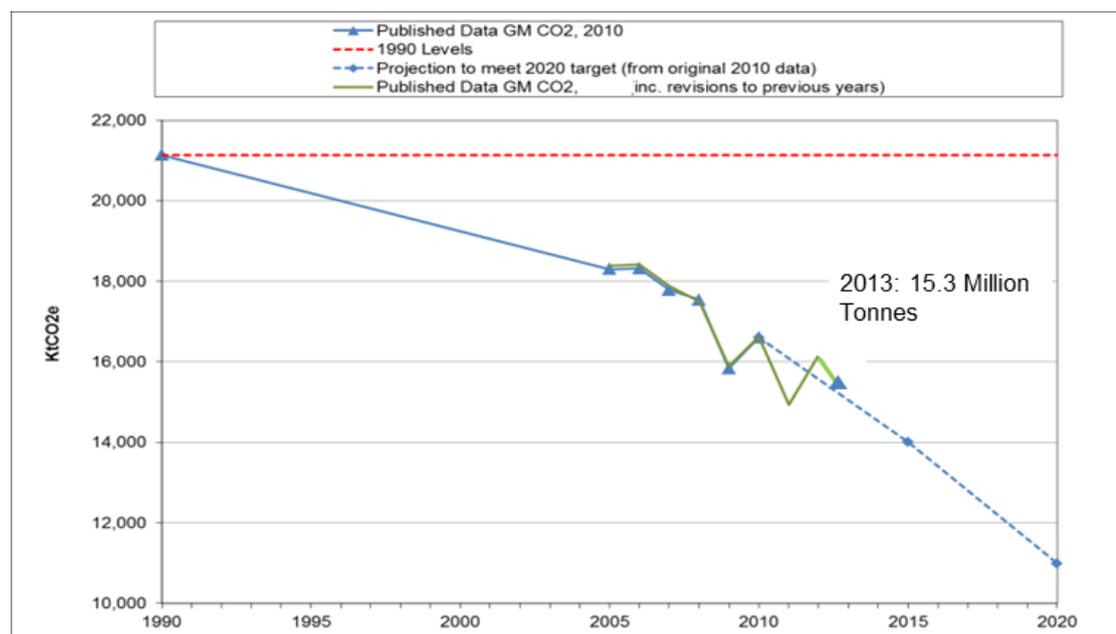
16.8 This equates to a gap of 3.61 million tonnes and less than two-thirds of what is required with less than five years to go. It is likely, therefore, that

⁴⁵ Source: Greater Manchester Climate Change Strategy (2011)

significant catch up will be needed to get back on track to an 80% reduction by 2050 between 2020-2035⁴⁶.

- 16.9 At the national UK level, there are legally binding targets and commitments for an 80% reduction in carbon emission by 2050 with specific milestones or carbon budgets between now and then. This would require a reduction in emissions to less than 5 million tonnes by 2050. Greater Manchester’s existing strategies and plans include specific targets only up to 2020 which is 15 years before the GMSF end date. However, Greater Manchester is publicly committed to reducing emissions to a maximum of 2 tonnes per capita by 2050 and to doing its part in keeping global mean temperature rises below 2 degrees as part of its Under 2 Memorandum of Understanding and Compact of Mayors commitments.

Figure 11. 2020 Carbon Trajectory



16.10 Conclusion:

- In order for the carbon emissions impact of key policy options in housing, employment land, transport and infrastructure to be understood, ongoing work will be needed to model the emissions implications of different spatial options, to act as evidence which can inform decision-making. A process, methodology and approach to undertaking this will need to be established.

⁴⁶ http://archive.agma.gov.uk/cms_media/files/lch_board_collated_agenda_6_march_2015.pdf?static=1

- Evidence on the detailed energy generation output of Greater Manchester e.g. current, potential, and required for compliance needs to be strengthened.
- The Low Carbon and Environment Goods sector shows potential for growth in pursuit of Greater Manchester's economic objectives, however this sector is diverse and specific employment land volumes and building characteristics requirements for this sector are not well understood.
- The Combined Authority has a comprehensive programme and dedicated policy and project teams progressing actions on renewable / low carbon technologies. Information on planned investments will be utilised to inform the appraisal of spatial option to maximise opportunities to plug into existing and planned low carbon energy networks.
- The layout, grouping and orientation of employment, housing and amenities has significant implications for Greater Manchester's direct and indirect carbon emissions.
- If Greater Manchester is to achieve its current targets and deliver on its commitments for the future it will need to ensure that the energy (heat and power) provision for new development is renewable and low carbon. Space for energy generation, management and additional heat network infrastructure will need to be planned for.
- There are clear interdependencies between the design of distribution infrastructure, the preferred approach to 'smart' infrastructure and lifestyles, energy market structure and the positioning of housing and employment land, with different 'smart futures' and energy system models suiting different spatial configurations. Evidence on the implications and options arising from this interdependency need to be strengthened to ensure that policy conflicts are minimised.

