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# LEICESTER GREEN INFRASTRUCTURE STRATEGY

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## 2015-2025

*EVIDENCE BASE, ACTIONS AND OPPORTUNITIES*



## FOREWORD

This framework sets out the strategic vision for our green sites in Leicester and the ways in which they can be created, managed and maintained to provide maximum benefits to the people who live, work or visit Leicester.

The actions are supported by an evidence base of data and information which recognise and prioritise key areas where resources can be focussed to develop high quality green infrastructure (GI) into our new and existing communities. By placing the framework within the planning system it is possible to provide the key tools needed to secure these areas and design them to provide multi-functional green space.

Improvements to established green space and creating new sites to surround built development will provide an accessible and natural green network. These areas will be capable of supporting a range of functions which include landscaping/public amenity, recreation, flood control, safer access routes, cooler areas to combat predicted climate change and places for wildlife.

These functions give rise to a range of environmental and quality of life benefits which include providing attractive and distinctive places to live, work and play; improving public health, facilitating access and encouraging sustainable transport as well as offering an environment to support wildlife. Placing a monetary value on these benefits is difficult, but many have potential to deliver significant economic value by increasing the attractiveness of a neighbourhood for businesses and employers, encouraging tourism and associated revenue, reducing health care costs and maintenance or clean-up costs from flooding. To achieve these significant benefits the framework has set out five priorities for the City. These are:

***PRIORITY 1 - A Place to Do Business and Get About*** – linked to economic growth, regeneration, housing targets but also sustainable transport and car travel.

***PRIORITY 2 - A Bio-diverse and Beautiful City*** – linked to provision of habitats, access to nature, attractive and well-maintained areas of green space.

***PRIORITY 3 - A Healthy and Active City*** – linked to green transport routes and formal/informal recreation to address health and quality of life issues.

***PRIORITY 4 - A Naturally Sustainable City*** – linked to flood storage, controlling impacts of climate change, improving soil, water and air quality

***PRIORITY 5 - Planning for GI*** – embedding the strategy within local policy and developing a strategic green network of space capable of providing multiple benefits in a cost effective and sustainable way

The framework recommends actions and supports good practice to deliver green infrastructure in Leicester. It identifies funding streams, the need for careful design and master-planning, adapting and retro-fitting designs to existing infrastructure, and how to

manage and maintain areas effectively. Land in private ownership, particularly gardens are also recognised within the framework as an important contributor to strategic green infrastructure by, for example, enhancing the character of an area, absorbing water and reducing flood risk, providing habitats for wildlife and helping to keep the City cool.

The final section of the plan identifies opportunities to incorporate green infrastructure across the City and includes areas of green space and regeneration areas as well as sites identified for housing and employment use. The framework does not go as far as specifying the design and layout to deliver green infrastructure on the ground in some of these areas, but does advocate using existing strategies/guidance, partnerships and new forums to prioritise schemes and attract funding for their completion. By doing so, the strategy provides the necessary framework and possible locations whilst remaining sufficiently flexible to adapt to changes in the economy, funding streams and political changes at a central and local government level.

The framework has been produced by a Partnership of in-house specialists in consultation with environmental organisations made up of local authorities, government agencies, non-government organisations and community groups. It is an important and proactive step towards safeguarding future growth and development whilst delivering well-designed and planned green infrastructure across the City.

The preparation of Leicester's Green Infrastructure Strategy was financially supported by the City Council and Natural England.

**This document does not assess the value of land for protection or make decisions on the use of land. Those decisions are taken through the planning process. This document identifies areas of land that may benefit from enhancements, and the benefits those enhancements can bring.**

It is intended that the Action and Delivery Plan will be used by the following groups:

- To inform planners and developers of the expectations of land use and determine where applications for change of use/development to meet the demands for growth whilst ensuring those areas selected are most appropriate; and can incorporate the creation or enhancement of Green Infrastructure both on and off-site;
- To inform engineers, hydrologists, flood/SuDs experts, pollution control, climate change strategists, ecologists and environmentalists where to prioritise sites for the creation, maintenance and enhancement of green sites to maximise benefits, mitigate and compensate for any potential impact resulting from land use;
- To inform planners of areas for CIL/S 106 contributions; funding programmes and allocation of resources and ensure best value;
- To inform on appropriate use, management and maintenance of sites together with their enhancement and creation which can be related to national and local strategies and objectives to which the Green Infrastructure Strategy is linked.

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# Part 1

## Leicester Green Infrastructure Evidence Base

# 1. INTRODUCTION

## 1.1. Overview

This document describes the **ACTIONS** required to deliver a successful Green Infrastructure (GI) Strategy in Leicester. The vision for delivery is upheld as:

**Planning for a safe, healthy environment enjoyed by people in Leicester whilst supporting a sustainable network of green space capable of providing multiple benefits where natural resources support key services to deliver economic growth and changing lifestyle.**

### 1.1.1 The Priorities

The framework sets out a planned strategic approach to green infrastructure across the whole of the City taking account of current conditions and future opportunities in urban areas and semi-rural green space. Priorities for delivery of the Strategy focus on the need for a strategic dimension and to build design and quality into the delivery of successful schemes.

Previous work has focused on the value of nature conservation and ecology earning the City its green credentials as the first Environment City with the publication of the Leicester Ecology Strategy (1990) and subsequent Biodiversity Planning Guidance (2003). The 6Cs Green Infrastructure Strategy and Leicester and Leicestershire GI Strategy (2009) provided an important evidence base of data and information for the area. This framework builds on this **evidence base** to help inform decisions about land use planning and management.

The framework **promotes** the full integration of GI into planning and management and is critical to helping to tackle **priority** issues within the City by identifying **actions** to meet these key priorities.

#### **PRIORITY 1**

**A Place to Do Business and Get About** – linked to economic growth, regeneration, housing targets but also sustainable transport and car travel etc.

The role of GI is to create an attractive green environment in which people can live and work; planning and enhancing green ways and non-car routes across the City.

*Benefits* – economic prosperity and investment in the City; improved visual amenity of redeveloped sites; overlooked areas and perception of safety; housing growth; encourage potential investors and residents to new and existing areas. Indirect benefits on health and well-being. Enhanced land values through place making and improved environmental quality to assist deliverability in regeneration areas.

## ***PRIORITY 2***

**A Bio-diverse and Beautiful City** – linked to provision of wildlife habitats and access to nature. Prioritise national and locally designated sites, parks and Public Open Space (POS) which contain natural and informal green space; habitats that support a diverse range of wildlife and those habitats/species protected by wildlife legislation.

*Benefits* – creation/enhancement of key habitats; conservation of species; improved connectivity to combat potential impacts of climate change and disturbance

## ***PRIORITY 3***

**A Healthy and Active City** – Access, recreation, movement & leisure – links to Parks & Green Space (GS), POS, Sports, Public Rights of Way (PROW) and accessibility – encouragement of use of green transport and non-car routes to address health and quality of life issues.

*Benefits* – Provision of safe and sustainable transport routes; health benefits (mental and physical); access to nature whilst greatly improving the quality of life for people living, working and visiting the City; reduction in respiratory ailments linked to improved air quality and combatting extremes of heat/cold.

## ***PRIORITY 4***

**A Naturally Sustainable City** – Flood attenuation & water resource management; climate change mitigation linked to areas of green space capable of providing flood attenuation, cooling and shade, improvements in water quality, water filtration and control of flow rates

*Benefits* – reduction in flood risk and attenuation of water during storm events or periods of drought; improved water and air quality; reduced temperatures to combat heat island effect

## ***PRIORITY 5***

**Planning for GI** – forms part of Planning Policy. This document is intended to help support the planning process going forward.

Three major steps make up the process of GI Planning – these are

- Step 1 Identify the key priorities and issues, up-to-date policies, collating an evidence base and working together with partners to develop the strategy;
- Step 2 Gather and analyse spatial digitised data to fully understand the issues identified in step 1 and relate to Green Infrastructure
- Step 3 Develop recommendations and actions from the evidence base, together with the stakeholder review to provide a SMART Action Plan to deliver Green Infrastructure in Leicester

### 1.1.2 Green Infrastructure Areas of Influence

The focus of the strategy is to influence planning, environment and health sectors in particular. To achieve the benefits at a strategic level it is necessary to work in partnership with many organisations, some of which are not traditionally linked with green issues. Figure 1.1 shows the types of organisations that will play a role in delivering the strategy.

### 1.1.3 Green Infrastructure and the Planning System

The strategy and action plan is centred on the Planning System to support the aspirations set out under the National Planning Policy Framework (NPPF) and Localism.

The strategy has been developed from a database of environmental evidence provided by the City Council and statutory partners and provides a data resource to inform on local decisions.



Figure 1.1: Green Infrastructure Partners and Areas of Influence © Liverpool City Council

## 1.2. The Influence of Green Infrastructure in Leicester

Many of the key objectives for the City can be supported by developing effective Green Infrastructure to facilitate change in a sustainable and cost effective way. The evidence base of information provided for the Strategy shows that:

- The City Centre and Inner Areas are key targets for future investment, but have low levels of accessible green infrastructure and some have low functionality (<http://citymayor.leicester.gov.uk/leicesters-economic-action-plan/>)
- Some new housing for the City and neighbouring districts is allocated to areas that are currently green field sites. A new Local Plan is being produced by the City Council. This will involve cooperation with the adjoining district, borough and county councils. Opportunities exist for multiple benefits and provision of accessible green space in these areas
- 67% of the city is currently green infrastructure. Leicester is already recognised as a green, environmental city and should be marketed as such for competitive advantage.
- Green infrastructure is not evenly distributed across the city. Some areas have less access to green infrastructure than other areas of the City.
- There is evidence of a link between low levels of green infrastructure and higher incidences of poor mental health, obesity and coronary heart disease, and poor air quality. Developing a strong community and sense of place via good urban design and landscaping; and facilitating good connectivity with cycle tracks, parks and walkable areas will promote good mental well-being.
- An action plan that concentrates on making the best use of existing green infrastructure and prioritising opportunities to create new infrastructure for multiple benefits.

## 1.3 Structure of the Green Infrastructure Strategy

**Green Infrastructure Datasets** – held by Leicester City Council IT and Conservation Team and made available to partners for local planning and strategy development. The datasets contain all of the data verified and produced as part of this Strategy plus “background” information for specific sites or areas.

**Action and Delivery Plan** – Provides an evidence base; identifies priorities for action to maximise benefits and opportunities available to deliver them

**Prospectus** – A summary report for general public and promotion which focuses on the key issues and actions

## 1.4 Under-lying Principles of good GI in Leicester

The key principles for the provision and management of GI Planning and management are outlined below

- **Principle 1: GI needs to be strategically planned to provide a comprehensive and integrated network.** GI needs to be planned and integrated so that it can function at different scales and across administrative boundaries. The City Council should identify strategic GI within Local Plans which are informed by cross boundary strategies and cooperation.
- **Principle 2: GI requires wide stakeholder buy-in.** The strategic planning of GI requires a co-ordinated approach from a multi-disciplinary, cross-organisational, cross-boundary team of partners. The Duty to Co-operate in the NPPF (2012) to engage with a diverse range of people and organisations across different sectors is required.
- **Principle 3: GI needs to be planned using good science and sound evidence.** The planning and implementation of GI should be based on up-to-date evidence and information of GI assets. Mapping existing resources and identifying areas of opportunity is an important strategic tool to identify opportunities and fill gaps.
- **Principle 4: GI can be multi-functional.** A GI network should fully demonstrate ‘multi-functionality’ where appropriate by seeking to integrate different functions on the same site and strategically across the GI network.
- **Principle 5: GI needs to be central to the development’s design and reflect and enhance the area’s locally distinctive character.** GI should be designed to high, measurable standards of quality and sustainability in order to deliver social, economic and environmental benefits. It needs to be fully integrated within the design of a development, reaching into the built environment and incorporating open space, extensive corridors and enhancements that connect with the wider countryside.
- **Principle 6: GI should identify and protect GI assets before development.** Developments should sustain existing areas of important habitat of sufficient quality and extent to support viable populations of species, that is, statutory and non-statutory designated nature conservation sites such as Sites of Special Scientific Interest (SSSI) and Local Wildlife Sites (LWS) and habitats of international, national, regional or local importance. Developments should also aim to create new habitat, where opportunity allows, creating stepping stones or habitat corridors for wildlife within the cityscape.
- **Principle 7: Connect GI components with each other and improve access for people.** GI can achieve physical and functional connectivity between sites at strategic and local levels. Connectivity can mean direct physical connection between site, and also proximity to a site to provide an integrated green network and help reduce impacts of climate change etc.
- **Principle 8: GI should be a framework for conservation and contribute to the historic and as well as the natural environment.** The protection, conservation and management of historic landscape, archaeological and built heritage assets should be integrated into how assets can be identified and integrated into the GI network.

## 2.0 Green Infrastructure – What is it?

### 2.1 Definition

Green Infrastructure (GI) comprises “the networks of **multifunctional** green space which sit within, and contribute to, the type of high quality natural and built environment required to deliver sustainable communities. Delivering, protecting and enhancing these networks require the creation of new assets to link with river corridors, waterways, woodlands, nature reserves, urban green space, historic sites and other existing **assets**.”(6Cs Growth Points (a) 2010).

GI has the potential to provide a range of **functions** that can help deliver a broad range of **benefits** or services related to economic, environmental and social policy priorities. Whilst these multiple functions can apply to individual sites, it is consideration of the collective value and the variety of functions and how they can be linked together to achieve the maximum benefits to the most people that is important.

A natural service-providing infrastructure is often more cost-effective, more resilient and more capable of meeting social, environmental and economic objectives than ‘grey’ infrastructure (Landscape Institute 2013).

GI can also play a key role in **place-making** which identifies the character, distinctiveness and sensitivities of different places; ensuring that policies, programmes and proposals respond accordingly to landscape and townscape character, vernacular and sense of place.

### 2.2 Green Infrastructure Assessment

Pressures on green space within large cities such as Leicester are easily recognised. Increases in population numbers, planned new housing and provision for business and employment as well as “grey” infrastructure requirements of roads, bridges and pathways put pressure on existing GI. Identification of new GI provision, enhancement of existing green space and adaption for multiple uses where possible will help ensure that all residents and visitors to Leicester have access to the many GI types that are essential for quality of life.

A standard approach to describing GI has been developed particularly in Northwest England. This tested and now formally adopted method appears transferrable across many UK areas with several landuse types and their functions being present in one form or another. The main difference is the magnitude, scale and connectivity of any green space – and whether the area studied is coastal or inland.

## 2.3 The Mapping of GI

The following sections describe the processes that have been completed to strategically map the City of Leicester using an objective methodology that identifies the five stages to assess current GI and identify opportunities for future GI requirements based on identified gaps in the green network and priorities based on national and local government statistics, climate change and flood risk, biodiversity designations, protected species data, and requirements from local demands. The four key priorities provide the focus from which evidence-based strategies and data have been used to inform on areas of deficiency and prioritisation of the network. Full details of mapping techniques and a range of maps produced are available in Appendix I and II.

The main stages of mapping are:

- Stage 1 – Typology
- Stage 2 – Functionality
- Stage 3 – Benefits
- Stage 4 – Needs
- Stage 5 – Targeting and Priorities

### 2.3.1 Typology of Green Infrastructure Assets

The first stage of the mapping is to establish that GI relates to all **types** of green space whether it is in private or public ownership, public access or in an urban or rural setting. The types of green space identified include formal parks and gardens, general amenity green space, natural or semi-natural areas and more strategic green corridors.

The types of green space identified in Leicester are based on types and definitions identified in the Defra guidance on Green Infrastructure (Davies *et al* 2005). These definitions were considered to be transferable to Leicester and are generally usable within any large urban environment in the UK. Figure 2.1 shows the different types of landuse mapped in Leicester according to their typology.

Appendix I details of the typologies identified. They are separated into main sub-categories which address:

- Land ownership and access e.g. public or private
- Location e.g. central urban or rural setting
- Type of use e.g. allotments, parks, private gardens, institutional grounds
- Land type e.g. wetland, grassland/scrub, woodland



Figure 2.1: Leicester's Green Infrastructure Typology

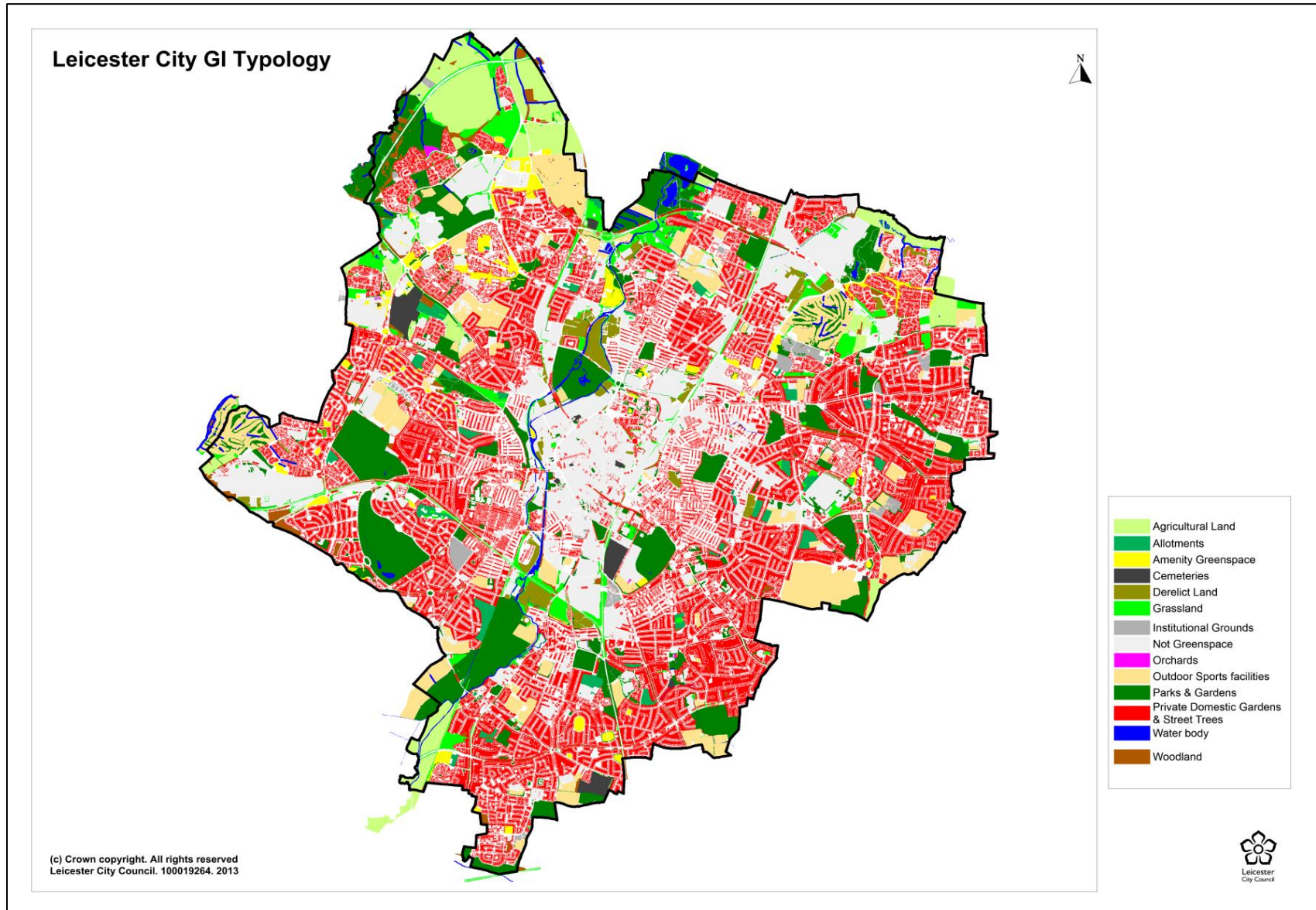


Figure 2.1 shows the distribution of different land types across Leicester based on information provided from the Ordnance Survey typology data base and local studies such as the Phase I Habitat Survey (2008) which identifies specific vegetation types such as woodland, species-rich grassland and surface water.

Table 2.1 shows the different types of landuse across the City and the percentage of the overall land type

**Table 2.1: Types of Landuse n Leicester with Percentage of Overall Land Type**

<b>Typology for Leicester</b>	<b>Area (ha)</b>	<b>Total area %</b>	<b>% of Green Site</b>
Agricultural Land	332.20	4.53	6.79
Allotments, community gardens or urban farms	84.76	1.16	1.73
Cemetery, churchyard or burial ground	50.10	0.68	1.02
Derelict Land	108.70	1.48	2.22
General amenity space	192.90	2.63	3.94
Grassland / heathland / moorland or scrubland	515.70	7.03	10.53
Green Roofs (Point data only)			
Institutional grounds	48.36	0.66	0.99
Orchard	2.39	0.03	0.05
Outdoor sports facility	520.80	7.10	10.64
Park or public garden	920.20	12.55	18.79
Private domestic garden	1869.00	25.49	38.17
Street trees (Point data only)			
Water body	30.98	0.42	0.63
Water course	42.82	0.58	0.87
Woodland	177.10	2.42	3.62
Non GI	2436.00	33.22	49.75
<b>Total area for Leicester</b>	<b>7332.01</b>		
<b>Total Green Space area for Leicester excluding Non GI</b>	<b>4896.01</b>		<b>4896.01</b>
<b>Green Infrastructure of the total area of Leicester</b>		<b>66.78</b>	

The key findings are:

- A total of 67% of the City is classified as GI with the largest individual type of landuse being private domestic gardens at 25.5%. The gardens, however, are not evenly distributed across the City with several areas such as the City centre and environs being devoid; and other more heavily industrialised areas (old or recent) unsurprisingly void of GI.

The size and density of gardens also varies across the City with traditionally large gardens found in the suburbs of Stoneygate and Knighton compared to dense terraced housing of Tudor Road and Clarendon Park and the more recent housing infrastructure at Hamilton which favours smaller gardens and more POS.



**Figure 2.2: Typical garden areas in Clarendon Park, Leicester**



**Figure 2.3: Typical garden areas in Knighton**



**Figure 2.4: Typical garden areas in Hamilton**

- GI is not evenly distributed and some areas of accessible green space are not well connected to other areas or are not located close to where people live or work,

This development of the GI network has resulted from the historical development of the City, largely centred on the Soar originally, followed by implementation of transport links and infrastructure firstly with the canal network and then railway. These routes continue to form an important green network originally their main function being to transport materials to make goods and then transport them to new markets. The heavy industry has now largely past leaving regeneration areas of “brownfield” sites able to provide temporary functions and benefits with further opportunities for the City.

### 2.3.2 Functionality of Green Infrastructure

The second stage of the mapping is to identify what functions each type of landuse is capable of providing, that is, the GI **functions** simply describe what the GI type does. A GI land **type** may provide one function or a range of functions depending on the spatial scale or location of an individual site. The types of functions that have been considered include provision for recreation, water interception and storage, habitat for wildlife and carbon storage. Appendix I provide a full list of functions. GI Planning aims to identify any existing or potential areas of green space that can provide high levels of multiple-functions where possible. Where a site can only provide a single or more limited functionality, their conservation as green space may only be considered appropriate if this is a function that is required by legislation or is of strategic significance.

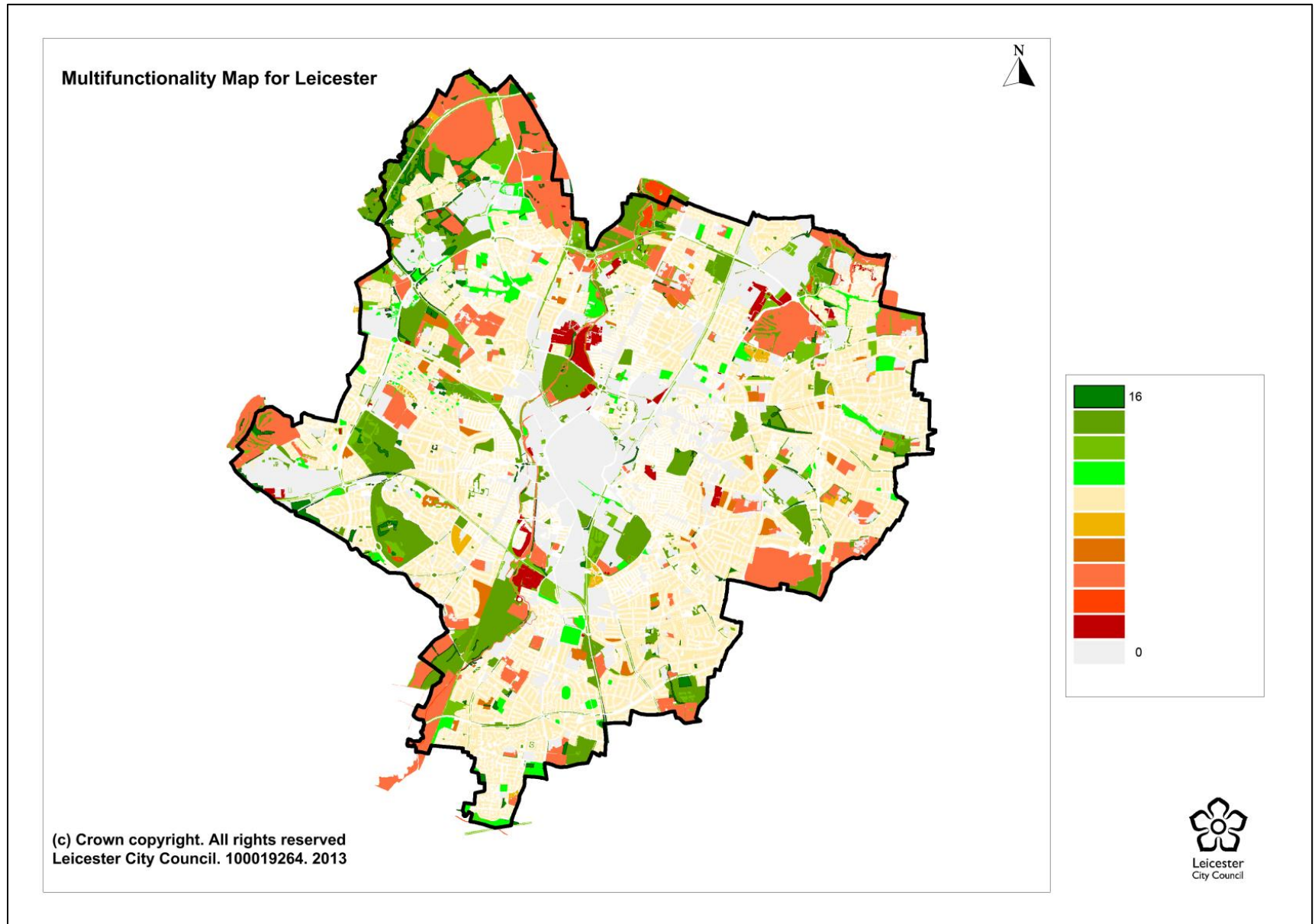
Figure 2.5 shows the areas of Leicester providing single or multiple functions according to their landuse type. The maximum number of functions in any one area of green space has been identified as 16 and the minimum (on non-GI land) is 0.

Those areas scoring the highest include many of the public parks and gardens that provide a recreational value as well as other functions such as sports and recreation or flood attenuation. The ability for such areas to contribute to climate change mitigation through cooling, carbon storage and shelter from the wind raise their importance; along with provision for natural green space and creation of habitats for wildlife alongside more formal areas for public amenity or sports which link to the biodiversity priority.

Such areas provide an attractive area for informal recreation such as dog walking, cycling or jogging as well as other pursuits such as photography and bird watching which contribute to peoples' health as well as providing opportunities to combat obesity and heart disease from increased exercise in areas of higher air quality. Having such areas on the doorstep of new housing or business provides an attractive area for people to live or work and want to invest. Encouraging the economy and investment in areas is equally important to justifying the need for GI and ensuring their protection and appropriate management to maintain their multiple functions in the long-term and so maximise benefits.

Appendix II shows individual function maps and their geographical distribution across Leicester.

Figure 2.5 Map of Leicester's Multiple Functions



### 2.3.3 Ecosystem Services/Benefits of GI

GI Planning also provides a method for identifying and categorising benefits that may arise from a variety of functions. These include benefits such as habitat provision and access to nature, water quality improvement, flood attenuation and water resource management, and countering “heat island” effect of urban areas. Not only should the environmental benefits be considered, but also the social and economic benefits that may arise from retention of green space.

Figure 2.6 shows the main benefit types considered in the strategy – each benefit consists of a mix of functions, for example, flood alleviation and water management is made up of four functions which include water conveyance, water storage, water interception and evapotranspiration.

Importantly, any consideration of GI requirements should not be restricted to the “red line” boundary of a development site or area, but be considered at a strategic City-wide and cross-administrative boundary level to incorporate the wider GI network to maximise such benefits.

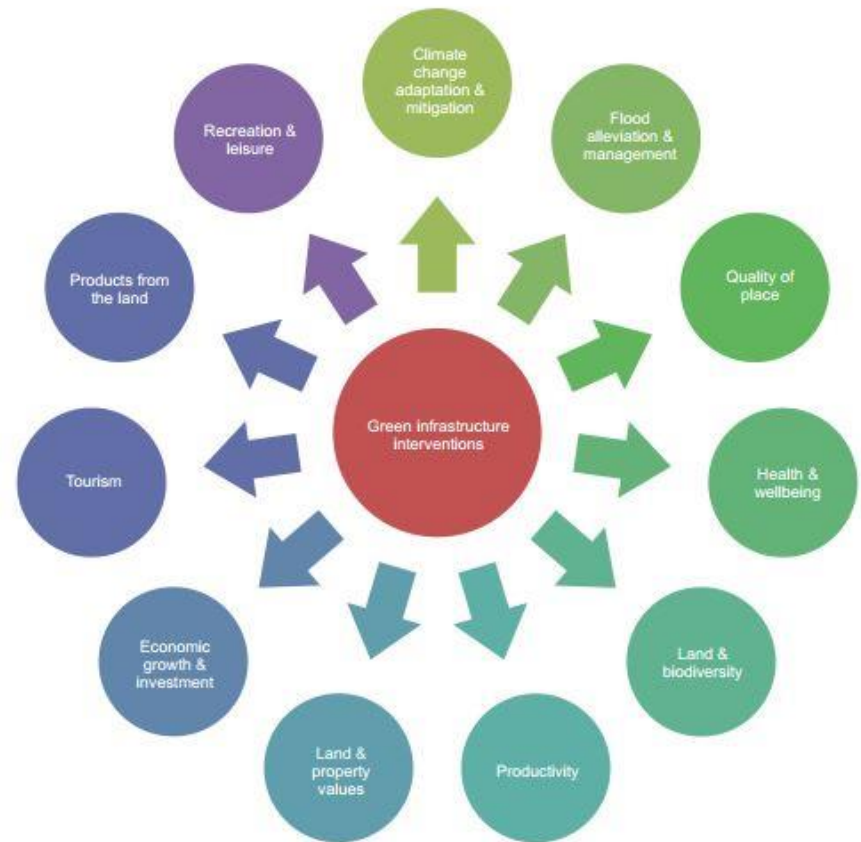


Figure 2.6: Benefits Associated with Green Infrastructure © Liverpool City Council

**Table 2.2: Direct and Indirect Benefits of Green Infrastructure**

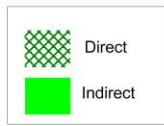
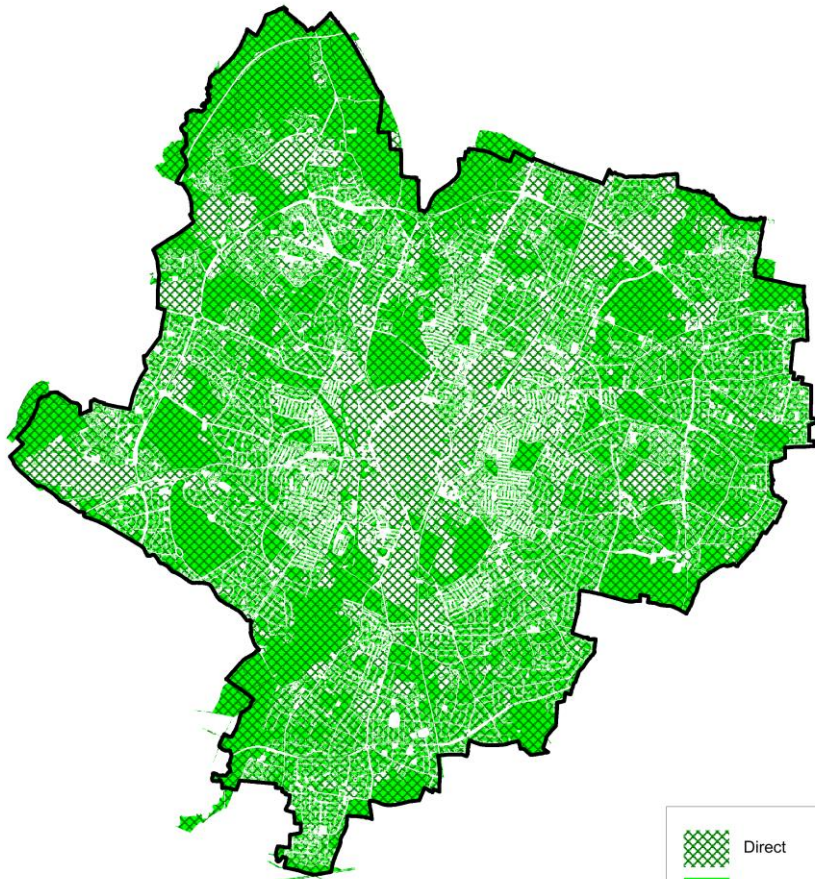
			FUNCTION																							
			recreation - public	recreation - private	green travel route	aesthetic	shading from sun	evaporative cooling	trapping pollutants	noise absorption	habitat for wildlife	corridor for wildlife	soil stabilisation	heritage	cultural asset	carbon storage	food production	wind shelter	learning	water storage	water interception	water infiltration / natural drainage	water supply			
PRIORITY/BENEFIT	climate change adaptation	Adapting to Climate Change																								
	climate change mitigation																									
	flood alleviation & water management																									
	quality of place	Health & Well-Being																								
	health & well-being																									
	land & property values	Sustainable City																								
	economic growth & investment																									
	labour productivity																									
	tourism	Tourism, Leisure & Recreation																								
	recreation & leisure																									
land & biodiversity	Ecological Network																									
products from the land																										

	Indirectly provides benefit from more than one function
	Indirectly provides benefit from one main function
	Directly provides benefit from one function

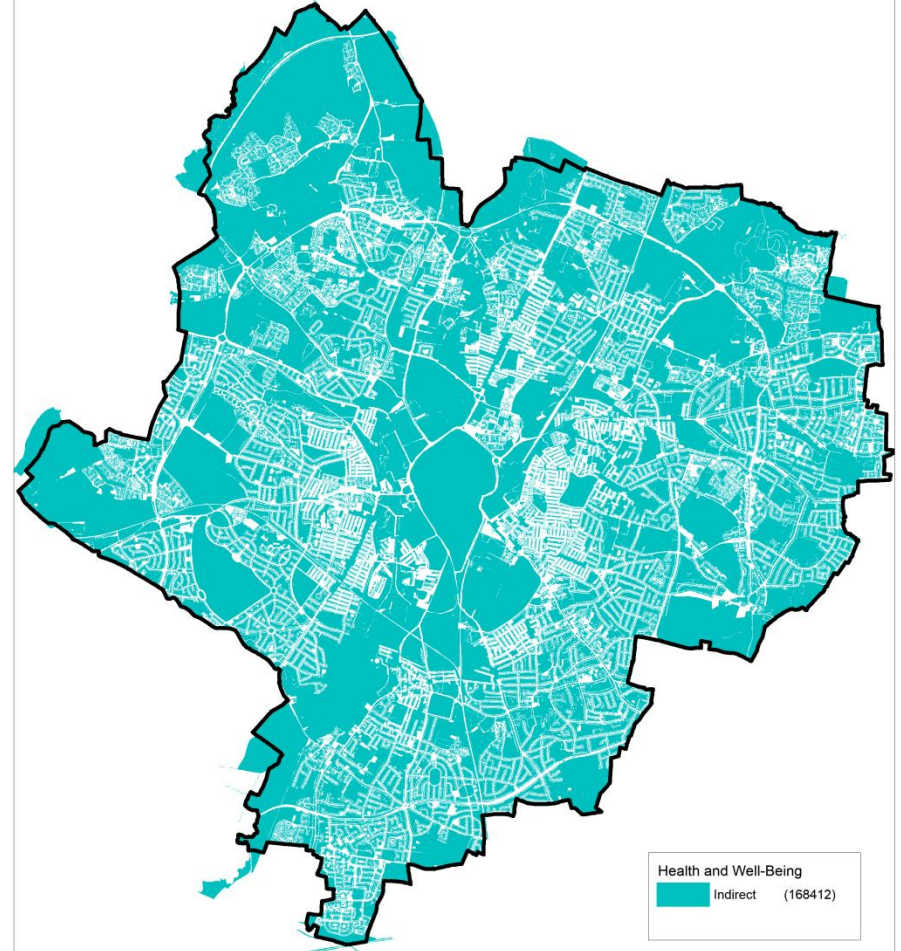
The above table shows that in most cases where a function is identified there will be either a direct or indirect benefit associated with it. In terms of mapping such benefits to broadly show the locations of benefits say to tourism and leisure or health and well-being almost the entire City is mapped as benefiting directly or indirectly with only those areas that are classified as non-GI disregarded. Figures 2.7 and 2.8 show examples of benefits for Recreation and Leisure and Health and Well-Being. Using such a method makes it difficult to differentiate between one area and another and where to prioritise GI, for example, the Health and Well-Being map shows that changes to GI will indirectly benefit the whole of Leicester in terms of Health and Well-Being. This is discussed further in Appendix I.

