Greater Manchester Natural Capital Investment Plan – Baseline Review

Natural Course, GMCA / September 2018

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Disclaimer

Document evolution

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Baseline review	31/07/2018	Reviewed by Ece Ozdemiroglu (eftec)
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Executive summary

Greater Manchester Combined Authority (GMCA) and Natural Course, an EU LIFE Integrated Project, have commissioned work to develop the first Natural Capital Investment Plan (NCIP) for the city region. This report presents the findings of Task 2: Baseline Review. The aim of this task is to use existing evidence to inform the development of the plan by identifying:

- Current stock of natural capital assets and the value of services they provide;
- Natural capital investment priorities, opportunities, and needs as identified through various frameworks, strategies, and spatial data; and
- Information regarding current projects aimed at enhancing and protecting natural capital, including identifying the potential/current revenue streams to inform assessment of investment opportunities.

Key priorities and opportunities for natural capital

The baseline review forms the start of the process for developing the Natural Capital Investment Plan (NCIP) and is an initial review of relevant strategies, frameworks, plans, projects and initiatives that are likely to influence the investment pipeline.

This baseline review does not aim to include an exhaustive list of all work in the natural capital area, but is an initial view of the most obvious and relevant pieces of evidence that are likely to shape the priorities and approach to the development of the plan. Any gaps identified will be picked up as part of the stakeholder engagement process.

If the NCIP is to be successful it must address the key priorities of the Greater Manchester city region. The spatial scope of natural capital considered by the plan is primarily that within the Greater Manchester boundary. The review of strategies and frameworks found that the key priorities and opportunities for natural capital are:

- **Improved health outcomes**, including an opportunity to address spatial health inequalities;
- **Improving place**, making the Greater Manchester region a more attractive place to live and work, which in turn will play an important role in attracting inward investment, skills and tourism. This also supports an uplift in property values;
- **Building resilience**, principally through addressing climate change and flood risks;
- **Supporting the local economy**, through investments that support new local development (e.g. various regeneration schemes) and business improvement. There is also potential to improve and grow the local green economy, such as growth in services to manage the natural environment, recreation-based

businesses, bio-fuel from timber or the development of local food market initiatives.
- **Conserving and enhancing habitat and wildlife**, valued for its own sake, but funded via targeted investors.

Related ecosystem services and benefits that emerged as priorities include:

- Physical and mental health and wellbeing derived from exposure and access (i.e. recreation and aesthetics);
- Sustainable travel (e.g. cycle paths where natural capital is enhanced);
- Water quality and flood management (surface water and fluvial);
- Climate regulation - carbon storage and sequestration, urban cooling and building sheltering;
- Air quality improvements; and
- Habitat and wildlife conservation and enhancement (including biodiversity).

The review of current natural capital projects found key patterns and themes including:

- Avoided water treatment and flood damage costs – key benefits of many natural capital projects within Greater Manchester;
- Avoided health care costs, such as from physical and mental health initiatives and conservation activities that provide recreation opportunities and air quality improvements;
- Carbon capture and storage, a particularly important opportunity due to Greater Manchester's natural capital asset base.
- Natural capital as improving attractiveness of area (e.g. for residents, businesses and visitors) with consequent economic benefits.

Exploring the potential investment mechanisms around these topic areas will be a key point to develop as part of the draft plan, as well as a key point for discussion within the stakeholder consultation.

Key gaps and next steps

Key current project and research information gaps include:

1. Understanding need and opportunities for natural capital investment, both:
    - In terms of socio-economic need across Greater Manchester, extending this project's opportunity mapping to link provision of multiple benefits to areas of need, including at a finer spatial scale (e.g. gardens), and
    - Within major development and infrastructure projects, such as; airport developments, rail, highways and major landowners/developers plans.;

2. The evidence base on the valuation of some project benefits, including evidence on the value of specific benefits, and the overall scope for assessing return on investment;

3. Building the links between project benefits and potential revenue streams;

4. General gaps in terms of additional projects that should be reviewed.

It is recognised that there is on-going work to address some of these gaps, for example work on the development of suitable metrics to assess Biodiversity Net Gain. This project will aim to include the latest available evidence to address these gaps within the upcoming stakeholder consultation – focusing the consultation on the types of information relevant to investment decisions.

Results from the review will support the task to identify a short-list of potential natural capital projects for investment by aiding in the development of prioritisation criteria, providing a basis for comparing whether and how projects align with Greater Manchester's social, environmental, and economic priorities and needs.

Contents

1. Introduction

Greater Manchester Combined Authority (GMCA) and Natural Course, an EU LIFE Integrated Project, have commissioned eftec and partners Environmental Finance and Countryscape to develop the first Natural Capital Investment Plan (NCIP) for the city region. The plan represents a key outcome announced at the Mayor's Green Summit[1], and will promote investment and delivery of opportunities that protect and enhance Greater Manchester's natural capital[2] to support a healthy population and economy.

Figure 1 presents an overview of the tasks and approach to developing the NCIP. This report presents the findings of Task 2: Baseline review. The aim of this task is to use existing evidence to inform the development of the plan by identifying:

- Current natural capital assets and the value of services they provide and to whom;
- Natural capital priorities, opportunities, and needs as identified through various frameworks, strategies, and spatial data;
- Information regarding projects aimed at enhancing and protecting natural capital, including potential/current revenue streams to inform assessment of investment opportunities, and
- Gaps in provision and where we need to prioritise future investment.