17. AIR QUALITY

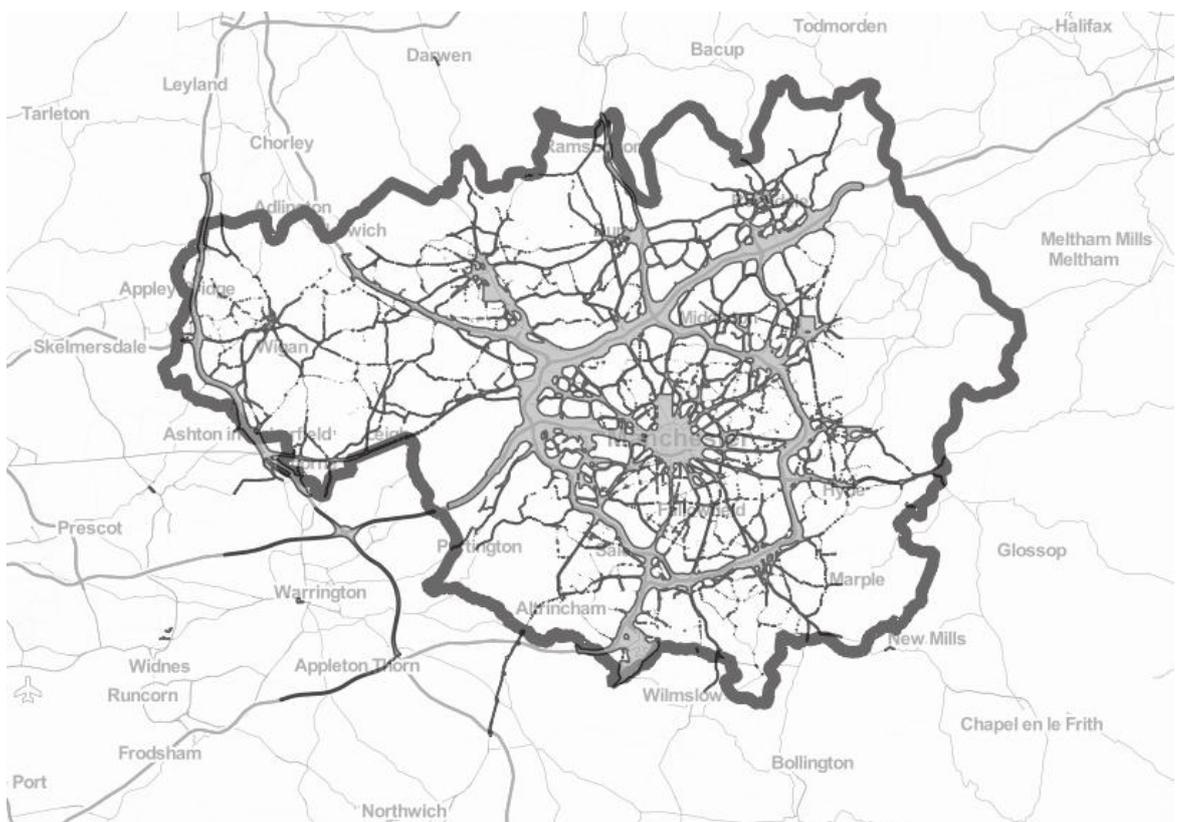
- 17.1 Action to manage and improve air quality is largely driven by EU legislation. The 2008 Ambient Air Quality Directive sets legally binding limits for concentrations in outdoor air of major air pollutants that impact public health such as particulate matter (PM10 and PM2.5) and nitrogen dioxide (NO₂). As already noted, Greater Manchester is one of a number of major UK conurbations where nitrogen oxide (NO₂) limits are exceeded. Transport is the main source of NO₂ emissions and the air quality management area (AQMA) reflects the location of motorways, major roads and urban areas^{47,48}. The main source of transport NO₂ emissions is from lorries, followed by cars, but the former make a disproportionately large contribution, as do buses in urban areas.