### Recreation & Leisure Benefit



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Leicester City Council. 100019264. 2013

### Health & Well-being Benefits Map



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Leicester City Council. 100019264. 2013

Figure 2.7: Areas Identified as Benefitting from Green Infrastructure Related to Recreation and Leisure

Figure 2.8: Areas Identified as Benefitting from Green Infrastructure Related to Health and Well-Being



### 2.3.4 Putting a Value on Benefits

There is increasing evidence which demonstrates that investment in GI can provide economic and financial gains. A well designed and managed GI scheme could result in reduced costs of energy and water resources in response to the need to mitigate and adapt to the effects of a changing climate in the UK. Land and property values may increase as a result of increased investment in GI to help create and/or sustain an attractive place where people can live, work or visit.

A reasonable amount of work has already been completed at a range of national government and local levels to evaluate and try and quantify the economic value of GI (HM Treasury 2010). Although sometimes controversial, it does enable a value to be placed on GI and then compared with other economic benefits associated with land use.

*“We believe the evidence is increasingly clear that providing good quality green space in our towns and cities can have significant economic benefits. It can promote investment, improve people’s health and protect our urban communities from the worst effects of climate change – all of which translate into millions of pounds of savings for the public purse.”*  
(Natural England 2012)

Delivery of economic value from GI may be delivered either directly or indirectly and may result in a reduction in costs or risk.

- Direct                                      Direct increase in employment opportunities and business development from the creation and management of GI
- Indirect                                     Creation of a quality place or life through GI to then encourage people to live or work in an area
- Cost Reduction                            Using GI approach as an alternative to more traditional “grey infrastructure” approaches e.g. use of GI softer engineering for flood storage and flood defence rather than traditional hard engineering flood walls and culverted drains
- Reduced Risk                              GI mitigation or adaptation in an area for a given risk creation/management of vegetation to reduce risk of crime and associated high costs of police resources, security systems, insurance, mental well-being

Although the process of geographical mapping of typology areas to the identification of valued benefits may appear to be a process of four simple steps, the interaction at each stage increases in magnitude so that the many different typologies can create many different functions and so escalate the number of benefits with which that original typology is associated.

**It is recommended that further work is completed to quantify the retention of green space and the value gained by implementing GI on land to provide multiple benefits to enable comparison with traditional methods of investment from say, housing and employment.**

**Table 2.3: Direct and Indirect Benefits of Green Infrastructure**

	<b>ECONOMIC</b>	<b>ENVIRONMENTAL</b>						
	<b>Economic Growth &amp; Employment</b>	<b>Protect and enhance landscape, geo-diversity and natural environment</b>	<b>Biodiversity conservation and enhancement</b>	<b>Climate change adaptation and mitigation</b>	<b>Promoting sustainable transport and reducing dependence on car travel</b>	<b>Protect and enhance cultural heritage</b>	<b>Community cohesion and life-long learning and volunteering</b>	<b>Healthy communities; health and well being</b>
<b>ACCESS, RECREATION, MOVEMENT AND LEISURE</b>	Green economy and designing attractive places for living and working	Safeguard sites through avoidance of development; raise awareness through education and interpretation	Safeguard sites through avoidance of development; raise awareness through education and interpretation	Appropriate and sustainable design e.g. access routes and greenways , creation of temporary flood storage and POS	Creation of permeable access routes for walking, cycling and provision of multiple recreational opportunities	Safeguard sites through avoidance of development; raise awareness through education and interpretation	Provision of safer, well-used meeting areas	Healthy communities – health and well-being, increased exercise and relaxation
<b>HABITAT PROVISION AND ACCESS TO NATURE</b>	Green economy, create attractive places to live, work and visit, increase property values	Reduce pressures on site by creation of additional or alternative access	Opportunities to conserve and enhance habitats; increased carbon storage; buffer and protection of designated sites	Improve connectivity between sites to reduce habitat fragmentation	Design access routes to avoid sensitive areas and provide visual access to nature	Opportunities for interpretation of historic features and habitats	Community involvement and participation in creation and on-going management; Opportunities for education and interpretation	Physical and psychological benefits of access to nature. Opportunities for “green gyms” and similar activities.
<b>LANDSCAPE SETTING AND CONTEX</b>	Green economy, including: Making attractive places for living and working, and to visit; Potential to increase property values.	Opportunity to provide enhanced landscape setting and to relate development to landscape character, place and context.	Opportunities for habitat enhancement and creation.	Opportunity to use water management for flood attenuation and enhanced landscape setting, and for SUDS to link development to landscape context.	Creating attractive settings in keeping with landscape setting for walking and cycling (e.g. greenways).	Making attractive places for living and working, and to visit.	Community involvement and participation; interpretation and education.	Places for meeting and events; provide a sense of place and identity.

<b>ENERGY PRODUCTION AND CONSERVATION</b>	Green economy, including: Making energy efficient and sustainable places to live and work.		Contribution of biomass fuel planting to biodiversity.	Provide the setting for renewable energy generation; Opportunities for climate change adaptation.	Promote sustainable transport routes and fuel/energy conservation.	Opportunities for traditional woodland management techniques – e.g. wood fuels, etc.		Increased use of green energies/ biomass fuels etc leads to improved air quality
<b>FLOOD ATTENUATION AND WATER RESOURCE MANAGEMENT</b>	Reduced economic and insurance risk in light of enhanced water resource management.	Opportunities to provide enhanced landscape setting and to relate riparian development to place and context.	Opportunities to create and restore wetland habitats.	Opportunities to link and create new wetland habitats.		Opportunities for education and interpretation in relation to wetland - understanding of place and context.	Opportunities for access to water for informal and formal recreation activities, and community involvement in conservation work.	Decreased risks of flooding reduces psychological costs/impacts on communities living in vulnerable areas.
<b>COUNTERING THE 'HEAT ISLAND' EFFECT OF URBAN AREAS</b>	Green economy, including: Making attractive and comfortable places for living and working; Potential for more economically efficient buildings, through green roofing and associated insulation.	Opportunities for provision of shading and cooling to restore and enhance landscape character and biodiversity, such as new tree, woodland and meadow planting, and also through green roofs and green walls.	Opportunities to provide habitat connectivity to assist species migration; and for planting of native species during urban tree planting programmes to provide urban cooling.	Opportunities for tree planting for carbon sequestration; Also creation of microclimates through structural landscape planting.	Providing greenways/traffic free routes to promote more local journeys on foot/cycle and therefore reduce the need for car use in urban centre.			Physical and psychological benefits.

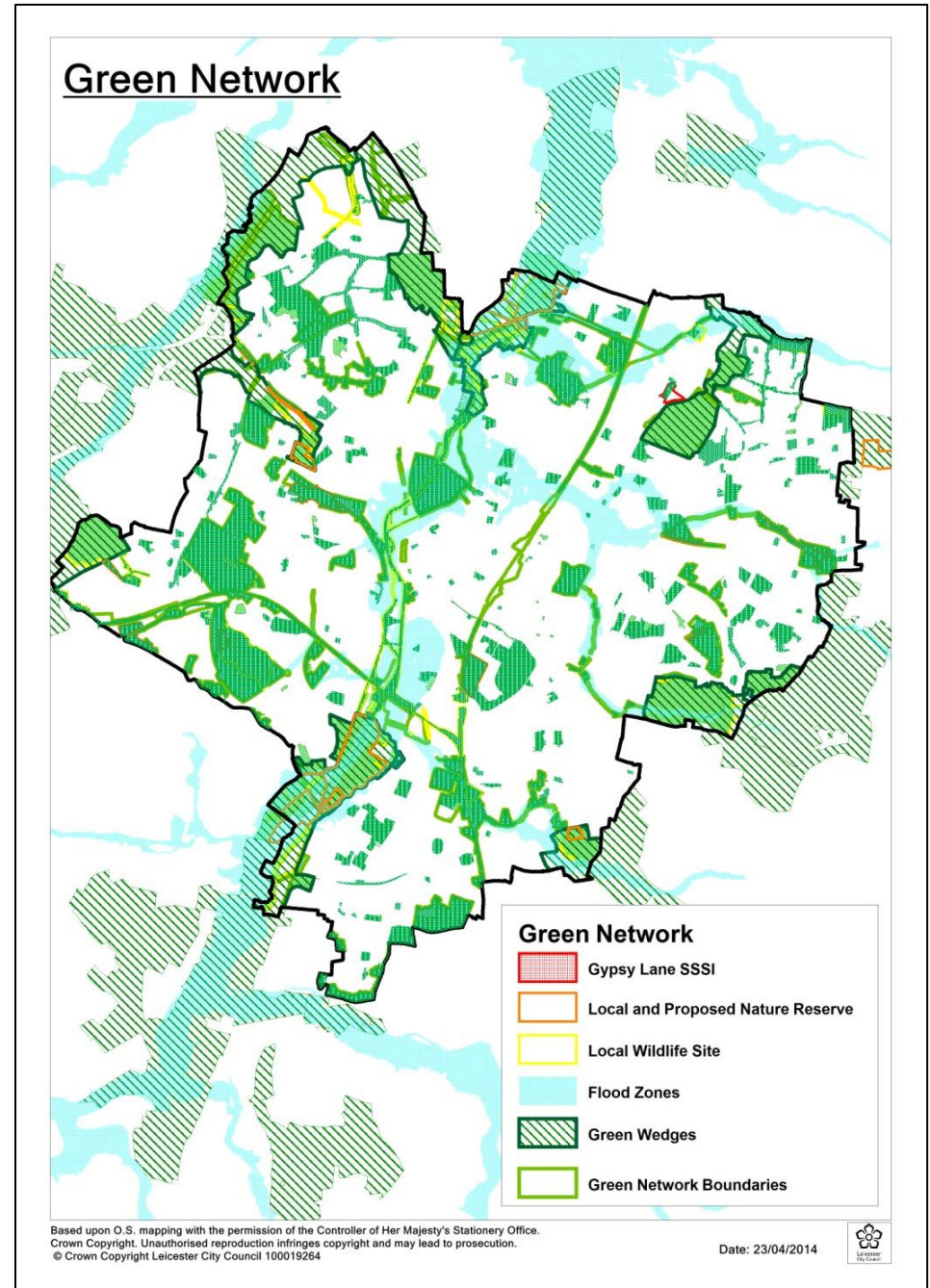
### 2.3.5 Assessing Needs and Mapping

Difficulties in providing effective datasets at the same spatial scale can inevitably lead to subjectivity in deciding which areas require the greatest need for say climate change adaptation or for health and well-being. Examples of the evidence base used to provide this data are provided in Section 3, but some data are only available at ward level whilst other data are site specific such as wildlife data, locations of trees, habitat types, parks and green spaces, cemeteries, woodlands and areas of flooding.

Methodologies used by some local authorities to identify areas of need and subsequently prioritise areas have been extensively investigated. However, the level of subjectivity and weighting of one need against another to identify arbitrary but meaningful thresholds was considered unnecessary for a City the size of Leicester.

Other methods were considered and because of the extensive data currently available for designated biodiversity sites, trees, public rights of way and cycle routes as well as pluvial and fluvial flooding; a GIS method of base mapping was used to overlay one data set on another and compare existing data with areas of maximum function and gaps in the network (see Figure 2.9). Linking in with ward data to identify areas of deprivation, vulnerable communities and high health risk has enabled a needs map identifying areas where GI is currently lacking and has the greatest need to be created.

**Figure 2.9: Green Network Map showing Green Space, Designated Sites and Flood Zones**



## 2.4 Evidence Base for Green Infrastructure Strategy/Action Plan

The evidence base for the GI Strategy comprises various sources of data that have been drawn together to provide an overview of GI provision in Leicester. The process by which this has taken place has identified a number of gaps in the baseline data and the need to address these gaps.

The Leicester GI Strategy follows on from the sub-Regional 6Cs study of the East Midlands and which divided the region into three specific areas of which Leicester and Leicestershire and the associated Housing Market Area (HMA) is relevant to the City (6Cs Growth Point (b) 2010). This provided the framework to develop a more detailed study/strategy for the City and ensure a co-ordinated and joined-up approach to the planning and delivery of GI provision. National and local guidance and policy have contributed greatly to the evidence base and are outlined in the following sections.

### 2.4.1 National Policy and Guidance

The Leicester GI Strategy takes into account the recent changes that have taken place both in legislation and planning policy. Key aspects of this are the Localism agenda, the development and implementation of the ecosystem services approach to spatial planning, the Natural England White Paper and the move towards landscape scale biodiversity planning and protection. Perhaps most significant is the changes in national planning policy and the general presumption in favour of economic growth and sustainable development. Fortunately GI continues to be part of many of these concepts the most recent and relevant are detailed below:

**European Commission Strategy for Green Infrastructure (2013)** – promotes the development, planning and use of green infrastructure as central to sustainable strategic landuse planning. Engagement with the European Bank, the strategy seeks to fund development of GI projects from 2014.

**The Natural Environment White Paper (2011)** advocates establishing “healthy functioning ecosystems” and “coherent ecological networks” using GI to manage environmental risks such as flooding and heat waves. It particularly advocates the role of urban GI as “completing the links in our national ecological network” and as one of the “most effective tools available to us in managing environmental risks such as flooding and heat waves”. The Paper resulted in central government support and the setting up of Local Nature Partnerships (LNPs), Nature Improvement Areas (NIA) and created the National Green Infrastructure Partnership.

**National Green Infrastructure Partners (Defra)** this was launched in 2011 to support the development of GI in England. Strengthening of ecological networks and improving community health, quality of life and resilience to climate change through the implementation of GI is considered. Leicester City Council is a member of the partnership and regularly receives updates and information on best practice (<http://www.defra.gov.uk/environment/natural/green-infrastructure/>)

**Local Nature Partnerships** – intended to mirror LEPs on a strategic scale to promote and enhance the natural environment with GI included within its remit. Note that the Town & Country Planning Act (2012) will require bodies, including LPAs to have regard for the views of the LNP on strategic planning matters – and this could include GI.

**The Localism Act 2011** requires Local Planning Authorities to co-operate on plan-making issues that cross boundaries. It created Neighbourhood planning and ability for neighbourhoods to identify and designate Local Green Space at this level.

**National Planning Policy Framework (2012)** reinforces the plan-led system to deliver sustainable development and the need for positive evidence-based plans. Para 114 states that LPAs should set out “a strategic approach in their Local Plans, planning positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure”

The NPPF also requires LPAs to “plan for biodiversity at a landscape scale across local authority boundaries” and identify and map components of the local ecological networks, including the hierarchy of international, national and locally designated sites of importance of biodiversity, wildlife corridors and stepping stones that connect them and areas identified by local partners for habitat restoration or creation (Para 117).

The NPPF also emphasises the importance of “Local Green Space” and states that LPAs should plan positively for the creation, protection, enhancement and management of networks of biodiversity and GI and use GI planning as a tool to manage risks and adapt to climate change.

**Countryside & Rights of Way (CROW) Act (2000) and Natural Environment & Rural Communities Act (2006)** – both the Acts refer to GI by recognising the need for strategic and open access, Local Access Forums and the duty of public bodies to have regard for biodiversity.

**UK National Ecosystem Assessment (2011)** – this was the first independent analysis to quantify the value of the UK’s natural environment in terms of the benefits it provides to society and economic growth. Based around processes that link human societies and their well-being to the environment and identifies the number and types of services that can be provided through ecosystems (<http://www.defra.gov.uk/environment/natural/uknea/> )

**European Water Framework Directive (WFD) (2000)** – The directive requires water bodies to achieve good status – which includes ecological as well as physical, chemical and biological quality through proactive schemes and projects

**Flood and Water Management Act (2010)** – this places the responsibility of approving and adopting Sustainable Drainage schemes (SuDs) on County Councils and Unitary authorities. The Act requires developers to seek approval for a proposed drainage scheme as a **separate** requirement for planning permission. SuDs are therefore a key opportunity to realise GI benefit for developer-lead schemes which can achieve not only flood and water management, but also other benefits such as enhancement for biodiversity, landscape character and health and well-being. See section on hydrology and SuDs which details Leicester City Council’s proactive role and delivery.

**The Biodiversity Strategy for England, Biodiversity 2020: A Strategy for England’s Wildlife and Ecosystem Services** (2011) builds on the Natural Environment White Paper and Lawton report and the role planning and development has in taking “a strategic approach to planning for nature”. It sets out the Government’s objectives and main actions to halt the loss of biodiversity by 2020 and to ensure the intrinsic value and benefits associated with biodiversity are fully recognised by society. The emphasis is very much about planning for biodiversity at a landscape scale. The report is available at [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/69446/pb13583-biodiversity-strategy-2020-111111.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69446/pb13583-biodiversity-strategy-2020-111111.pdf)

**The National Adaptation Programme (NAP)** – In July 2013 the Government set out the NAP in line with the commitment set out in the Climate Change Act (2008). Following evidence provided in the UK Climate Change Risk Assessment (2012) it sets out the objectives, policies and proposals for addressing the risks identified. The NAP report is available at <https://www.gov.uk/government/policies/adapting-to-climate-change> . Green Infrastructure appears as an adaptation measure in the Built Environment, Healthy & Resilient Communities, Natural Environment and Local Government themes.

## 2.4.2 Local Policy and Guidance

Over recent years Leicester has developed specific strategies that address key issues in the City, identifying what the issues and opportunities are within each area, and perhaps more importantly, an Action Plan on how to achieve those objectives set.

The documents listed below provide brief details of those strategies currently available and are of most relevance in providing an evidence base for GI. Note that the strategies generally run for a 3-5 year period and reviewed in line with changes in legislation, policy and funding. Full details of the specific strategies can be found on the City Council websites and the evidence base is discussed in more detail in a number of sections within this document. Current links to each strategy are provided below.

### *Strategic Overview*

**City Mayor’s Delivery Plan 2014-15** – an annual review and update of collated objectives and actions to be delivered across key areas which include “A place to do business”, “Getting about in Leicester”, “A low carbon city”, “The built and natural environment” and “A healthy and active city” that are directly relevant to achieving GI on the ground in Leicester. [https://www.google.co.uk/?gfe\\_rd=cr&ei=DgUmVoCyBYzj8we1357qBA&qws\\_rd=ssl#q=leicester+city+mayors+delivery+plan](https://www.google.co.uk/?gfe_rd=cr&ei=DgUmVoCyBYzj8we1357qBA&qws_rd=ssl#q=leicester+city+mayors+delivery+plan)

**Leicester Economic Action Plan 2012-2020** – outlines key actions to drive economic growth for Leicester and build on substantial investment to create more jobs, Investment Areas, new apprenticeships and support for new and existing businesses [https://www.google.co.uk/?gfe\\_rd=cr&ei=0AlmVugzMOeq8we2ypKIBg&qws\\_rd=ssl#q=leicester+economic+action+plan](https://www.google.co.uk/?gfe_rd=cr&ei=0AlmVugzMOeq8we2ypKIBg&qws_rd=ssl#q=leicester+economic+action+plan)

**Connecting Leicester 2012** – sets out priorities to create connections that provide a safe, family and pedestrian friendly city centre by reducing the dominance of roads and creating an attractive environment for local people to enjoy the historic city. <https://www.leicester.gov.uk/media/113568/connecting-leicester-vision.pdf>

### *Local Plan and Core Strategy*

Currently, the key documents relevant to Planning Policy and its implementation are the City of Leicester Local Plan 1996-2016 (adopted January 2006) which contains several saved policies and the Leicester City Council Local Development Framework (LDF) Core Strategy (adopted in November 2010).

<http://www.leicester.gov.uk/your-council-services/ep/planning/plansandguidance/localplan/direction-letter-january-2009/cllp-plan-saved-policies/>

The City Council has started initial preparation work, with the aim of adopting a New Local Plan by 2016.

**Leicester's Core Strategy 2010** sets out the spatial planning strategy for Leicester until 2026. The strategy includes a vision of the City in the future as well as objectives and policies for new development. The Core Strategy is available at

[https://www.google.co.uk/?gfe\\_rd=cr&ei=0AlmVuqzMOeq8we2ypKIBg&qws\\_rd=ssl#q=leicester+core+strategy](https://www.google.co.uk/?gfe_rd=cr&ei=0AlmVuqzMOeq8we2ypKIBg&qws_rd=ssl#q=leicester+core+strategy)

The aim of the core strategy policies is to contribute to a thorough and reliable green network by:

- Identifying and protecting the existing local and strategic GI corridors/areas from development;
- Identifying the types of GI to be provided by developers and others to an agreed local standard that will address the shortfalls of scarce or rare habitat types;
- Improving the quality and robustness of GI networks by using developer contributions (biodiversity off-setting) towards the future management and maintenance costs in the medium and long-term.



Several of the Spatial Objectives relate directly to the Priorities identified within the strategy as follows:

### ***PRIORITY 1***

#### **A Place to Do Business and Get About**

*Spatial Objective 3: To enable Leicester to become a thriving and diverse economy.*

To promote prosperity and competitiveness through the development of new housing in sustainable mixed communities and good employment opportunities offering a wide range of jobs with supporting infrastructure

*Spatial Objective 8: To enable people to move in and around the City*

To improve accessibility to jobs, homes and services by developing integrated transport, ensuring the improvement of opportunities for walking, cycling

*Spatial Objective 9: To develop a strong and vibrant City Centre*

To maintain and enhance the dominant position of the City Centre as a sub-regional and major retail, employment and leisure destination; To make it safe, attractive and accessible for all Leicester residents and visitors.

### ***PRIORITY 2***

#### **A Bio-diverse and Beautiful City**

*Spatial Objective 11: To conserve, protect and enhance the City's natural environment.*

To support the role of strategic and local green infrastructure in protecting and enhancing biodiversity and to ensure no net loss of priority habitats and species

*Spatial Objective 12: To ensure access to high quality outdoor sports, children's play provision and active recreational facilities for all residents*

To improve Leicester's strategic green network and use quality green space to provide an important recreational, social, health and educational role. To improve access opportunities to quality open space.

### **PRIORITY 3**

#### **A Healthy and Active City**

*Spatial Objective 1: To create thriving safe and inclusive communities*

To address social exclusion through the regeneration of disadvantaged areas to create strong, sustainable and safe neighbourhoods and by ensuring accessibility for all to ...recreation and open space for leisure and play.

*Spatial Objective 5: To reduce inequalities of health between city communities.*

To improve the health of all residents through improved air quality, the availability of good quality well designed housing and access to health, leisure and recreation facilities.

### **PRIORITY 4**

#### **A Naturally Sustainable City**

*Spatial Objective 6: To reduce the impact of development on climate change*

To take action to reduce the scale and impact of future climate change, in particular the risk to life and property from flooding, especially through the location and design of new development. To promote the prudent use of resources and reduce overall energy use.

#### **Green Space Evidence Base, Objectives**

**Leicester City Open Space Study 2007** – provides an audit of the City’s accessible green space which includes sports, recreational and natural green space based on Planning Policy Guidance (PPG) 17.

[https://www.google.co.uk/?gfe\\_rd=cr&ei=0AlmVuqzMOeq8we2ypKIBg&qws\\_rd=ssl#q=leicester+open+space+study](https://www.google.co.uk/?gfe_rd=cr&ei=0AlmVuqzMOeq8we2ypKIBg&qws_rd=ssl#q=leicester+open+space+study)

**Parks Green Space Strategy 2008-2015** - The Green space Strategy sets out Leicester City Council’s vision for its green space, and the goals it wants to achieve, plus the resources, methods and time needed to meet these goals.

[https://www.google.co.uk/?gfe\\_rd=cr&ei=0AlmVuqzMOeq8we2ypKIBg&qws\\_rd=ssl#q=leicester+parcs+and+green+spaces+study](https://www.google.co.uk/?gfe_rd=cr&ei=0AlmVuqzMOeq8we2ypKIBg&qws_rd=ssl#q=leicester+parcs+and+green+spaces+study)

**Leicester City Green Space SPD 2012** - supports City Council’s Core Strategy Policy CS13 “Green Network,” which sets out the broad context for Leicester’s network of green space. It outlines the process for determining the amount of green space that new

residential development would need and the mechanism for calculating the amount of developer contributions that would be required to enhance existing Green Space, if it is not possible to provide on-site green space.

<https://www.leicester.gov.uk/media/179109/green-space-spd-calculations-documents-adopted-april-2011-revised-july-2013.pdf>

**Leicester Biodiversity Action Plan 2011-2021** – The Plan summarises what is known about the most important areas of green space and how they provide a place for animals and plants to survive in Leicester. It also provides information on the many organisations and local groups that have contributed to conserving wildlife in the City.

The BAP highlights the importance of the City's natural resources both to its residents and administrators, and especially how they can contribute to our quality of life. A number of objectives and targets have been identified to conserve the valued habitats and species which characterise Leicester whilst also contributing to an attractive and sustainable natural environment.

[https://www.google.co.uk/?gfe\\_rd=cr&ei=nAQmVs6GLoTj8we4rZ3oAg&qws\\_rd=ssl#q=leicester+biodiverstiy+action+plan](https://www.google.co.uk/?gfe_rd=cr&ei=nAQmVs6GLoTj8we4rZ3oAg&qws_rd=ssl#q=leicester+biodiverstiy+action+plan)

**Leicester, Leicestershire & Rutland Biodiversity Action Plan** – sets out the action plans for habitats and species. It concentrates on assessment, evaluation and action to improve habitats at a strategic and large-scale level and covers both rural and urban areas

[https://www.google.co.uk/?gfe\\_rd=cr&ei=nAQmVs6GLoTj8we4rZ3oAg&qws\\_rd=ssl#q=leicester+biodiverstiy+action+plan](https://www.google.co.uk/?gfe_rd=cr&ei=nAQmVs6GLoTj8we4rZ3oAg&qws_rd=ssl#q=leicester+biodiverstiy+action+plan)

**River Soar & Grand Union Canal Partnership Strategic Plan 2013** – sets out a number of proposed strategies to address several aspects including economic development, wildlife and conservation, public amenity and recreation specifically along the Soar/GUC corridor

[https://www.google.co.uk/?gfe\\_rd=cr&ei=DgUmVoCyBYzj8we1357qBA&qws\\_rd=ssl#q=river+soar+and+guc+action+plan](https://www.google.co.uk/?gfe_rd=cr&ei=DgUmVoCyBYzj8we1357qBA&qws_rd=ssl#q=river+soar+and+guc+action+plan)

**Selection of Local Wildlife Sites in Leicestershire and Rutland 2011** – sets out the criteria and process for identification and designation of sites that meet the Local Wildlife Site criteria in Leicester, Leicestershire and Rutland.

[https://www.google.co.uk/?gfe\\_rd=cr&ei=DgUmVoCyBYzj8we1357qBA&qws\\_rd=ssl#q=river+soar+and+guc+action+plan](https://www.google.co.uk/?gfe_rd=cr&ei=DgUmVoCyBYzj8we1357qBA&qws_rd=ssl#q=river+soar+and+guc+action+plan)

**Stepping Stones Action Plan 2014-19** – sets out the evidence base within the Action Plan on how to deliver GI in Leicestershire in the Action Plan with a focus on the administrative urban/rural boundary between Leicester and Leicestershire

[https://www.google.co.uk/?gfe\\_rd=cr&ei=DgUmVoCyBYzj8we1357qBA&qws\\_rd=ssl#q=river+soar+and+guc+action+plan](https://www.google.co.uk/?gfe_rd=cr&ei=DgUmVoCyBYzj8we1357qBA&qws_rd=ssl#q=river+soar+and+guc+action+plan)

### *Health and Well-being- Physical and mental well-being, Low Carbon, Walking and Cycling*

**Leicester's Food Plan 2014** – sets out the main actions and stakeholder responsibility for encouraging people to grow their own produce and/or to eat healthy food. Link with multiple benefits for use of green sites in Leicester – see Milestones pg. 15

<http://sustainablefoodcities.org/Portals/4/Documents/Leicester's%20Food%20Plan%20-%20final-2.pdf>

**Closing the Gap – Leicester's Joint Health and Well-Being Strategy 2013-16** – sets out the main objectives for creating a healthier and more active population, to increase life expectancy and create a better quality of life for the residents of Leicester

[https://www.leicester.gov.uk/media/177755/leicester\\_s\\_joint\\_health\\_and\\_wellbeing\\_strategy\\_2013-2016.pdf](https://www.leicester.gov.uk/media/177755/leicester_s_joint_health_and_wellbeing_strategy_2013-2016.pdf)

**Leicester Joint Strategic Needs Assessment (2012)** – integrates a range of data and information and identifies needs of broad strategic importance to the health and well-being of the City. The assessment underpins the Joint Health and Well-Being Strategy

<http://www.pfdiscovery.com/upload/Our%20Services/Leicestershire%20JSNA.PDF>

**Leicester Local Transport Plan 2011-2026 and Local Transport Asset Management Plan 2011-2015** – sets out Leicester's Plan for sustainable transport and road infrastructure. It does have sections on Leicester's walking and cycling objectives, but separate strategies refer to these and are in the process of being updated.

[http://www.leics.gov.uk/consultation\\_document\\_june\\_2010- final\\_pdf-2.pdf](http://www.leics.gov.uk/consultation_document_june_2010- final_pdf-2.pdf)

**Rights of Way Improvement Plan 2011-2021** – sets out identifying the existing and proposed links through the adopted public rights of way around Leicester, the standards and maintenance requirements

<http://www.leicester.gov.uk/media/178151/rights-of-way-improvement-plan-2011-2021.pdf>

**Cycling Strategy – currently being updated 2015-2024** – provides a series of actions and targets to encourage greater use of bicycles as a sustainable method of daily commuting to places of work and school as well as for use for recreation and leisure

<https://www.leicester.gov.uk/media/179027/leicester-cycle-city-action-plan.pdf>

### *Climate Change and Sustainability*

**Leicester City Climate Change Adaptation Plan 2014** – sets out the plans to combat predicted impacts of climate change through appropriate planning and best use of land across Leicester to maximise mitigation. Separate advice on SuDs is in progress

[https://www.google.co.uk/?gfe\\_rd=cr&ei=DgUmVoCyBYzj8we1357qBA&gws\\_rd=ssl#q=leicester+climate+change+adaptation+plan](https://www.google.co.uk/?gfe_rd=cr&ei=DgUmVoCyBYzj8we1357qBA&gws_rd=ssl#q=leicester+climate+change+adaptation+plan)

**Leicester City Climate Change Programme of Action and Technical Appendix (2014)** – refers to achievements and actions for forthcoming year to combat predicted impacts on climate change - see Milestones 15-19

[https://www.google.co.uk/?gfe\\_rd=cr&ei=DgUmVoCyBYzj8we1357qBA&gws\\_rd=ssl#q=leicester+city+climate+change+programme+of+action](https://www.google.co.uk/?gfe_rd=cr&ei=DgUmVoCyBYzj8we1357qBA&gws_rd=ssl#q=leicester+city+climate+change+programme+of+action)

**Surface Water Management Plan (SWMP) 2012** - gives detailed information about the risk of surface water flooding. It predicts the areas likely to be at risk from a range of different storms, how dangerous these areas may be (flood hazard) and investigates how the risk can be reduced.

<http://www.leicester.gov.uk/media/178251/swmp-main-report.pdf>

**Leicester City Council Environmental Policy (2014)** – sets out the principles for achieving a low-carbon City and how the policy should be implemented

<https://www.leicester.gov.uk/media/179261/environmental-policy-nov-2014.pdf>

**Leicester City Council Environmental Management Auditing System (EMAS) (2012)** – set out the objectives and targets for each area on which the Council is specifically monitored – includes biodiversity, parks and green space, health and well-being and regeneration/development

<http://www.leicester.gov.uk/your-council-services/ep/the-environment/environmental-policies-action/>

### 3.0 Leicester’s Green Infrastructure

#### 3.1 Preparation of GI by Design

The strategic nature of planning and delivery of GI is central to its success and the spatial planning of GI for Leicester cannot be taken in isolation due to the complexity and geographical range of many of the GI assets. The principles of establishing a Strategic GI Network were laid down in the Regional guidance and 6Cs Growth Points study (6Cs Growth Points 2010). The documentation of evidence produced at a regional and sub-regional level provides an evidence base and this has been developed more specifically at the City-scale, and then down to Local GI and finally Site GI within this document.

The diagram shows the hierarchy and proposed level of detail from the City-scale GI down to Site Level adapted from the 6Cs Vol 1 GI Strategy 2008.

The basis of the GI Strategy in creating a planned multi-functional network of green spaces, natural features and inter-connecting green links is via analysis of the **existing** GI assets, followed by an analysis of the **opportunities** and **needs** for the conservation, enhancement and expansion of GI provision.

Through this process it is possible to identify and prioritise land that needs to be safe-guarded, managed or secured in order to create a multi-functional network of green spaces and assets for which investment can achieve the greatest range of benefits.

Flexibility in this approach is paramount – without it, the evolving strategy would soon be out-of-date and be unable to take account of changes in land ownership, funding streams, community aspirations, development opportunities and policy considerations – all of which may at some state change priorities for investment over time.

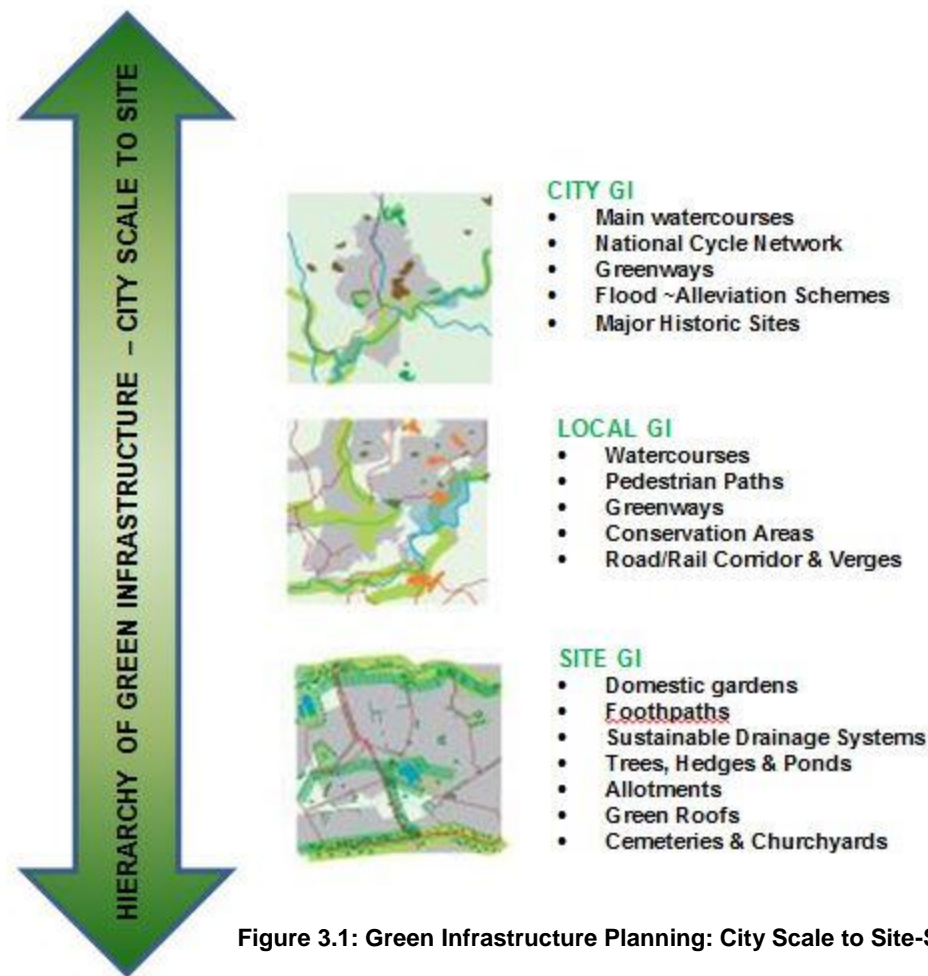


Figure 3.1: Green Infrastructure Planning: City Scale to Site-Specific



**City-Scale GI Corridors** – these broadly defined corridors link to the Sub-Regional GI Corridors and Urban Fringe Enhancement Zones. They provide linkages for people and wildlife between the urban areas and wider rural landscape.

These more localised networks have a range of land uses including natural and built heritage resources, but provide access, movement and recreational linkages to maximise public benefit whilst creating opportunities for biodiversity enhancement. Opportunities to increase the number of functions of green space in these areas will require a reasonable level of investment and so increase benefits to both new and existing communities. Examples include the major regeneration areas which run alongside the main river and tributaries where opportunities to integrate GI into regeneration projects could help to reduce flood risk, improve water quality and bring a better quality of life to local residents.

**Figure 3.3: Core Strategy Areas and Green Infrastructure**

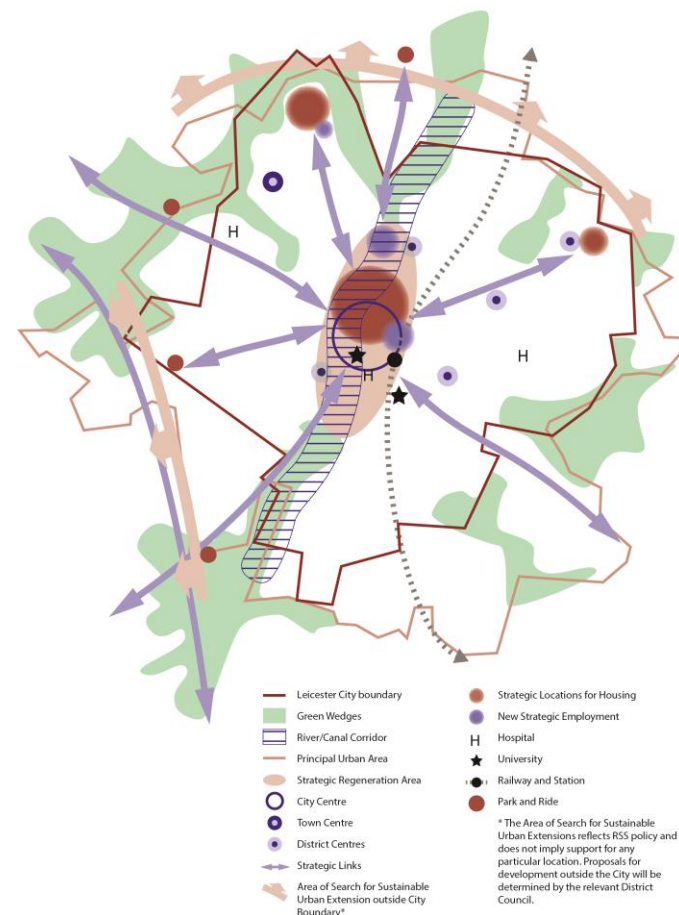
### 3.2 Links to Core Strategy Areas

The City Councils adopted planning policies have sought to ensure developments and regeneration areas address green spaces and seek enhancements where possible. This Green Infrastructure strategy will form part of the evidence base which will support the production of the New Local Plan.