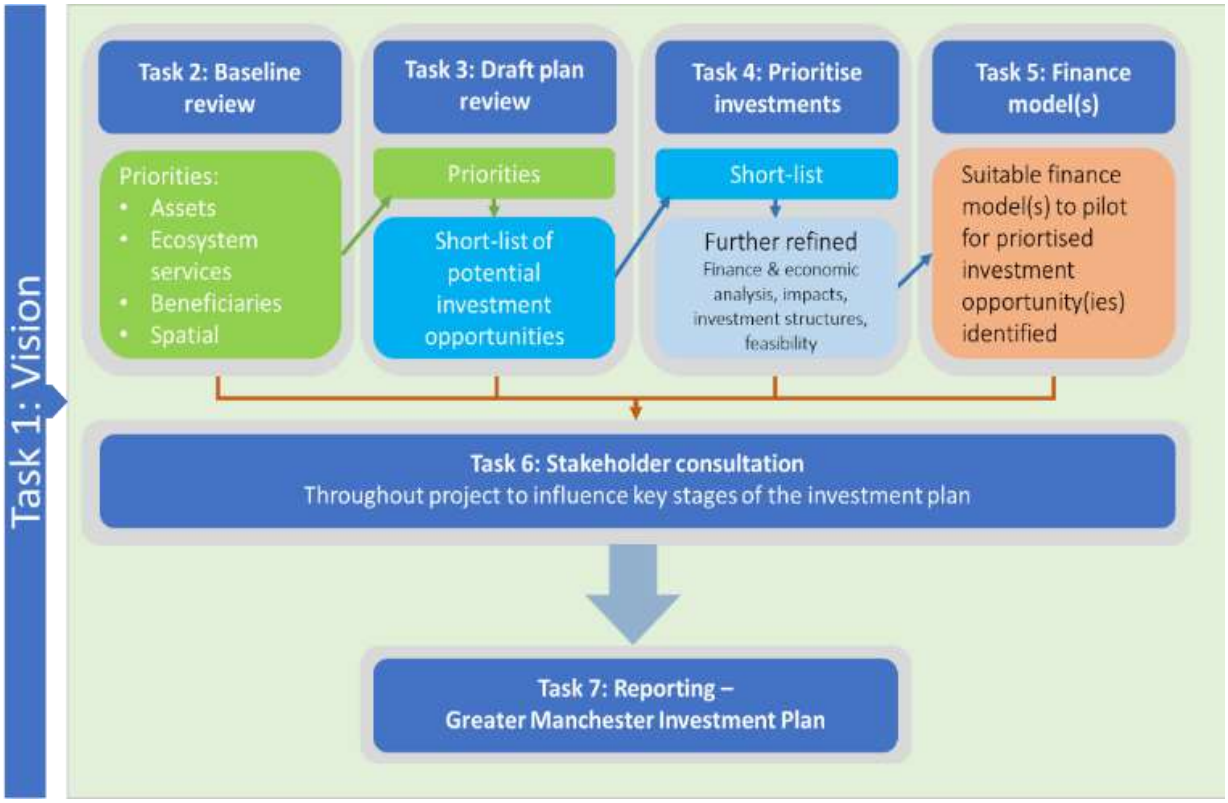

Figure 1: Approach to developing the Greater Manchester Natural Capital Investment Plan

The baseline review forms the start of the process for developing the Natural Capital Investment Plan (NCIP) and is an initial review of relevant strategies, frameworks, plans, projects and initiatives that are likely to influence the investment pipeline.

[1] https://www.greatermanchester-ca.gov.uk/info/20005/green_city_region/117/green_summit/1
[2] Natural capital is defined as the elements of nature that directly or indirectly produce value to people, including ecosystems, species, freshwater, land, minerals, the air and oceans, as well as natural processes and functions. It underpins all other types of capital – manufactured, human and social – and is the foundation on which our economy, society and prosperity is built (Natural Capital Committee, 2014).

This baseline review does not aim to include an exhaustive list of all work in the natural capital area, but is an initial review of the most obvious and relevant pieces of evidence that are likely to shape the priorities and approach to the development of the plan. Any gaps identified will be picked up as part of the stakeholder engagement process.

The identification of these assets, priorities and opportunities are integral to understanding the context of natural capital within Greater Manchester and ensuring that investment priorities developed (within Task 3) and identified within the plan align with the city region's wider objectives. It also provides useful information regarding gaps in provision (the distribution of services provided by natural capital across the city-region) and by clarifying priorities for investment including social, environmental, and economic priorities.

In addition, through an initial exploration into current natural capital projects the review gathers readily-available financial information. All information gathered by the review will help identify gaps which will be reflected in the discussions as part of the stakeholder consultation. The review also provides the necessary material that can inform the investment opportunities currently held by various actors within Greater Manchester.

The structure of this report is as follows:

- Section 2: Method and approach
- Section 3: Baseline Review Results
- Section 4: Conclusions
- Annex 1: Baseline review sources and evidence
- Annex 2: Detailed literature review
- Annex 3: Spatial analysis – sources and method
- Annex 4: Spatial analysis – mapping outputs
- Annex 5: Project review

2. Method and approach

The guiding vision for the NCIP has been developed by the project team and Advisory Group as part of the previous Task (1):

> **"a Greater Manchester where investments in natural capital enhance the long-term social, environmental, and economic health and wellbeing of its people and businesses".**

The vision highlights the need for taking an environmentally-led approach (versus a purely financial approach) which embraces a broad range of outcomes, while also identifying the needs most relevant to sourcing investment as defined within the vision and approach for the plan:

Investment

An investment is an asset or item acquired with the goal of generating income or appreciation. In an economic sense, an investment is the purchase of goods that are not consumed today but are used in the future to create wealth. In finance, an investment is a monetary asset purchased with the idea that the asset will provide income in the future or will later be sold at a higher price for a profit[1].

For the purposes of this project, the focus will be investments intended to return principal (initial sum/amount invested) or generate profit while also resulting in a positive impact on natural capital. This includes the complementary use of public and private funds to mobilise additional capital into investible or near-investible opportunities.

Whilst the focus of this plan will be on investments, as defined above using financial criteria, investors can measure 'returns' in different ways. As a result, the plan will also consider the role of public and philanthropic investment to support and enable elements of the overall plan.

In recent years there have been numerous natural capital projects, programmes, and initiatives undertaken by various actors within Greater Manchester, including the Urban Pioneer and Natural Course projects as well as the work of the Natural Capital Group. In parallel, natural capital initiatives and objectives have been included within many local, regional and national strategies and frameworks, and within specific local projects such as City of Trees, GM wetlands, My Back yard, etc.

This desk-based baseline review sought to bring this information together in order to understand the context relating to natural capital assets, priorities, opportunities, and projects within Greater Manchester. This included sourcing information to provide a better understanding of the current state of funding and investment in natural capital initiatives, such as 'which organisations are funding which natural capital projects for which reasons'. A key challenge to natural capital investment is the lack of reliable and recognised revenue streams (Aldersgate Group, 2017[3]), and so a key consideration of the review was the existence of current or potential revenue streams relevant to natural capital project outcomes.