⁴⁷ Source: Greater Manchester Emissions Inventory

⁴⁸ The AQMA area can be viewed at: <http://www.mappinggm.org.uk/gmodin/>

- 17.2 The Greater Manchester councils have recently completed a substantial modelling study for the whole urban area, and an amendment to the AQMA is expected to be submitted to Defra for approval with reference to this modelling later in 2015.
- 17.3 National Planning Policy Guidance recommends that drawing on the review of air quality carried out for the local air quality management regime, the Local Plan may need to consider:
- the potential cumulative impact of a number of smaller developments on air quality as well as the effect of more substantial developments;
 - the impact of point sources of air pollution (pollution that originates from one place); and
 - ways in which new development would be appropriate in locations where air quality is or likely to be a concern and not give rise to unacceptable risks from pollution. This could be through, for example, identifying measures for offsetting the impact on air quality arising from new development including supporting measures in an air quality action plan or low emissions strategy where applicable

Figure 12. Air Quality Management Area



18. NOISE

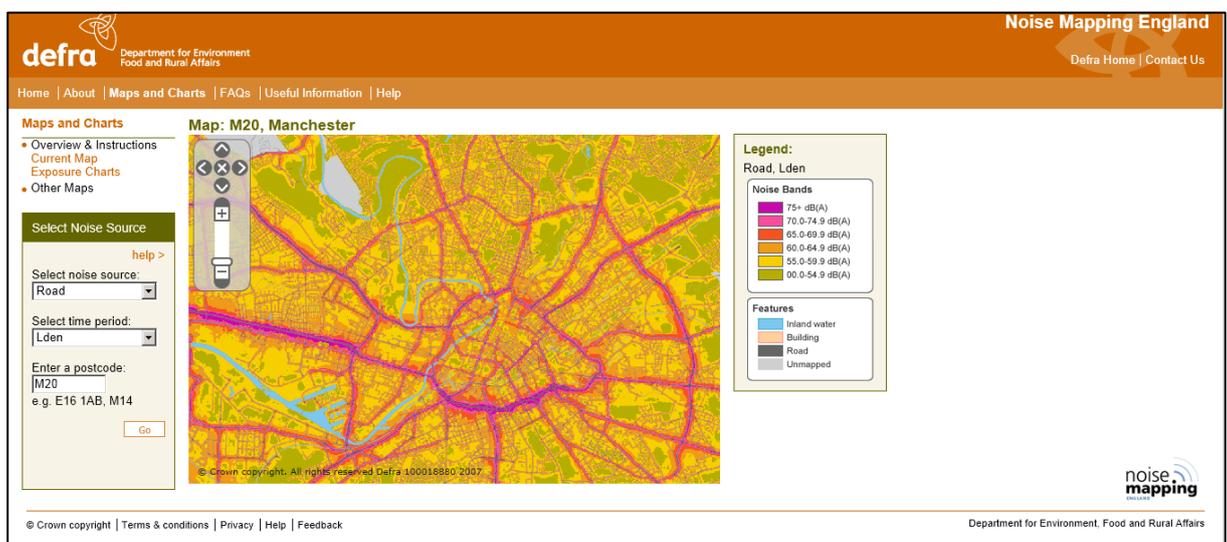
18.1 National Planning Policy states that “Planning policies and decisions should aim to:

- avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;
- recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and
- identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason”.

18.2 Noise maps have been produced by the Department of Food and Rural Affairs (Defra) to meet the requirements of the Environmental Noise (England) Regulations 2006, and are intended to inform the production of noise action plans for large urban areas, major transport sources, and significant industrial sites in England. Figure 13 provides an illustration of a noise map for Manchester city centre.

In 2007 the Campaign for Rural England (CPRE) produced a tranquillity map of England⁴⁹, this identified Greater Manchester as one of the least tranquil places in the country.