Figure 3.3 shows the Strategic Locations for Housing, New Strategic Employment areas, the Strategic Regeneration Areas, the strategic links (road and rail network) and the green wedge areas across the City (Leicester Core Strategy 2010).

**Policy CS 1 – Location of Development** meets the following spatial objectives of the Core Strategy and is linked to Priorities 1-5 of the Green Infrastructure Strategy. Currently these are adopted but will be reviewed in the Local Plan

- **Spatial Objective 3:** To enable Leicester to become a thriving and diverse economy (Priority 1 GI Strategy)
- **Spatial Objective 5:** To reduce inequalities of health between city communities (Priority 3 GI Strategy)
- **Spatial Objective 6:** To reduce the impact of development on climate change (Priority 4 GI Strategy)
- **Spatial Objective 8:** To enable people to move around the City (Priority 1 GI Strategy)
- **Spatial Objective 11:** To conserve and protect the City’s natural environment (Priority 2 GI Strategy)





The key residential development areas are the Strategic Regeneration Areas (SRA) of the City Centre, Waterside and Abbey Meadows plus the proposed Sustainable Urban Extension (SUE) at Ashton Green (see Section 5.2.3) and residential housing at Hamilton.

New business opportunities are also focused within the SRA which includes Abbey Meadows and the Innovation Park along with Ashton Green, and the SRA within the City centre.

The River and Canal corridor is clearly one of the main strategic corridors through the City (see Figure 3.7) and provides many opportunities for GI along the existing corridor and the creation of new green space within proposed developments. CS 1 Policy directly refers to Strategic Green Infrastructure and “Maintenance of the River Soar and Grans Union Canal corridor as a resource for both wildlife and recreation as well as a focus for regeneration” (Leicester City Core Strategy 2010).

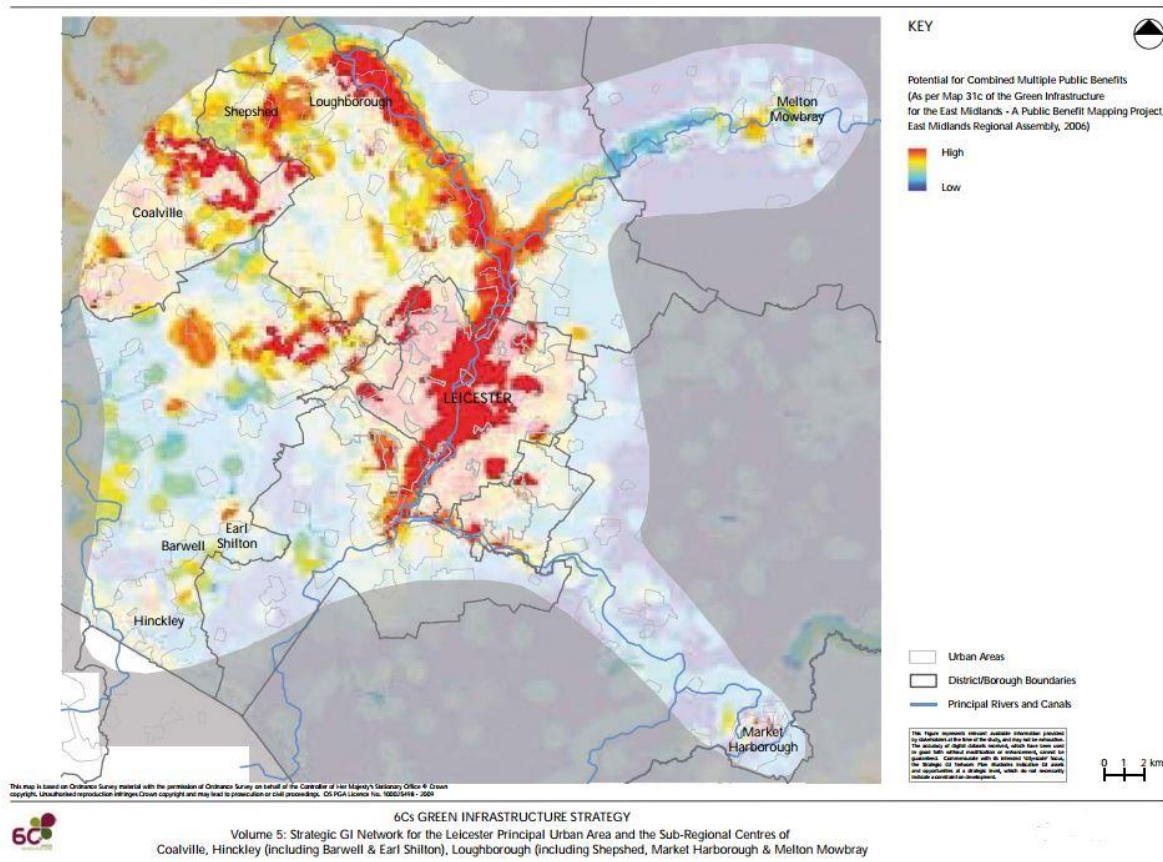
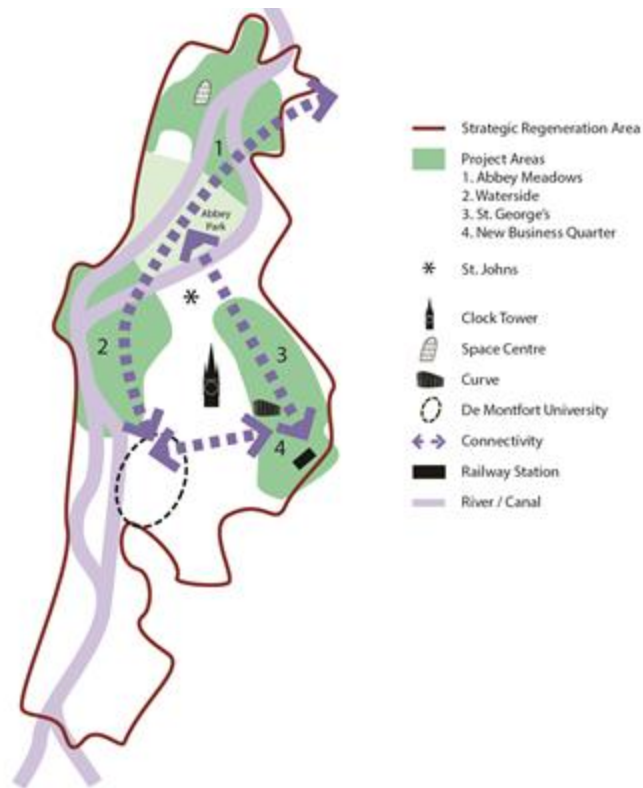


Figure 3.4 shows a regional map of Leicester and Leicestershire showing the potential areas for multiple public benefits (6Cs Growth Points 2010) and clearly shows the opportunities identified along the river/canal corridor and adjacent large areas of green space such as Castle Hill Country Park, Eyres Monsell and Humberstone areas. Specific opportunities are described in Section 6.

Interestingly, this differs from the multi-functional map of Leicester (Figure 2.5) which shows the City centre being only capable of supporting a low number of functions. This is because of the existing infrastructure present. Opportunities do exist on a larger scale within the Regeneration Areas and these are detailed further in Table 3.1.

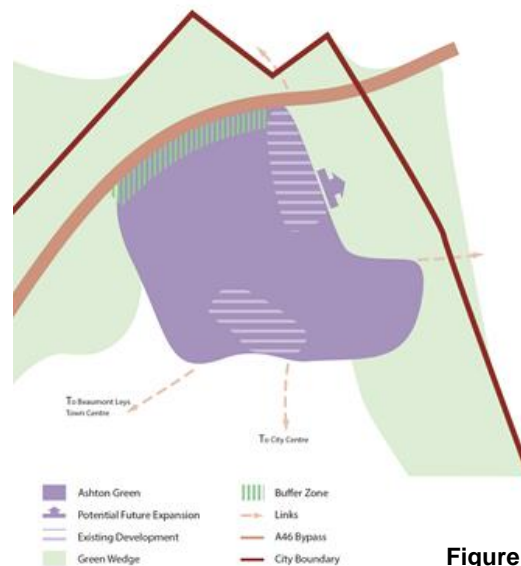
**Figure 3.4: Regional Map of Leicester and Leicestershire Showing Multiple Functional Areas (6Cs 2010)**

**Figure 3.5: Strategic Regeneration Areas and Potential Infrastructure**



Policy CS 4 relates specifically to the Strategic Regeneration Areas of the City, namely Abbey Meadows, Waterside, St Georges (see Figure 3.5). Specific design guidance has been developed to promote economic growth and employment, high-quality living and improved accessibility with opportunities for walking and cycling; protection and enhancement of designated and other heritage assets and the protection, enhancement or creation of areas specifically for wildlife together with a maintenance programme for the canal and riverside to safeguard the natural environment and increase its ecological value.

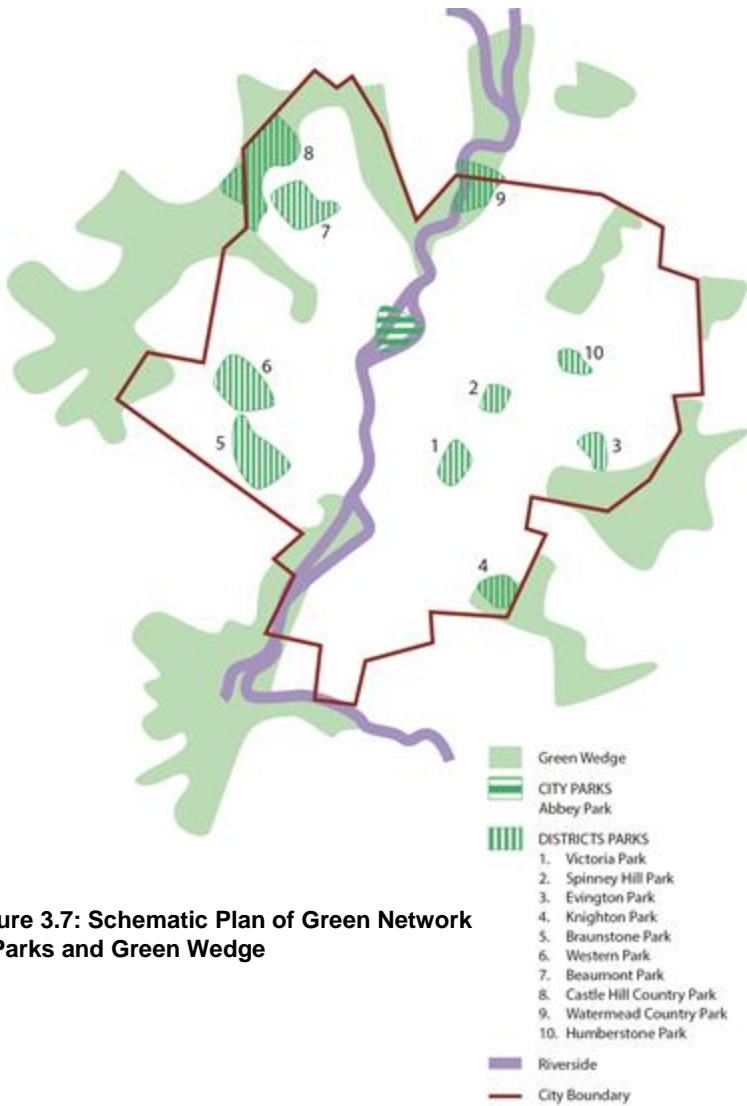
Table 3.1 shows generic opportunities of GI in each area



Policy CS 5 relates to the development of Ashton Green, a greenfield site to the Northwest of the City to provide approximately 3000 homes, employment, schools and other amenities (see Figure 3.6). The master-planning process and implementation of Green Infrastructure is seen as a key component of providing a sustainable community. Opportunities to incorporate GI into the design are discussed in Sections 5 and 6.

**Figure 3.6: Ashton Green Schematic Plan and Adjacent Green Wedge**

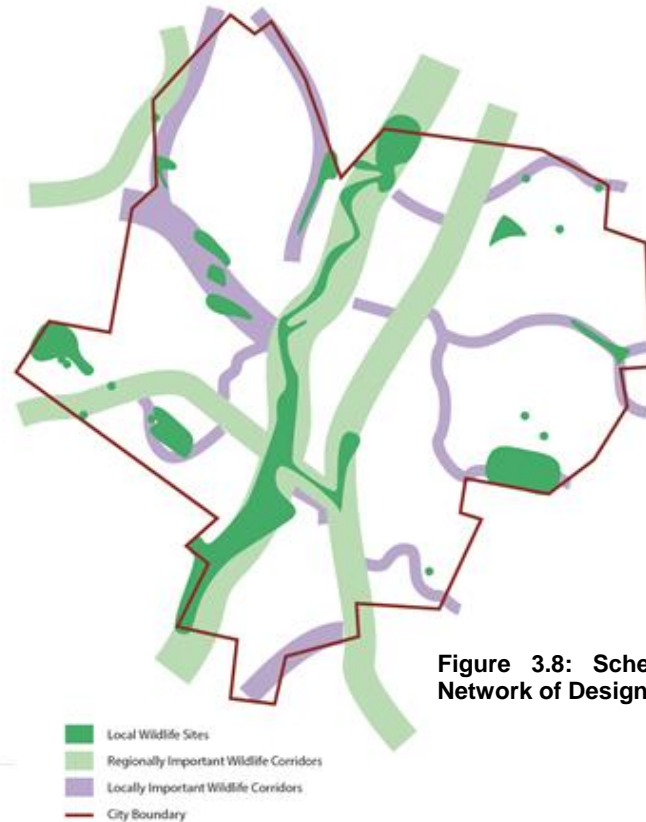
Private domestic gardens make up 25.5 % of land area in Leicester which is a significant proportion of the whole environment. Their functions and benefits are many and varied with some back gardens bordering onto watercourses, woodlands, parks and adjacent established gardens. The gardens therefore provide opportunities for water storage through infiltration, water flow control and improved water quality; habitats for wildlife, dispersal routes and buffers to larger areas of green space; cooling and evaporation and carbon storage to ameliorate against climate change and urban heat island effect; landscape character and visual amenity as well as contributions towards health and well-being and increased exercise through gardening and other recreational activities. Section 5 provides further generic information on opportunities for GI within gardens.



**Figure 3.7: Schematic Plan of Green Network of Parks and Green Wedge**

Core Strategy policies CS13 (Green Network), CS17 (Biodiversity) and saved local plan policies green wedges (GE06) and green space (GE09) relate to allocated areas of green spaces that provide a number of different uses. Some of the areas are also designated nationally as Sites of Special Scientific Interest (SSSI) – Gipsy Lane Claypit SSSI; or locally as Local Nature Reserves (LNRs), Local Wildlife Sites (LWSs) or Biodiversity Enhancement Sites (BESs). The Glossary provides details

Collectively the policies control the type of landuse on a particular area of green space and the presumption is for their retention and use as open space for wildlife, sport, recreation and/or general amenity. As such some of the sites are strategically placed and can provide greater opportunity for GI within the City. Table 3.1 shows the types of landuse and opportunities that could be provided.



**Figure 3.8: Schematic Plan of Biodiversity Network of Designated Sites**

A summary of the main findings are:

- The River Soar and Grand Union Canal provide major assets for the City in terms of strategic routes for transport, habitat and dispersal routes for wildlife, heritage and the historic built environment, water storage and conveyance, water quality, climate adaptation and cooling the City; strategic position for economic regeneration, business and housing growth; visual amenity and recreation with sense of well-being. The importance of creating well-designed waterfront areas at a range of scales in and around the Soar and Grand Union Canal – both within the City and outside of the City centre in combination with other GI improvements could make a significant contribution to quality of place as has occurred in other cities such as Bristol and Manchester
- The major parks such as Abbey Park, Aylestone Meadows and Evington Park provide major assets for the City and are strategically located next to main rivers and several are nearby to planned or proposed development
- The greatest deficiencies and action required to improve green infrastructure functionality are located in the City Centre and its environs. A co-ordinated approach to protecting and enhancing GI could make a significant contribution to the City's aspirations in terms of combating climate change, improving peoples health and encouraging investment

### 3.3 Overview of GI Typology, Opportunities and Benefits in Core Strategy Areas

Table 3.1 provides an overview of the key Core Strategy Policy areas and the opportunities and benefits available for each land type.

**Table 3.1: Core Strategy Policy Areas and Potential Green Infrastructure Opportunities and Benefits**

Core Strategy/Local Plan Policy	Major Typology	Sub-Typology	Opportunities	Benefits
CS1	City Centre and Environs		<ul style="list-style-type: none"> <li>• Creation of new areas of green space</li> <li>• Enhancement and maintenance of existing areas of green space</li> <li>• Green roofs on new or retrofit on existing buildings; Green walls</li> <li>• Planting of street trees</li> <li>• Temporary greening brownfield sites</li> <li>• Improved access in and around City</li> <li>• Reduce light pollution &amp; remove artificial lighting from sensitive areas</li> <li>• Cross boundary projects</li> </ul>	<ul style="list-style-type: none"> <li>• Improved POS and amenity value</li> <li>• Greater use by public for recreation and health &amp; well-being</li> <li>• Increase carbon storage, wind shelter and reduce impacts of climate change</li> <li>• Greater visual amenity</li> <li>• Encourage investment</li> <li>• Conserve and safeguard pollinating insects</li> <li>• Strategic continuity of schemes</li> </ul>
CS4	Strategic Regeneration Areas	<ul style="list-style-type: none"> <li>• Waterside</li> <li>• Abbey Meadows</li> <li>• St Georges</li> </ul>	<ul style="list-style-type: none"> <li>• Creation of new areas of green space</li> <li>• Enhancement and maintenance of existing areas of green space</li> <li>• Green roofs on new or retrofit on existing buildings; Green walls</li> <li>• Planting of street trees</li> <li>• Temporary greening of brownfield sites</li> <li>• Improved access in and around City</li> <li>• Implementation of SuDs – using natural systems for multiple benefits</li> <li>• Reduce light pollution &amp; remove artificial lighting from sensitive areas</li> </ul>	<ul style="list-style-type: none"> <li>• Improved POS and amenity value</li> <li>• Greater use by public for recreation and health &amp; well-being</li> <li>• Increase carbon storage, wind shelter and reduce impacts of climate change</li> <li>• Greater visual amenity</li> <li>• Flood attenuation &amp; reduced risks</li> <li>• Encourage investment</li> <li>• Conserve and safeguard pollinating insects;</li> <li>• Carbon storage</li> </ul>
CS5	Housing Market Area	Ashton Green	<ul style="list-style-type: none"> <li>• Master plan and implement principles of GI at early stage</li> <li>• Enhancement and maintenance of existing areas of green space – safeguard habitats &amp; wildlife corridors</li> <li>• Implement SuDs using natural systems for multiple benefits</li> <li>• Planting of street trees</li> <li>• Sustainable access routes to schools, work and green space</li> </ul>	<ul style="list-style-type: none"> <li>• Creation of POS and amenity value</li> <li>• Greater use by public for recreation and health &amp; well-being</li> <li>• Increase carbon storage, wind shelter and reduce impacts of climate change</li> <li>• Greater visual amenity</li> <li>• Flood attenuation &amp; reduced risks</li> <li>• Encourage investment</li> <li>• Conserve pollinating insects</li> </ul>

Core Strategy/Local Plan Policy	Major Typology	Sub-Typology	Opportunities	Benefits
CS3 CS13 CS17	Public/Formal Open Space	<ul style="list-style-type: none"> <li>Parks</li> <li>Cemeteries</li> <li>Golf Courses</li> <li>Sports Grounds</li> <li>Housing – POS</li> <li>School Grounds</li> <li>Hospital Grounds</li> <li>Church Grounds</li> </ul>	<ul style="list-style-type: none"> <li>Creation of meadows and species-rich grasslands using native grasses and wildflower mixes</li> <li>Hedge planting</li> <li>Retention/allocation of nature areas and management for nature conservation to increase ecological value</li> <li>Retain trees of high value</li> <li>SuDs and flood alleviation</li> <li>Food growing, biomass production, carbon storage</li> </ul>	<ul style="list-style-type: none"> <li>Improved POS and amenity value</li> <li>Enhanced biodiversity with more habitats and greater connectivity</li> <li>Creation of stepping stone points for wildlife dispersal</li> <li>Greater use by public for recreation – with health &amp; well-being</li> <li>Job opportunities, encourage investment, increase property values,</li> <li>Reduce anti-social behaviour and encourage use</li> </ul>
CS13 CS17		<ul style="list-style-type: none"> <li>Street Trees</li> </ul>	<ul style="list-style-type: none"> <li>Retain all high value trees and replace any lost on 2:1 basis with appropriate size, species and structure</li> <li>Incorporate street planting in all new development</li> <li>Incorporate street planting into new cycle and pedestrian ways</li> </ul>	<ul style="list-style-type: none"> <li>Increase carbon storage, wind shelter and reduce impacts of climate change</li> <li>Greater visual amenity</li> <li>Habitat and corridors for wildlife</li> </ul>
CS8 CS13 CS17	Gardens and Buildings	<ul style="list-style-type: none"> <li>Public and Private Gardens</li> </ul>	<ul style="list-style-type: none"> <li>Planting of native trees, shrubs and herbs to attract wildlife</li> <li>Planting of native and non-native plants to encourage pollinating insects – bees etc</li> <li>Pond/Suds construction</li> <li>Wildlife-friendly gardening</li> <li>Bird feeding/Bee-Friendly gardening</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced biodiversity with more habitats and greater connectivity</li> <li>Increase carbon storage, wind shelter and reduce impacts of climate change</li> <li>Greater visual amenity</li> <li>Improved well-being</li> </ul>
CS18		<ul style="list-style-type: none"> <li>Public and Private Buildings</li> </ul>	<ul style="list-style-type: none"> <li>Installation of nesting/ roosting boxes for birds &amp; bats</li> <li>Creation of green/brown roofs</li> <li>Creation of green walls</li> </ul>	<ul style="list-style-type: none"> <li>Improved water storage and quality</li> <li>Increase cooling, less evaporation</li> <li>Habitat creation</li> </ul>
GE06 GE09 CS13 CS17	Agricultural Land	<ul style="list-style-type: none"> <li>Agricultural grassland</li> </ul>	<ul style="list-style-type: none"> <li>Create new hedgerows or replant/maintain hedgerows and hedgerow trees</li> <li>Encourage/release for other Open Space uses</li> <li>Create/restore field ponds</li> <li>Re-instate meadow management and/or grazing</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced biodiversity with more habitats and greater connectivity</li> <li>Greater use by public for recreation and health &amp; well-being</li> <li>Greater visual amenity</li> </ul>
GE06 GE09 CS13 CS17		<ul style="list-style-type: none"> <li>Arable land</li> </ul>	<ul style="list-style-type: none"> <li>Create new hedgerows or replant/maintain hedgerows and hedgerow trees</li> <li>Encourage organic farming with no chemicals</li> <li>Set aside land for nature etc.</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced biodiversity with more habitats and greater connectivity</li> <li>Local food production</li> <li>Improved water quality &amp; wildlife</li> </ul>
CS13 GE19		<ul style="list-style-type: none"> <li>Allotments</li> </ul>	<ul style="list-style-type: none"> <li>Create new/maintain hedgerows or replant</li> <li>Retain orchard/fruit trees and supplement</li> <li>Encourage wildlife on vacant plots</li> <li>Encourage organic practices, food growing</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced biodiversity with more habitats and greater connectivity</li> <li>Local food production</li> </ul>

Core Strategy/Local Plan Policy	Major Typology	Sub-Typology	Opportunities	Benefits
GE03 CS13 CS17	Land Left to Nature	Disused and Unmanaged Land	<ul style="list-style-type: none"> <li>Create public access and use by local residents/voluntary groups</li> <li>Create additional habitats e.g. ponds and woodlands</li> <li>Low cost enhancement and management using low maintenance ecological techniques</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced biodiversity with more habitats and greater connectivity</li> <li>Greater use by public for recreation and health &amp; well-being</li> </ul>
CS13 CS17		Woodland	<ul style="list-style-type: none"> <li>Improve structure - under-plant with trees and shrubs</li> <li>Develop urban forestry and plant new woodlands</li> <li>Control non-native invasive species</li> <li>Erect bird, bat, invertebrate boxes</li> <li>Retain standing /lying dead wood to rot down</li> <li>Monitor and control diseased trees</li> <li>Food-growing, biomass production, carbon storage</li> </ul>	<ul style="list-style-type: none"> <li>Increase carbon storage, wind shelter and reduce impacts of climate change</li> <li>Enhanced biodiversity with more habitats and greater connectivity</li> <li>Improved air quality and absorption of particles</li> </ul>
CS02 CS13 CS17		Ponds & Wetlands	<ul style="list-style-type: none"> <li>Construction of SuDs, wetland and open water areas</li> <li>Replacement of hard edges with softer engineering and vegetation</li> <li>Regular maintenance and reclamation by de-silting and rubbish clearance to agreed standard</li> <li>Planting of native species of aquatic/wetland plants</li> <li>Creation of wetland grassland</li> <li>Grazing by livestock</li> </ul>	<ul style="list-style-type: none"> <li>Improved water storage, infiltration and water quality</li> <li>Enhanced biodiversity with more habitats and greater connectivity</li> <li>Improved visual amenity</li> </ul>
CS13 CS17	The Natural Network	Canals and Rivers	<ul style="list-style-type: none"> <li>Retention of soft banks vegetation &amp; habitat diversity</li> <li>Improved river habitat and morphology</li> <li>Protection of floodplain</li> <li>Control of pollution</li> </ul>	<ul style="list-style-type: none"> <li>Improved water storage, infiltration and water quality</li> <li>Enhanced biodiversity with more habitats and greater connectivity</li> </ul>
CS13 CS17		Streams	<ul style="list-style-type: none"> <li>Supplementary bankside planting</li> <li>Creation of adjoining ponds and marshland</li> <li>Sensitive &amp; appropriate management, land drainage</li> <li>Control of pollution</li> <li>Creation of artificial nest banks and ledges</li> <li>Soft embankments, culvert removal and buffer strips</li> </ul>	<ul style="list-style-type: none"> <li>Improved water storage, infiltration and water quality</li> <li>Enhanced biodiversity with more habitats and greater connectivity</li> <li>Improved visual amenity and well-being</li> </ul>
CS13 CS17		Hedges & ditches	<ul style="list-style-type: none"> <li>Supplementary hedgerow planting and creation of new ditch and bank systems</li> <li>Sensitive appropriate management hedges &amp; ditches</li> <li>Reinstate hedgerows</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced biodiversity with more habitats and greater connectivity</li> <li>Improved carbon storage</li> </ul>
CS13 CS17		Road verges	<ul style="list-style-type: none"> <li>Sensitive maintenance regimes</li> <li>Additional tree and shrub planting</li> <li>Plant/sow wildflowers and grasses</li> </ul>	
CS13 CS17		Railway lines (used and disused)	<ul style="list-style-type: none"> <li>Sensitive management to retain wildlife diversity</li> <li>Encourage use of disused lines as cycle/footpath</li> </ul>	

A photograph of a green infrastructure site. In the foreground, there are numerous purple flowers with green foliage. In the middle ground, a wooden fence runs across the frame. In the background, there are several buildings and trees under a clear sky.

# Part 2 Leicester Green Infrastructure Action Plan



## 4.0 Leicester – Actions to Establish Multifunctional GI

### 4.1 Overview of Actions

A summary of the issues and opportunities identified from local strategies is provided in Table 4.1:

**Table 4.1: Priorities and Issues for Green Infrastructure Opportunities**

PRIORITY	ISSUES
<b>A Place To Do Business and Get About</b>	Major regeneration programmes and housing growth need to be encouraged by improving the quality of place to be able to attract investment and encourage people to live and work in the City and also to visit the City as a retail/tourist destination
	Levels of productivity need to be increased and distributed more evenly across the City to reduce pressure on transport routes
	Levels of carbon need to be reduced in the City from improved business technology and transport
<b>A Beautiful and Bio-diverse City</b>	Core biodiversity areas need to be protected, conserved and properly managed
	Identifying how the GI delivery programme can contribute to the City BAP and other Biodiversity targets including Biodiversity 2020.
	Linking green spaces to establish wildlife corridors and buffer zones to create a net increase in biodiversity within the cityscape
<b>A Healthy and Active City</b>	Tackling health deprivation and inequality across the City and in particular helping to tackle issues of coronary heart disease, obesity and diabetes
	Increase levels of physical activity by making green space more accessible
	Reduce levels of poor mental health across the City
	Reduce health-related respiratory problems by improving air quality, reducing air pollution
<b>A Carbon Resilient City</b>	Management of the urban heat island effect are required in vulnerable communities
	Managing hot spots for flooding and reducing flood risk to vulnerable properties
	Incorporating SuDs into new development – including design for green roofs & walls
	Retrofit GI to adapt to high temperatures in the City – to reduce temperatures and evaporation
	Use land for local food production, biomass and facilitate increased carbon storage

The following sections set out actions to address the issues identified whilst Priority 5 (linked to Planning) sets out the design and management to underpin the other spatial priorities. A brief review of evidence is provided along with relevant maps. Specific local strategy documents provide further information.

## 4.2 PRIORITY 1

### A Place to Do Business and Get About (Economic Growth, Regeneration, Housing, Travel Routes)

#### 4.2.1 Introduction

Much work has been achieved with the publication of several key documents that set out the goals and aspirations for Leicester to succeed in being one of the best places to live, work, invest and play (see Section 2.4.2 for relevant strategies).

The documents focus on a number of objectives that concentrate on the need to attract new business investment related to high-tech and knowledge and so encourage people to come to live and work in Leicester. In November 2012 Leicester's Economic Action Plan was launched and details the programme of packages and investment to support growth in Leicester.

Building on the leading research relating to Space technology and travel and working with our partners at the National Space Centre, Code, Innovation Centre, and established businesses across Leicester, the aim is to retain our home-grown talented graduates from Leicester's leading universities.

Leicester's title as "Environment City" continues today by focussing on businesses that promote a low carbon economy. Improving skills levels and jobs within associated employment is central to Leicester's determination to remain ahead of the game. The City has aspirations to be a hub for the Food and Drinks industry from manufacture to supplier to retail and consumer, concentrating on good quality, low-impact and environmentally aware small industries that can compete and react quickly to changes in market demands. Many enterprise opportunities are also linked directly to GI, including actions to encourage new businesses e.g. tourism/visitor enterprises linked to wildlife and food production; the green economy and organic produce; market gardening, woodland products and/or biomass production.

Many opportunities exist for training linked to GI, particularly associated with the management of green space, conservation management, horticulture, and food production which can all be linked to the green economy and increase to Leicester's economic growth.

The City was ranked overall 3<sup>rd</sup> in the list of Sustainable Cities in England which measured Environmental Impact, Quality of Life and Future-proofing – how well the City is preparing for a sustainable future.

[http://www.forumforthefuture.org/sites/default/files/images/Forum/Projects/Sustainable\\_Cities\\_Index/Sustainable\\_Cities\\_Index\\_2010\\_FINAL\\_15-10-10.pdf](http://www.forumforthefuture.org/sites/default/files/images/Forum/Projects/Sustainable_Cities_Index/Sustainable_Cities_Index_2010_FINAL_15-10-10.pdf)

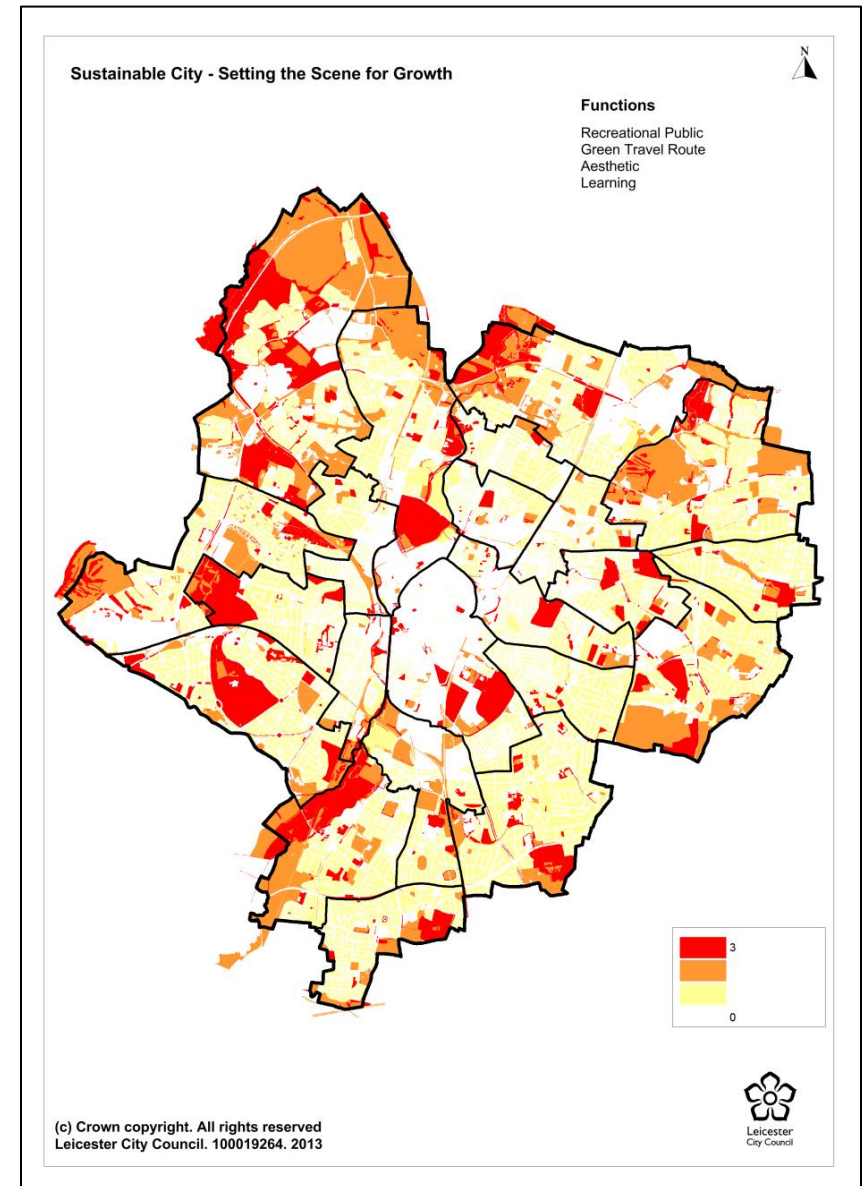
The City Centre has seen a remarkable face-lift in recent years. Building on the successes of the major shopping complex at High Cross; the Connecting Leicester Project aims to provide attractive areas that will conserve and enhance our built heritage, provide open and attractive walkways and cycle routes, new and exciting open spaces and encourage business and investment.

Leicester's history and heritage are central to its identity. Finding Richard III and the success in making Leicester the last Plantagenet's final resting place has put the City firmly in the spotlight. This has encouraged more people to visit Leicester from across the world and boost leisure and tourism resulting in increased trade to our hotel and catering industries. The building of a Visitor Centre, improvements to the Cathedral Gardens and pedestrianisation of the cobbled roads and back-streets with high-quality designed paving, seating and trees make this an attractive area for visitors and residents to explore. The newly created cycle and walking routes around the Cultural and Business Quarters make for a quieter, sustainable and more enjoyable experience, providing an opportunity for key green infrastructure interventions.

Figure 4.1 considers recreation, green travel route, aesthetic, heritage, cultural asset wind shelter and learning functions to identify key areas that currently provide opportunities for growth linked with green infrastructure.

The map shows the distribution of GI functions that can support housing growth and regeneration across the City. The areas with the highest function are located towards the outer City with the areas of green space nearest to the City centre most prominent. Those areas of lowest functionality are located mainly around the central area of Leicester where the number of green space sites is severely limited along with other industrial areas on the outskirts of the City centre.

The key areas for Housing Growth in the inner City are Abbey Meadows/Wolsey Island and Waterside although currently shown as areas of medium-low potential to provide multiple functions. At present, most of the area is derelict land, having supported a thriving hosiery and manufacturing industry in the past.



**Figure 4.1: Priority GI Areas Linked to Potential Growth and Investment Opportunities**

The area offers great opportunities for GI due to the proximity of the canal and river; cycling and walking routes to work, school and leisure. Sports/recreation and informal play space, and nature green space are all well within the accepted standard levels of the Green Space Study (2007). Tables 3.1 and 4.1 have highlighted some of the generic GI opportunities that could arise for economic growth and regeneration. Further details are provided on key areas within Section 6.