Bringing together the various sources provided an opportunity to fully explore synergies across the city region and will support the assessment of the multiple benefits of projects working with the natural environment. A better understanding of the relationship between key infrastructure /

[3] Aldersgate Group (2017). Increasing investment in natural capital

development requirements and financing, and natural capital investment is needed including the emerging local industrial strategy, spatial framework, infrastructure plans, resilience strategy and Transport 2040.

The review also identified gaps in data that can be discussed during the stakeholder consultation phase of this work. In particular, this discussion will involve a call for significant project information from key stakeholders, which may include public and private investment but may also include the work of not-for-profit organisations and community groups where relevant.

2.1 Literature, policy, and evidence

A long list of 44 strategies, frameworks, research, literature, and projects relating to, or with implications for, priorities to inform natural capital investments was compiled through communication with the NCIP Project Advisory Group. The list builds on previous work, including from:

- A Greater Manchester (GM) Natural Capital and Ecosystem Services Evidence Review (June 2018);
- Urban Pioneer call for innovative funding/delivery projects (October 2016);
- Outputs from the GM Natural Capital Studies Workshop (November 2017); and
- Discussion with the project Advisory Group as part of the inception meeting for this project (June 2018).

This initial list, presented in Annex 1, provided the basis of the review, with a focus on information relevant to the natural environment and related social and economic priorities. Key priorities were recorded, with over-arching GM strategies and frameworks taking precedence.

A key aspect of background to the baseline review is to understand how the NCIP fits with other strategies, policies and plans. This is important for the following reasons:

- Ensuring that the NCIP is consistent with major strategies and policies will increase its relevance, added value and prospects for future funding;
- Understanding the relative importance of various strategies will help inform the prioritisation to be used in constructing the investment pipeline in subsequent tasks; and
- Making linkages to important initiatives will assist in communicating the benefits of the NCIP to a wider audience and so enhance the acceptability of the plan.

Projects were reviewed to identify their current funding situation and potential for creating revenue streams. The definitions of activities impacting upon natural capital can be very broad. While it is recognised that there are many natural capital projects within GM that can deliver useful services, the focus here is to feed into future investments and hence projects that do / could deliver services at the more strategic, GM scale.

The results of this review are presented in Section 3.2.

2.2 Spatial analysis

As part of the baseline review, spatial data for Greater Manchester (GM) was sourced for Geographic Information Systems (GIS) analysis. The data was gathered through MappingGM[4] and requests to key organisations working within GM (e.g. GMCA, Environment Agency). The boundary for data is the terrestrial boundary of the 10 Districts which make up the GMCA.

The spatial scope of natural capital considered by the NCIP is primarily that within the GM boundary. However, exceptions can be made to consider some investments outside this boundary. These exceptions may be justified, for example, where the natural capital has a significant impact on beneficiaries within GM (e.g. flood risk reduction investment that benefit downstream areas), or there are strategic benefits (such as a project that overlaps the GM boundary, with impacts outside the GM area which may help the business case to fund projects that benefit GM, e.g. along transport corridors).

The aim of the GIS assessment was to identify where spatial data could provide support for the priorities and themes emerging from the review of strategies and frameworks, but also to explore whether the various data layers could provide an additional perspective on opportunities within GM. Layering of physical, social, and economic spatial data could identify opportunity areas where various priorities could be targeted in the same location through natural capital interventions and solutions. For example, an area where both flood risk and air pollution are priorities can therefore support the case for projects that can help mitigate both. The aim of this analysis is not to completely merge all social, environmental, economic metrics across GM, but rather to provide an indication of how a few readily-available and relevant spatial data may contribute to identifying opportunities.

The broad categories of data and priorities explored include social indicators, natural capital quality indicators, major development sites, natural capital asset locations, and ecosystem services. As depicted, there are areas where spatial priorities overlap, and this analysis aimed to provide a way of scoring to identify the spatial areas where most priorities overlap. Some data layers used are inevitably linked (e.g. some environmental and social factors are interrelated), but for the purposes of this review and through the process of scoring and weighting the implications of any links have been acknowledged.
Annex 3 provides more detail of the methodology and rationale developed for scoring and weighting of each data layer used. In general, a higher score was given to areas of lower environmental quality and in areas of higher social deprivation (e.g. highlighting the need for investment), as well as to those areas that aligned with identified priority green and blue infrastructure as identified within the forthcoming GM Spatial Framework (forthcoming).

In total, ten spatial data layers were combined in order to produce the mapped output presented in Table 1. Figure 2 provides a visual overview of the layering exercise.

Table 1: Data layers used within spatial analysis

Category	Layer
Assets	Priority GI & BI
	GI & BI opportunity areas[a]

[4] Greater Manchester's online mapping portal, available at: https://mappinggm.org.uk/

Quality	Air quality management areas
	Water Framework Directive (WFD) Status
	Agricultural land classification
Social indicators	Index of Multiple Deprivation (IMD)
	Accessible Natural Greenspace Standard (ANGSt)
	Physical activity levels
Ecosystem services	Flood risk
Major development areas	Housing, office and industrial development

Note: [a] Also based on multiple metrics of quality – see Annex 3 for more detail.