Figure 13 Defra Noise Map

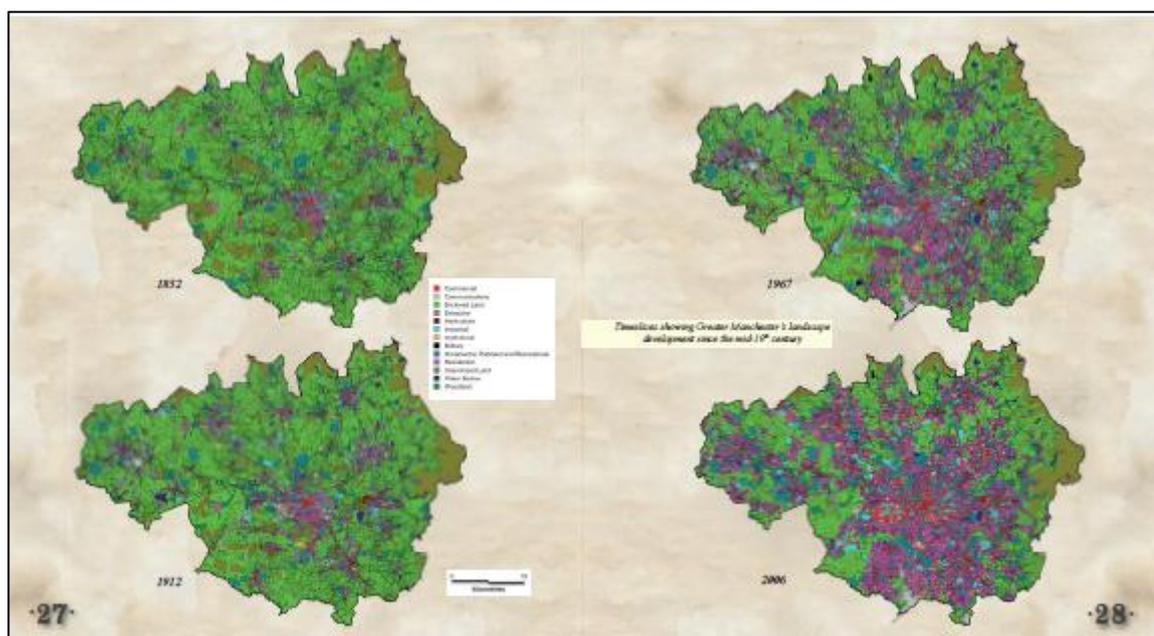


⁴⁹ See: <http://www.cpre.org.uk/resources/countryside/tranquil-places/item/1839->

19. HISTORIC ENVIRONMENT

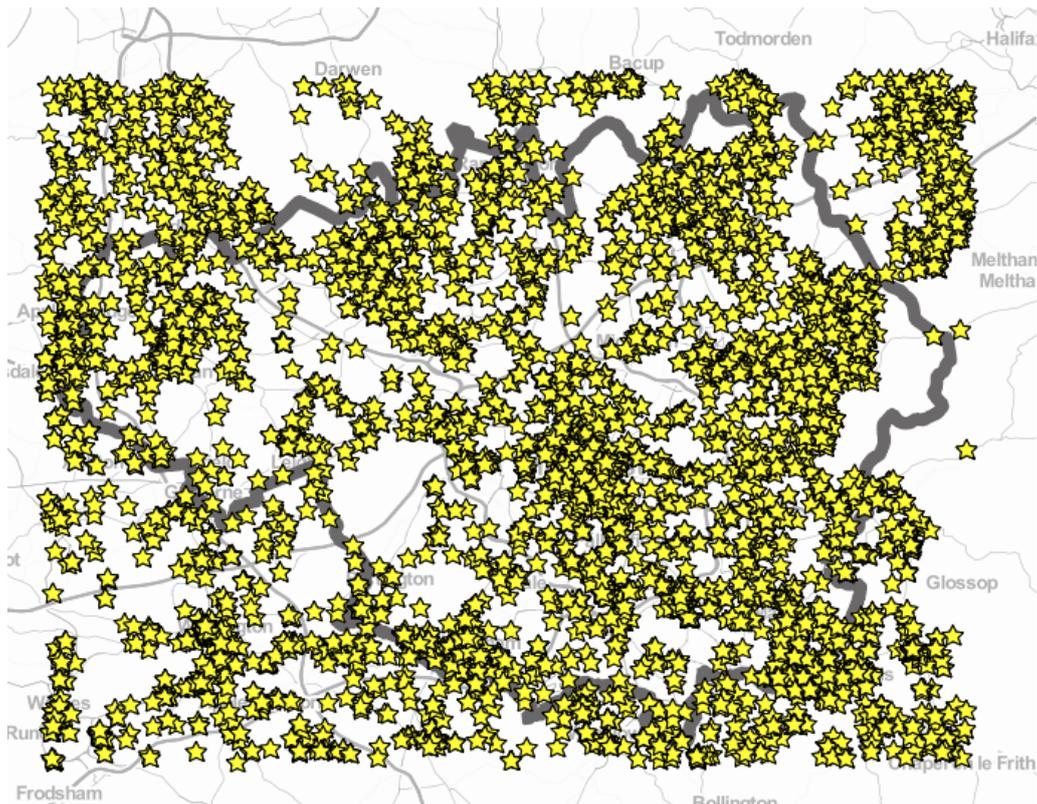
- 19.1 Greater Manchester has an extraordinarily important and diverse history which is reflected in a rich historic environment of archaeological sites, monuments and buildings, museum collections of national and international importance, and historical archives, records and in particular the Historic Environment Record.
- 19.2 The historic environment assets of Greater Manchester include: Prehistoric burial mounds and hillforts; Roman forts; Medieval townscapes and the Post-Medieval legacy of the region's industrial past (such as canals, railways and textile mills), which together provide a rich resource for archaeological enquiry, study, management and development.
- 19.3 The Historic Landscape Characterisation Assessment⁵⁰ also provides considerable mapped (GIS) data, around 54,000 polygons, which define the modern landscape through 13 broad character types, such as residential, enclosed land, communications, commercial, institutional and industrial. Each broad type is broken down into a number of narrow types, for instance there were 18 narrow types for residential, including villas, terraces, semi-detached, planned estates, and farms etc. Each piece of land is then defined by its predominant character, but with historic mapping used to show how it had evolved over a 150 year period (see figure 14).