**Table 4.2: Priority 1 - Key Actions for Delivery of Business, Access and Green Infrastructure**

Issue	Evidence	Recommendations/Actions
<b>Improving quality of place for projected housing growth and major regeneration schemes</b>	GI promotes quality of place and supports high quality design to maximise value of GI. People prefer living in greener places, attracts higher house prices. Well-planned GI can boost commercial trading by up to 40%.	<p>Green infrastructure actions are targeted at the main areas for housing growth and regeneration across the city, where possible safeguarding the existing assets and seeking to provide green infrastructure in the areas of need.</p> <ul style="list-style-type: none"> <li>• Ensure mitigation of loss of GI assets which leads to a net gain in GI</li> <li>• Promote multiple use/function of green space by managing existing GI differently or creating new GI</li> <li>• Use temporary vacant or derelict land productively – encourage “meanwhile” use of land – see “Brownfield Sites” Section 5.4.5.</li> <li>• Ensure high quality design and management</li> <li>• Re-structuring and new development should contribute towards adding GI assets to the city</li> </ul> <p>Opportunities are taken to improve the green infrastructure around major gateways and routes into the city such as the A50 Groby Road and the Melton Road.</p>
<b>Improving walking and cycling routes</b>	<p>GI can help to provide walkable communities and help to reduce car use by providing safe and attractive routes between residential and work/retail areas.</p> <p>Link cycle routes and off road routes into the public realm to create additional connectivity as well as safe and visually attractive routes</p>	<p>Green infrastructure is used as a mechanism to help create “walkable” neighbourhoods, linking green infrastructure with wider public realm to encourage walking and cycling.</p> <p>Access to good quality open spaces is an important part of quality of place and life – facilitating access through creation or improving access to nearby areas through appropriate routes is required.</p>
<b>Provide or encourage high level master-planning and urban design into schemes at an early stage</b>	CABE and RTPI Studies	Require detailed green infrastructure plans for all major developments. The plan should be prepared by the project proposer, showing how the development will contribute to the Leicester Green Infrastructure Strategy. See Ashton Green Case Study example
<b>Reduce the inequalities of GI across wards by focussing contributions in areas to maximise benefit</b>	Green Space SPD	The Green Infrastructure Target (an approach to ensure that development uses green infrastructure to best effect) is developed and used for all development in Leicester with specific targets for each Ward area in accordance with Green Space SPD and CIL
<b>Design sustainable schemes and ensure maintenance in long-term</b>	CABE and RTPI Studies	Use recommendations on design and implementation within Sections 5 and 6 to support green infrastructure delivery across the city. Reduce light pollution and remove artificial lighting from more sensitive areas for wildlife

## 4.3 Priority 2 – A Bio-diverse and Beautiful City - Habitat Provision and Access to Nature

### 4.3.1 Introduction

Many of the landuse changes proposed within the strategy that make up Green Infrastructure also provide opportunities to help improve biodiversity in Leicester. To gain maximum benefit it is necessary to provide recommendations and actions of where the areas of most value to wildlife are located; which species are particularly vulnerable or rare and need our help and where to prioritise actions to provide connectivity and favourable habitats,

Leicester is essentially a green city with 67% of the City classified as green infrastructure, with a large proportion of that space being made up by private gardens. Assessments of landuse for wildlife have been completed and include the 2006-08 Phase I Habitat Survey and development of an ecological green network. Green Flag has been awarded to a number of high-profile Parks across the City based on a number of factors which include attractive and welcoming sites as well as wildlife and biodiversity. The Parks range from being historic parkland to relatively newly created Open Space carefully designed and landscaped to maximise their aesthetic value.

The City has some areas of high biodiversity value with one SSSI, six Local Nature Reserves and over 40 Local Wildlife Sites designated for their nature conservation value, presence of rare species or quality of habitat. The nature reserves are valuable areas used for public recreation, education and enjoyment, some of which are located within densely populated urban areas.

The Leicester Biodiversity Action Plan 2011-2021 provides a ten-year vision for the City in how to care for its wildlife in recognition of its duty as a statutory authority and its commitment to work with other partner organisations to achieve maximum benefits where possible. It provides a good starting point for the implementation of green infrastructure across the City.

Biodiversity is partly a measure of the City's green infrastructure resource. The City Council takes this responsibility seriously and came top in Environmental performance as the most ecological Sustainable City in 2010. The Council has also consistently achieved its targets for managing its Local Wildlife Sites with more than 60% being in favourable condition or managed in such a way to improve their value in recent years.

Figure 4.2 shows the overall distribution of the ecological framework of Leicester and includes the areas that function as a habitat for wildlife, a corridor for wildlife and pollutant removal from soil water (to improve water quality etc). The map shows that there are areas within the City centre and the environs made up of dense housing and industrial areas that have very little GI, whilst areas towards the periphery of the City such as Aylestone, Evington and Beaumont Leys are relatively well connected to the wider rural environment.

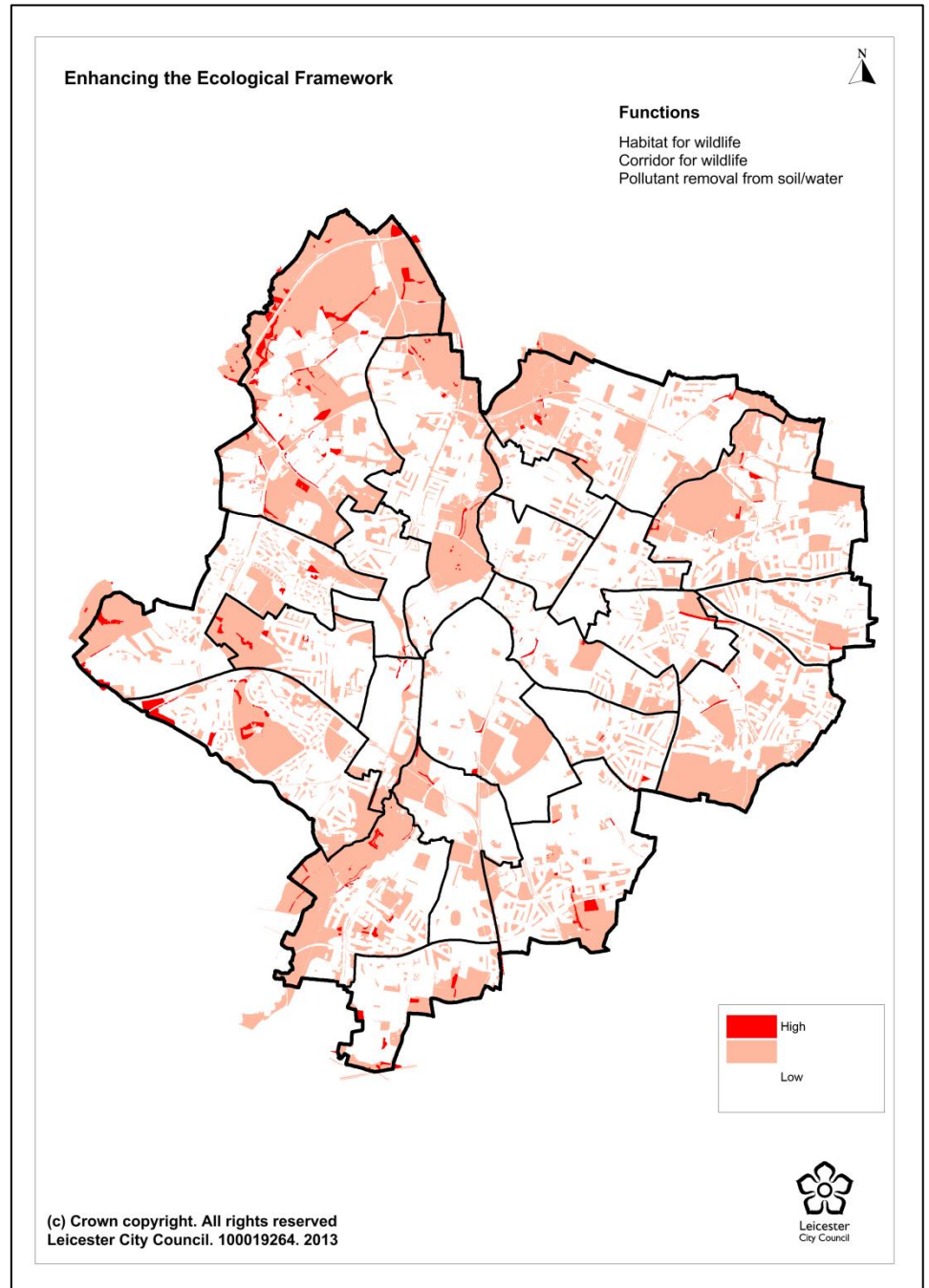
All public bodies have a statutory duty to consider biodiversity in their decision-making (Sec 40 NERC Act 2006) and to ensure development that may damage areas of high ecological value is avoided or can be sufficiently mitigated or compensated. Biodiversity does provide a measure of the health of the city's GI resource and the size and range of suitably managed green space capable of supporting a range of species is a good indicator of a thriving GI.

Opportunities to link the biodiversity and nature conservation value of the City to other functions and benefits is key to gaining an appreciation from a wider audience and justifying the retention of areas of green space that will also benefit wildlife as a secondary or subsidiary benefit to the main function an area will provide.



Examples of this already are present such as the wetlands at Aylestone Playing Fields which provide a valuable habitat for amphibians and invertebrates as well as feeding areas for birds and bats. They also provide drainage for the adjacent football pitches to enable play for longer periods, attractive areas for people to see wildlife as well as areas to store water temporarily – to either minimise flooding to nearby housing or to act as reservoirs in times of drought.

**Figure 4.3: Wetland Scrape, Aylestone Playing Fields Providing Flood Alleviation, Biodiversity and Amenity Benefits**



**Figure 4.2: Priority GI Areas and Opportunities to Enhance the Ecological Network**

**Table 4.3: Priority 2 - Key Actions for Delivery of Biodiversity and Green Infrastructure**

Issue	Evidence	Recommendations/Actions
<b>Areas of ecological importance are under threat from other demands</b>	Areas of high ecological importance are an important GI asset. The size, quality determines the species diversity and urban areas often provide safe havens for wildlife compared to intensively managed agricultural areas. Areas of lower value are also important in enhancing the biodiversity value of the City such as Parks, domestic gardens and water courses	<ul style="list-style-type: none"> <li>• Conserve existing designated sites of high ecological value and identify and designate other sites that meet the LWS criteria</li> </ul>
<b>How to link areas of green space and create networks or corridors for wildlife</b>	Identify buffer zones and areas of expansion around core areas to facilitate linkage and movement. Private gardens particularly provide a mosaic of different types of habitat that collectively can provide linkages to large areas of green space	<ul style="list-style-type: none"> <li>• Identify the existing ecological network to safeguard linkages</li> <li>• Identify areas through regeneration, development to create and/or enhance areas of natural green space to maximise benefits to wildlife</li> <li>• Promote good wildlife gardening practices across the City, particularly adjacent to areas of green space</li> </ul>
<b>How to link the aims and objectives of the City BAP to GI delivery</b>	Guidance is available on how GI framework can help achieve BAP actions and targets. These are largely linked to increasing habitats and managing them appropriately; improving linkages and facilitating movement of particular species	<ul style="list-style-type: none"> <li>• Avoid development in areas where biodiversity cannot be compensated for or appropriately mitigated;</li> <li>• Ensure adequate habitat creation and/or enhancements related to particular species where necessary</li> <li>• Consider importance of the built environment and provision for endangered species such as peregrines, swifts</li> <li>• Seek linkages through existing corridors such as railway links, road and brooks to enhance and facilitate</li> <li>• Use native species of plants, trees and shrubs where appropriate to encourage native wildlife – particularly insects and pollinators in danger from climate change and other factors</li> </ul>
<b>How to ensure biodiversity is fully considered in development proposals</b>	Statutory responsibilities required of LPAs to ensure compliance with wildlife legislation. Detailed guidance on how to integrate biodiversity into planning process has been produced by Defra, Natural England, the Green Paper and Lawton Report.	<ul style="list-style-type: none"> <li>• Work with Policy team to ensure Local Plan and Core Strategy has sufficiently robust policies for biodiversity, green network and fully reference GI</li> <li>• Provide advice and information to internal departments responsible for managing green space and built structure, securing related policies/strategies and externally to developers and associated specialists</li> <li>• Follow advice and recommendations put forward in the design principles to maximise benefits to wildlife</li> </ul>

## 4.4 Priority 3 – A Healthy and Active City – Health and Well-Being, Access, Recreation, Movement & Leisure

### 4.4.1 Introduction

Leicester is firmly committed to improving the health and well-being of its residents. Leicester's Joint Health and Well-Being Strategy 2013-2016 vision is to *“Work together with communities to improve health and reduce inequalities, enabling children, adults and families to enjoy a healthy, safe and fulfilling life”*

[https://www.leicester.gov.uk/media/177755/leicester\\_s\\_joint\\_health\\_and\\_wellbeing\\_strategy\\_2013-2016.pdf](https://www.leicester.gov.uk/media/177755/leicester_s_joint_health_and_wellbeing_strategy_2013-2016.pdf)

Leicester is the 10<sup>th</sup> largest City in the UK and has a growing population of 329 900 recorded in Census 2011 (an increase of 16.7% since 2001). The largest increases in the population are in people aged in their 20s (16,100) and under 5s (5,200) and Leicester has a much younger population than England, with a large proportion under 35 years old.

Leicester is highly deprived, according to the Index of Deprivation 2010, ranking 25<sup>th</sup> most deprived of 326 local authority areas. There is a strong association between high levels of deprivation and poorer health. The impact of deprivation on health includes:

- high levels of obesity and tooth decay in children
- adults with worse levels of physical activity and healthy eating
- early death from heart disease, stroke and smoking
- higher than average mental illness, homelessness, and cancer

Average life expectancy in Leicester is significantly lower than the national average; 2.2 years lower in males and 1.2 years lower in females. Any death below 75 is classified as premature. There is also a variation in life expectancy across Leicester – a gap of around eight years for both men and women living in the most deprived and the least deprived areas of Leicester. The main causes of death are from cardiovascular disease (related to the heart and circulatory system), respiratory (breathing) disease and infant mortality.

There is a growing body of evidence that green infrastructure can improve health and well-being – an overview of the evidence and reference to case studies is provided in the City Council Strategies – Section 2.4. The main areas identified where health benefits could be achieved from green infrastructure planning, management and delivery are:

- social cohesion
- increasing physical activity
- opportunities to grow food locally
- improving mental health
- improving air quality

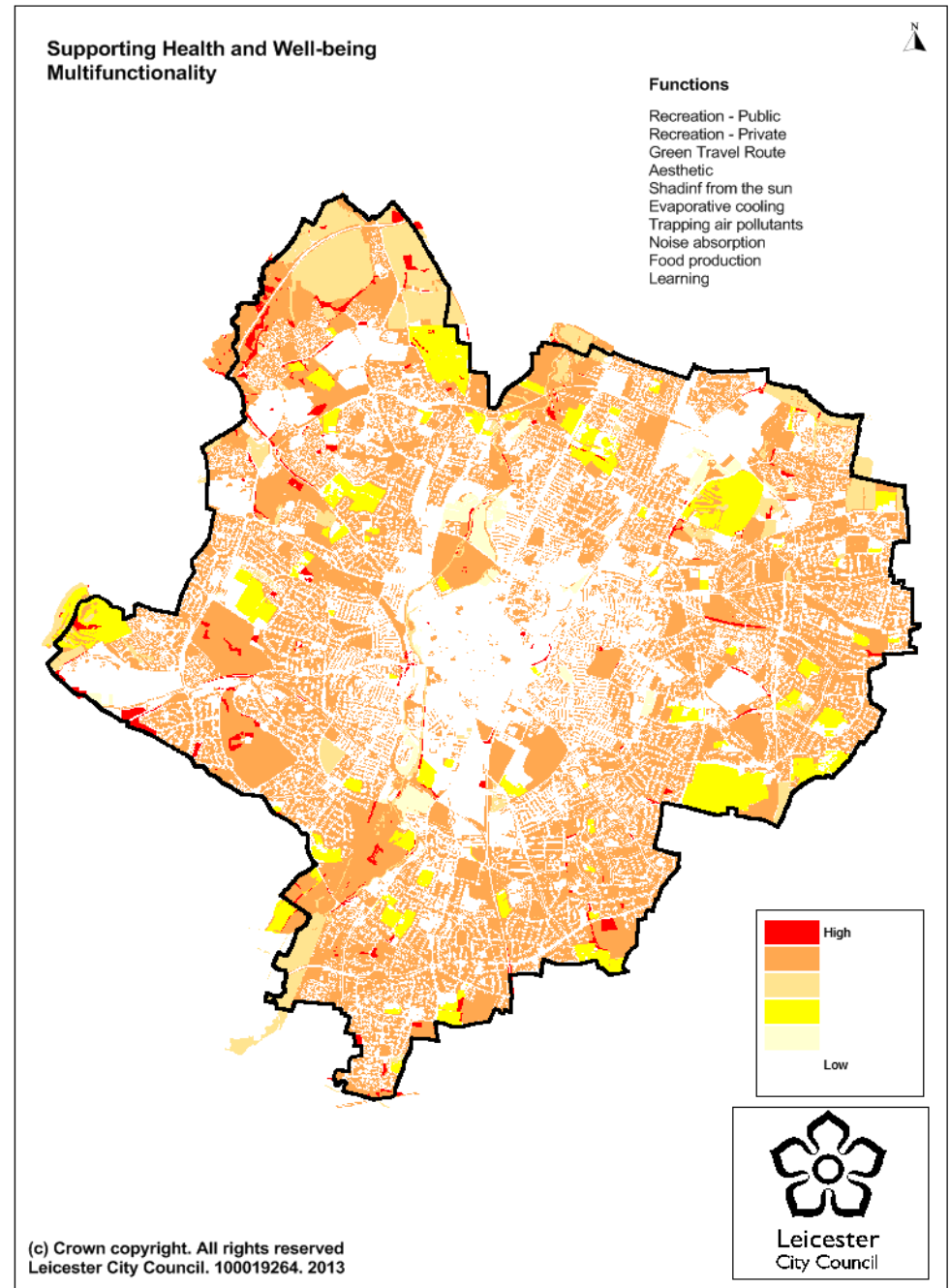
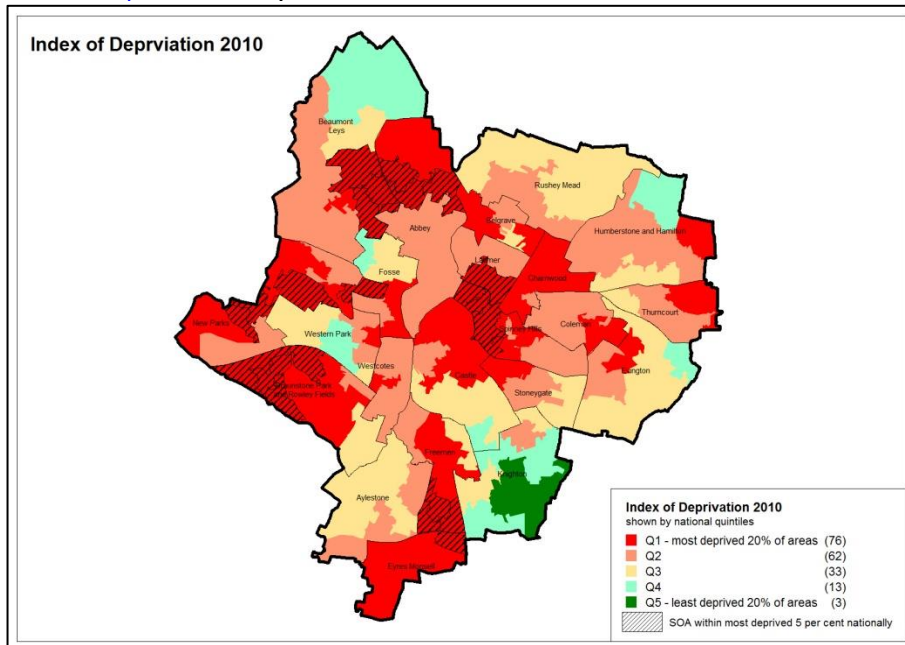


The recent Marmot Review also supports the concept that green infrastructure and access to green space can improve mental and physical health as well as reducing obesity.

Figure 4.4 highlights those areas identified from the different types of landuses that could offer the most benefit to residents in terms of health and well-being. The areas identified with the higher number of functions will provide the most benefits.

Figure 4.5 shows the Leicester wards ranging from those most deprived to least deprived. There are key areas centred on Braunstone, Abbey and Highfields, although there is great variation within each ward and more detailed information is available based on postcodes.

**Figure 4.5: Leicester Deprivation Index by Ward** (source <https://www.gov.uk/government/publications/english-indices-of-deprivation-2010>)



**Figure 4.4: Priority GI Areas for Supporting Health and Well-Being**

**Table 4.4: Priority 3 - Key Actions for Delivery of Health and Well Being and Green Infrastructure**

Issue	Evidence	Recommendations/Actions
<b>Health deprivation and inequality</b>	Research indicates that a link exists between poor health, deprived areas and availability of green infrastructure. It suggests that increasing the levels of GI can help reduce health inequalities	<ul style="list-style-type: none"> <li>• Change the management of green space to make it more accessible and multi-functional in areas of greatest deprivation and include functions to benefit health and well-being e.g. enable local food growing</li> <li>• Prioritise improvement to GI in areas of greatest deprivation to reduce inequalities</li> <li>• Increase the quality and quantity of GI to provide relatively calm, low-noise areas for people to “escape” to and relax – helping with stress levels and mental health</li> </ul>
<b>High levels of coronary heart disease and diabetes</b>	Increasing levels of physical activity will help prevent or manage these diseases. Evidence shows there is a synergy between green exercise and both physical and mental health	<ul style="list-style-type: none"> <li>• Target provision and improve access to recreational and natural green space areas and facilitate programmes to encourage use.</li> </ul>
<b>High levels of obesity in children and adults</b>	Obesity is linked to coronary heart disease and diabetes. Increased physical activity can reduce obesity and associated risks. There is a link between proximity of green space and levels of activity. Programmes such as Forest Schools actively encourage physical activity via the learning process.	<ul style="list-style-type: none"> <li>• Planning and other strategies such as the Food Growing Strategy support the temporary use of vacant or derelict land for sustainable use including food and fuel growing</li> <li>• Encourage growing of local produce (exercise) and healthy eating of fresh food linked to Food Plan and Healthy Weight Strategy</li> </ul>
<b>High levels of poor mental health</b>	Increasing evidence that green space can have a positive effect on mental well-being through physical access and usage as well as visual access – the views of trees, lakes, and landscape can also relieve stress, blood pressure. Reducing inequalities of access to green space to help improve mental health and well-being as shown by “5 ways to wellbeing” (Connect, Be Active, Learning, Give to Others, Take Notice)	<ul style="list-style-type: none"> <li>• Work with landowners to find opportunities for redevelopment of green space - create visually attractive settings and maximise views of “green”.</li> <li>• Encourage Growing food programme and horticultural therapy to improve mental and physical health</li> </ul>
<b>Low levels of physical activity</b>	Research shows the levels of physical activity are greatest close to areas of accessible green space. Central government advocate 30 mins exercise 5 days a week. NICE guidance PH8 recommends provision of accessible POS and public paths that can be reached to bicycle or foot and which are maintained to a high standard to encourage and maximise use	<ul style="list-style-type: none"> <li>• As well as recreation, the daily routine of cycling or walking into work/school etc can be encouraged to achieve this.</li> <li>• Ensure facilities and services are accessible by walking or cycling</li> <li>• Ensure GI opportunities used to include informal green space and natural play opportunities where possible in new development</li> <li>• Maximise opportunities to support Green Gyms with trainer and/or programme to encourage use</li> <li>• Use Forest Schools and other conservation programmes to encourage more activity whilst achieving other results – e.g. improving habitats for wildlife</li> </ul>
<b>Reduce levels of air pollution</b>	Trees and woodlands are good at removing pollution from the atmosphere	<ul style="list-style-type: none"> <li>• Use GI to reduce air pollution along main road routes – through programme of tree and meadow planting</li> </ul>

## 4.5 Priority 4 – A Sustainable City – Flood Attenuation & Water Resource Management; Climate Change Adaptation and Mitigation

### 4.5.1 Introduction

Leicester is firmly committed to providing a naturally sustainable environment and has gathered information and evidence to fully inform on the Climate Change Adaptation Plan (2012), the adopted Climate Change Supplementary Planning Document (2011) and the annual Programme of Action which details specific actions to be taken each year to combat the impacts of climate change by the City Council and its partners. This work includes recommendations on built design, transport, water control as well as Green Infrastructure.

Leicester had a total of 102 key weather events between 2000 and 2008 with an average of seven to 18 events each year ranging from storms and high winds to severe flooding. In total this cost Leicester City Council £3.56 million during this period (LCC Climate Change Profile 2011) with £97K spent on flood damage, £33K dealing with flash flooding on Leicester's roads as well as dealing with 3000 roof leaks and loss of rent subsidies from outdoor facilities such as the Leicester market. Other costs incurred through storms and high winds include £879K to damaged trees, and £12500 damage to council buildings. The cost to individual businesses and residents has not been calculated for this period but would have been economically significant as well as causing great stress and impact to health.

The predictions of more erratic weather with heavy thunder storms and extreme weather events such as droughts, heat waves, storms and floods will impact on the people of Leicester, its economy and the natural environment.



Figure 4.6: Flooding Following Summer Storm at Fosse Road North (2010)

Using green infrastructure as one of several tools to combat some of the impacts of climate change is seen as a way forward in achieving opportunities and greater benefits as well as taking a pro-active stance to these natural events. The use of GI could help intercept rainwater and store it; help water quality through infiltration and provide a healthier environment through cooling and shading. Providing green leafy streets similar to those at New Walk and attractive squares in which to relax in a city centre environment is fundamental to cooling the city and making it more liveable.

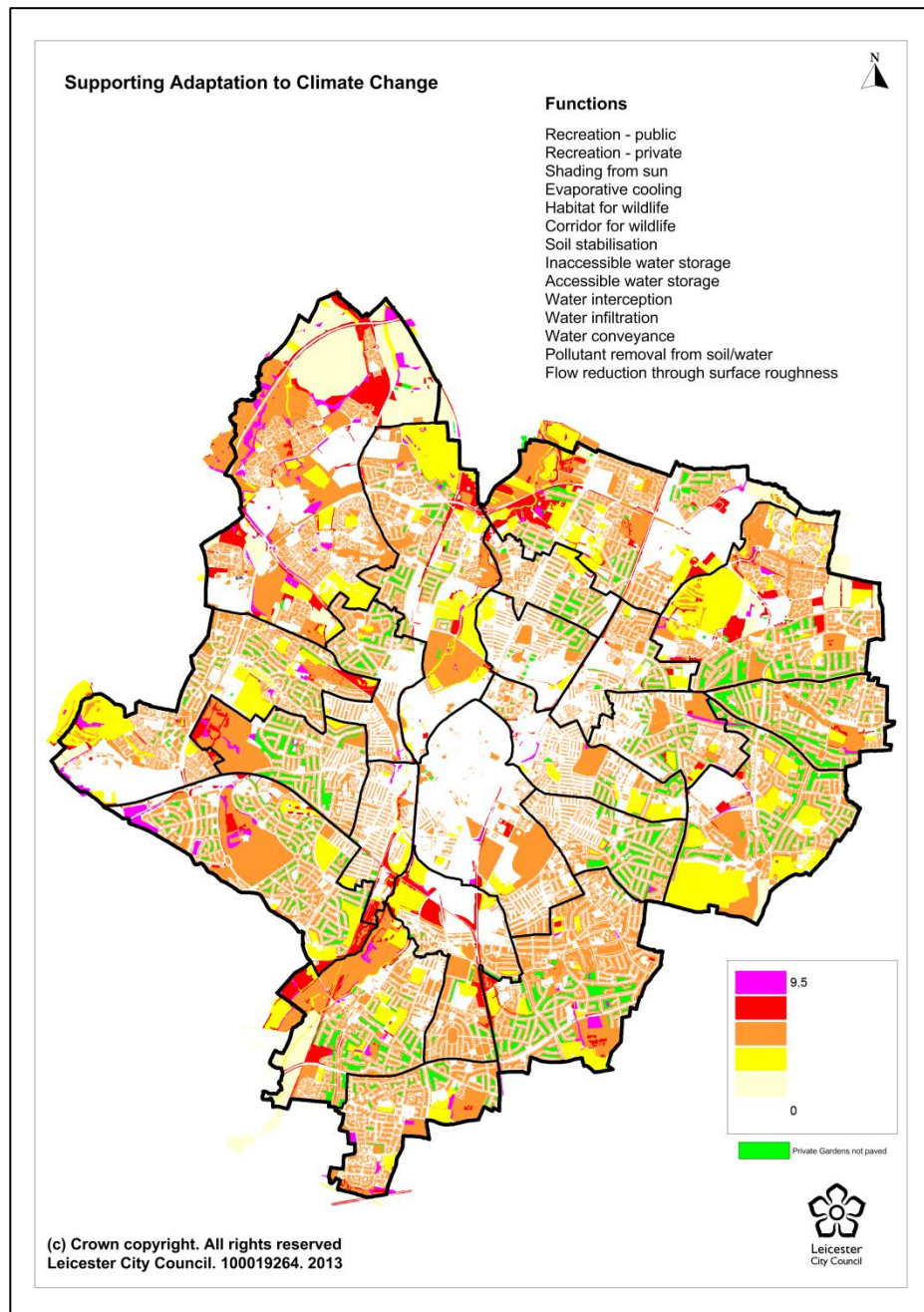


Figure 4.7: Priority GI Areas Supporting Adaptation to Climate Change

Figure 4.6 shows the areas providing the highest number of functions to negate against the impacts of climate change based on current landuse. Those providing the greatest number of functions will provide the maximum benefits to residents.

The Surface Water Management Plan (SWMP) (2012) provides details on the areas most likely to flood as a result of fluvial and pluvial surface water (See Figure 4.7). These areas are referred to as Critical Drainage Areas (CDAs) and additional “hotspot” areas likely to flood after events are also identified to prioritise works. Green Infrastructure is seen as a key stage in providing flood relief and this evidence has been used to identify areas for GI improvements across the City (see Section 6).

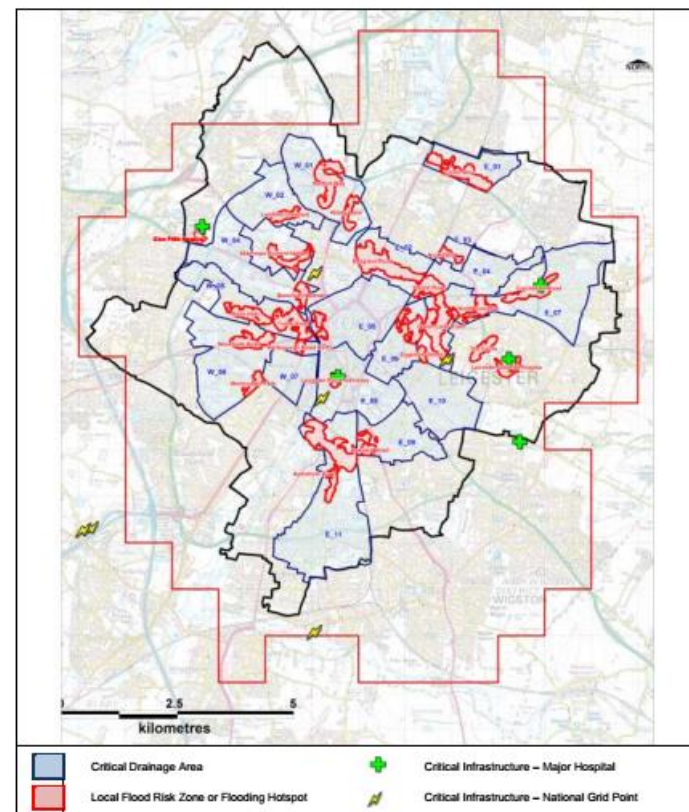


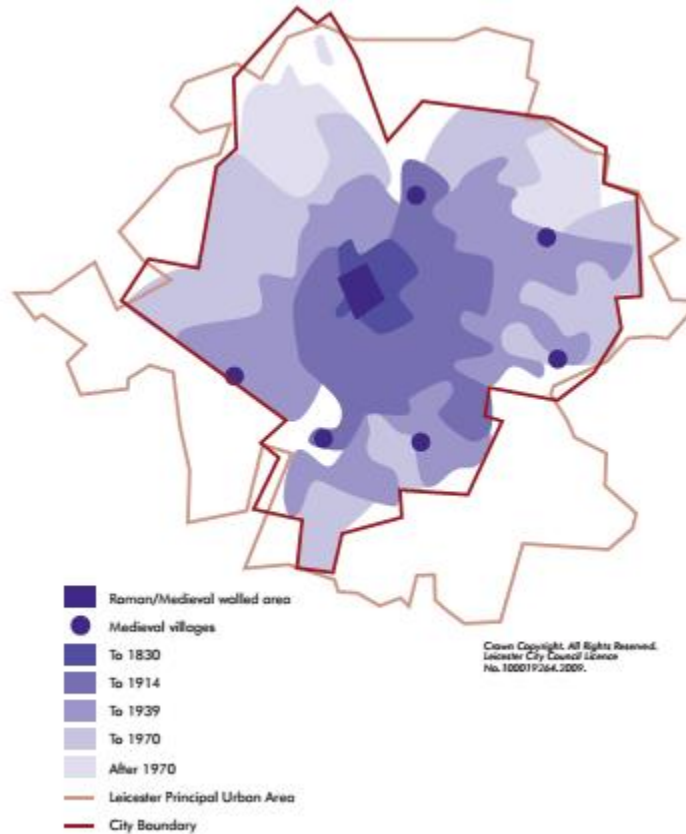
Figure 4.8: Flooding Hotspots and Critical Drainage Areas in Leicester

**Table 4.5: Priority 4 - Key Actions for Delivery of a Naturally Sustainable City and Green Infrastructure**

Issue	Evidence	Recommendations/Actions
<b>Manage the Heat Island Effect and control rising temperatures</b>	Maximum surface temperatures can be maintained at today's levels through a 10% increase in GI and reduce the heat island effect	<ul style="list-style-type: none"> <li>Climate change adaptation principles to be incorporated into design principles at early stage of master planning process to agree principles</li> <li>Identify priority areas in greatest need where vulnerable communities, poor health and little GI and increase the cooling function through creation of GI</li> <li>Use good design principles to encourage air flow into urban areas by aligning new development and incorporating GI</li> </ul>
<b>Help wildlife cope with changing climate</b>	Species naturally migrate northwards as temperatures rise, but urban areas can provide barriers to dispersal.	<ul style="list-style-type: none"> <li>Improve wildlife corridors by providing a network of GI including road and rail verges; gardens and larger areas of sustainable habitat that directly link together or act as stepping stones for wildlife to disperse</li> <li>Enhance connectivity through tree, wildflower planting and watercourses</li> <li>Implement Water Framework Directive to deliver improvements in water quality</li> </ul>
<b>Management of surface water on an catchment scale and in new and existing development</b>	Flooding and/or drought impacts can lead to movements in soil resulting in subsidence; immediate impacts of flooding on houses and businesses with increased water levels. GI can help manage water through intercepting rainfall, increased soil infiltration, water uptake water storage and delaying/decreasing peak flows. A 10% increase in GI cover can reduce runoff by 5%	<ul style="list-style-type: none"> <li>SuDs will be required as part of all new development (Flood Water Management Act 2010) and incorporate this requirement into Policy</li> <li>Work with SuDs approval body and support catchment-sensitive farming approach to reduce runoff and siltation coming into City</li> <li>Identify areas of permeable soils and increase level of GI as part of the strategic water management system</li> <li>Design for sustainable irrigation to mitigate against drought conditions and promote healthy plant growth to further assist with cooling and shading</li> <li>Identify and prioritise naturalisation of channelled brooks and culverts</li> <li>Implement WFD to deliver improvements in water quality</li> </ul>
<b>Old infrastructure in the city is poorly adapted to rising temperatures</b>	Shade provided by trees is up to 30°C cooler on hot summer days. Trees planted on south side of buildings reduces temperatures and the use of air conditioning In winter shelterbelt effect of trees & other GI can slow winds/reduce the level of heat loss in buildings Improved infrastructure will help to reduce risk of disease and death related to heat waves	<ul style="list-style-type: none"> <li>Retrofit GI to adapt to high temperatures through planting of urban trees, particularly in areas of poor tree cover</li> <li>Implement WFD to deliver improvements in water quality</li> </ul>
<b>Carbon storage is limited and release of greenhouse gases more significant in the City</b>	Planting trees and other plants will increase ability to sequester carbon. Large urban trees can store up to a 1000 times more carbon than smaller trees and sequestration rates are 90 times greater. Domestic gardens with mature trees and shrubs have much greater capacity to store carbon in soils	<ul style="list-style-type: none"> <li>Develop a city-wide greening strategy focussed on the city centre and environs only with a focus on urban tree planting, green walls &amp; roofs to provide multiple sustainable benefits</li> <li>Develop a new tree strategy with agreed replacement/compensation ratio of at least 2:1 that considers multiple benefits of trees &amp; management Promote green roofs in the city centre – particularly in regeneration areas on new buildings</li> </ul>
<b>Too many brownfield sites in the City centre lying dormant with no plans for the immediate future</b>	Many of the brownfield sites are old industrial sites with hard surfaces that reflect heat and increase temperatures contributing to the overall heat island effect	<ul style="list-style-type: none"> <li>A city-wide greening strategy to “green brownfield sites” temporarily by identifying sites for wildflower planting; biofuel crops and/or local produce growing</li> <li>Work with landowners, groups &amp; volunteers to create and manage areas on a temporary/semi-permanent basis with flexibility to react to changes in economy/funding etc</li> </ul>

## 4.6 Priority 5 – Planning for GI – central within Planning, Policy framework

### 4.6.1 Introduction

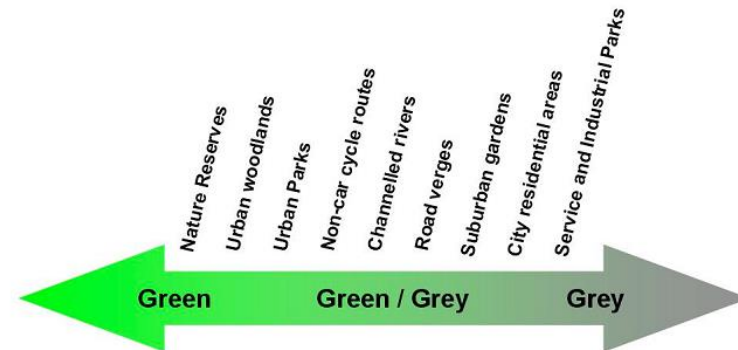


**Figure 4.9: Historic Development of Leicester**

The concept of “grey to green” is fundamental in trying to recognise how green infrastructure can replace or compliment traditional forms of infrastructure. Opportunities for good planning to link up areas of GI across the city with existing and newly created public spaces and encourage greater connectivity for cyclists and pedestrians should be identified. This is one of the concepts behind the Connecting Leicester Project.