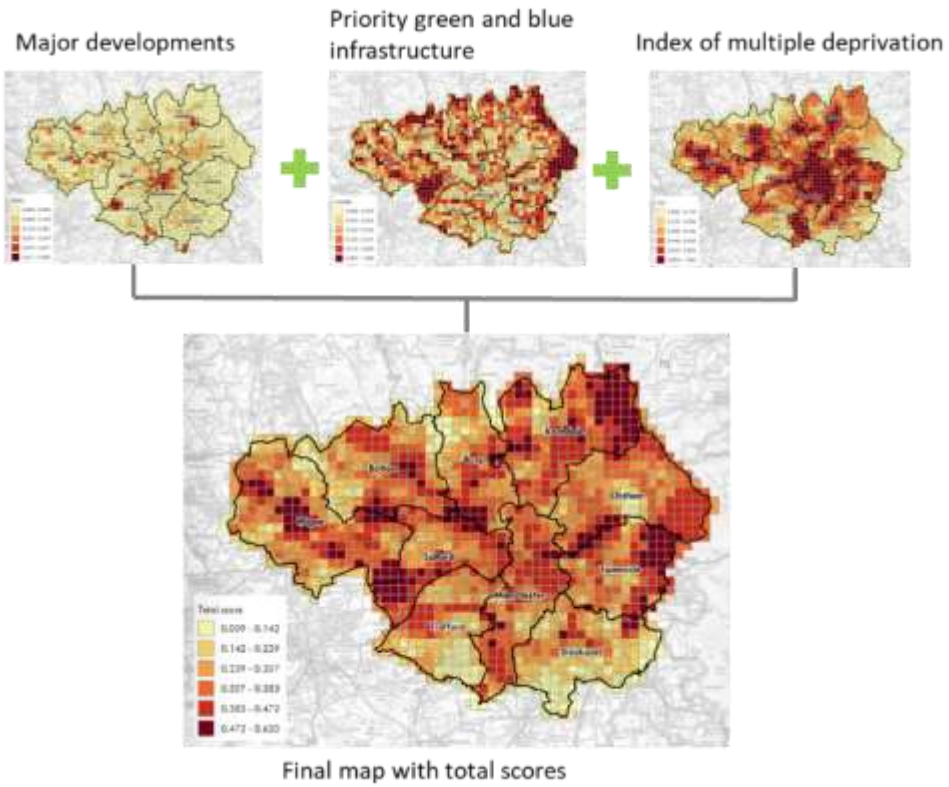

Figure 2: GIS analysis – multiple layers combined to produce final map with total scores

3. Baseline review

This section presents the results of the baseline review, including the information gathered on Greater Manchester's natural capital asset base and the provision and value of services it provides, as well as the natural capital priorities and opportunities identified within relevant policies, strategies, frameworks and plans. In addition, information on natural capital projects within Greater Manchester is presented with the goal of providing further context to the current actions and opportunities that exist.

These results will support the development of prioritisation criteria, providing a basis for comparing whether and how projects align with Greater Manchester's social, environmental, and economic priorities and needs.

3.1 Natural capital assets in Greater Manchester

There have been multiple studies that aim to identify and value the services provided by Greater Manchester's natural capital. The most recent and comprehensive studies include the Urban Pioneer's Greater Manchester Natural Capital Account and Natural Course's Irwell Natural Capital Account.

Table 2 presents a breakdown of the extent of natural capital assets identified as part of both studies (water quality and water resource from the Irwell account). It also presents estimates of the quantity and economic value of the annual services provided. Table 3 presents the indicative value of benefits delivered by these assets.

Extent of Natural Capital and its Benefits

The results reflect the extensive urban area within the city region, but also the rural areas on its periphery, including significant extent of improved grassland. The breakdown of broad habitats shows that while over 40% of the area is 'urban', arable, broadleaved woodland, upland and semi-natural grassland habitats all make up between 6% and 9% of the area.

As shown in Table 3 the value of benefits provided by Greater Manchester's natural capital are varied and vast – nearly £900m per year. Many of the monetised benefits represent improvements in human health, either in terms of avoided health costs or in improved quality and length of life (as measured by Quality Adjusted Life Years (QALYs)), further highlighting the vital role natural capital plays in the health of the population.

The table shows the extent of the natural capital assets which is useful to identify the current capacity of the area to produce ecosystem services using the typology of land cover. For example, areas with more water features (rivers, lakes, canals) would mean more opportunity for investments in water quality. It also provides a basis for exploring links between outcomes from various programmes and policies. For example, the proportion of upland habitat (within mountain, heath, and bog) highlights the potential for carbon sequestration and storage which can link to sustainability offsetting and green growth initiatives. It is clear that natural capital can play a measurable role in supporting the health of the population, the details of these benefits can be used to identify other initiatives that are aimed at achieving similar outcomes.

Table 2: Natural capital assets in Greater Manchester

NC assets (Broad UK habitats)	Area (ha)[a]
Arable	9,264
Broadleaf woodland	11,118
Built-up areas and gardens	58,537
Coniferous Woodland	190
Freshwater	1,450
Improved grassland	29,871
Mountain, heath, bog	8,423 (> 4,000 ha of which bog)
Semi-natural grassland	8,761
Total	**127,613**

Source: Greater Manchester Natural Capital Account[5]

Table 3: Key benefits - indicative value provided by natural capital across Greater Manchester (£m/yr)

Benefit/ service	No	Physical unit	Value	Monetary unit
Air Quality	54.6	Parts per billion of PM2.5, SO_2, NO_2, O_3 removed	£41m	Avoided healthcare costs
Recreation	95.8	Million visits to public open spaces	£372m	Welfare
Physical Health	4,600	QALYs saved due to physical activity Active visits supported	£92m[a] £56m	Welfare QALYs gained Avoided healthcare costs
Mental Health	124,000	Point reductions on GHQ index, (see Table S.2), arising from the extent of public green spaces.	£264m	Avoided healthcare costs
Noise	44,000	Number of buildings with noise mitigated	£1.4m-2.7m	Avoided healthcare costs
Local Climate	0.75	°C cooling from natural capital	£10m	Avoided costs to business
Carbon	38,000	Tonnes of CO_2e	£2m	Non-traded cost of carbon
Food	56,000	Hectares of land farmed	£50m	Estimated gross margins
Minerals	1.40	Million tonnes of aggregates	£74m	Market value
Water quality[b]	464	Kilometres of waterways of 'Good' WFD status	£14m	Welfare
Water resource[b]	181	Million m^3 abstracted	£23m	Market value
			£909m	

Note: [a] Not included within total to avoid double-counting with recreation values. [b]For Irwell Catchment area only, from the Irwell Natural Capital Account and Ecosystem Services Opportunities Mapping (TEP, Vivid, 2018).

[5] eftec et al. (2018). Greater Manchester Natural Capital Account. Available online: https://naturegreatermanchester.co.uk/....

Condition of Natural Capital

The condition of natural capital within Greater Manchester has been assessed using data layers within the spatial analysis. Data layers pertaining to the quality of natural capital asset include:

- Water quality (Water Framework Directive (WFD) status);
- Arable land quality (agricultural land grades);
- Air quality (air quality management areas); and
- Green infrastructure quality (Greater Manchester Spatial Framework (GMSF) data layer that considers Special Protection Areas, Special Areas of Conservation, Sites of Special Scientific interest, National Nature Reserves, Sites of Biological importance, and Local Nature Reserves).

Notable gaps include data on; the quality of woodland and individual trees, soil and non-designated public green spaces. It should be noted that there is ongoing work in these areas to address these gaps. For example:

- City of Trees is in the process of carrying out a GM wide iTree eco survey that will assign financial values to the ecosystem services provided by all of GM's trees and woods. The work will determine age and species mix of GM's trees as well as their condition.
- National soils data developed by Cranfield University to be purchased by GMCA.
- Initiatives such as 'My Back Yard' and 'GHIA' are working to improve the quality of private gardens and public realm green spaces.