Figure 14. Development of Greater Manchester since 1852



⁵⁰ See: http://archaeologydataservice.ac.uk/archives/view/gmanchester_hlc_2012/downloads.cfm

Figure 15. Listed Buildings



19.4 In accordance with national planning policy the GMSF will require a positive strategy for the conservation and enjoyment of the historic environment

20. NEXT STEPS AND ACTIONS

Critical Infrastructure and Resilient Places

Action 1: An infrastructure funding assessment and strategy is required to ensure that the critical infrastructure required to deliver the GMSF is in place.

Action 2: An assessment of the impact of spatial growth options on infrastructure is required to understand future infrastructure requirements and any capacity 'pinch points'.

Action 3: Ensure that the key resilience issues relevant to the scope of the GMSF are considered as the broad strategic growth options are translated into a draft spatial framework.

Transport

Action 4: Transport evidence developed for the Transport Strategy should consider the likely changes to Greater Manchester arising from the GMSF and opportunities from and for existing and new transport investment

Social Infrastructure

Action 5: An assessment of the likely spatial implications of growth on current social infrastructure in particular: school places, health and recreation provision is required.

Green Infrastructure

Action 6: A refresh of the existing Green Infrastructure framework is required to ensure that it remains central to the planning of future growth.

Action 7: Consideration will be given to the application of standards such as the Woodland Access Standards promoted by the Woodland Trust and Accessible Natural Greenspace Standards (ANGSt).

Development Viability

Action 8: A Viability Assessment of the GMSF will be undertaken to ensure that the pipeline of sites can be delivered in the first 5 years of the plan.

Flood Risk and Water Management

Action 9: A sequential approach to flood risk is required to ensure that vulnerable uses are allocated to areas of least risk.

Action 10: Draft a flood risk management strategy for Greater Manchester to reflect the opportunities for the strategic management of land within the main catchments and ensure an integrated approach to water management is undertaken.

Pollution - Air and Noise

Action 11: Through the Integrated Assessment consider the implications of new development on air and noise pollution and ensure that these are reflected in relevant actions plans produced by the Greater Manchester Combined Authority.

Low Carbon

Action 12: To complete an objective dispassionate assessment of existing evidence to determine the realistic potential of large scale renewable energy generation within Greater Manchester and how this may be reflected in the GMSF.

Action 13: Utilise national building standards and information on planning low carbon investments to model the carbon emissions associated with different spatial options.

Action 14: Draft a coherent and evidenced low carbon strategy that which can be capable of informing the development of spatial options.

Historic Environment

Action 15: Draft a positive strategy for the conservation and enjoyment of the historic environment and reflect this within the GMSF.