Leicester’s green space has previously been on an ad-hoc basis with legacies left over from our industrial past as the City rapidly expanded (see Figure 4.8). This has resulted in areas rich in green space where our Parks and Gardens predominate in the centre of the large suburban areas such as Stoneygate, Knighton and Humberstone. Other areas have developed more recently from previous landuse of heavy industry and landfill and the foresight of previous planners and environmentalists in recognising the need to identify sites of wildlife value alongside opportunities to create new areas on previously contaminated land. The Riverside Park commenced in 1974; adoption of an Ecology Strategy in 1986 which later earned Leicester the title of the first Environment City in 1990 provides good examples of this.

Since then, the largely rural areas of Beaumont Leys and Hamilton have been developed mainly for housing and employment use to support the growing population of Leicester. Green space has been incorporated into both, but the continued needs to achieve housing targets and provide economic growth to enable Leicester to compete with other cities on a national and international basis has placed increasing demands on our green space.



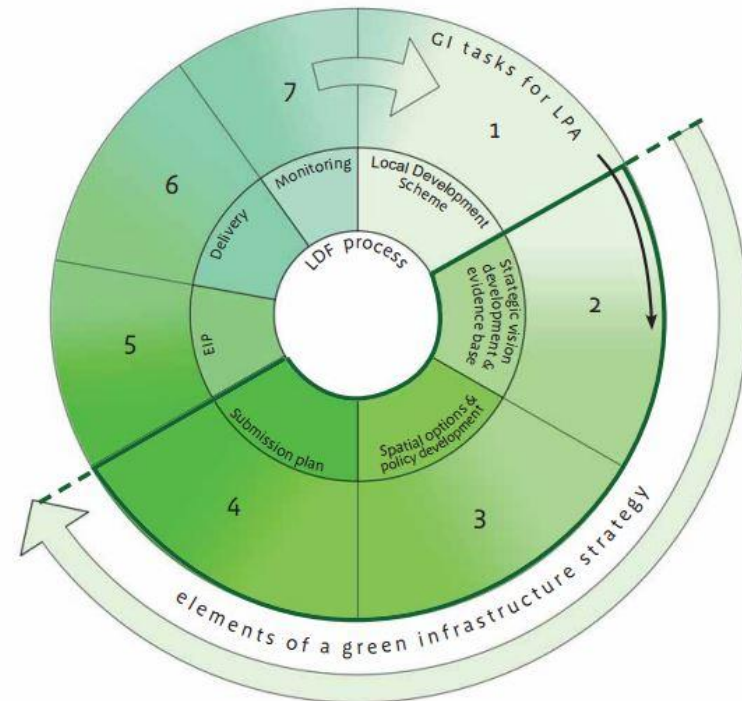
**Figure 4.10: The Green to Grey Continuum of Green Infrastructure**

This strategy sets out a strategic picture of the benefits associated with green infrastructure and sits above a number of other single-issue strategies that provide an important and valuable evidence base from which to make policy, plan and implement on the ground.

The focus of GI is very much on identifying the multiple functions a green space can provide, but in order for it to be delivered there is also a need to identify some important principles

- Planning policy and development management – to ensure the main principles of GI are integrated into policy and guidance documents to advise on how or where to implement
- The economic value of GI – a quantitative assessment to illustrate the economic long-term benefits of retaining green space vs short-term economic gain from changes in landuse and sales
- Partnership working and pooling of resources to target priority areas and achieve the greatest benefit

Figure 4.10 shows the main GI tasks for a Local Planning Authority (LPA) in ensuring that the place and character of an area is secured, protected, enhanced and managed through appropriate polices. It is therefore desirable to draw up a GI policy which enables engagement with a range of partners based on existing provision and deficiencies and need.



**Figure 4.11: Implementation of Green Infrastructure into the Local Development Plan (Natural England 2009)**

**Table 4.6: Priority 5 - Key Actions for Delivery of an Effective Planning Service and Green Infrastructure**

Issue	Evidence	Recommendations/Actions
<b>Polices are not strong enough to enforce GI in early stages of design</b>	Statutory responsibilities required of LPAs to ensure compliance with wildlife legislation. Detailed guidance on how to integrate biodiversity into planning process has been produced by Defra, Natural England, the Green Paper and Lawton Report	<ul style="list-style-type: none"> <li>• Ensure that the Local Plan and polices refer to the need to assess and evaluate GI and provision of POS and incorporate it into design and development</li> <li>• Review and develop a GI guide to inform on implementation and best practice</li> </ul>
<b>Insufficient funds targeted towards green space</b>	Green Space Study has identified deficiencies in green space by ward; Green Space SPD has quantified the level of contributions necessary for parks, sports and recreation and natural green space.	<ul style="list-style-type: none"> <li>• Ensure contributions are secured for green space related to development that will secure the creation and/or enhancement of facilities for new residents and benefits to reduce flood risk.</li> <li>• Quantify and gain recognition of the need for CIL to contribute to GI as a similar requirement to grey infrastructure</li> </ul>
<b>Balancing the demands of green space and GI with other demands such as housing growth and employment areas</b>	Making areas of GI available within new housing schemes can provide multiple benefits including evaporative cooling that help reduce the urban heat island effect, improved water quality, public amenity, biodiversity	<ul style="list-style-type: none"> <li>• GI actions should be targeted at the main areas of housing growth and regeneration across the City. Any existing assets should be retained where possible and new areas of GI created in areas of need</li> <li>• Ensure mitigation/compensation for loss of GI assets that can provide greater number of functions</li> </ul>
<b>Good planning policy and design should involve considering the strategic value of green space</b>	Guidance from Defra, RTPI and others advocate the need for strategic planning of green space and implementation of a GI Plan for an area that will fulfil the multiple functions required and link to the wider network of existing green space	<ul style="list-style-type: none"> <li>• This guide to provide general guidance and act a as a pre-cursor to more detailed guidance to promote high quality design which takes into account landscape and urban design as well as climate changes adaptation, biodiversity by design principles and delivery of GI at a city-wide level</li> <li>• Maintain close working relationships with neighbouring authorities to ensure development is well planned taking into account the duty to co-operate</li> </ul>
<b>Difficulties in quantifying GI benefits to enable schemes to be implemented</b>	Information produced by TPA, Defra and NE to quantify the benefits of GI in terms of flood alleviation, carbon storage, health and well-being etc.	<ul style="list-style-type: none"> <li>• To research and develop good practice to determine the value of GI to aid decision making</li> </ul>
<b>Duty to co-operate with other administrative authorities and regional partners takes control beyond the City boundary</b>	NPPF states that there is a duty to co-operate across administrative boundaries. Defra and major funding strands advocate large-scale projects at strategic level with multiple partners	<ul style="list-style-type: none"> <li>• Create a Leicester and Leicestershire GI Forum or similar to link City to wider green network or link in with other forums such as Local Nature Partnership, Climate Change Board</li> <li>• Embed GI Strategy into other strategies at a City/County level</li> </ul>



## 5.0 Implementation of GI in Leicester

The Green Infrastructure Strategy should not be seen as a stand-alone document but rather one that acts as an evidence base and support for other statutory plans and strategies. Leicester City Council, although often acting as a lead in forming partnerships which can utilise partners' expertise, financial resources and land-ownership, should not be seen as the only stakeholder in the delivery of the Strategy. Working in partnership with other organisations, Trusts and Forums to deliver the actions identified is necessary to deliver on planning, provision and maintenance of local GI. This is likely to be the only way in which the Strategy and opportunities for delivery and management of GI can be achieved.

### 5.1 Stakeholders and Green Infrastructure Forum

It is strongly recommended that a Green Infrastructure Forum is formed that will link projects that require GI support with the organisations that can provide it. It is proposed that the Forum operate at a City-level so as to address the mainly urban constraints and requirements for GI rather than incorporate rural issues and opportunities within the same partnership. Links to other partnerships such as the Local Nature Partnership (LNP), Soar and Grand Union Canal Partnership, Natural and Historic Environment, City-wide Environmental Experts Reference Group and Climate Change Forum that operate at a Leicester/Leicestershire level would be required and these groups should be fully informed of prospective projects to seek support. Potential stakeholder members of the Forum are shown in Table 5.1 and Figure 5.1 shows the roles those organisations provide.

The terms of engagement and roles of individual groups will need to be established at the outset and the size of the Forum should be guided by those organisations and individuals who have a key influence on achieving the five main priorities of the GI Strategy.

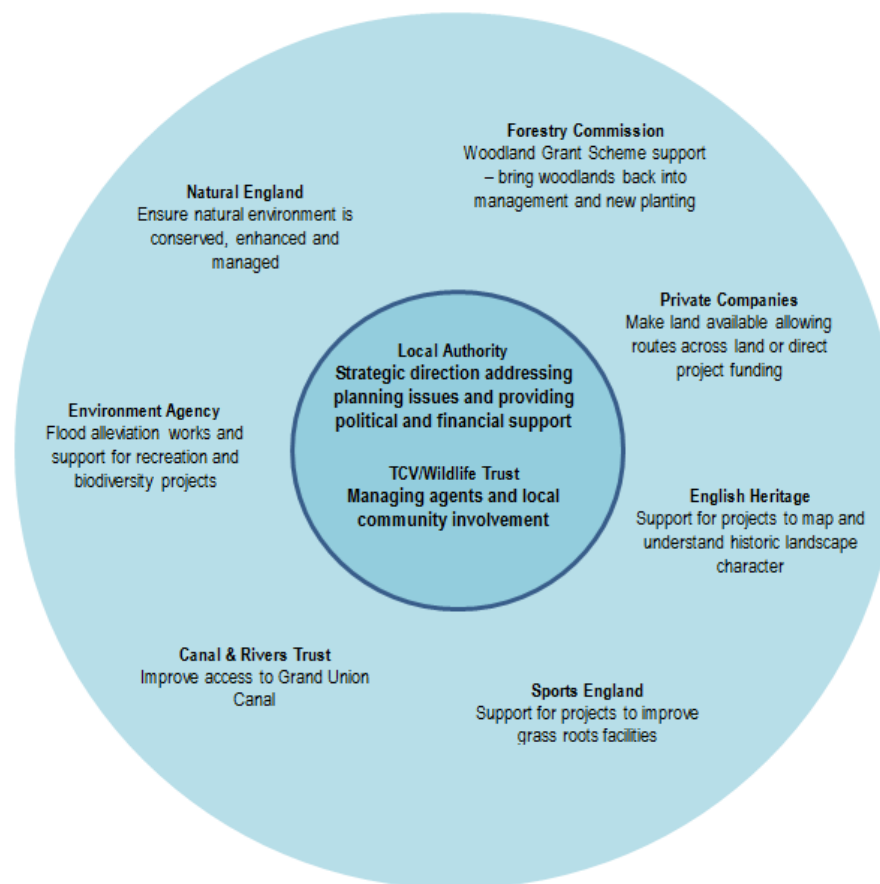


Figure 5.1: The Role of Partner Organisations in Implementing Green Infrastructure

Potential leads for action include the Climate Change Group, Leicester City Council, Environment Agency, Leicester & Leicestershire Health Forum, Natural England, Canal and River Trust, Soar and Grand Union Canal Partnership and Leicestershire & Rutland Wildlife Trust

**Table 5.1: Potential Stakeholders for Green Infrastructure Forum**

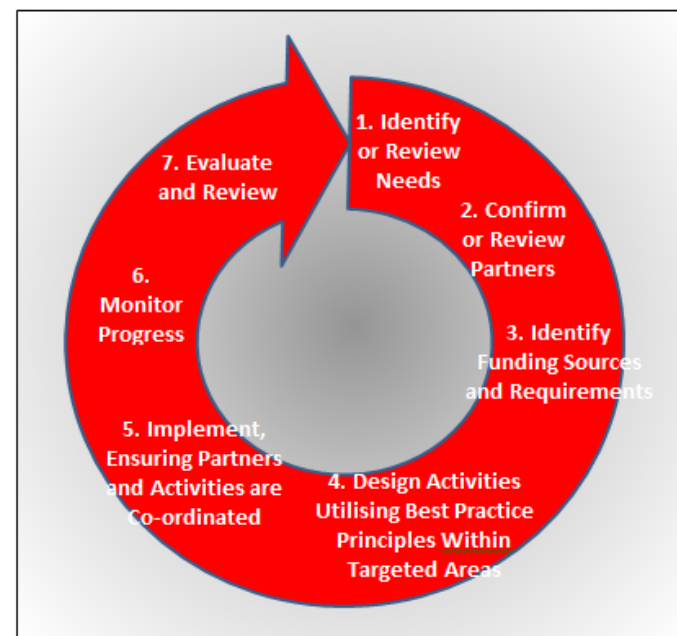
Public Interest (Political and Statutory Bodies)	Private Interests	Community Interests
Planning and Highway Authorities	Private landowners/farmers	Amenity Groups
GI Partnerships	Developers	Special Interest Groups
Local Service Providers	Management Agents	Local Communities
Statutory Consultees	Transport Providers e.g. Network Rail	Local Politicians
Education/Schools		Children & Young Persons
Sports		Visitors

## 5.2 GI Implementation Process

The planning system is the only system available to encourage the incorporation of Green Infrastructure into new development. It is also important that this is developed on the ground by volunteers, practitioners and developers through use of case studies and practical implementation.

The use of Policy and planning conditions to ensure GI is included at the early stages of major schemes across the City as part of the master planning process and identification of strategic delivery issues and options illustrates the benefits. The practicalities of designing a good scheme on the ground by working with specialists such as landscape architects, urban designers and ecologists as well as flood and highways engineers or conservation groups, the local community and volunteers for smaller scale projects provides the flexibility to implement and complete a good scheme and maximise the benefits of GI. Figure 5.2 shows the main actions involved to incorporate green infrastructure successfully.

**Figure 5.2: Actions Required to Source and Implement Green Infrastructure into Projects**



The long-term vision for GI is to “maintain, enhance and extend a planned multi-functional GI network (6Cs Growth Point 2010).

Having identified current needs in select areas (see Section 6) and set up the Forum with flexibility for additional partners depending on the Project, the next stages are to identify funding sources and design the project more fully. These two elements are described in the following sections.

### 5.2.1 GI Funding Opportunities – Capital and Long-term Maintenance

The capital costs of creating GI can usually be met by a range of national and local sources (see 5.3.1 and 5.3.2 below). In some cases green space creation can be done as an incidental expenditure arising from another engineering-related use such as flood alleviation or provision of a transport network. Securing the long-term management of a site is vital so that any design objectives met can remain in good condition and maximum use is made by local communities, wildlife etc. Funding for long-term maintenance therefore also needs to be available and supported as it would be for any other public service to the community, rather than relying on irregular and ad-hoc or uncertain funding. Long-term maintenance opportunities are also discussed in Section 5.3.3.

Traditionally, local government funding provided the means to support and deliver projects, but with reduced funds from central government, the downturn in the economy and pressures on resources this is no longer an option. Local authorities do, however, have a statutory duty for GI provision or management in their duty towards biodiversity in the Natural Environment and Rural Communities Act (2006). Incorporation of sustainable systems under the climate change agenda and supporting a healthy and active community should ensure all options are explored to achieve a range of aims and objectives. The following sections provide information on funding options for pro-active project delivery and delivery of GI through the planning and development process. The list is up-to-date but not exhaustive due to frequently changing funding streams.

#### Public Sector Grant Funding

Working with partners with common agendas at the concept stage and seeking a combination of funding from various sources appears to be the way forward.

Funding for GI is available from a range of government departments and public agencies based on **policy objectives** such as housing growth or flood alleviation; or **delivery** such as healthy living, sustainable transport or biodiversity initiatives. This approach requires that a project should deliver **multiple-benefits** and is often a pre-requisite of GI and green space projects.

Leicester City Council can play a key role in forming partnerships with public sector organisations whose targets can be achieved by GI. To maximise success and gain acceptance of GI politically and with partners it is strongly recommended that the monetary value of the functions to be provided are quantified e.g. health benefits, improvements to water quality.

**Better Regulation Delivery Office (BRDO) Grant** – available to local authorities and others that can support business and economic growth whilst applying the Regulators Code  
<https://www.gov.uk/government/collections/brdo-grants>

**Air Quality Grant Programme** – DEFRA – available to local authorities who wish to bid for support in tackling exceedance of the UK nitrogen dioxide (NO<sub>2</sub>) objectives and other pollutants  
<https://www.gov.uk/government/collections/air-quality-grant-programme>

**Big Lottery Fund** – tend to be for large, strategic projects on a national basis e.g. Access to Nature (administered by Natural England) but can be used to involve people in their local green space e.g. horticultural therapy related to health and well-being. At a Leicester level it may be possible to link in with a national project and act as a case study.  
<http://www.biglotteryfund.org.uk/about-big>

**Heritage Lottery Fund** – supports capital and revenue projects to improve public and historic parks and designed landscapes, providing local communities with an opportunity to learn about the natural and historic environment. Successful applications have been made at Spinney Hill Park and Welford Road Cemetery where improvements in the natural environment have been incorporated into heritage schemes. These examples will provide good case studies for future applications.  
<http://www.hlf.org.uk/Pages/Home.aspx>

**Local Sustainable Transport Fund** – bids for 2015/16 application by local authority partnerships. £100 million capital funding for the Fund has been made available through the Local Growth Fund for 2015 to 2016. The department has also made available a further £78.5 million of revenue funding (including Bikeability training) to enable further investment in sustainable transport schemes.  
<https://www.gov.uk/government/collections/local-sustainable-transport-fund>

**Environmental Stewardship Schemes** – Natural England - The Higher Level Stewardship (HLS) Scheme can support projects to enhance the landscape quality, biodiversity habitats and particular species as well as historic environment and public access. Successful applications have been made by Leicester City Council for Aylestone Meadows and Kirby Frith LNRs. Further opportunities are available in the City – see Section 6.  
<http://www.naturalengland.org.uk/ourwork/farming/funding/es/>

**English Woodland Grant Scheme** – Forestry Commission – are available to support projects for the creation and/or management and maintenance of existing woodlands, particularly where public access can be facilitated. Grants could also apply to large-scale woodland planting in relation to urban extensions where visual mitigation is required  
<http://www.forestry.gov.uk/forestry/infd-6dce98>

**Landfill Communities Fund (LCF)** – Landfill Operators (LOs) have to pay a tax to central government per ton of waste disposed of in landfill sites. The LCF enables LOs registered with ENTRUST to give a percentage of the tax to organisations to deliver environmental objectives instead of paying to the government. GI projects include provision or enhancement of a public park/amenity within 10 miles of a landfill site; remediation or restoration of polluted land; and habitat creation for biodiversity.

<http://www.entrust.org.uk/landfill-community-fund>

**Biffa Award** – Local LO with landfill sites within 10 miles of proposed projects in Leicester <http://www.biffa-award.org/about-us-inner>

**Sita** – new landfill site in Whetstone – potential funding for projects within 3 miles of site (include Aylestone area)

<http://www.sitatrust.org.uk/news/700>

**Stepping Stones** – funding for cross-boundary projects for private and community grants

[http://www.leics.gov.uk/stepping\\_stones\\_grants](http://www.leics.gov.uk/stepping_stones_grants)

### **Planning and Development Opportunities**

**Planning Conditions** – Local Planning Authorities are guided by principles set down in Planning Policies and supporting strategies and Plans in making decisions on the appropriateness of development. Green space can be created, restored or enhanced as part of a planning condition with separate arrangements made for maintenance and adoption. The conditions are imposed where it is necessary to enable development to proceed and where, in the case of green space or biodiversity, where mitigation or compensation are required to ensure that there is no net loss resulting from development. Policy should consider the strategic nature of GI and influence applications that are considered on a site by site basis to best guide the use of land.

**Planning Obligations (Sec 106 Agreements)** – An agreement is reached between the LPA and developer to fund provision and management of green space within a specific development or a sum is commuted to the local authority for the long-term maintenance of the site.

**The Green Space SPD (adopted 2010)** provides a quantitative measure of contributions necessary ward by ward basis dependant on the size of development, the type of green space and its supply. Contributions are payable towards parks and gardens, allotments, sports and play equipment as well as natural green space. Planning Policy make it clear to developers from the outset that a contribution towards GI is likely <https://www.leicester.gov.uk/media/179109/green-space-spd-calculations-documents-adopted-april-2011-revised-july-2013.pdf>

**Community Infrastructure Levy (CIL)** – As a result of the CIL Regulations, from April 2015 the use of S106 contributions will be scaled back significantly. Off-site contributions collected as a tariff for the types of GI in the SPD will be to be possible after April 2015. The method of CIL allocation is currently being considered.

## 5.2.2 GI Design and Masterplanning

Master plans and development briefs are applicable to the City, local and site-scale and must also relate to the relevant Development Plan documents for the locality of any proposed development areas. Careful design is required to maximise and achieve the multiple benefits associated with GI and ensure that the GI is designed to a high standard of quality and sustainability to deliver social and economic, as well as environmental benefits.

The master planning process consists of three main phases:

1. **Preparation** – developing an understanding of the context of the development and setting the strategic framework/vision for the master plan (the brief)

This stage involves researching and collating an evidence base of information on which to base the master plan and development brief. It should include reference to local GI studies and strategies already completed. Leicester can refer to the 6Cs Leicester and Leicestershire GI Plan and the Stepping Stones Action and Delivery Plans as well as this strategy.

Biodiversity Action Plan targets should be used to inform on how GI can contribute to conserving or enhancing key habitats and species. The Leicester, Leicestershire & Rutland Biodiversity Action Plan and Leicester City Biodiversity Action Plan provide information on this.

2. **Design** – creation of a spatial master plan through a process of analysis of baseline data, consultations, testing and refinements to reach agreement on i) the layout – streets and housing blocks, movement routes, POS, landscaping/green space and ii) defines the design quality of buildings within the landscape context in terms of massing, heights, densities and orientations of buildings

Test the provision within the existing Green Space SPD against the standards of GI provision and quality that will be expected in a new development and take into account the standards for green space (PPG17 Study) and Design guidance (e.g. CABE's Building for Life standard). See Section 5.5 and 6.0 for further recommendations.

Figure 5.3 shows simplistically how variation in density and layout provides the opportunity for a range of green infrastructure functions such as recreation, habitat provision and improvements to the water environment through flood attenuation and water management via sustainable drainage (see Section 5.4.1)

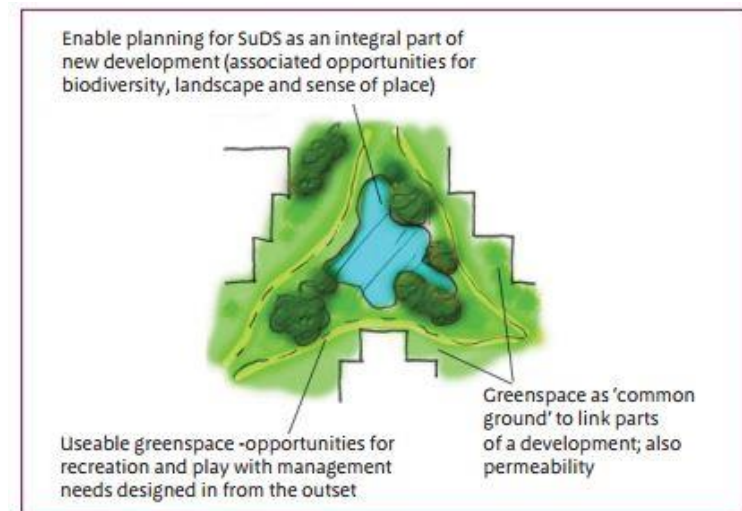


Figure 5.3: Schematic Plan for Green Infrastructure Options (Natural England 2009)

Many of the components of GI such as the POS of parks and play areas or public art are also directly related to creating a **sense of place** and to either enhancing the local character of an existing area or creating a new community with opportunities to contribute to a new local identity and landscape character. The next stage in design is to identify deficiencies in green space and other demands as well as other constraints that may influence the layout of an area such as areas liable to flooding or contaminated land. All the opportunities for GI enhancement should then be identified (such as areas of low environmental quality or deficient in biodiversity) and any gaps in the network (such as public access and links between different habitats). Any connections designed for public and wildlife should either be continuous or provide “stepping stones” to aid dispersal. The GI created within the site should also be in context with the wider environment and link with GI networks beyond the City. Figure 5.4 shows an example of GI, multi-functionality and place-making.

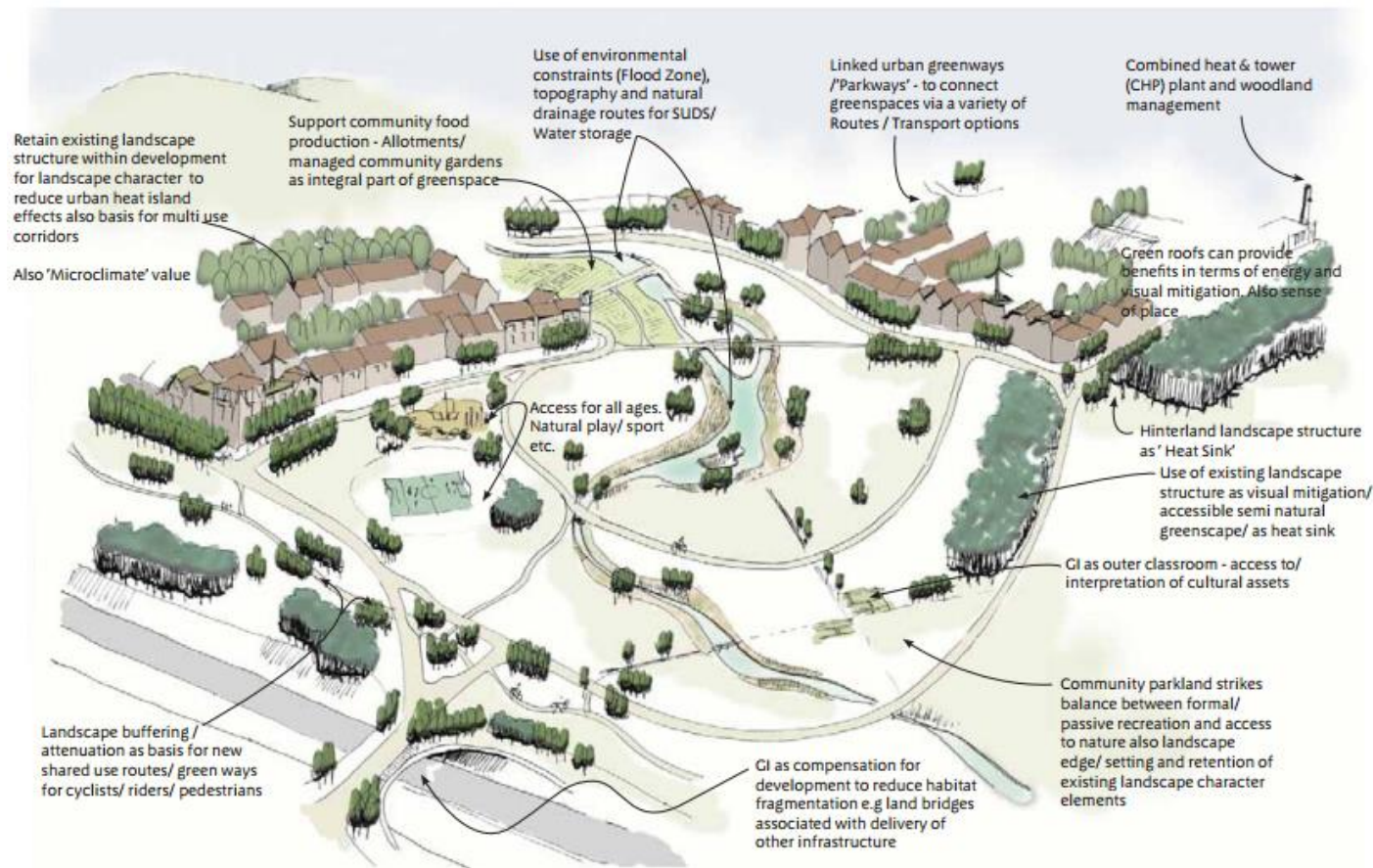


Figure 5.4: Schematic Plan of Green Infrastructure Multiple Functions and Place Making (Natural England 2009)

3. **Implementation** – consideration of the processes and strategies required to implement schemes and deliver the aspirations of the master plan on the ground amongst the changing economic, social and political climate.

The action plan for implementation of GI on the ground should include details of the proposals for the long-term delivery of the projects and show the funding sources and allocation of resources including provision for the long-term management of the GI elements (see Section 5.3).

The Implementation Phase should include:

- A schedule or timetable of progress
- Funding sources
- Delivery vehicles or agency
- Partners in local delivery
- Marketing
- Management and maintenance strategy
- Risk analysis

Delivery of a high quality design should be achieved by:

- Detailed design brief
- Design guidelines and codes
- Team of specialists – architects, engineers, designers
- Find appropriate development partners
- Monitor proposals against the master-planning principles
- Review and/or amend if baseline conditions change



### 5.2.3 Master Planning and Implementation: Case Study – Ashton Green

<http://www.leicester.gov.uk/your-council-services/ep/economic-regeneration/regenerationnews/ashtongreen/masterplan/>

Ashton Green is a 135 ha site to the north-west of Leicester which was granted outline planning permission for large-scale major development in 2011 for mixed use development. The site is approximately 3.2 miles from the city centre and consists predominantly of farmland, existing natural features and wetland. A Country Park with a Scheduled Monument lies to the west of the site and Birstall golf course is located to the east. The majority of the site is owned by the City Council and is allocated for residential development in the Local Plan with a green wedge to the north, east and west. Figure 5.5 shows the Master plan layout proposed for Ashton Green in 2010.

A Development Team approach has been used to promote the site with a Project Board set up to cover the many specialisms within the Council such as planning, urban design, housing, transport and ecology along with individual working groups set up to deal with specific issues.

Extensive public consultation, assessment of needs and analysis of opportunities resulted in an indicative master plan being submitted with the outline planning application in 2010.

In 2012 the City Council announced the intention to prepare a detailed delivery strategy for the implementation of the permission. A new approach to delivery is being adopted with the City Council acting as lead enabler and offering small parcels of land for development. Conditions require a number of strategic documents including a Green Infrastructure Strategy which will outline in detail the expected design standards of the different types of GI and when it will be delivered.

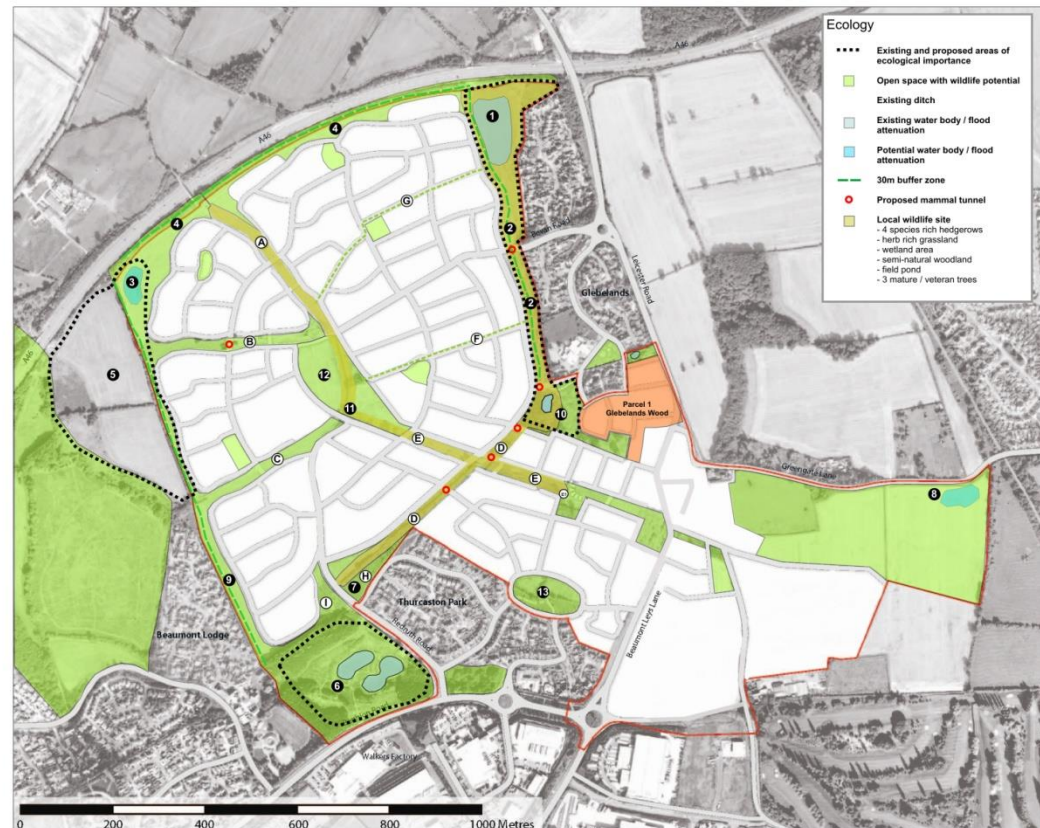


Figure 5.5: Ashton Green Master plan Layout (2010)

Whilst this is an on-going process and open to review, the Council in its initial role of promoter/enabler will provide some of the early key infrastructure that is required. The site-wide Green Infrastructure Strategy will time-table the processes necessary for delivery.

The GI Strategy will be available on the City Council Ashton Green webpage which details the progress being made in the design and implementation of GI and acts as a useful case study at a local level, particularly with regards to design guidance to fully inform developers of the requirements and standards expected within each area. This is particularly relevant as it is likely that sections of the site will be developed by a number of developers.



Figure 5.6: Ashton Green Illustration of Proposed Design Schemes

The figures show the process of master-planning at a whole-site level, to more specific village neighbourhood and rural fringe communities that will encompass the site and provide different areas with a sense of place.



Figure 5.7: Ashton Green – Bradgate Ride (proposed highstreet)

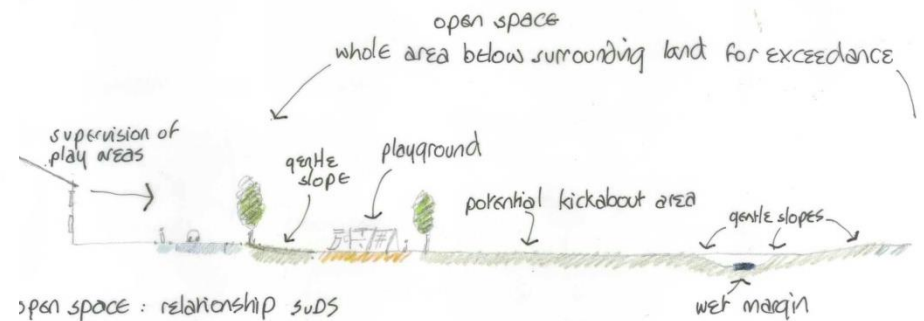


Figure 5.8: Ashton Green Cross-section of street-scene

### 5.3 GI Management and Maintenance



**Figure 5.9: Green Infrastructure Incorporated Within the Olympic Park**

The management and maintenance of a site goes hand-in-hand with funding and will vary depending on the funding and management approach taken. There are a number of factors that need to be taken into consideration which include:

- The specific characteristics of the site
- The type of GI created
- If the GI is on-site and directly related to development
- If the GI is off-site and provided via contributions
- Aspirations of stakeholders

The National Planning Policy Framework (NPPF) requires any development to be sustainable and genuinely sustainable development depends on appropriate long-term management and maintenance of the site's assets, including GI. Preparation of management plans as a requirement of planning (for a 5 or 10-year period depending on the complexity of the site) will ensure an agreed approach that can be enforced through the planning system. Currently, planning conditions are attached to specify the management requirements and applicants are required to provide detailed plans of maintenance. An example of where this has been implemented is at the Olympic Park where a 10-year Management and Maintenance Plan has been prepared by the Olympic Delivery Authority (ODA) – see Figure 5.9.

Even where GI interventions have been introduced on existing sites or within POS, a long-term management plan, accompanied by maintenance schedules will help ensure that appropriate management is continued to maximise benefits. The Royal Parks have adopted this approach by ensuring that stakeholders have an input into the Plan and that the Royal Parks can follow a “demand-led” approach to funding which subsequently provides evidence for funding requests and ensures that investment is made in appropriate areas of the park maintenance and management programme.

Opportunities to provide multi-functional GI can be maximised by creating more ecologically self-sustaining habitats and areas of recreational use and have potential to reduce costs over the long-term following initial establishment. This approach requires skilled staff to ensure appropriate and effective management and this aspect is addressed in the next section.

### 5.3.1 Resources for Long-term Maintenance of Green Infrastructure

Securing long-term commitment to funding and management arrangements of green space are challenging with previous methods advocating POS be managed by local authorities with contributions for the initial upkeep made by developers and long-term management funded by council tax revenue. It is critical that ongoing management and maintenance is factored in from the start and GI aspirations are designed accordingly and realistically.