Furthermore, there is more detailed information that should be used in developing specific investment opportunities, such as the distinction between lowland and upland peatlands.

3.2 Natural capital priorities and opportunities

As mentioned above, while local strategies were also included within the review, the main focus was further refined to include work that had the most significant implications for natural capital within the Greater Manchester area at the strategic level. This was done through an initial screening exercise (i.e. reading the document to assess overall relevance) as well as with input from the Advisory Group.

Many of the identified strategies are mutually supportive. Full detail of the review is provided in Annex 2. The key strategies, polices and plans and themes that emerged from the review are discussed in the remainder of this subsection.

Greater Manchester Strategy

The NCIP should support the overall strategy for Greater Manchester[6], and in particular make a major contribution to the strategy's following priorities:

- **A thriving and productive economy in all parts of Greater Manchester** (Priority 4) – there are opportunities for investments in natural capital to increase the attractiveness

[6] GMCA (2017). Our people, our place.

of the region for inward investment, improve resilience to risks, including climate change, to protect the local economy, and promote the importance of a healthy and productive workforce for a thriving economy.

- **A green city region and a high-quality culture and leisure offer for all** (Priority 7) – investments in natural capital contributions to a green city region include delivering an outstanding natural environment, contributing to climate regulation via urban cooling and carbon sequestration, increasing opportunities for outdoor recreation, improving air and water quality, and enhancing biodiversity.

- **Healthy lives with quality care available for those that need it** (Priority 9) - natural capital is key to improving health outcomes and mental well-being, and is an opportunity to attract funding, providing returns mainly by avoiding future health costs.

Greater Manchester Spatial Framework

The Greater Manchester Spatial Framework is still in development and is due for forthcoming consultation. The project team has incorporated consideration of identified priority green and blue infrastructure and opportunity areas within the baseline review. It has also been noted that likely key features of the framework may include a focus on net gain policies and the setting of priority areas for green and blue infrastructure.

Industrial Strategy

Greater Manchester is at the heart of the Northern Powerhouse Strategy[7], which in turn is closely aligned with the UK Industrial Strategy and UK Clean Growth Strategy[8]. The local industrial strategy is still a work in progress, but the key challenge for the NCIP is to demonstrate the importance and value of natural capital to local industry.

Key links from national and local industrial strategies to the NCIP:

- There is the potential for enhancements in green infrastructure through sustainable transport initiatives. This includes at a national level, the National Productivity Investment Fund (£31bn to 2022/3) and Transforming Cities Fund (£1.7bn), and major investments identified by the Northern Powerhouse Strategy include £13bn in transport over five years and £3.3bn to the Local Enterprise Partnerships (LEPs).

- The UK Clean Growth Strategy includes a Green Finance Taskforce[9] and an aim to enhance the value and benefits of natural resources. This policy area includes specific policies on the creation of a new network of forests, a £10m fund for peatland restoration (for carbon capture and storage), and a £99m agri-tech fund to explore innovative farming methods, improve water quality and leachate, and target better environmental outcomes.

In summary, linking these industrial strategies is the extent to which investments in natural capital:

- Boosts the health and productivity of the workforce (including attracting more skilled workers to live in Greater Manchester), which can be made more tangible through evidence on days of work lost, and levels of support to regional recruitment and retention;

[7] HM Government (2016). Northern Powerhouse Strategy.
[8] HM Government (2017). The Clean Growth Strategy - Leading the way to a low carbon future.
[9] Charged with delivery of the public and private investment needed to meet UK carbon budgets and maximise the UK's share of the global green finance market.

- Delivers on UK targets for carbon reduction and other improvements to natural resources, such as water quality;
- Acts as a boost to inward investment through making places more attractive to live and work, by contributing to property uplifts and levels of inward investment; and
- Supports resilience of the economy and infrastructure, for example through natural flood risk management and adaptation to climate change.

Health

Within the various Greater Manchester policies referenced there is a strong level of understanding the link between the provision of green space and human health and well-being. For example, the GM Population Health Plan[10] recognises the 'Economics of Prevention'. Safe and accessible recreational space provides benefits of avoided physical and mental health costs and boosts productivity as well as enhancing well-being and bolstering a sense of community. This also has the potential to support the social equality agenda by highlighting areas of higher deprivation, lower activity rates, poorer health and low levels of greens space provision.

GM Made to Move[11] is an important £1.5bn initiative in this area, in addition to GM Moving[12] which has just been awarded £10m in Lottery Funding. Both are aimed at linking mobility and health, in which green infrastructure will play an important role.

The key challenge for the NCIP is the extent to which investment in green space provides a value for money return through reducing health-care costs for society. It also highlights priority areas for improving health. A further challenge is the timescales over which these effects take place, investing in actions that have benefits of preventing future ill-health may make sense, but the benefits are realised in the future, which is not adequately accounted for in current NHS funding models. Another important consideration is the opportunity provided by the devolvement of health budgets, and the degree to which (in future) funds could be invested in natural capital as a prevention measure.

In the UK, there have been some limited examples of health budgets being used to provide recreation as a cost saving measure (such as allocation of public health budget to parks management in Newcastle[13]) but work in this area is growing. The Department of Health has also released details of a series of initiatives being funded under a £100m Health and Social Care Transformation Fund[14]. A portion of this funding has been set aside for 'innovation funding' which may have the potential to link to natural capital-based health outcomes and innovative mechanisms including the potential to further link to the GM Health and Social Care Partnerships' social prescribing initiatives[15].

Wider links to natural capital

From the North West River Basin Management Plan[16], an analysis of the significant water management issues preventing waters reaching good status, suggests that the water quality priorities for Greater Manchester (in order of reasons for) are:

1. Reducing waste water pollution which is largely for UU investment to address;
2. Pollution from cities and transport, with many and varied solutions, some of which may use natural capital solutions; and
3. Agricultural run-off, which would benefit from catchment management measures.

[10] GMCA (2017) The Greater Manchester Population Health Plan, 2017-2021
[11] GMCA (2017) Made to Move
[12] https://www.greatersport.co.uk/get-active/greater-manchester-moving
[13] As reported in the Times (2017). Newcastle uses public health case to save city parks.
[14] Department of Health (DOH) (2018). Health and social care transformation funding announced.
[15] GM Health and Social Care Partnership (2018). GM Embraces prescribing for the person to improve mental health and wellbeing.
[16] Environment Agency (EA) (2016). North West River Basin Management Plan.

Regarding wider links to natural capital, investing in natural capital will be crucial to meeting over half of the United Nations' Sustainable Development Goals (SDGs) which the UK is committed to. It will also be necessary to delivering the 25 Year Environment Plan[17], Defra urban pioneer[18] and the reform of agricultural policy post Brexit[19]. Locally relevant policies that include targets are the GM Green Summit[20], the aspirations of the Mayor and the Greater Manchester Urban Pioneer, GM Resilience Plan[21], the Greater Manchester Setting City and Area Targets and Trajectories for Emission Reduction (SCATTER) [22], and the Climate Change and Low Emissions Strategy (CCLES) [23] Implementation Plan, and the Northern Forest[24] and local emerging tree strategy and plans[25].

Infrastructure

Key investment areas are transport (e.g. airport development, HS2), development/housing (especially green infrastructure to support larger developments, such as the Manchester Housing Providers Partnership holdings), water quality (e.g. United Utilities (UU) investment plans) and flood resilience (e.g. Environment Agency's (EA) capital flood programme). In addition to new infrastructure projects, there are opportunities within existing infrastructure to enhance natural capital, e.g. green spaces and gardens owned by housing associations. The key connection for developing the NCIP is the degree to which some of this investment can be utilised for the provision or enhancement of natural capital. Opportunities for investment in natural capital identified within the emerging Greater Manchester Infrastructure Strategy Framework include:

- Green and blue infrastructure financing and funding;
  - Including sustainable transport (where natural capital is enhanced, rather than exploited), habitat enhancement and biodiversity, resilience;
- Natural solutions that provide better returns than conventional engineering solutions – e.g. Sustainable Drainage Systems (SuDS), catchment management to improve water quality;
- Investment to enhance the local environment and thereby improve the attractiveness for investors and buyers – e.g. gateway developments; and
- Compensation for development – e.g. biodiversity offsets for developers and transport projects (particularly where offsetting is within Greater Manchester boundary).

Conclusions

Many of these strategies are mutually supportive and have overlapping or similar priorities, however the key priorities and opportunities that they present for natural capital are:

- **Improved Health Outcomes**, mainly via improving activity levels, but also through sustaining overall well-being and localised improvements to air quality and climate regulation. There is also an opportunity to address spatial health inequalities.
- **Improving Place**, chiefly by making the Greater Manchester city region a better place to live (Greater Manchester Strategy). The opportunity is not only to improve quality of life,

[17] HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment
[18] EA & GMCA (2018). Defra Urban Pioneer Strategic Plan
[19] DEFRA (2018). Health and Harmony: the future for food, farming and the environment in a Green Brexit
[20] GM Green Summit
[21] GMCA (2017). 100 Resilient Cities - Greater Manchester Agenda-Setting Workshop - Summary Report
[22] Tyndall Centre (2018). Quantifying the implications of the Paris Agreement for Greater Manchester - Setting City and Area Targets and Trajectories for Emission Reduction (SCATTER).
[23] GM Low Carbon Hub (2016). Climate Change and Low Emission Strategies' Whole Place Implementation Plan for Greater Manchester (2016-2020)
[24] The Woodland Trust – Northern Forest
[25] Manchester City Council (2017) Manchester Tree Action Plan (2016-20)

but also to play an important role in attracting inward investment, skills and tourism. This is also an opportunity to focus on disadvantaged places and to raise property values.
- **Building Resilience**, principally through addressing climate change and flood risks.
- **Supporting the Local Economy**, through investments that support new local development (e.g. various regeneration programmes) and business improvement. There is also potential to improve the local green economy.
- **Conserving Habitat and Enhancing Habitat and Wildlife**, valued for its own sake, but funded via targeted investors.

Related ecosystem services and benefits that emerged as priorities include:

- Physical and mental health and wellbeing derived from exposure and access (i.e. recreation and aesthetics)
- Sustainable travel
- Water quality and flood management (surface water and fluvial)
- Climate regulation - Carbon storage and sequestration and urban cooling
- Air quality improvements
- Habitat and wildlife conservation (including biodiversity)

3.3 Spatial analysis

The spatial analysis included the scoring and weighting of spatial areas regarding nine data layers as presented in Table 1. Full detail of the method and rationale to scoring each data layer is provided in Annex 3.

As shown the data layers used provide information on the extent and quality (condition) of natural capital assets, social indicators, ecosystem services, and major developments.

Each of these layers was used to produce scores for spatial areas based on whether the area links to many (higher score) or few (lower score) priorities identified. For example, areas with lower environmental quality, or higher deprivation receive a higher score. Similarly, areas that align with identified priority green and blue infrastructure (as identified through the draft GMSF) receive higher scores. Many layers were scored based on a binary basis: a score of '0' if an area does not align with a data layer and a score of '1' if it does.

For example, the scoring of spatial areas for air quality was a '0' for areas outside of the air quality management areas and a '1' for areas within air quality management areas (i.e. areas expected to breach air quality targets). This air quality score was then added to scores for other layers such as flood risk, with the aim being that a higher score would be given to areas that have both poor air quality and high flood risk, highlighting areas with greater need for investment. Therefore, the higher the score the more the area aligns with social and environmental needs (i.e. deprivation and lower environmental quality) and previously identified priorities. Maps of the results of scoring for each layer are provided in Annex 4. Figure 3 represents the final output of the spatial analysis. Highest scoring areas represent those that aligned most with the criteria within other data layers.

These results align with the priority areas identified within the draft GMSF. As shown, highest scoring areas include:

- Wigan Flashes;
- Hulton Park;
- Chat Moss;

- Lower Irwell Valley;
- Medlock Valley; and
- Portions of the South Pennines around the Eastern boundaries of both Rochdale and Tameside.

The spatial analysis also identifies additional high-scoring areas such as within Manchester City Council and Rochdale Borough Council. These are partly a product of the data sets used, for example with higher priority given to lower-grade farmland contributing to higher opportunity being identified on the upland moorland on the eastern side of Rochdale District.