Whichever organisation manages or oversees the management of the GI, it is important that staff are trained and have the skills to manage such areas to achieve optimum conditions in a cost effective and sustainable way. The costs of training staff, together with appropriate monitoring and review should be considered and included in any Management Plan for the site. Alternative ways of managing green space are increasingly being implemented as private landscaping/conservation companies or Trusts are formed that directly compete with LAs.

**An Independent Trust** – Where a developer may be committed to deliver GI as part of the development intent rather than as mitigation, then long-term maintenance costs need to be accounted for in the same way as building or other service maintenance. An example of this already exists at Hamilton where areas of green space and SuDs are managed by the Greenbelt Group and the land remains in the ownership of the Hamilton Trust.

**Management Companies** – independent companies with landscaping and nature conservation skills has steadily increased and is used largely to manage areas that are not publically owned. Examples include land owned by water companies or large businesses that can own important GI assets. Some local authorities have tendered work to local contractors for highway verge maintenance.

**Not for Profit Organisations** – Such organisations in Leicester include The Conservation Volunteers (TCV) and Leicestershire & Rutland Wildlife Trust (LRWT). TCV manage areas of green space in the City via a Service Level Agreement (SLA) with the City Council. As a not-for-profit organisations with charitable status they have they are able apply for funding through their national or local branches to fund development and on-going management of green space, usually with a community-based focus and work in partnership with the City Council.

**Volunteers and Local Communities** – can contribute time and labour to help maintain and manage areas of green space within a local area which particularly helps with local ownership of a site. Community-based projects can often attract small grants from local and national sources for capital works which they then help to maintain in the future. Examples include Castle Hill Country Park where local residents have set up a group and the First Group Pocket Park which is private land owned by the bus company First Group plc, which employees of the company volunteer to improve its nature conservation value.

There is potential for health benefits from having local communities supporting maintenance of green space beyond that of green space itself. These include improved physical and mental health, increased community engagement and social capital for those involved.

Table 5.2 shows options that have been implemented by a range of local authorities depending on the size, scale, administrative area and resources available. It is likely that within a complex network of green space such as exists in Leicester that more than one model for delivery will be used across the network and should be regularly reviewed. As the majority of green space in Leicester is still in the ownership of the LA it is advocated that the overall decision-making as to its future management is made by the City Council in consultation with other key stakeholders to achieve maximum efficiency, sustainability and benefits.

**Table 5.2: Potential Delivery Mechanisms for Green Infrastructure (Source: Buckinghamshire CC)**

Delivery Mechanism	Management Opportunities	Management Implications	Example where Implemented
<b>Local authority with in-house management teams</b>			
<p>The local authority employs an in-house team of skilled grounds maintenance staff.</p> <p>Ownership of the GI assets and the associated legal responsibilities remain with the local authority</p>	<ul style="list-style-type: none"> <li>The local authority has direct control over the management and maintenance of the GI assets and is able to ensure maintenance operations are carried out to the required standard.</li> <li>Directly employed staff provide flexibility and responsiveness.</li> <li>Funding is provided annually and the local authority is not generally reliant on the GI asset to generate income.</li> <li>The grounds maintenance staff would be responsible for only maintaining the green spaces within the City imparting a sense of ownership</li> </ul>	<ul style="list-style-type: none"> <li>Local authority budgets are reviewed annually with the budgets for green spaces often competing with other local authority services.</li> <li>The local authority would need to cover the costs of managing a team of dedicated staff (e.g. staff salaries, Insurances and administration support) as well as providing appropriate facilities, equipment, and vehicles.</li> <li>Additional funding may be available but will be dependent upon resources and the potential for development.</li> </ul>	<p>City of London City of Leicester</p>
<b>Local authorities in partnership with private contractor</b>			
<p>Management of GI assets is through local authorities' parks team with support of a private grounds maintenance contractor.</p> <p>Ownership of the GI assets and the associated legal responsibilities remain with the local authority.</p> <p>NB: The local authority may retain a small team of in-house staff to carry out specialist horticultural operations or to maintain key GI assets.</p>	<ul style="list-style-type: none"> <li>The local authority has direct control over the management and maintenance of the GI assets and is able to oversee the contractor to ensure maintenance operations are carried out to the required standard.</li> <li>Funding is provided annually and the local authority is generally not reliant on the GI asset to generate income.</li> <li>The grounds maintenance contractor can spread the costs of delivering the maintenance operations over a number of sites (economy of scales) reducing the overall delivery cost to the local authority</li> </ul>	<ul style="list-style-type: none"> <li>The local authority will need to monitor the grounds maintenance contract to ensure that required operations are delivered on time and to the specified standard.</li> <li>Depending on procurement procedure adopted by LPA, internal pressure to reduce costs may lead to accepting low cost tenders from grounds maintenance contractors which may lead to a decline in the quality of GI assets.</li> <li>Local authority budgets are reviewed annually with the budgets for green spaces often competing with other local authority services.</li> <li>Additional funding may be available but will be dependent upon resources and the potential for development</li> </ul>	<p>Buckinghamshire County Council/district councils Runnymede Borough Council London Borough of Camden</p>

Delivery Mechanism	Management Opportunities	Management Implications	Example where Implemented
<p><b>Public sector partnership</b></p> <p>Local authorities and other public sector Organisations pool financial and management resources and adopt a combined regional or sub-regional approach.</p>	<ul style="list-style-type: none"> <li>The local authority has direct control over the management and maintenance of the GI assets and is able to oversee the contractor to ensure maintenance operations are carried out to the required standard.</li> <li>Funding is provided annually and the local authority is generally not reliant on the GI asset to generate income.</li> <li>The costs of delivering the maintenance operations can be shared by the local authorities.</li> <li>Potential for additional sources of funding and expertise.</li> <li>Potential to link with voluntary schemes to provide training and education.</li> <li>A broader spread of resources available to secure external funding.</li> <li>A strategic approach to management can reduce maintenance costs allowing more resources to be used on other GI assets</li> </ul>	<ul style="list-style-type: none"> <li>There may be competing interests in the management of the GI assets.</li> <li>Local authority budgets are reviewed annually with the budgets for green spaces often competing with other local authority services.</li> <li>Additional funding may be available but will be dependent on resources and the potential for development.</li> </ul>	<p>Lee Valley Regional Park</p>
<p><b>Charitable trusts</b></p>	<ul style="list-style-type: none"> <li>The Trust would be formed of a dedicated team responsible for the management and maintenance of the specific GI asset.</li> <li>Trusts have financial benefits including tax relief and are eligible for a greater range of external funding.</li> <li>There are opportunities for local ownership and social enterprise to be realised through the development of a trust</li> </ul>	<ul style="list-style-type: none"> <li>The Trust would need to ensure that the required skills and knowledge are available.</li> <li>Unless the Trust has income from an endowment or through rent received from property, they will need to be continually exploring funding opportunities. A dedicated funding arm to the Trust may need to be set up.</li> </ul>	<p>The Rockingham Forest Trust Milton Keynes Park Trust Bank Side Open Spaces Trust (the London Borough of Lambeth) Coin Street Community Builders (Southwark)</p>
<p><b>Community Interest Companies</b></p> <p>Limited companies are formed with the primary purpose to provide benefits to the community</p>	<ul style="list-style-type: none"> <li>There are opportunities for local ownership and social enterprise to be realised through the development a limited company.</li> <li>The company would be formed of dedicated staff responsible for the management and maintenance of the GI asset.</li> <li>Capped dividends can be paid to shareholders to encourage investment.</li> <li>Compared to charities they are not subject to onerous regulations and are free to operate more commercially than charities.</li> <li>A charity may own a CIC and the CIC is permitted to pass assets to the charity</li> </ul>	<ul style="list-style-type: none"> <li>The assets of the CIC must be used for the benefit of the community.</li> <li>The business would have to be viable so will therefore need to generate enough income to cover all management and maintenance costs as well as ensuring that the activities are benefiting the local community.</li> <li>Charities have certain tax advantages that CIC do not have</li> <li>Grants may be available dependent on the expected activity</li> </ul>	<p>Colne Valley Community Interest Company</p>

Delivery Mechanism	Management Opportunities	Management Implications	Example where Implemented
<b>Boards of Conservators</b>			
<p>Statutory bodies established to manage publicly accessible land (usually registered common land) under the powers of the Commons Act 1876 and confirmed by one or more individual Provisional Order Confirmation Acts. Conservators can register as Charities</p>	<ul style="list-style-type: none"> <li>• Purposes and powers of Boards of Conservators vary according to circumstances.</li> <li>• Purposes tend to include maintaining natural beauty and biodiversity; securing open space for public recreation and enjoyment; protecting the rights of registered commoners; and preventing encroachment.</li> <li>• Boards usually include representatives of landowners, commoners and local authorities and may include representatives from local communities and user groups.</li> <li>• Well suited to managing complex sites with a range of owners and local authorities (such as the Chilterns Conservation Board and the Malvern Hills).</li> <li>• Conservators can use their charitable status to raise money and apply for funding, and can use their statutory management status to apply for and manage agri-environment funding</li> </ul>	<ul style="list-style-type: none"> <li>• Require primary legislation to be established.</li> <li>• No recent examples of new Boards of Conservators</li> <li>• Would require agreement of land owner.</li> <li>• Most suitable where land is registered common land or where it is owned by the local authority or another public body.</li> </ul>	<p>Chilterns Conservation Board; Malvern Hills Conservators</p>
<b>Private management companies</b>			
<p>Private management companies will be responsible for managing GI assets associated with a specific development.</p> <p>Legal responsibilities are transferred to the management company.</p> <p>The existing green space resource would be managed by the local authority</p>	<ul style="list-style-type: none"> <li>➤ The responsibility for the managing the GI asset is held with the private management company reducing the risks to the local authority.</li> <li>➤ Long-term investment in the GI asset is ensured.</li> <li>➤ Private companies may have access to funding streams not available to local authorities.</li> <li>➤ Service charge could also be used for creating new spaces or management fees may be applied on new development.</li> </ul>	<ul style="list-style-type: none"> <li>➤ The local authority would have very limited control over the management of the GI asset and influence over the management would need to be secured through planning and legal agreements.</li> <li>➤ This vehicle may only be suitable for sites within proposed residential or commercial developments so wider GI assets would need to be managed by a complementary vehicle.</li> </ul>	<p>Canary Wharf, London Greenbelt Group, Hamilton Bradgate Heights Ground Zero – for Severn Trent Water NHS Trust Sites - Leicester</p>

## 5.4 Adaptation and Retrofitting Green Infrastructure

There are a number of opportunities to retrofit GI in urban environments. These can be realised through SuDs – integrated into streetscape and traffic calming schemes or play areas; green/brown roof systems and roof gardens; green walls; management of roadside verges, temporary use of brownfield sites and naturalisation of river corridors. Each opportunity is described briefly in the following sections.

### 5.4.1 Sustainable Urban Drainage

Sustainable Urban Drainage Systems (SuDs) can be designed into a new development (requirement under Flood and Water Management Act 2010) and following an agreed design will be adopted by the LA. If the design fails to meet the requirements of the SAB (SuDs Approval Body) the LA is not obliged to adopt the scheme. It usually includes measures such as swales, ponds and planted filter strips at street level which form components that can connect the urban green network. The design should incorporate features that will have multiple benefits such as sense of place and amenity value, biodiversity as well as water related benefits such as flood alleviation, water storage and water filtration which will control flow rates, reduce flood risk and improve water quality (See Figure 5.10).

Details of design and maintenance are contained in the recently published Leicester City Council Guide to Sustainable Drainage. The Guide also contains a useful Checklist on what information is required to be submitted with development applications (<https://www.leicester.gov.uk/media/179759/suds-guidance-april-2015.pdf>).

Depending on the type of water control required there are a number of alternatives listed below. Over the last few years there have been an increasing number of SuD schemes incorporated into either POS or that form an integral part of a new development scheme in Leicester. Examples include the wetlands at Abbey Meadows, Castle Hill Country Park and Aylestone Playing Fields; basins and balancing ponds within new development at Glenfrith and Barkbythorpe; swales at Hamilton, roadside verge at Bennion Road and Rowley Fields School and porous paving at Leicester College and Glenfield Hospital. The list is not exhaustive, but provides a useful series of case studies from which to build on. Many schemes have also been recently approved on planning applications and a range of management and maintenance plans have been agreed which range from contributions and formal adoption by the LA to management by a Trust or Green company set up by the developers.



**Figure 5.10: Wetland Benefits – Water Control and Biodiversity near to National Space Centre, Leicester**



Examples of SuDs types and methods that may be considered appropriate are provided below. No one size fits all and as new ideas and concepts are implemented, the number of relevant case studies and examples are increasing. It is important to keep up with relevant technologies, advice and legal requirements in order to develop the most effective scheme for the level of use required.

### Source control; where rainwater falls

- Rainwater harvesting
- Soakaways
- Porous pavements
- Green roofs



Figure 5.11: Road Verge Infiltration Trenches



Figure 5.12: Swales Taking Water from Housing Areas to Main Water Courses

### Site control

- Infiltration devices-below ground or surface structures to drain water directly into the ground such as - infiltration trenches, swales, infiltration basins, filter strips and swales
- Oversize storage tanks for use where underlying is impermeable or within flood zone

### Regional control

- Basins and balance ponds; the difference being that basins are free from water in dry periods, ponds contain water at all times,
- Such as -detention basins, balancing/attenuation ponds, flood storage reservoirs, lagoons, retention ponds and wetlands/reed beds.



Figure 5.13: Wetland Lagoons and Reedbeds, Hamilton Housing Scheme

## 5.4.2 Green Roofs and Walls

The use of green roofs and walls as a means to achieving a number of functions and benefits to the areas in which they are sited is steadily increasing at an international and national level. The focus is on their installation within a City centre or sub-urban location where the maximum number of benefits may be achieved and include urban drainage, improved micro-climate and air quality; energy conservation and carbon reduction; enhanced biodiversity; amenity and health; noise attenuation; extension of roof life and potential marketing and investment benefits.

Currently Leicester has a limited number of green roofs located mainly on buildings used by the public, but not necessarily in the ownership of the local authority. Examples include the VAL Centre, University of Leicester Medical Centre, Charles Street Police Station and the Emerald Centre. The installation of these structures is largely due to the individual organisations wish to design a sustainable landmark building and contribute to the knowledge and use of such buildings in future design rather than any legal or planning requirement.

A green wall is being designed on a new-build development at the University of Leicester. This will be the first example of this technology for the City and will provide a useful study of the construction and maintenance of such as system.

Evidence relating to the benefits of climate change and biodiversity in particular and information regarding the storage capacity of roofs designed at varying capacities to aid evaporation, use within buildings or to sustain vegetation is available on the internet and via links below.

The Green Roof Centre has produced a Code of Practice for green roofs in the UK and provides useful information on the benefits of installing these structures, design guide and techniques as well as maintenance and likely costs incurred. <http://www.thegreenroofcentre.co.uk/Library/Default/Documents/GRO%20ONLINE.pdf>

The cities of London, Sheffield and Manchester are leading the way on the guidance and implementation of green roofs within their cities and can provide examples of significant schemes that have been implemented in the last 10 years. For example see Sheffield Climate Change and Design SPD (2011)

<https://www.sheffield.gov.uk/planning-and-city-development/planning-documents/local-plan/supplementary-planning-documents/climate-change-and-design-spd.html>



**Figure 5.14: Example of Green Roof in an Urban Setting (Islington Borough Council)**

Currently Leicester has reference to the installation of green roofs/walls within several key documents including the Climate Change Adaptation Strategy where the benefits of installation are advocated; the City Biodiversity Action Plan which promotes the use of green roofs for provision of wildlife areas and the Sustainable Drainage Guidance which promotes green roofs/walls as part of an overall package of sustainable drainage techniques used to control water flow, water quality and biodiversity.

Reference is also made to the installation of green roofs within Planning Policy Leicester's Core Strategy which underpins the desire to install green roofs.

### **CS Policy 2 Assessing Climate Change and Flood Risk**

*Paragraph 4.3.18 New development **should** incorporate the principles of Sustainable Drainage Systems (SuDS) which aim to control surface water run-off as close to its origin as possible and often mimic the natural processes of undeveloped land. SuDS provide multiple flood risk, water quality, amenity and biodiversity benefits and the variety of SuDS techniques allows them to be widely applied to developments when appropriately designed. Techniques including **green roofs**, wetlands, ponds and swales will be encouraged.*

*Section 7 Green Infrastructure should be used as a way of adapting and mitigating for climate change through the management and enhancement of existing habitats and the creation of new ones to assist with species migration, to provide a source of locally grown food through local allotments, to provide sustainable transport routes, to provide shade and counteract the urban heat island and for flood mitigation strategies*

*Section 8 Existing development **should wherever possible** be adapted to climate change and help contribute to the reduction in carbon emissions by, where appropriate, including the introduction of **green roofs**, micro-renewable energy, recycling facilities, building efficiency measures and cycle parking.*

The principles of urban drainage are now supported by the Flood and Water Management Act (2010) with regards to control of water flow and reduction of flood risk. The measures taken are largely accepted and achieved via a number of techniques such as rainwater harvesting, swales, wetlands, and flood attenuation ponds. However, there are further opportunities through green roof construction in Leicester. The priority should be on sites where they are most required and where the impacts of urban heat island effect, flooding, health and well-being and biodiversity can be mitigated. It is possible to identify such areas by overlaying flood maps, areas of non-GI/green network and high temperatures where efforts to incorporate green roofs should be concentrated.

Sheffield provide an example of how policy influence can achieve actions and targets set and so contribute to the LA statutory responsibilities of combating climate change, having regard to biodiversity; alleviating flood risk and improving water quality.

#### **Guideline CC1 Sheffield City Council Climate Change and Design SPD (2011)**

Provided they are compatible with other design and conservation considerations, and where viable, green roofs will be required on all larger developments, and encouraged on all other developments. The green roof should cover at least 80% of the total roof area.

#### **Definitions:**

'**Green roofs**' – roofs on which plants are grown. Modern green roofs involve re-creating natural environments using a multi-layered system, and can take various forms.

'**Larger developments**' – 10 or more dwellings, or more than 1,000 sq m gross internal floorspace.

### 5.4.3 Urban Trees

Urban trees are an integral part of Green Infrastructure and provide multiple benefits that can be delivered through a well-planned planting and maintenance tree programme. Benefits associated with trees are shown in Figure 5.15 have been well-documented and are summarised below:

- **Economic benefits** – include flood management and alleviation to reduce flood risk through evaporation, root absorption; increased investment related to house-buying, business location and tourism by enhancing visual amenity and attractiveness of an area and increase in property values.
- **Environmental benefits** – include climate control through air cooling in summer months, habitat provision and migration routes for wildlife, reduction in surface water flooding and filtration of pollutants
- **Social and cultural benefits** – include outdoor areas for recreation, transport, education and relaxation.

Urban trees are however perhaps the most vulnerable of our vegetation types in the City despite also having the ability to provide maximum benefits. Often seen as a hindrance, there is concern at the clearance of trees to make way for new development; highway maintenance, road widening or creation of new link roads; backland development and loss of trees from private gardens.

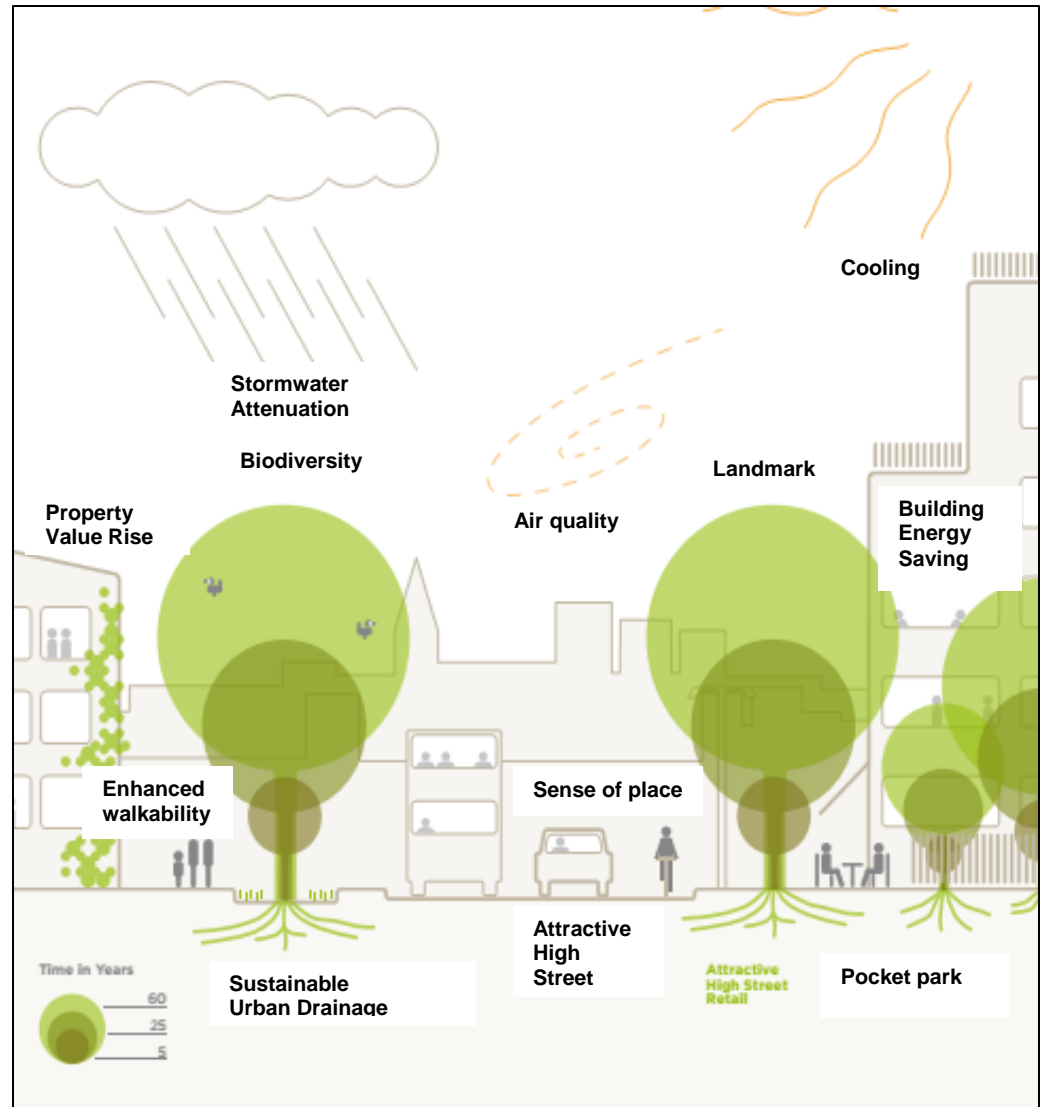


Figure 5.15: Green Benefits Associated with Trees in an Urban Environment

A mix of Action Plans, Policies, SPDs and linked strategies influence how the trees are currently managed in Leicester (e.g. Tree Protection City Wide Guide SPG 2003; Public Realm Strategy – Tree Planting Strategy Section; Climate Change Adaptation Plan – A Low Carbon City 2013 – Tree Strategy Action; Leicester City BAP 2011-2021 – Habitat Action Plans for Woodlands & Spinneys/Veteran Trees; Leicester Transport & Asset Plan 2011-2015 – Chapter 9 Tree & Landscaping Management Plan), British Standards, previous Tree Strategies (1986, 2007) and Planning Policy related to National Planning Policy and Core Strategy Policy 13 Green Networks/ Policy 17 Biodiversity – although direct reference to trees is limited.

In recent years Leicester has had two large-scale tree-planting programmes that have been aimed largely at community planting



#### **The 10 000 Tree Project**

Aim: To plant 10 000 new trees in Leicester 2007 - 2011

Planting: In parks, residential areas, street trees, schools, cemeteries, allotments

#### **The Big Tree Plant**

Aim: To plant 1 million trees over a 4-year period across England

Groundwork national initiative to support tree planting in local community areas to help develop urban areas – scheme supported by local Groundwork Leicester & Leicestershire

**Figure 5.16: 10,000 Tree Campaign, Leicester**

As the evidence base grows in support of maintaining a population of trees varying in age, height, physical structure and species type dependent on planting conditions and requirements, it is recommended that the Tree Strategy is updated to inform, protect and conserve the existing tree stock and plant trees in areas of most need.

Figure 5.17 shows the locations of street trees across Leicester. In order to achieve maximum benefits it is important that Leicester has a full understanding of its current tree resource and a strategy which will inform on:

- Gaps in the green network linkages and where new tree planting may be required
- Protection and conservation of trees within Conservation Areas
- Protection and conservation of trees designated with a Tree Preservation Order (TPO)
- Trees of wildlife value designated or meeting the criteria for designation as a LWS for their biodiversity value and ability to support wildlife
- Trees within development sites
- Trees on private land including gardens

Leicester City Council has benefitted from having a specialised and well-qualified Trees & Woodlands team that manage trees located within POS. This includes any trees adjacent to highways, trees located within Parks, public gardens and cemeteries and those located within school grounds. In addition, the planning service provides advice, authorisation of works and oversees enforcement of works to individual or groups of trees with a TPO (Tree Preservation Order) and works to trees within Conservation Areas. Advice on planning matters related to development is provided by a specialist tree officer to ensure compliance with British Standards. Nature conservation staff provide additional advice on wildlife and biodiversity issues to the public, developers and private landowners.

Recommendations to support urban trees in Leicester are:

- **Establish tree resources** – The Trees & Woodlands team have an on-going programme of mapping trees in POS across the City and assessing TPO designated trees using the Ezytreev system. Details include the species type, age, girth, health. Other initiatives have been used to map areas using community and volunteers in other areas (case studies available)
- **Produce a Tree Strategy** – a collaborative strategy that is evidence based, provides accountability within a given timeframe and is supported by a robust planning policy in relation to trees.
- **Embed trees into Policy and other Plans** – clear standards of protection, care and planting of trees should be included in key corporate policy documents

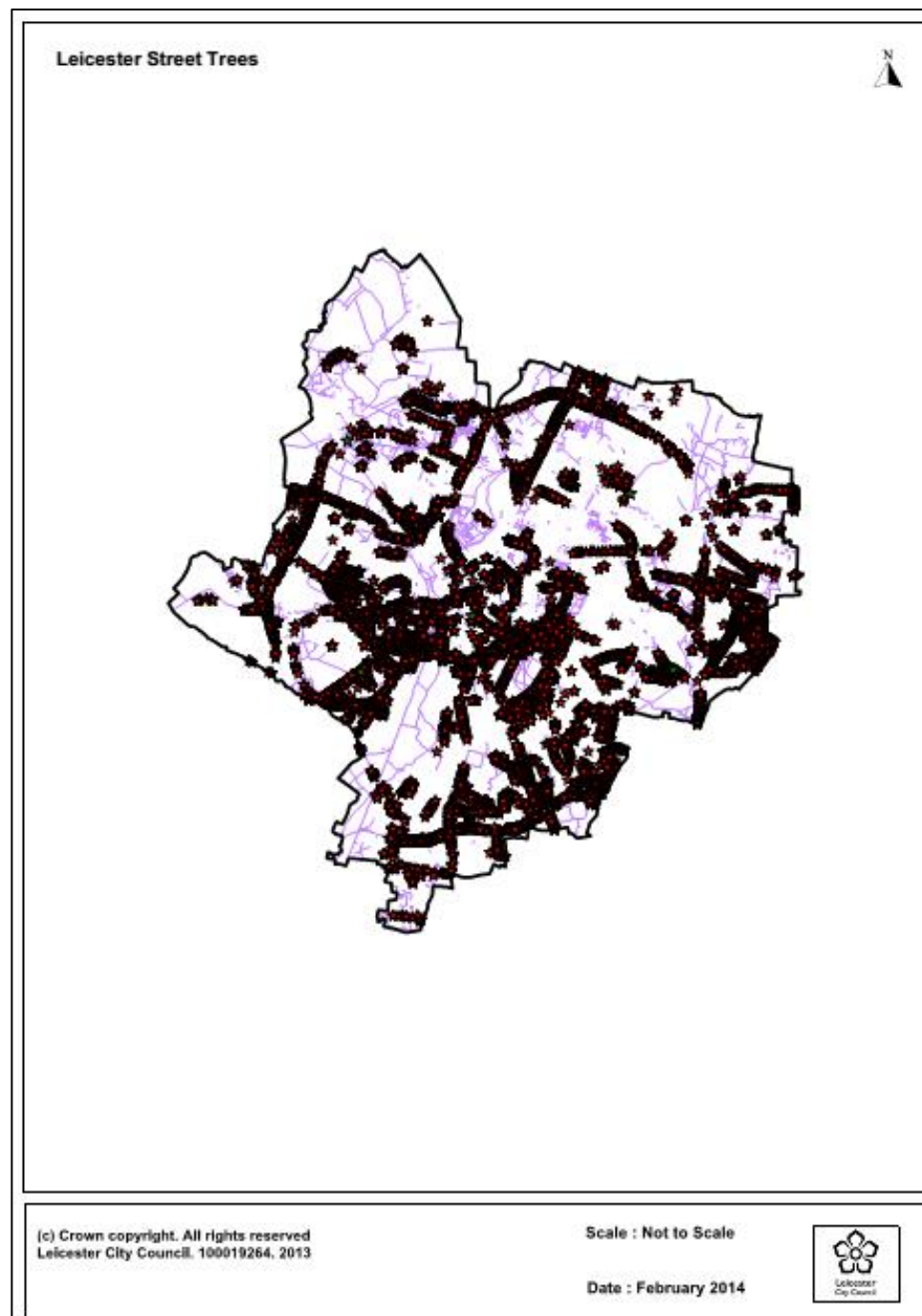


Figure 5.17: Plan of Street Trees in Leicester



**Figure 5.18: Tree-Lined Avenue at New Walk, Leicester – Popular with Pedestrians and Office Workers**

- **Plant the Right Tree in the Right Place** – create places where tree species can thrive and deliver multiple benefits without causing harm or nuisance. Planning planting for the long-term is necessary (50 year plus). Use of urban design principles to create leafy neighbourhoods and reduce risk of conflict between trees, buildings and people; selecting the right species will reduce risk of short-term failure and increase opportunities for trees to mature in the right settings.

- **Seek to Maximise Benefits of Trees** – whether advocating the retention of trees or planting of new stock – the benefits of each should be explored holistically when considering development and design – include flood alleviation, climate amelioration and cooling; health and air quality; biodiversity, public amenity, economy and investment

- **Increase Survival Rate** – plant healthy, vigorous trees that have been conditioned to thrive in the selected site – more cost effective (failure rate less, better value for money in procurement process); ensure that trees have adequate access to soil nutrients, air and water to fulfil growth potential and longevity

- **Work with others** – public and private landowners, politicians, developers, professionals (tree surgeons/consultants etc) conservation groups and individuals have an interest in urban trees and their welfare. Reduce pressure on internal resources and seek out other funding sources

- **Strategic Asset Management Planning** – taking an overall strategic approach to management of tree stock will inform all planning, management and investment decisions – should include a quantitative assessment of the costs of trees and their maintenance plus the value that trees can deliver (i.e. value in terms of other associated benefits)

- **Be Risk Aware (Rather than Risk Averse)** – taking a balanced and proportionate approach to tree safety management has been operated in Leicester in recent years. Assurances are necessary to meet the duty of care within budget constraints, but where possible trees can be wholly or partially retained to continue to support public amenity, biodiversity and other benefits.

- **Pro-active Tree Management** – tailoring tree management and maintenance to local requirements can ensure optimum benefits whilst responding to local needs. The City council seeks out new techniques such as tree veteranisation to improve the contribution trees can make to local biodiversity



**Figure 5.19: Avenues of Trees at Victoria Park, Leicester**

#### 5.4.4 Linear Routes and Corridors – Roadside Verges, Rights of Way



Roadside verges across Leicester vary in species diversity, proximity to other green space and soil/nutrient conditions. Some are already of wildlife value such as the Saffron Lane and Ethel Road verges designated as LWS for their species diversity and Coleman Road, Hockley Farm Road and Conaglen Road as Biodiversity Enhancement Sites because of their connectivity and ability to link to a wider network of green space. These areas function as wildlife corridors either in their own right or have capacity to be enhanced as part of the GI network to create multiple benefits such as biodiversity and dispersal routes, visual amenity and flood alleviation.

**Figure 5.20: Green pedestrian route – New Walk**

Many other areas of roadside verges and roundabouts are relatively species-poor nutrient-rich areas and some are mown regularly. Recent changes in the mowing regimes has enabled areas of longer grass and tall herb vegetation to establish during spring and summer with less frequent cuts on some verges. These areas along with the species-rich grassland areas are valuable for wildlife and provide urban havens for butterflies, bees and feeding areas for birds and bats.



**Figure 5.21: Wildflower meadow creation on busy carriageway**



A large number of roadside verges have already been identified in Leicester where it is possible to relax the mowing regime to encourage grasses and wildflowers whilst not impeding on road safety. An area of meadow has been created at Troon Way in partnership with Campaign to Protect Rural England (CPRE) to support pollinating insects and increase visual amenity. Where wildflowers are already persistent in these areas, it is advocated that the grassland management regime is relaxed and areas are cut in the spring and autumn by flailing to prevent the build-up of scrub and invasive vegetation.

**Figure 5.22: Troon Way Meadow – junction of Melton Road and Troon Way, Leicester**



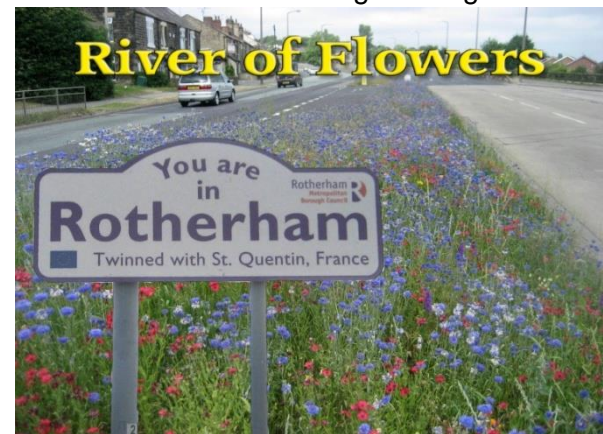
Opportunities to create linear corridors of species-rich vegetation are advocated to provide multiple benefits which include reducing the runoff from roads into adjacent areas; enhancing biodiversity value; improving visual amenity and potential for economic investment.

Areas of extensive grassland verges have also recently been identified as recommended allocated green space in addition to any biodiversity enhancement designations. These areas are likely to be a priority for enhancement either through changes in the management regime or species enrichment. Organisations such as Buglife and Landlife have successfully completed projects across the UK illustrating that attractive roadside planting can play an important role in improving the image of an area or enhancing approach roads to a City, local school or park.

Several local authorities have used this approach to create areas of wildflower planting, for example Rotherham with their extensive “River of Flowers” campaign along a 7 km stretch is one of many towns and cities across the world that have joined the Rivers of Flowers campaign. Leicester has opportunities to take part with verges along the main arterial roads into the City and the outer and inner ring roads providing a main focus to link areas of existing meadow and to provide an attractive route along which many commuters enter the City.

A range of roadside mixes can be seeded into areas to meet with conditions required, for example, for a short or a tall verge and that are suitable for mainly clay or calcareous soils found in the City,

Areas of species-rich roadside verge should only be created on areas that are species-poor but have the capacity to connect to other areas of green space or newly created grassland verge. After the initial preparation which will involve flailing and killing off existing vegetation, followed by seeding, areas should be cut with a flail mower when grass height reaches 50 mm in the first year and then cut only once in April and again in September in subsequent years. This instigates a management regime that is both sustainable and capable of providing several benefits to the wider environment.



**Figure 5.23: Wildflower Grass Verge Meadow Planting (Rotherham City Council)**

#### 5.4.5 Greening Brownfield Sites – temporary/permanent use of derelict sites

Brownfield land is defined as previously developed land (including “wasteland”) which is now unused, neglected or cleared and includes former industrial and mineral extraction sites, spoil heaps etc. Other terms used to describe these areas are “derelict”, “abandoned” or “idle” but they reflect the changing landuses of these sites that are a feature in all of our towns and cities. Such sites can support rare and important plant species including bee orchids and 12-15% of Britain’s nationally scarce and rare species categorised as red data book species are found on such habitats. Invertebrates in particular are associated with this sparsely vegetated habitat.

Almost 1.5% of Leicester is classified as derelict land most of which is found in the inner City centre where demands for change of landuse and development are at their greatest. Brownfield sites are currently focused around the regeneration areas of Abbey Meadows/Wolsey Island and the Waterside where the heavy industries of the hosiery and shoe trade once thrived in the nineteenth and twentieth centuries. These sites have

been largely cleared and opportunistic vegetation such as buddleia, bramble, self-set trees and tall ruderal vegetation have seeded. In this state the sites can provide some benefit to wildlife associated with such transitional habitats, but little else. Often, they are areas that can attract anti-social behaviour and fly-tipping or illegal trespass; they can be viewed as highly unattractive and neglected, and in turn can depreciate land values and investment in an area dominated by such land use.



Figure 5.24: Potential Short-term Use of Land, Wolsey Island



Many brownfield sites are in private ownership, having been purchased for future development, but remain un-developed for periods of time due to legal wrangles or changes in the economy whilst other areas are owned by the City Council. Opportunities, however, may be available for either

- i) **Permanent** green space sites on former industrial land; OR
- ii) **Temporary** green space sites on former industrial land

Figure 5.25: Wildflower Meadow on Brownfield site © Ecoseeds  
<http://www.ecoseeds.co.uk/urbanplantingschemes.htm>

The potential types of use and management of these wildlife areas would allow pioneer species of vegetation to take hold and provide an open mosaic that will support selective species, particularly invertebrates; other sites may be more suitable for seeding with wildflowers and grasses to create an easily managed and sustainable landscape; whilst others areas could be used as temporary food-growing sites with raised allotment beds, fruit trees and container planting.

All these options can provide multiple benefits in the short, medium and long-term that will help meet the main objectives of the GI strategy.

#### Supporting a Bio-diverse and Beautiful Place

- The types of habitats will bring a benefit to wildlife, particularly in the inner City where areas of green space are limited and will help in connecting sites to the wider green network to parks and gardens as well as the river and canal corridor flowing through the City.

#### Supporting a Healthy and Active City

- Attractive areas of public amenity would be created and encouraging local residents and community involvement to use such areas to grow food or visit them would improve health and well-being benefits associated with green space and fresh food.

#### Supporting a Naturally Sustainable City

- Greening open land and hard surfaces on a temporary or permanent basis will reduce the solar radiation and accumulation associated with heat absorption and the urban heat island effect. Air pollutants and particles can be reduced by stabilising the ground on such areas and so improve air quality.
- Greening open land will also reduce the runoff rates onto surrounding land and enable some water to be absorbed by the vegetation. This in turn could reduce flood risk on some vulnerable areas of land or reduce the risk of runoff into adjacent water courses from derelict land and so assist in improving the general quality of water.



**Figure 5.26: Example of Allotment Use on “meanwhile lease”, St Leonards Allotment, East Sussex © Sally Walton**

## Supporting a Place to do Business and Get About

- A well-managed, attractive and well-used area of green space either as permanent or temporary feature could encourage investment in an area which may otherwise appear rundown. This will help the economy of Leicester and facilitate investment in areas most needed.

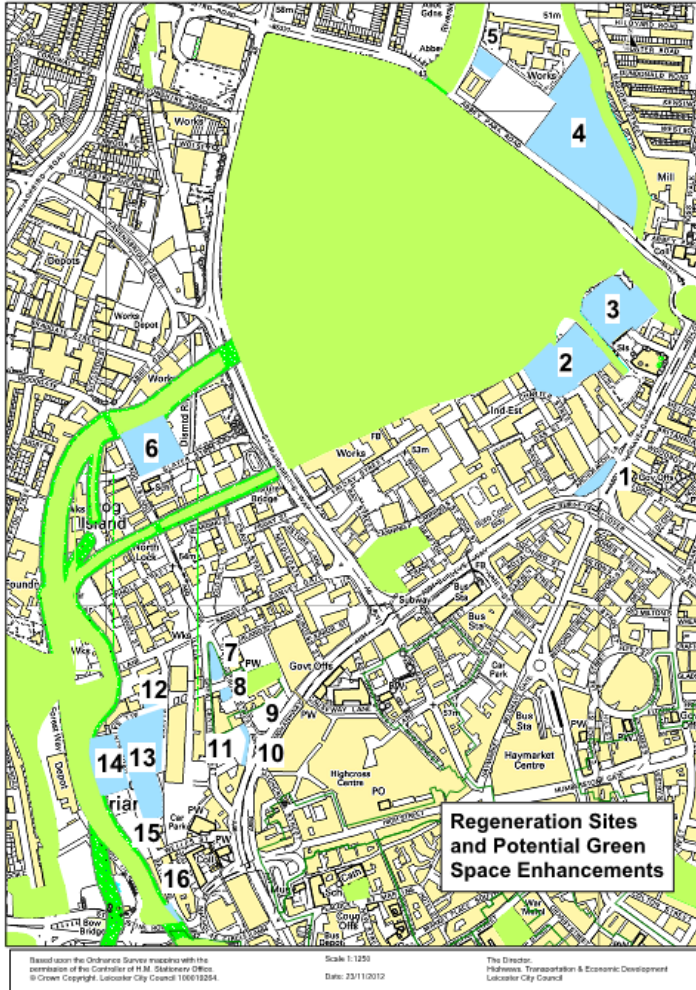


Figure 5.27 shows some of the land classified as brownfield (in blue) within the City boundary and indicates the high proportion of this landtype within the Regeneration Area. The green network (in green) shows the proximity of the water courses and other areas of green space or where there are opportunities to bridge the gaps in the green network by having a temporary or permanent green space.

Examples of where land has been used on a temporary basis are at the Community Gardens at Queen Elizabeth Hall, London and Canary Wharf. Good schemes have also been introduced on brownfield sites awaiting re-development in Sheffield and Liverpool. Leicester has a number of similar sites where “meanwhile leases” could operate to make temporary use of dysfunctional green space.

Organisations such as Landlife and Buglife have developed techniques in how to create and manage such landuse and opportunities are already present within Leicester to work with local conservation organisations and community groups to take on responsibility for the upkeep and management of such sites.

Appendix III shows a process to identify appropriate sites and transfer them into areas of green space (Forestry Commission 2007).

Figure 5.27: Plan of Areas of Classified as Derelict Land in Leicester

### 5.4.6 Naturalisation of River Corridors

Leicester has historically suffered from flooding with significant flood events having impacted on people and their homes and businesses. The EA and Defra have recently identified Leicester as being in the top ten indicative Flood Risk Areas within England and Wales with an estimated 36 900 properties at risk of flooding from surface water (SWMP 2012). The EA have also identified watercourses failing the Water Framework Directive on a number of levels including hydromorphology, water quality and biodiversity.

There are many watercourses within the administrative boundary, some of which are designated as Statutory Main River such as the River Soar and Rothley Brook whilst others are ordinary watercourses, many of which are culverted and artificially straightened. These are retained by formal engineered structures that the City Council has direct responsibility for. The main tributaries flowing into the River Soar where opportunities for GI may be present are the Melton Brook, Braunstone Brook, Saffron Brook and Willow Brook. These brooks have sections which were straightened or culverted following a severe flood event of 1968 and were constructed to swiftly divert flood waters down river and away from the city. It is accepted that these measures have provided some protection to residential areas in the city from flooding since their installation.



**Figure 5.29: Channelled brook – Netherhall Open Space**

Additional minor water courses where opportunities to naturalise the watercourses through GI improvements are located along the Hol Brook, Queens Road Brook, Portwey Brook, Gilroes Brook, Wash Brook, Ethel Brook, Thurmaston Parish dyke and Western Park Brook. All the brooks have a range of land types along the watercourses and include areas of POS such as parks or cemeteries; school grounds and playing fields, private land and back gardens, and industrial areas where the brooks may also be culverted underground.

Green infrastructure improvements such as naturalising the channelled sections of brook flowing through green space could provide multiple benefits to the residents of Leicester and contribute towards the objectives of other statutory authorities in improving water quality under the Water Framework Directive or to significantly reduce the risk of flooding in some areas. The main benefits identified are: reduction in flood risk; enhancements in biodiversity; improved visual and public amenity; improved health and safety; climate change amelioration, cooling and evaporation; health and well-being with encouragement to use safer more attractive areas; opportunities for recreation; and potential to increase investment or increase property prices by creating more attractive areas of green space.



**Figure 5.28: Channelled brook – Humberstone Park**

Leicester already has a good example of watercourse naturalisation at Spinney Hill Park where the Evington Brook has been naturalised from the highly-engineered channel flowing through the park into a natural system by creating a series of meanders, pools and riffles. The scheme on the park received funding from the Heritage Lottery Fund as part of an overall scheme to restore and improve the natural heritage of the historic park. Other features included placing several dipping platforms along the water course to encourage use by local residents and school groups.



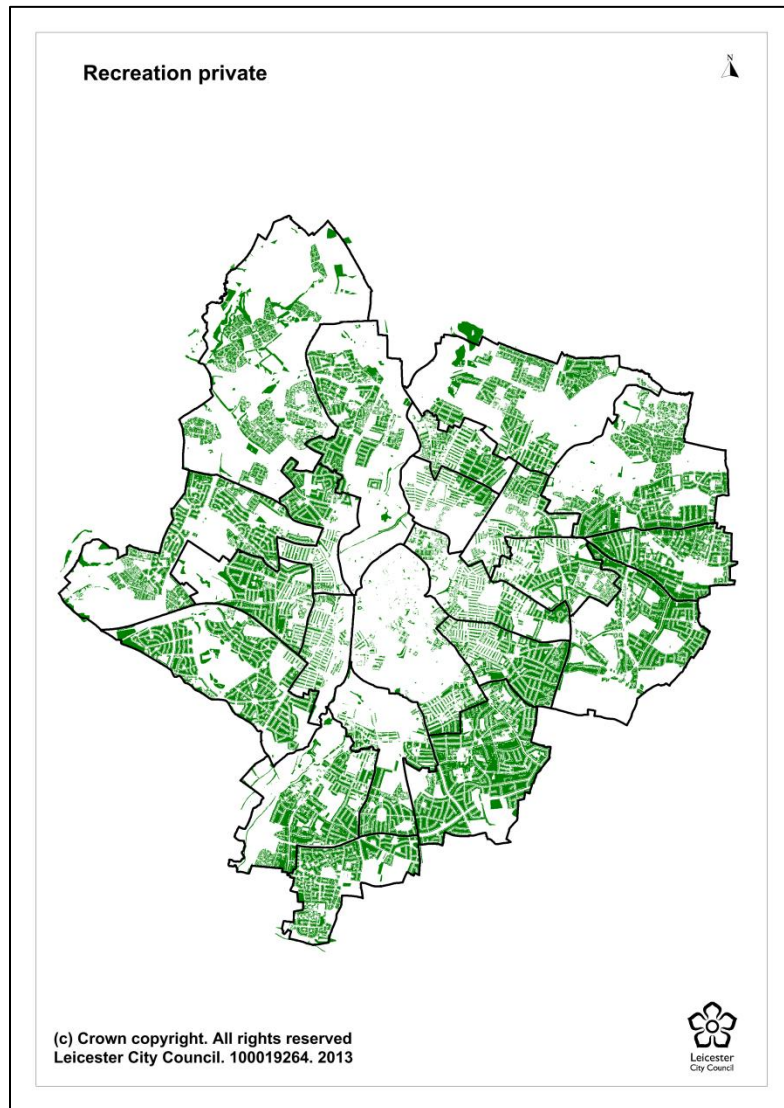
**Figure 5.30: Channelled Section of Brook at Spinney Hill Park Pre-works**

The scheme was highly successful as it transformed the park into an attractive and well-used area of green space and the water course is now an attractive feature that supports local wildlife including a large population of frogs, newts and kingfisher.



**Figure 5.31: Naturalised Section of Brook at Spinney Hill Park**

## 5.5 Private Gardens



Private gardens in particular have been shown to be of great importance to biodiversity as they contain a range of habitats from mature trees to areas of short or rough grassland, ponds, shrubs and bedding plants with a re-known thirty-year study of wildlife in a Leicester urban garden (Stoneygate) providing a relevant case study (Owen 2010). Such gardens often provide the connection between larger areas of green space and, in themselves, can provide large areas when several gardens back onto each other enabling species to move or disperse more easily and combat the impacts of climate change or physical barriers such as road and rail infrastructure

Figure 5.32 shows areas of private recreation with the largest sector taken up by private gardens. Gardens make up a significant amount of Leicester's land cover with approximately 25 % classified as private garden or backland. Research has found that such areas are valuable for both people and wildlife; and with climate change predictions, gardens as a method of storing carbon, combating the urban heat island impact and controlling temperatures have been identified from research which uses Leicester as a case study and example of a typical urban city facing these challenges – see 4M Project <http://mMMM.lboro.ac.uk/>

It is recommended that a two-tier approach is used to safeguard the existing GI asset and to maximise the functions this type of landuse can provide to Leicester irrespective of whether its residents have gardens of their own.

Figure 5.32: Private Garden Typology in Leicester

Firstly, a strategic approach is required as private gardens constitute the largest single type in the City and represent a major asset, but not one that can be easily influenced by policy. Although still classified as “green”, these gardens are under increasing pressure from development with sales of neighbouring back gardens forming one development plot; hard-landscaping areas with current trends towards decking and paved areas or parking areas, particularly to the fronts of properties. The suburbs of Evington, Knighton, Western Park, Rushey Mead and parts of Stoneygate and Aylestone are predominated by larger private gardens.

The Core Strategy (adopted November 2010) does recognise the importance of protecting neighbourhoods from inappropriate development and planning should play a key strategic role in advising and influencing this type of development.

Small scale infill sites can play a key role in the provision of new housing. However these should only be developed where damage can be avoided to the very qualities that make living in these neighbourhoods so desirable. Backland development is a significant issue in the suburbs, particularly in areas with larger gardens such as Aylestone, Evington, Knighton and Humberstone. The Council will therefore not permit development that does not respect the scale, location, character, form and function of the local area. Backland development should be compatible with the locality and any neighbourhood buildings and spaces in terms of design, layout, scale and mass. Development on garden land will not be permitted where it will have an unacceptable impact on levels of biodiversity in the neighbourhood.

Using other key legislation and/or strategies that indirectly influences the practices within private gardens should also be considered, such as protection of individual/group trees by designation with a preservation order; or consideration of works within gardens located within Conservation Areas that could impact on trees meeting a TPO criteria.

Secondly, raising awareness both collectively across the City and on a more personal note to residents with gardens in key areas and within new developments will influence how gardens can be managed to maximise their benefit for wildlife. The Leicester BAP recognises the importance of gardens for biodiversity and set an objective to “Consider potential approaches relating to the issue of the loss of back gardens to development and the impact on wildlife”. Planning guidance has been produced to assess the appropriateness of backland development proposals. This takes into account the potential impacts on the surrounding neighbourhood in terms of size and scale as well as sustainability and potential impacts on flooding, biodiversity, and transport network.

Working in partnership with other BAP stakeholders it will be possible to encourage, support and assist people throughout Leicester to value, conserve and enhance the biodiversity and wildlife in their gardens. By doing so, this will provide other multiple benefits such as climate change amelioration, public health, education and well-being, and investment in local areas.



## 6.0 Opportunities for Green Infrastructure in Leicester

### 6.1 Hotspots and Opportunities for GI – Priority Sites

This section identifies greenfield sites where opportunities for GI are present and potential benefits that could be achieved from the implementation of schemes. The list is not exhaustive and it is recommended that a partnership approach is taken to agree next steps and prioritise sites to meet the actions set out in this strategy and to link to other strategies and objectives of the City Council.

The section is divided into the following areas:

1. The main river and canal network
2. Areas to the west of the River and Canal
3. Areas to the east of the Canal

#### 6.1.1. *The River Soar and Grand Union Canal Network*

**Note: All areas within Table 6.1 are located within or adjacent to the fluvial flood plain**

Appendix IV shows the river and canal corridor from Birstall to Aylestone, public rights of way and areas of significant green space showing the current GI network (2014).

The Soar is a comparatively small catchment in the Midlands but is strategically important in a local context, flowing from south to north in a continuous green corridor through Leicester. To the south at Aylestone and the north at Watermead there are important areas of natural green space designated as “green wedge” that run alongside the river and which continue right into the urban area.

Along much of the river course, the Grand Union Canal runs in close proximity from the south of Leicester, meandering through the centre until eventually joining to the north by the National Space Centre to become a canalised river before separating again within Watermead Country Park.

The Soar and the Grand Union Canal are significant features within the City and their designation as a Local Wildlife Site (LWS) provides recognition of their importance as a habitat of quality and diversity as well as its provision for recreation and public access



Figure 6.1: Watermead Country Park Former Gravel-pit Site

Together the water network provides an interesting conundrum of opportunity and risk. Historically, a river and watercourse associated with flooding and destruction; flood alleviation in the past concentrated on heavily engineered drains and culverts to move water quickly from one area to another.

The canal and river were also a main focus for industry associated with a need for water – for power, cleaning, transportation of materials and disposal of waste. Being located next to the water was seen as a necessity and many of the major dye works, shoe and hosiery businesses associated with Leicester’s industrial heritage were sited alongside the watercourses.

Poor water and stinking water courses have been replaced by good quality, clear water with an abundance of aquatic plants and associated wildlife. A proportion of heavy industry and large redundant warehouses linked to former industries have been cleared in recent years to make way for high quality housing, clean innovative industries and services.

Improved environmental data linked to modelling of flood risk, wildlife and species presence; public recreation, and health and amenity use has enabled a master plan of specific areas along the river corridor to be developed.

The numbered sections illustrate potential areas for GI enhancements and opportunities to provide new GI capable of providing multiple benefits along the river corridor. Opportunities exist for joint working around the Sence and Soar Green Wedge – Glen Parva/Glen Hills LNR to Aylestone Meadows; the non-traffic routes to and from the City along the Great Central Way and increasing the biodiversity value of wildlife corridors along these strategic routes. The sites are located from the north to the south of the City. Table 6.1 provides details.



**Figure 6.2: Grand Union Canal at Limekiln Lock, Leicester**

**Table 6.1: River Soar and Grand Union Canal Network – Green Infrastructure Opportunities and Potential Benefits**

Site ID	Site Name	Description	Opportunities	Potential Benefits
R1	<p><b>Watermead Park to Thurcaston Rd</b> (Includes Leicester Marina, Belgrave Meadows, Outdoor Pursuit Centre) <b>Site Designations</b> Watermead CP LNR</p> <p><i>Local Wildlife Sites</i> 5 River Soar/Grand Union Canal 6 Watermead CP 7 Birstall Meadows</p> <p><i>Biodiversity Enhancement Sites</i> 18 Birstall Meadows South 19 Birstall Meadows North 20 Outdoor Pursuit Centre &amp; fields 21 Silt tip and Bestways site</p>	<p>Flooded gravel pit site and marginal marsh, willow carr and reedbed, waterfowl, winter-flooded pasture, grassland and hedgerows; Wet grassland and brownfield sites, mature trees, former silt dump, mature plantation, allotments and pool; Angling and sports facilities, recreation, mature trees, grassland, scrub, marsh, ditches and ponds,</p>	<p>a) Maintain and enhance POS to encourage greater use by local community b) Improve access and network of paths, cycle routes c) Improve flood capacity and protection d) Create, enhance and maintain main habitat types</p>	<p>a) Major flood storage – reduce risk of flooding b) Recreation and leisure by providing safe network of paths and cycle routes c) Improve nature conservation value of existing habitats and improve connectivity to facilitate dispersal along adjacent canal/river network d) Encourage investment in local area e) Increased use of sites from tourism and increased income; f) Encourage greater use, health &amp; well-being</p>
R2	<p><b>Thurcaston Rd to Belgrave Lock</b> (includes former John Ellis Playing Fields, Belgrave Gardens, Beaumanor OS) <b>Site Designations</b> <i>Local Wildlife Sites</i> 5 River Soar/Grand Union Canal</p> <p><i>Biodiversity Enhancement Sites</i> 22 Belgrave Primary School 24 Former John Ellis School/Beaumanor 25 Belgrave Gardens</p>	<p>River and adjacent pools, marina, grassland and marsh, parkland, gardens, lock and weir, scrub and mature trees</p> <p>Mature trees, shrubberies and amenity grassland; important historic buildings and gardens</p> <p>Good pedestrian and cycle access Bats, badger, little grebe, kingfisher</p>	<p>a) Maintain and enhance POS to encourage greater use by local community b) Improve access and network of paths, cycle routes c) Improve flood capacity and protection d) Create, enhance/maintain habitat types e) Major investment in regeneration areas/former industrial sites f) Develop part of site at allotments and former school grounds to facilitate other improvements</p>	<p>a) Major flood storage – reduce risk of flooding b) Recreation and leisure by providing safe network of paths and cycle routes c) Improve nature conservation value of existing habitats and improve connectivity to facilitate dispersal along adjacent canal/river network d) Encourage investment in local area e) Increased use of sites from tourism and increased income; f) Encourage greater use, health &amp; well-being</p>
R3	<p><b>River – Belgrave Lock to Evans Weir (includes Abbey Park)</b> Allotments, Swans Nest Weir, Belgrave Lock, former Wolsey Island and Abbey Meadows sites <b>Site Designations</b> <i>Local Wildlife Sites</i> 5 River Soar/Grand Union Canal</p> <p><i>Biodiversity Enhancement Sites</i> 26 Allotment Gardens – Abbey Park Rd 31 Abbey Meadows – riverbank 45 Abbey Park</p>	<p>Abbey Park – large POS with weir basin, range of plants, Scheduled monument, mature trees; allotments disused and prime site for investment river frontage mix of scrub, grassland, mature trees</p> <p>Former industrial brownfield sites – major regeneration area – Wolsey and Abbey Meadows with industrial heritage</p> <p>Bats, little grebe, kingfisher, ferns on walls, weirs and other structures</p>	<p>a) Maintain and enhance POS to encourage greater use by local community b) Improve access and network of paths, cycle routes c) Improve flood capacity and protection d) Create, enhance and maintain main habitat types e) Major investment in regeneration areas/former industrial sites f) Develop part of site at allotments and former school grounds to facilitate other improvements</p>	<p>a) Major flood storage – reduce risk of flooding b) Recreation and leisure by providing safe network of paths c) Improve nature conservation value of existing habitats and improve connectivity to facilitate dispersal along adjacent canal/river network e) Encourage investment in local area f) Encourage greater use, health &amp; well-being</p>

Site ID	Site Name	Description	Opportunities	Potential Benefits
R4	<p><b>Canal – Belgrave Lock to Evan’s Weir includes Soar Island and Hitchcocks Weir</b>  <b>Site Designations</b>  <i>Local Wildlife Sites</i>            5 River Soar/Grand Union Canal</p> <p><i>Biodiversity Enhancement Sites</i>            46 Grand Union Canal (St Margarets Way to Belgrave)</p>	<p>Canal, locks, canal basin, amenity grassland with young trees, shrubberies, hedges and scrub; Good fern communities, slow-flowing river, floating marginal and bankside willow carr habitat; local features such as “leather bank” on canal;</p> <p>Good access along towpath, but few exit points</p> <p>Bats, kingfisher, waterfowl</p>	<p>a) Improve access and network of paths, cycle routes alongside water course            b) Create, enhance and maintain main habitat types and POS            c) Improve flood capacity and protection</p>	<p>a) Encourage greater use, health &amp; well-being            b) Major flood storage – reduce risk of flooding            c) Recreation and leisure by providing safe network of paths            d) Improve nature conservation value of existing habitats and improve connectivity to facilitate dispersal along adjacent canal/river network</p>
R5	<p><b>Old River Soar (Richard III Rd to Bede Park and Great Central Way)</b>  <b>Site Designations</b>  <i>Local Wildlife Sites</i>            5 River Soar/Grand Union Canal</p>	<p>Mainly amenity grassland with scrub and mature trees along river edge; wall and structures</p> <p>Poor public access along river</p> <p>Bats, little grebe, kingfisher, ferns on bridges and walls</p>	<p>a) Improve flood capacity and protection            b) Enhance and maintain main habitat types along riverbank and POS            c) Improve and maintain network of paths and cycle routes</p>	<p>a) Recreation and leisure by providing safe network of paths            b) Encourage greater use, health &amp; well-being            c) Encourage investment in local area            d) Flood storage, control flows and improve water quality</p>
R6	<p><b>Mile Straight - Evan’s Weir to Twelve Arches Bridge - Ivanhoe Railway at Twelve Arches, Bede Island South, Great Central Way and sidings</b>  <b>Site Designations</b>  <i>Local Wildlife Sites</i>            5 River Soar/Grand Union Canal</p>	<p>LWS – former industrial sites and railway lines associated with grasslands, young trees and scrub providing strategic wildlife corridors, park and gardens, weir</p> <p>Historical and cultural heritage</p> <p>Network of public paths – Great Central Way, Canal towpaths, formal/informal path network</p> <p>Bats, little grebe</p>	<p>a) Improve flood capacity and protection            b) Create, enhance and maintain main habitat types and POS            c) Improve access and network of paths, cycle routes            d) Housing/business growth which contribute to above</p>	<p>a) Major flood storage – reduce risk of flooding in densely populated areas of Leicester            b) Biodiversity – support diverse range of species within complex ecosystem            c) Encourage investment in local area            d) Encourage greater use – health and well being</p>

Site ID	Site Name	Description	Opportunities	Potential Benefits
R7	<p><b>Aylestone North Twelve Arches Bridge to Marsden Lane</b>  <b>Site Designations</b>  Aylestone Meadows LNR</p> <p><i>Local Wildlife Sites</i>  28 Grand Union Canal  29 Aylestone Meadows – North</p> <p><i>Biodiversity Enhancement Sites</i>  74 Faircharm/Marlow Road Estate  75 St Marys Mills  77 Gas Works – Aylestone Rd  79 Gas Holder &amp; former sports area  80 Goose Island  81 Meredith Road allotments  82 Aylestone Playing Fields  83 Land off Braunstone Lane East  84 Braunstone Lane East Playing Fields  85 St Andrews FC Playing Fields  86 Boathouse Kennels</p>	<p>Diverse habitats – flood meadow, marshland, ponds and wetlands, woodlands and scrub, amenity grassland, hedges</p> <p>Historical and cultural heritage</p> <p>Network of public paths – Great Central Way, Canal towpaths, formal/informal path network</p> <p>Bats, otter, badger, grass snake, king fisher, great crested newts, ferns on bridges,</p>	<p>a) Improve flood capacity and protection  b) Create, enhance and maintain main habitat types  c) Improve and maintain network of paths and cycle routes  d) Improve access and furniture (bins, seating, sign posting etc)  e) Education and research – local schools, groups, HE and FE  f) Increased investment in surrounding area through provision of well-maintained and used attractive green space with good linkages, access and proximity to City  g) Housing/business growth to contribute to above</p>	<p>a) Major flood storage – reduce risk of flooding in densely populated areas of Leicester  b) Biodiversity – support diverse range of species within complex ecosystem  c) Recreation and leisure by providing safe network of paths  d) Encourage greater use, health &amp; well-being  e) Raise awareness and importance, identify species present and effective management  f) Increased investment and economic regeneration in Aylestone, Braunstone and Leicester</p>
R8	<p><b>Aylestone South – Marsden Lane to Blue Bank Lock</b>  <b>Site Designations</b>  Aylestone Meadows LNR</p> <p><i>Local Wildlife Sites</i>  28 Grand Union Canal  30 Aylestone Meadows – Central  31 Aylestone Meadows – South</p> <p><i>Biodiversity Enhancement Sites</i>  82 Aylestone Playing Fields  87 Aylestone Farm North  88 Conaglen Road former allotments  89 Aylestone Farm South  90 Gilmorton Avenue</p>	<p>Diverse habitats – flood meadow, marshland, ponds and wetlands, woodlands and scrub, amenity grassland, hedges</p> <p>Historical and cultural heritage</p> <p>Network of public paths – Great Central Way, Canal towpaths, formal/informal path network</p> <p>Bats, otter, badger, grass snake</p>	<p>a) Improve flood capacity and protection  b) Create, enhance and maintain main habitat types  c) Improve and maintain network of paths and cycle routes  d) Improve access and furniture (bins, seating, sign posting etc)  e) Education and research – local schools, groups, HE and FE  f) Increased investment in surrounding area through provision of well-maintained and used attractive green space with good linkages, access and proximity to City  g) Housing/business growth to contribute to above</p>	<p>a) Major flood storage – reduce risk of flooding in densely populated areas of Leicester  b) Biodiversity – support diverse range of species within complex ecosystem  c) Recreation and leisure by providing safe network of paths  d) Encourage greater use, health &amp; well-being  e) Raise awareness and importance, identify species present and effective management  f) Increased investment and economic regeneration in Aylestone, Braunstone and Leicester</p>

### 6.1.2. Sites - West of the River Soar

#### *Ashton Green (W1)*

Ashton Green is a site to the north-east of Castle Hill CP currently made up of arable land, rough grassland, mature hedgerows and trees and a number of small ponds. The site was granted planning permission in 2010 for development of approximately 3000 houses and associated infrastructure (schools, roads, parks etc). The mature hedgerows, species-rich grassland and open water areas are designated as Local Wildlife Sites and the presence of protected species on site form a constraint to development.

Many opportunities exist to incorporate GI within the Ashton Green and adjacent Castle Hill CP site in order to encourage development of the site and create a pleasant environment in which to live, work or visit. The City Council has worked hard to advance this concept by developing innovative GI principles to guide developers in the design and creation of a scheme that will fully incorporate GI from the outset.

The main concept of the GI is referred to briefly below, but a more detailed document is available on-line at <http://www.leicester.gov.uk/your-council-services/ep/economic-regeneration/regenerationnews/ashtongreen/masterplan/>

The scheme is to be used as an exemplar study with the phased implementation of GI across the site, commencing prior to developers starting on site. See Section 5.2.3.

#### *The Rothley Brook and Castle Hill Country Park (W2)*



The Brook is a tributary of the River Soar with the headwaters located in the Desford/Thornton/Botcheston area, including Thornton Reservoir and enters the Soar just north of Cossington. It forms the boundary between Charnwood and the City for a short distance between Anstey and Beaumont Leys, on the edge of Castle Hill Country Park. This north-west area of Leicester's urban fringe provides opportunities for GI and flood risk management by creating, restoring and extending lowland broadleaf woodland, grassland and lowland meadows. It could provide access to natural green space to existing and proposed communities and help connect the green access corridor to link Leicester, Anstey and Loughborough. Such opportunities are also identified in the Stepping Stones Action Plan (2014).

**Figure 6.3: Castle Hill Country Park – Wetland Creation**

The Brook is generally a slow-flowing and meandering stream in this area with flood meadows on either bank. The banks are mainly made up of earth banks, mature willow trees and bankside scrub and grassland. Within Castle Hill Country Park there are extensive areas of semi-improved grasslands and young plantations. Recent improvements (2010) have incorporated a series of wetlands and open ponds, meadow areas including the Olympic Meadow (2012) and improvements to the path network. The site also has a Scheduled Ancient Monument (Fort) and King Williams Bridge, a stone bridge with a species-rich lichen community which is also designated as a Local Wildlife Site (LWS).

### *Beaumont Leys (W3)*

This area was largely agricultural land before being developed from the 1970s onwards. The area includes several large housing estates, industrial areas and a large area of modern housing at Anstey Heights. On some of the estates, single or two-person apartment accommodation has been constructed with areas of grassed open space surrounding; other housing areas contain small private gardens. The whole area is interspersed with large mown grassland areas of POS and poorly-connected pedestrian walkways such as Heacham Drive Open Space, Beaumont Park, Astill Lodge Park and Beaumont Walk. Some of the POS is on former landfill sites which have been capped. Although this limits some of the functions that can be provided on such areas of green space, the sites have been largely planted with amenity grasses and trees and have developed into a maturing landscape of spinney, scrub grassland and amenity mown grassland.

There are many opportunities to manage such areas to maximise the benefits to Leicester and its residents and typical GI could include wetland creation and storm balancing areas; hedgerow restoration and planting; management of main access routes to improve public security and well-being as well as encouraging use as walking and commuter routes to schools and business areas or for recreation.

### *Anstey Green Wedge (W4)*

This area includes the large wedge of green space between Anstey Lane and Groby Road to the north of the City which is designated as Green Wedge in the Local Plan.

This is one of the most important corridors for local wildlife because it has strong connections at the eastern end which directly connects to the River Soar at Evan's Weir. It also connects westwards to the Rothley Brook and to the more open countryside surrounding the villages of Groby, Anstey and Newtown Linford. This area to the north of the City (within Charnwood DC) is one of Leicestershire's most sensitive and important areas with many SSSIs, LNRs, LWS and BAP priority species and habitats. How Leicester develops and links to these areas is fundamental to GI and previous strategies



**Figure 6.4: The Orchards Local Nature Reserve**

put forward are supported within this document (see refs from Stepping Stones).

The northern section of this area is severed by the ring road and a residential development near to Glenfield Hospital, but still contains significant areas of green space with opportunities to maximise benefits to local residents. Green spaces of particular importance are The Orchards and Goss Meadows Local Nature Reserves which are also designated as Local Wildlife Sites; Gilroes Spinney and the adjacent cemetery; and the City Farm located adjacent to The Orchards and English Martyrs Secondary School.

### *Stokeswood Park, The Rally Park and associated Green Spaces (W5)*



These areas of green space are separated from the Anstey Green Wedge by the A50 Groby Road and housing which form a narrow corridor between the two significant areas of green space that stretch northwards out of the City.

The two medium-sized and semi-formal parks are connected by the partly disused allotments along Groby Road, parkland and along the former railway track – now the Forest Way cycle path and a major traffic-free commuter cycle route in and out of the City.

The area is particularly notable for its scrub, grassland and hedgerow habitats, and has a ditch running alongside the Groby Road and into Stokeswood Park.

The allotments form a boundary of the busy Fosse Road/Groby Road junction which is a flooding hot-spot and priority area for flood alleviation. Such areas have been prioritised in the SWMP (2012) based on the flood depth and hazard, the number and types of properties likely to flood, the critical infrastructure affected and whether the area is classified as “deprived” in the ONS National Index of deprivation. Landscaping/GI works at Fosse Road Recreation Ground could increase the storage capacity of the park and help reduce the flood risk at Tudor Road.

**Figure 6.5: Fosse Way Cycle Track adjacent to Stokeswood Park, Leicester**



### *Former Great Central Railway and Redhill (W6)*



**Figure 6.6: Former Allotments, Redhill, Leicester**

Redhill Way and Abbey Lane have been identified as discreet Local Flood Zones (LDZ) in the SWMP (2012) and are included in the wider Critical Drainage Area (CDA) of Stocking Farm. Opportunities to create temporary flood storage areas to alleviate flood risk downstream of the Redhill area could be identified and implemented.

To the South of the Leicester North Station, the line of the track is still present and again forms a linear corridor along the embankment and cutting of dense mature scrub, up to the southern section of Beaumont Leys Lane. The connectivity is then lost due to industrial development, but remaining fragments closer to the City are still present and are designated as either LWS or BESS in recognition of their wildlife value and/or strategic position in the green network.

Within the Blackfriars area the connectivity and industrial habitat has almost disappeared, but much of the land is still open and identified as brownfield land which is often used on a temporary basis for car parking and storage or is left derelict as a long-term

The former Great Central Railway connected Nottingham and Leicester to London until the late 1960s, with its main station at Blackfriars close to the river at West Bridge.

In the late 1980s the southern section was converted to a cycle path and walkway and currently forms an unbroken linear route of scrub and grassy banks from Glen Parva (to the south of the City boundary) through Aylestone Meadows to Mill Lane near to the City Centre.

To the north, the steam trains still run on the railways between Leicester North Station (located adjacent to Red Hill allotments) and Loughborough. To the north of the allotments, the railway line is within Charnwood DC and forms part of the City/Charnwood boundary. Within the City boundary, the land between the railway line and Thurgate Road/Leicester Road is designated as Green Wedge. This land is mainly used for agricultural production of arable crops and is of low ecological value apart from the mature spinneys.

investment for the landowner. However, the supporting blue-brick arches that carried the line above the warehouses and sheds and into the station are still present.

Scrub, species-rich grassland and fern communities are prevalent along the blue-brick walls, bridges and viaducts which also support the more mobile species of wildlife such as bats, birds and invertebrates feeding on the insects and vegetation. Badgers also use the disused and relatively undisturbed former line as a means of access between areas, foraging into the adjoining back gardens and scavenging off waste.

### *Kirby Frith (W7)*

This area comprises of the Kirby Frith LWS and LNR, Western Park Golf Course and smaller areas of POS directly adjacent to the two sites associated with the residential housing and small businesses. The LNR is the last fragment of a much larger area of unimproved and semi-improved grassland that has been lost to housing development, industry and recreation uses. The site was originally part of the much larger golf course, but is now surrounded on three sides by roads and industry. It is designated as POS as well as a LWS and LNR.

Most of Western Park Golf Course and adjacent land is semi-improved grassland which is mown regularly for the purposes of recreation and public access and amenity. The golf course does, however, provide additional habitat features such as ditches, ponds, hedgerows, spinneys and mature trees, and rough grassland. They collectively make up an important mosaic of habitats which help support a locally significant population of great crested newts (UK and European Protected Species).



**Figure 6.7: Kirby Frith Local Nature Reserve**

The golf course relates to the small, but species-rich meadow grasslands at Kirby Frith LNR. There are opportunities within the golf course to maintain the connectivity of habitats and enhancing their capacity to support biodiversity. Creation and management of areas could provide a number of advantages to local residents and users as well as wider benefits of flood alleviation and climate change amelioration.

### *Braunstone Park and Western Park (W8)*

The parks were once part of the Leicester Forest (referred to in the Domesday Book of 1089) and provided an important game preserve where the Earls of Leicester and their descendants hunted. An Oak tree referred to as “Old Major” remains from this period in Western Park, whilst Braunstone contains many mature Oak trees of a similar size and stature to those found at Bradgate Park.

**Braunstone Park** covers 67 hectares (ha) made up of open parkland, mature spinneys, wooded areas and meadow with evidence of ridge and furrow cultivation. The park also has large areas that are managed solely as amenity grassland. The two large lakes to the southern boundary of the site attract migrating birds and a diverse range of resident waterfowl. The lake is popular with anglers, but has suffered from periodic pollution incidents via the Braunstone Brook from the industrial and housing area off Scudamore Road and Cort Crescent.

Braunstone Hall is located towards the centre of the park on higher land, used most recently as a secondary school; it has fallen into disuse for some years. The adjoining stable block however, was refurbished in 1989 and now accommodates offices and a Visitor/Information Centre run by the City Council. Both are Grade II listed buildings. The walled garden, located next to the stable block was re-designed and landscaped in 1983. This is a hidden gem within the park.



**Figure 6.8: Braunstone Parkland and Veteran Trees**

Braunstone Park also has a large area of species-rich grassland which is the historic agricultural and parkland use; as well as a number of veteran oak trees which provide an important specialised habitat particularly for beetles.