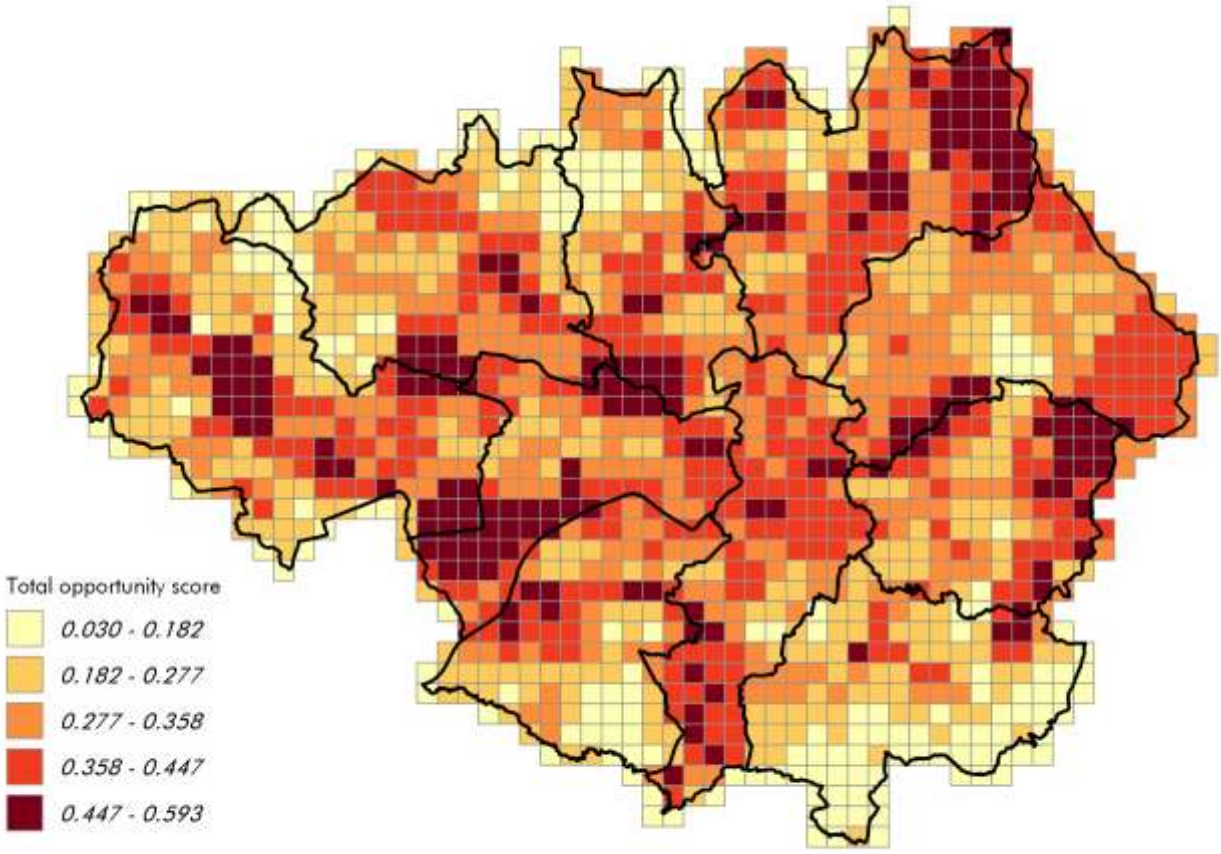

Figure 3: Spatial analysis – priority and opportunity areas identified by total scores

It is recognised that opportunities for natural capital creation and enhancement can occur anywhere and at many different scales. But the mapping output can help with aligning the natural capital projects to where they are most needed. The identified sites and areas are identified because they represent sites and areas that align with data at a strategic scale. These areas are not constraints on built development, in fact the inclusion of development data layers was aimed at identifying that development represents an opportunity for investment in natural capital.

3.4 Overview of identified natural capital projects

This section summarises the results from reviewing readily-available information on a select number of major projects that have been identified thus far as currently making a significant impact on natural capital in Greater Manchester (or those that have the potential to be scaled-up). The results of the project review confirm that there are many natural capital projects within the city region. In addition, various actors have worked to bring this information together as part of previous work, providing a useful evidence base to work from.

Investing in natural capital can involve a large number of stakeholders across economic sectors, types of organisations as well as the type of natural capital assets and the benefits of projects and investments. Within this variety, there are two key objectives natural capital projects (and their investment cases) can have: maintain the existing assets or enhance them (and of course a combination of the two).

For the purposes of preparing this investment plan, the scope of work is primarily within Greater Manchester (see Section 3.3). Therefore, the focus is on projects that can deliver benefits at the strategic Greater Manchester scale.

Information regarding natural capital projects was sought from previous work within Greater Manchester, including a Greater Manchester Natural Capital and Ecosystem Services Evidence Review (June 2018); Urban Pioneer call for innovative funding/delivery projects (October 2016); Outputs from the Greater Manchester Natural Capital Studies Workshop (November 2017); and discussion with the project Advisory Group as part of the inception meeting for this project (June 2018).

In addition, major infrastructure projects were considered where there was potential to leverage investment in natural capital. This included various regeneration schemes and major transport investments (e.g. with the potential to create green infrastructure). The potential for these development and infrastructure projects to deliver natural capital outcomes (and potential funding sources) will be considered further.

The following information was gathered:

- Project name and organisation;
- Natural capital assets concerned;
- Type of benefits produced (e.g. cost savings);
- The value (£) of benefits produced; and
- Funding levels.

In addition, the project team also made an initial assessment of:

- Links to potential revenue streams to those who manage (maintain and/or enhance) natural capital (is there one currently/can one be created?) as assessed by the project team; and
- Future prospects (e.g. scalability).

The selection of projects and the detailed review are provided in Annex 5. A total of 32 projects were reviewed, with the broad project themes presented in Table 4. This represents a selection of projects

identified as part of the baseline review and is not exhaustive. Additional projects will be included as part of the stakeholder engagement process.

Table 4: Overview of projects reviewed

NC assets	No.	% of total projects
Trees / woodlands	7	17%
Water quality / rivers	13	31%
Green infrastructure	16	38%
Other	6	14%
Total	42	100%

Funding information (including funding needs) was available for around 70% of projects (28 projects). The range in funding was from £20,000 in costs to a ring-fencing of £1.5billion (Made to Move – opportunity for a portion of this to enhance green infrastructure).

The project team also made an initial assessment of the potential to link project outcomes to potential revenue streams. For example, if the benefit of natural capital for human health or worker productivity can be shown, public health providers and private sector could be encouraged to co-fund the necessary investments. In nearly all cases links could be made to outcomes (e.g. avoided flood damage costs) which have the potential to link to revenue streams (assessed based on judgment by the project team). However, more information is needed to confirm these links. The majority of projects aligned with the following outcomes:

- Avoided water treatment costs, flood damage costs – key benefits of many natural capital projects within Greater Manchester;
- Avoided health care costs, such as from physical health initiatives and conservation activities that provide recreation opportunities;
- Carbon capture and storage, particular opportunity due to Greater Manchester's natural capital asset base; and
- Natural capital as improving attractiveness of area (e.g. for visitors and businesses and people).

Exploring the potential mechanisms around these topic areas will be a key point to develop as part of the draft plan, as well as a key point for discussion within the stakeholder consultation.

This process has also identified gaps in data that can inform the structure/focus of stakeholder engagement to be undertaken. Key gaps include:

1. Understanding opportunities for natural capital investment within major development and infrastructure projects. A review could be conducted on the extent to which natural capital is included in all major development plans, which is often low. These opportunities can involve:
    - The provision of natural capital within the projects themselves, by applying the mitigation hierarchy.
    - To secure compensatory funding for unavoidable damage from developments (e.g. HS2).

- This will be addressed by engagement with developers (and possibly infrastructure planners if available) in the stakeholder consultation process.

2. The evidence base on the valuation of project benefits.
    - Projects are usually clear on the benefits they deliver, but not on the physical and/or monetary values of these benefits. Building this evidence is an important step to seeking funding.
    - This will be developed further as part of the stakeholder engagement with key projects identified.

3. Building the links between project benefits and potential revenue streams.
    - This is another key step in the process to attract funding. This step will be developed through interviews with selected project owners and EF/project team.

4. General gaps in terms of additional projects that should be reviewed
    - The project list is an evolving list which will be refined throughout the project with new opportunities as they emerge.

These gaps will be key topics covered within upcoming stakeholder consultation. Building on this baseline review, prioritising projects for natural capital investment requires further work in this project (Task 3) including delving further into sources of funds and potential revenue streams as part of developing the draft plan.

4. Conclusions

The development of a natural capital investment plan for Greater Manchester is a key outcome announced as part of the Mayor's Green Summit and recommendations from both the Urban Pioneer and Natural Course projects. This review of current natural capital assets, value of their services; priorities and projects provides further evidence that investment in natural capital can support the achievement of numerous over-arching local and national strategies, objectives, and priorities. The results of the baseline review represent the first stage in the process of collating relevant information regarding natural capital priorities and projects, but is by no means exhaustive. Stakeholder engagement will be undertaken to further refine these results and fill in any information gaps.

Key Priorities and Opportunities

If the NCIP is to be successful it must address the key priorities of the GM city region. The review of strategies and frameworks found that the key priorities and opportunities for natural capital are:

- **Improved health outcomes**, including an opportunity to address spatial health inequalities;
- **Improving place**, making the GM region a more attractive place to live and work, which in turn will play an important role in attracting inward investment, skills and tourism. This also supports an uplift in property values;
- **Building resilience**, principally through addressing climate change and flood risks;
- **Supporting the local economy**, through investments that support new local development (e.g. various regeneration schemes) and business improvement. There is also potential to improve the local green economy.
- **Conserving and enhancinghabitat and wildlife**, valued for its own sake, but funded via targeted investors.

Related ecosystem services and benefits that emerged as priorities include:

- Physical and mental health and wellbeing derived from exposure and access (i.e. recreation and aesthetics)
- Sustainable travel (where natural capital in enhanced)
- Water quality and flood management (surface water and fluvial)
- Climate regulation - carbon storage and sequestration and urban cooling
- Air quality improvements
- Habitat and wildlife conservation (including biodiversity)

Project Review

In addition a total of 32 natural capital projects were also assessed. The majority of these projects fit the broad themes of trees and woodland (22% of total projects assessed), water quality and rivers (41%), and green infrastructure (25%). The review of natural capital projects found key patterns and themes including:

- Avoided water treatment costs, flood damage costs – key benefits of many natural capital projects within Greater Manchester;
- Avoided health care costs, such as from physical health initiatives and conservation activities that provide recreation opportunities;
- Carbon capture and storage, particular opportunity due to Greater Manchester's natural capital asset base.
- Natural capital as improving attractiveness of area (e.g. for visitors and businesses and people).

In nearly all cases links could be made to outcomes (e.g. avoided flood damage costs) which have the potential to link to revenue streams (assessed based on judgment by the project team). However, more information is needed to quantify these links.

In summation there is evidence to suggest that exploring revenue streams, investment and financing opportunities, linked to avoided water treatment and flood damage costs, avoided health care costs, and carbon capturing are key to linking to the current landscape of projects within Greater Manchester.

Exploring the potential mechanisms around these topic areas will be a key point to develop as part of the draft plan, as well as a key point for discussion within the stakeholder consultation.

Key Gaps and Next Steps

Key project information gaps include:

1. Understanding opportunities for natural capital investment within major development & infrastructure projects
    - There is little detail on natural capital within these plans, yet opportunities exist to enhance natural capital within regional regeneration schemes, and to secure compensatory funding from developments (e.g. HS2).
    - This will be addressed by engagement with developers (and possibly infrastructure planners if available) in the stakeholder consultation process.

2. The evidence base on the valuation of project benefits.
    - Projects are usually clear on the benefits they deliver, but not on the physical and/or monetary values of these benefits. Building this evidence is an important step to seeking funding.
    - This will be developed further as part of the stakeholder engagement with key projects identified.

3. Building the links between project benefits and potential revenue streams.
    - This is another key step in the process to attract funding. This step will be developed through interviews with selected project owners and EF/project team.

4. General gaps in terms of additional projects that should be reviewed
    - The project list is an evolving list which will be refined throughout the project with new opportunities as they emerge.

These gaps will be key topics covered within upcoming stakeholder consultation.

These results will support the task to identify a short-list of potential natural capital projects for investment by aiding in the development of prioritisation criteria, providing a basis for comparing whether and how projects align with Greater Manchester's social, environmental, and economic priorities and needs.

The gaps in information identified will be used to refine the focus of the stakeholder consultation, providing a useful indication of the types of information relevant to investment decisions which should be discussed further with key stakeholders.

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