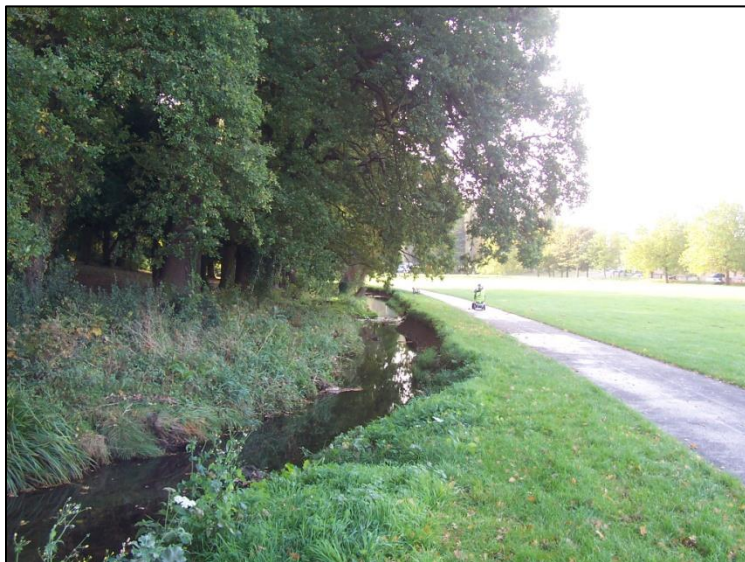
**Western Park** is located to the north of Braunstone Park, separated by A47 Hinckley Road, the main Ivanhoe Railway line and dense post-war housing development. The park is one of the largest in Leicester at 72 ha and contains a mix of meadows, mature woods, hedgerows and ponds. The park also contains a range of sporting facilities which include a bike track, skate ramp, baseball field, bowling greens, football pitches, tennis courts and cricket pitches.

The area of the park which has the bike track along with the adjacent embankment of the Ivanhoe line was designated a SSSI in 1974. This area is known locally as “Shoulder of Mutton Hill”. There are sandstone rocks from the Permian Triassic geological period exposed in the banks of the former lane. However following a review by the Nature Conservancy Council, it was de-notified in 1989. It is still of importance for the study of geology, and is identified as a Regionally Important Geological Site (RIGS). RIG Sites

are of similar status to Local Wildlife Sites (LWS); i.e. they have no statutory protection but are subject to policies within the Local Plan protecting them from damage from inappropriate development or landuse.

Western Park also contains several LWS – a number of veteran trees including the Old Major; a field pond and hedgerow. The park is designated as a Biodiversity Enhancement Site (BES) due to the presence of several habitats of quality; the extensive area of green space, its strategic position to the west of Leicester and the linkages to other wildlife corridors and other green space nearby.

### *Braunstone Brook (W9)*



**Figure 6.9: Braunstone Brook Adjacent to Braunstone Park**

The Brook has been heavily engineered in the past and large sections of it are either concrete channelled courses or are culverted with no sign of a water course actually being present. This is perhaps most obvious in the Rally Park under which the Braunstone Brook flows before entering the River Soar close to the City centre. The section of the brook downstream of Braunstone Park historically may have been re-routed from its natural course towards the River Soar (SWMP 2012).

The Brook has also suffered from heavy pollution in the past, being located close to industrial units at Scudamore Road where the brook arises and flowing through densely populated areas. Here there are few opportunities to de-culvert under dense terraced housing and only if whole neighbourhoods are developed some time into the future depending on building structure and financial resources could opportunities arise to open out the channel.

Nevertheless, there are a number of sites along the course of the brook that open into areas of green space, namely, flowing into Braunstone Park, and through Westcotes Park and Fosse Recreation Ground. These areas are currently unattractive and are failing the Water Framework Directive in terms of the geomorphology of the channelled watercourse. De-culverting and naturalisation of the watercourse will improve public amenity by creating an attractive, more natural watercourse which will support a greater range of wildlife; slow water flows down and create greater capacity for flood storage as well as enabling infiltration to produce improved water quality.

Additional benefits include creating attractive areas to encourage people to visit and take part in formal and informal recreation in a safe environment will provide benefits to health and well-being as well as encouraging investment in these often over-looked and under-invested areas.

*Ivanhoe Railway and Sidings (W10) – see also connections to E2 and E7 Mainline Railway*

Many of the sites adjacent to the Ivanhoe junction have been designated as Local Wildlife Sites (LWS) in recognition of the early successional communities and unusual species of plants such as common cudweed, silvery hair-grass, blue fleabane and small toadflax. Species such as common lizard have been noted along the railway embankments and are not found in other parts of the City.

The railway lines form an important linear dispersal route and habitat for wildlife. GI opportunities adjacent to the lines should be considered with development proposals and provide opportunities for improving linkages and enhancement with areas allocated as green space. Biodiversity and climate change amelioration/ reducing impacts of urban heat island and indirect improvements in health and well-being could be provided through appropriate GI along these routes.

**Table 6.2: Sites West of River Soar: Green Infrastructure Opportunities and Potential Benefits**

Site ID	Site Name	Description	Opportunities	Potential Benefits
W1	<p><b>Ashton Green</b>  <b>Site Designations</b>  <i>Local Wildlife Sites</i>                      34 Ashton Green</p> <p><i>Biodiversity Enhancement Sites</i>                      1 Leicester Rd – stream and hedge                      2 Fox Covert                      3 Bevan Rd – Ashton Green                      4 North of Greengate Lane – woodland and stream</p>	<p>Arable fields, spinneys, hedgerows and standard trees, ponds and ditches, species-rich grassland</p> <p>Badgers, bats</p>	<p>a) Incorporate good urban design to develop site GI through provision of well-maintained and used attractive green space with good linkages, access and proximity to City                      b) Create POS and create new or enhance and maintain main habitat and landuse types                      c) Improve flood capacity and protection                      d) Create new, improve and maintain network of paths and cycle routes</p>	<p>a) Increased investment and economic regeneration in north-west Leicester through housing growth                      b) Major flood storage – reduce risk of flooding in new development                      c) Biodiversity – support diverse range of species through creation and maintenance of a mosaic of habitats                      e) Recreation and leisure by providing safe network of paths                      f) Encourage greater use, health &amp; well-being</p>
W2	<p><b>Rothley Brook and Castle Hill Country Park</b>  <b>Site Designations</b>  <i>Local Wildlife Sites</i>                      2 Castle Hill CP – Gorse Hill                      3 King William’s Bridge – Rothley Brook                      35 Veteran tree</p> <p><i>Biodiversity Enhancement Sites</i>                      5 Castle Hill Country Park                      6 Boston Rd allotments</p>	<p>Stream, hedges, hedgerow trees, ditches, improved and semi improved grasslands, recent plantations</p> <p>Badgers, bats, lichens</p>	<p>a) Improve amenity value of POS through improved access and furniture (bins, seating, sign posting etc)                      b) Create, enhance and maintain main habitat types                      c) Improve and maintain network of paths and cycle routes                      d) Improve flood capacity and protection                      e) Education and research – local schools, groups, HE and FE                      f) Increased investment in surrounding area (Ashton Green) through provision of well-maintained and used attractive green space and facilitate above</p>	<p>a) Increased investment and economic regeneration in north-west Leicester through housing growth                      b) Well-used and popular POS for recreation and leisure by providing safe network of paths and multiple uses                      c) Major flood storage – reduce risk of flooding in new development and Anstey                      d) Biodiversity – support diverse range of species through creation and maintenance of a mosaic of habitats                      e) Encourage greater use, health &amp; well-being</p>
W3	<p><b>Beaumont Leys Green Space</b>  <b>Site Designations</b>  <i>Biodiversity Enhancement Sites</i>                      7 Beaumont Park                      9 Gorse Hill verges                      11 Beaumont Walk                      12 Home Farm Close</p>	<p>Improved and semi -improved grasslands (mostly created or regenerated on former tip sites), recent plantations, mature spinneys, hedges and ditches, ponds</p> <p>Badgers</p>	<p>a) Use principles of urban design to assess the current green space and its functions and usage and identify opportunities for improvements                      b) Improve connectivity of paths and access around residential housing, businesses and link to/through POS                      c) Enhance biodiversity value of natural green space through good management                      d) Work with local community to raise funding/grants for local projects and encourage localism                      e) Use contributions from local development to improve play and natural green space, access routes e.g. Home Farm</p>	<p>a) Recreation and leisure by providing safe network of paths                      b) Encourage greater use, health &amp; well-being                      c) Biodiversity – support diverse range of species through creation and maintenance of a mosaic of habitats                      d) Learning opportunities through increased use by local schools and groups</p>

Site ID	Site Name	Description	Opportunities	Potential Benefits
W4	<p><b>Anstey Green Wedge</b> (includes Goss Meadows, City Farm)  <b>Site Designations</b>  The Orchards LNR</p> <p><i>Local Wildlife Sites</i>  13 Anstey Lane Pastures &amp; Goss Meadows  14 The Orchards</p> <p><i>Biodiversity Enhancement Sites</i>  8 Leicester Frith Park  37 Gilroes Cemetery  39 City Farm</p>	<p>Nature reserve Ancient hedge, hedgerows, ditches, improved and semi-improved grasslands, mature specimen trees, species rich grassland, mature plantations</p> <p>Badgers, birds</p>	<p>a) Improve amenity value of The Orchards LNR and encourage use  b) Link works at English St Martyrs boundary to improvements within The Orchards LNR to encourage use by school and local residents  c) Improve boundary and management of pond and tree/scrub between English Martyrs and City Farm – plant-up and maintain  d) Seek agricultural funding for City Farm and other grazing areas in City  e) Improve hedgerows and enhance Leicester Frith Park  f) Education and research – local schools, groups, HE and FE  g) Improve management and maintenance at Goss Meadows LNR, raise awareness and encourage use</p>	<p>a) Biodiversity – support diverse range of species through creation and maintenance of a mosaic of habitats  b) Recreation and leisure by providing safe network of paths  c) Encourage greater use, health &amp; well-being  d) Learning opportunities through increased use by local schools and groups</p>
W5	<p><b>Stokeswood Park, The Rally Park and Green Space</b> (includes Gilroes Cemetery)  <b>Site Designations</b>  <i>Local Wildlife Sites</i>  15 Stokeswood Park</p> <p><i>Biodiversity Enhancement Sites</i>  40 Groby Rd Allotments  41 Hudson Close allotments  42 Stokeswood Primary School  43 Fosse Road North allotments  47 The Rally Park</p>	<p>Ancient hedge, hedgerows, ditches, species rich grassland, scrub and new plantations, pond</p> <p>Badgers</p>	<p>a) Improve boundary management along Groby Rd with options for natural SuDs on adjacent land and/or rainwater harvesting on road verges  b) Improve amenity value of Stokeswood Park, Rally Park and encourage use  c) Extend allotments along Groby Rd or seek supporting land  d) Manage parts of Gilroes Cemetery for wildlife and seek Green Flag status  e) Encourage wildlife areas within current allotments  f) De-commission former allotments at Hudson Close, Fosse Rd North depending on demand</p>	<p>a) Increased water storage and reduced flood risk in hot spot of Blackbird Rd/Fosse Rd North  b) Increased biodiversity value through natural SuDs and management of green space  c) Recreation and leisure with improved facilities  d) Improved access and sustainable transport routes from network of paths and major cycle routes  e) Investment potential from improvements on a main gateway into City  f) Encourage greater use, health &amp; well-being  g) Sustainable food production from local produce</p>
W6/R2,3,5,7,8	<p><b>Former Great Central Railway and Red Hill (northern section)</b>  <b>Site Designations</b>  <i>Local Wildlife Sites</i>  14 Redhill, Gt Central Railway and Belgrave Cemetery</p> <p><i>Biodiversity Enhancement Sites</i>  13 Red Hill allotments  14 Kennels – Redhill Way  15 Redhill Way  23 Wolsey House Primary School  44 Great Central Way, Blackbird Rd/Jarvis St</p>	<p>Species rich grassland, tall herb and grassland/scrub habitat mosaics, close-mown improved grassland, walls and structures</p> <p>Disused and active railway line, link to riverside corridor</p> <p>Badgers, orchids, ferns on bridge structures</p>	<p>a) Support good urban design principles to develop site to high standard that incorporates highly functional GI and appropriate mitigation and compensation for loss of green space;  b) Development of site to encourage public usage/tourism, employment and recreation  c) Protect and create new areas of biodiversity and amenity value  d) Incorporate flood alleviation areas  e) Construct exemplar building – incorporate sustainable features – to include green roofs and walls</p>	<p>a) Increased investment and employment opportunities  b) Increase in tourism and leisure with associated spending power  c) Biodiversity – support diverse range of species through creation and maintenance of a mosaic of habitats  d) Recreation and leisure by providing safe network of paths  e) Encourage greater use, health &amp; well-being  f) Learning opportunities through increased use by local schools and groups</p>

Site ID	Site Name	Description	Opportunities	Potential Benefits
W7	<b>Kirby Frith</b> (Includes Western Golf Course, Kirby Frith LNR and POS) <b>Site Designations</b> Kirby Frith LNR <i>Local Wildlife Sites</i> 16 Western Golf Course and ditches	Meadows, amenity grassland, spinneys, hedgerows, ponds  Great Crested Newts, Badger	a) Protect and enhance designated areas and improve connectivity to other green space b) Improve path network to encourage use c) Increase usage of sites for recreation and public amenity d) Create flood alleviation measures e) Tree planting and effective management of natural green space	a) Biodiversity – support diverse range of species through creation and maintenance of a mosaic of habitats b) Recreation and leisure by providing safe network of paths for commuting and leisure c) Encourage greater use, health & well-being d) Increased carbon storage and ameliorate climate change
W8	<b>Braunstone Park and Western Park</b> <b>Site Designations</b> <i>Local Wildlife Sites</i> 21 Braunstone Park Meadow 33 Braunstone Park trees  <i>Biodiversity Enhancement Sites</i> 64 Western Park 70 Braunstone Park	Meadow, parkland, mature trees, ancient hedgerows, new plantations and spinneys, ponds, park lakes	a) Restoration and use of buildings within Braunstone and Western Park b) Improve path network and use within and between parks c) Create new habitats and improve connectivity within and between parks d) Improve water quality and storage areas through land management e) Management and planting programme to manage veteran trees	a) Safeguard historical buildings and associated parkland at Braunstone Park b) Greater use and natural surveillance of buildings and green space on boundary to Western Park c) Biodiversity – support diverse range of species through creation and maintenance of a mosaic of habitats d) Improved water quality and storage areas for flood alleviation, biodiversity and public health e) Encourage greater use, health & well-being
W9	<b>Braunstone Brook</b> (Includes Westcotes Park and Fosse Rd Recreation Ground) No LWS <i>Biodiversity Enhancement Sites</i> 49 Fosse Road Recreation Ground 66 Ivanhoe Railway Line Braunstone Brook 72 Westcotes Park	Stream – semi-natural, culverted and channelled sections, scrub, grassland  Bats	a) Naturalise the channel (meanders etc) b) Create additional flood storage areas at Westcotes and Fosse Rd Rec c) Incorporate natural and biodiversity features into flood alleviation schemes d) Increase public amenity value e) Create sustainable, cost-effective schemes f) Create a safer environment	a) Increase flood storage, improve water quality b) Reduced risk of flooding in surrounding housing and businesses – encourage investment c) Encourage greater use, health & well-being, reduce stress-related risk of flooding and after-math d) Biodiversity – support diverse range of species through creation and maintenance of habitats
W10	<b>Ivanhoe Railway Line and Sidings</b> (Includes Hockley Farm Rd)  <i>Biodiversity Enhancement Sites</i> 66 Ivanhoe Railway Line 67 Hockley Farm Road 68 Highway Spinney 69 Bendbow Spinney	Grassland, mature trees, scrub, ancient hedge, spinneys	a) Protect and enhance designated areas and improve connectivity to other green space b) Improve path network to encourage use c) Increase usage of sites for recreation and public amenity d) Create flood alleviation measures e) Tree planting and management of natural green space	a) Biodiversity – support diverse range of species through creation and maintenance of a mosaic of habitats b) Recreation and leisure by providing safe network of paths for commuting and leisure c) Encourage greater use, health & well-being d) Increased carbon storage and ameliorate climate change
W11	<b>Ratby Lane and Braunstone Lane Corridor</b> Includes Highway Spinney & Meynells Gorse, St Peters, Coalpit Spinney <i>Local Wildlife Sites</i> 19 Ratby Lane hedge and spinney 20 Highway Spinney/Meynells Gorse <i>Biodiversity Enhancement Sites</i> 71 St Peters and Churchfields 73 Coalpit Spinney	Woodland, spinneys, mature trees, ancient hedgerows, meadows	a) Protect and enhance designated areas and improve connectivity to other green space b) Improve path network to encourage use c) Increase usage of sites for recreation and public amenity d) Tree planting and effective management of natural green space	a) Biodiversity – support diverse range of species through creation and maintenance of habitats b) Recreation and leisure by providing safe network of paths for commuting and leisure c) Encourage greater use, health & well-being d) Increased carbon storage and ameliorate climate change



### 6.1.3. Sites - East of the River Soar

#### *The Melton Brook, Humberstone, Hamilton and Gypsy Lane Brickworks (E1)*

Hamilton is located to the north-east of the City; formerly arable land with mature hedgerows, this area has been extensively developed largely for residential use in the last 15 years. The area was generally of minimal wildlife value and was farmed intensively, but a requirement of planning permission was the creation of a sustainable drainage feature (SuDs) made up of a series of swales and ponds. These areas have developed into a mature wetland and are of high value to wildlife. In addition, the hedges, ponds, spinneys and mature trees contained within the former arable landscape have largely been retained, as have two species-rich meadows along the Melton Brook.

The Melton Brook in this area is made up of a medium flow, meandering brook with pools and riffles, steep earth banks, and mature willows. It provides a valuable habitat for local wildlife and forms the boundary between Leicester and Charnwood administrative areas.

Further housing to the east and also to the north across administrative boundaries, together with proposed access routes to potential large-scale housing development in the Charnwood area will have a cumulative impact on the surrounding green space and quality of life of existing and new residents. The principles of GI are key to how this area should be developed in the future.

The Melton Brook flows from the Hamilton area and joins the River Soar at the Belgrave plantation (see Appendix IV). Along the way it passes adjacent or through a number of green spaces where opportunities for the creation and enhancement of GI exist. There are also areas of established housing with mature back gardens adjacent to the brook, but the threat of backland development (that is, the loss of back gardens to small housing development) is possible and could result in increased flood risk, loss of biodiversity as well as a decline in general visual amenity.



**Figure 6.10: Hamilton wetland and SuDs**

### *Mainline Railway North (E2) see also E7*

The national Midland Mainline railway connects the North-east of the UK and London. It runs north-south through Leicester, joined by the regional 'Ivanhoe' railway line (Burton to Leicester) just south of the main station.

Many of the sites adjacent to the Mainline junction have been designated as Local Wildlife Sites (LWS) in recognition of the early successional communities and unusual species of plants such as common cudweed, silvery hair-grass, blue fleabane and small toadflax. Species such as common lizard have been noted along the railway embankments and are not found in other parts of the City.

Sites adjacent to the mainline and Ivanhoe line act as “stepping stones” for wildlife and those not designated as LWS are designated as Biodiversity Enhancement Sites (BES) in recognition of their position in the strategic network and opportunities available to enhance their condition and provide improved natural green space and other wider benefits to local communities. Such sites are also referred to in other sections as they generally run from the south-west and west to the Mainline railway.

### *Willow Brook and Scraftoft Brook (E3)*



**Figure 6.11: Willow Brook near to Ocean Road Open Space, Leicester**

The Scraftoft Brook which joins to form the Bushby Brook (near to Monks Rest Gardens) and the Willow (or Bushby) Brook arise in the Scraftoft area to the east of the City. The watercourses have been heavily modified through past engineering schemes in the late 1960s-70s to provide flood defences to dense housing and employment areas. This has resulted in straightened water courses, concrete channels with some sections being little more than a concrete gutter or completely culverted over. In their current state, the brooks fail to meet the parameters set by the Water Framework Directive – particularly with regard to its geomorphological state.

As a priority, there are opportunities to break open the channels and create a more natural meandering water course. These opportunities are most obvious where the brook flows through POS or land allocated as green space in the Local Plan such as Netherhall Open Space, Willowbrook Park and Ocean Road Open Space, Dakyn Road Sports field, Humberstone Park and several allotments.

Creating a more natural, meandering and open water course along sections of its length will assist with flood defence (see Surface Water Management Plan Part I 2012), create a more attractive amenity and safer environment as well as encouraging greater use of such areas and a sense of general health and well-being.

The Strategy identifies several flood relief basins and open parks along sections of the Bushby Brook and these have potential for expansion to increase the storage capacity, for example, at the recreation ground on Thurnby Brook immediately upstream and downstream of the Dakyn Road Flood Storage Area (FSA). Whilst the main function may be to reduce flood risk to surrounding properties, other benefits from the implementation of GI could include improved amenity, access, recreation and biodiversity. The area is already frequently visited by otters, badgers and kingfishers; and water voles were historically recorded in the past.

Humberstone Park is a very popular and well-used park, but there is some significant surface water flood risk to gardens and properties both upstream and downstream of the Park. Appropriate landscaping works to improve flood storage and other GI improvements such as re-naturalising the heavily engineered brook would result in significant benefits both locally and strategically across this area of the City. Reduced flood risk to the surrounding neighbourhood with associated costs and well-being from added security; improved visual and recreational amenity value, biodiversity and improved water quality are but a few of the benefits perceived from such an improvement (see Table 6.2).

As the Willow Brook flows down toward the confluence with the River Soar near to Abbey Park, it flows through a number of industrial and residential areas along Dysart Way and the former sidings at Ulverscroft Road/Syston Street East. Re-development of the industrial areas around the mainline railway may offer some potential to de-culvert the brook and to make it more of a focal point whilst improving flood storage and water quality. These options should be included in planning the long-term future and re-development of this area.

In the immediate future, there are several opportunities taking place. The Belgrave flyover has recently been demolished in March 2014 and the area will be opened up to create an “entrance” onto the now famous “Golden Mile” along Belgrave Road. A formal area of green space will be incorporated into the new road layout and parking scheme. Opportunities should be explored to re-naturalise the culverted and channelled section of brook within the roundabout area before it opens out into the more attractive watercourse flowing into the River Soar by Leicester College around Limekiln Lock.

### *Coleman Road Area (E4)*

The Coleman Road area is a mix of dense post-war housing interspersed with areas of green space. The road itself is lined with an avenue of mature trees with occasional groups of tree planting which provide an attractive setting and feeling of openness on the urban fringe of Leicester.

The green space is made up of a mix of general amenity grassland areas which provide informal POS, wilder areas of scrub on former allotments, ponds and mature trees. The road verges provide particularly good connectivity and the Lily Marriott POS is a small, but attractive and well-maintained park that is well used by the local residents.

### *Evington Park (E5)*



Evington Park is located within the Evington Conservation Area and is made up of the House and surrounding parkland and ornamental gardens to the north and more formal amenity and sports provision to the south of the park. It has generally retained the tranquil atmosphere of the country estate it once was. The 17.8 ha of parkland include attractive floral displays and a wide variety of trees. The Burnaby Gardens, at the rear of the House, has recently been refurbished. The large areas of ornamental shrubs in the specialist gardens attract many species of insects and provide foraging grounds for bats and birds.

Trees are the main feature of Evington Park and there are fine examples of English Oak, Chestnut and a new avenue of 22 Elms. There is also the rare Ginkgo as well as mature Beech, Rhododendron and Azalea.

**Figure 6.12: Evington House, Evington Park, Leicester**

The nature area located close to the House contains wildlife ponds which attract amphibians and invertebrates as well as the areas of longer, rough grass and meadow species that contrast sharply with the public amenity areas used for sport and recreation.

A “Green Gym” was set up near to the House in 2009 and the outdoor gym equipment is well used by the local residents who either use it as individuals or attend organised classes. This contributes greatly to the health and well-being provided by exercising in the open-air within pleasant surroundings.

### *Evington Brook, Leicestershire Golf Course and Adjacent Sites (E6)*

The Evington Brook arises in the open countryside near to Stoughton and flows westwards through the Arboretum and long the perimeter of the Leicestershire Golf Course. After this its course towards the confluence with the Bushby Brook is mainly through suburban residential areas in the form of a steep-sided cutting at the back of gardens.

The rear of these gardens varies in their maintenance up to the edge of the brook, but they provide an important buffer to flood control in the adjacent areas. The threat of backland development, that is, the loss of back gardens to small housing development is a concern in terms of increasing run-off into the brook and the flow of water which could result in flood hotspots further downstream.

Leicester's Surface Water Management Plan (May 2012) has identified potential opportunities to link surface water and flood risk management with Green Infrastructure along the Evington Brook. Whilst it is recognised that opportunities on land in private ownership, particularly back gardens may be limited, the benefits of providing additional flood storage along the Evington Brook have been identified. The areas particularly high-lighted are within Leicestershire Golf Course, Shady Lane Arboretum and Spinney Hill Park (see Table 6.2 for opportunities).

Spinney Hill Park has undergone significant changes in the last few years as a result of receiving funding from the Heritage Lottery Fund (HLF) to restore and improve the facilities and infrastructure within the Park. New buildings, landscaping and naturalisation of the brook, together with resources for a full-time park officer, has transformed the Park into a well-used, popular and attractive public park (see Section 5.4.6).

### *Mainline/Ivanhoe Railway Junction (E7) see also E2*

The junction of railway crossings and adjacent green space provides an important crossroads for linear green corridors and dispersal routes for wildlife. The former embankment of Saffron Lane supports steep-sided species-rich verges and Welford Road cemetery supports a species-rich grassland meadow – a remnant of the more extensive grassland meadows that were present during the nineteenth century. The historical and ecological value of the churchyard located directly alongside the mainline railway provides an important oasis for wildlife and heritage.

Bede Park, Aylestone Road gasworks and the former St Mary's allotments forms a significant area of green space with a rich industrial heritage and biodiversity. Opportunities to develop more usable green space with appropriate management of vegetation; and protection of more wildlife sensitive areas could be encouraged with the support of well-designed development and contributions towards new or enhanced green space in the area.

### *The Wash Brook or Saffron Brook/Mainline Railway South (E8)*

The brook arises in Oadby and Wigston area and flows through the Racecourse and golf course before entering the City at Knighton Park. It is open along most of its length unlike some of the other more engineered and channelled water courses and in addition, it flows through or adjacent to many open spaces. The sites running alongside the brook lie close to the Mainline railway which together provides good linkages and corridors for wildlife dispersal. Collectively the green space, linear routes and water course are important in the context of the City's biodiversity network.

Like other brooks in the City, the water course is culverted along some sections – in this case either side of Saffron Lane and under the gasworks, and in other areas the brook is contained within steep-sided concrete channels that control the flow. Some channelled areas are connected at points along the linear corridor such as at the northern end of Aylestone Meadows where the brook connects with the River Soar and the old connection at St Mary's Mill Lock by pass channel. The flow here is now diverted to emerge below Freeman's Weir. This area is particularly rich in wildlife largely due to its inaccessibility and contains plantations of mature poplar and willow.

Areas where the channel is open and flows either through or adjacent to areas of green space provide opportunities for naturalisation. These include Welford Road allotments, Dawson's Drive Open space, the Washbrook Nature Reserve and Neston Gardens as well as Aylestone Recreation Ground and St Mary's Allotments where the brook flows in a concrete channel with small excavated swamps.

The SWMP (2012) has highlighted opportunities to improve and increase the capacity of the existing flood relief basins at Bluebell Close and Severn Road along with improved public amenity, biodiversity and access of the wooded areas following the course of the Wash Brook to the A6.

Leicester Racecourse, Knighton Park, Overdale Spinney and the nearby allotments provide opportunities to utilise existing recreational landuses (sport, recreation and golf course) to increase biodiversity and improve flood risk management through additional flood storage areas. Knighton Park already has a flood storage area, but there is potential to increase this area within the park by encouraging the Wash Brook to flood areas temporarily during high flows and so reduce flood risk to areas along the Wash Brook and Saffron Brook further downstream.

Combined works to provide formal flood storage and increase biodiversity to the allotments opposite areas such as Cairnsford Road, Wash Brook NR and the Aylestone Recreation Ground could provide flood relief from fluvial and pluvial sources to properties along Saffron Lane, Knighton Fields Road, Shakespeare Street, Sheridan Street and Lothair Road.

### *Eyres Monsell and Saffron Hill (E9)*

The area around Queen's Park Way and Featherstone Drive Open space is located strategically within the green network of the adjacent rural countryside of Blaby district and is further linked by the linear green space of both the Grand Union Canal and Mainline Railway that provide an important corridor for wildlife to live and disperse. The area is also linked to the River Sence, a tributary of the Soar. Collectively, these areas provide a core of green space that separates Glen Parva and the Leicester border from the smaller urban areas of Blaby and Whetstone.

Areas of green space of particular value where opportunities for green infrastructure are present include the Grand Union Canal (Dunn's Lock, Simpkin's Bridge and Knight's Bridge areas) that provide an attractive post-industrial landscape and support colonies of ferns on the built structures. This area of the Soar/Sence floodplain provides opportunities for jointly managing flood risk, enhancing the character and distinctiveness of the landscape and creating, restoring and extending the main habitat types of wet woodland, ferns, reedbed and flood meadow. Catchment-scale management also provides opportunity for better land management to reduce soil erosion, land degradation and so reduce the amount of siltation entering the water courses. This will improve water quality and help contribute to the overall objectives of the Water Framework Directive.



This area could connect with the City-scale corridors such as a green way to link Leicester and Lutterworth as well as the River Soar, River Sence and Grand Union Canal and so provide multiple benefits from GI improvements and enhancements. Accessible natural green space would be accessible to existing and proposed communities whilst enhancing the character and distinctiveness of the landscape in this area.

The River Sence flows parallel to the Grand Union Canal in this area meandering through the horse-grazed fields, paddocks, pasture and floodland which separate Eyres Monsell from the villages of Blaby and Whetstone. The Everards Brewery has proposals to re-site the brewery within this area with visitor centre facilities. Opportunities to improve public access over the watercourses, management of the land and creation of new habitats and linkages linked to the development proposal are possible.

**Figure 6.13: Grand Union Canal near to Eyres Monsell, Leicester**

The spinneys in the area include Two Acre Spinney, Her Ladyships Covert and Diamond Jubilee Covert which contain mature trees and hedgerows. The spinneys have suffered from lack of management previously and the housing estates now largely surround the

spinneys. Pressures from anti-social behaviour and lack of ownership/budgets to maintain the sites or involve local communities are threatening the longevity of the woodlands. A strategic approach, partnership involvement and working with local residents may attract external funding to collectively manage the woodlands more effectively to increase their wildlife value and make them more attractive areas for informal recreation and encourage people to walk or cycle.

Saffron Hill Cemetery is a large parkland area and contains many mature trees and grassland. The grassland, along with that at Sonning Way, Rolleston School and Sturdee Road recreation ground is largely semi-improved short-mown grass and opportunities to enhance these areas through changing grassland management regimes; creation of ponds, tree planting, improving rights of way could create attractive linkages of benefit to wildlife and locals alike.



**Table 6.3: Sites East of River Soar: Green Infrastructure Opportunities and Potential Benefits**

Site ID	Site Name	Description	Opportunities	Potential Benefits
E1	<p><b>Melton Brook, Humberstone, Hamilton and Gipsy Lane Brickworks</b></p> <p><b>Site Designations</b></p> <p>SSSI – Gipsy Lane claypit</p> <p><i>Local Wildlife Sites</i></p> <p>8 Melton Brook floodplain</p> <p>9 Hamilton Meadows</p> <p>11 Quakesick spinney</p> <p>12 Gipsy Lane Claypit and land</p> <p>45 Appleton Park &amp; Peebles Way</p> <p><i>Biodiversity Enhancement Sites</i></p> <p>28 Troon Way</p> <p>29 Appleton Park</p> <p>30 Rushey Fields School &amp; Melton Brook</p> <p>33 Raynor Rd &amp; Melton Brook</p> <p>34 Barkythorpe Rd &amp; Melton Brook</p> <p>35 Hamilton</p> <p>36 Humberstone Golf course</p>	<p>Grassland, tall herbs and scrub, spinneys, brook, hedgerows and trees, ponds and floodmeadow, former brickworks</p>	<p>See below</p>	<p>See below</p>
E1a	<p>Hamilton Meadows LWS</p>	<p>Species-rich meadows, hedges and ditches</p>	<p>a) Create, enhance and maintain main habitat types and POS</p> <p>b) Improve flood capacity and protection</p> <p>c) Improve access and network of paths, cycle routes alongside water course</p>	<p>a) Biodiversity – support diverse range of species and link to existing wetland</p> <p>b) Major flood storage – reduce risk of flooding to new housing area</p> <p>c) Recreation and leisure by providing safe network of paths</p> <p>d) Encourage greater use, health &amp; well-being</p> <p>e) Encourage investment in local area</p>
E1b	<p>Hamilton greenways and swale park</p>	<p>A series of inter connected linear walkways and SuDs features which include former hedgerows, spinneys and ponds</p>	<p>a) Create, enhance and maintain main habitat types and POS</p> <p>b) Improve access and network of paths, cycle routes</p>	<p>a) Biodiversity – support diverse range of species and link to existing wetland</p> <p>b) Recreation and leisure by providing safe network of paths</p> <p>c) Encourage greater use, health &amp; well-being</p> <p>d) Control of crime and anti-social behaviour through increased usage and surveillance</p>
E1c	<p>Hamilton Park</p>	<p>Parkland consisting of lake, hedgerows, grassland and young woodland plantations with network of paths</p>	<p>a) Create, enhance and maintain main habitat types and POS</p> <p>b) Improve access, signage and network of paths, cycle routes throughout park</p>	<p>a) Recreation and leisure by providing safe network of paths and areas of informal play space</p> <p>b) Biodiversity – support diverse range of species and link to adjacent areas of green space</p> <p>c) Encourage greater use, health &amp; well-being</p>

Site ID	Site Name	Description	Opportunities	Potential Benefits
E1d	Melton Brook floodplain LWS	Flood balancing areas with species-rich marsh and willow carr, plus early successional habitats	<ul style="list-style-type: none"> <li>a) Create, enhance and maintain main habitat types</li> <li>b) Improve flood capacity and protection</li> <li>c) Create access and network of paths, cycle routes</li> <li>d) Housing/business growth which contribute to above</li> </ul>	<ul style="list-style-type: none"> <li>a) Major flood storage – reduce risk of flooding to surrounding housing and businesses</li> <li>b) Biodiversity – support diverse range of species and link to existing wetland</li> <li>c) Recreation and leisure by providing safe network of paths</li> <li>d) Encourage greater use, health &amp; well-being</li> </ul>
E1f	Gipsy Lane SSSI	Former gypsum quarry and brickworks with geological features of international importance. Good ecological value with pioneer species prevalent  Badger Smoot newts	<ul style="list-style-type: none"> <li>a) Maintain and manage habitat types</li> <li>b) Incorporate SuDs into surrounding areas to provide buffer of protection</li> <li>c) Provide interpretation and encourage research and visitors</li> </ul>	<ul style="list-style-type: none"> <li>a) Biodiversity – support diverse range of species</li> <li>b) Flood storage and improved water quality</li> <li>c) Encourage greater use, health &amp; well-being</li> <li>d) Education and research to further knowledge of international site</li> </ul>
E1g	Appleton Park and Peebles Way Nature Reserve	Park and recreational area, some species-rich grassland, broad-leaved woodland, area of former landfill – now grassland	<ul style="list-style-type: none"> <li>a) Create, enhance and maintain main habitat types</li> <li>b) Improve flood capacity and protection</li> <li>c) Create access and network of paths, cycle routes</li> <li>d) Contributions from local development to enhance green space</li> </ul>	<ul style="list-style-type: none"> <li>a) Major flood storage – reduce risk of flooding to surrounding housing and businesses</li> <li>b) Biodiversity – support diverse range of species and link to existing wetland</li> <li>c) Recreation and leisure by providing safe network of paths</li> <li>d) Encourage greater use, health &amp; well-being</li> <li>f) Encourage investment in local area</li> </ul>
E2	<b>Mainline Railway North Site Designations</b> <i>No Local Wildlife Sites</i> <i>Biodiversity Enhancement Sites</i> 32 Mainline Railway (north of Ulvescroft Rd) 51 Mainline Railway (Welford Rd to Ulvescroft Rd)	Pioneer species, scrub, rough grassland, built structures  Bats, ferns on abutments	<ul style="list-style-type: none"> <li>a) Protect and enhance designated areas and improve connectivity to other green space</li> <li>b) Improve path network to encourage multiple use</li> <li>c) Increase usage of sites for recreation and public amenity</li> <li>d) Create flood alleviation measures</li> <li>e) Tree planting and effective management of natural green space</li> </ul>	<ul style="list-style-type: none"> <li>a) Biodiversity – support diverse range of species through creation and maintenance of a mosaic of habitats</li> <li>b) Recreation and leisure by providing safe network of paths for commuting and leisure</li> <li>c) Encourage greater use, health &amp; well-being</li> <li>d) Increased carbon storage and ameliorate climate change</li> </ul>
E3	<b>Scraptoft Brook and Willow Brook Site Designations</b> <i>Local Nature Reserve</i> The Rally Bank Local Wildlife Sites 22 Willow Brook/Ocean Rd OS <i>Biodiversity Enhancement sites</i> 52 Humberstone Park & Rally Bank 53 Bushby Brook 54 Willow Brook	Amenity grassland, mature trees, scrub, woodland, meadows and marshland, streams, allotments	<ul style="list-style-type: none"> <li>a) Naturalise the channel (meanders etc) e.g. Humberstone Park, Netherhall OS</li> <li>b) Create additional flood storage areas at Dakyn Road, Ocean Rd OS</li> <li>c) Incorporate natural and biodiversity features into flood alleviation schemes</li> <li>d) Increase public amenity value</li> <li>e) Create sustainable, cost-effective schemes</li> <li>f) Create a safer environment</li> </ul>	<ul style="list-style-type: none"> <li>a) Increase flood storage, improve water quality</li> <li>b) Reduced risk of flooding in surrounding housing and businesses – encourage investment</li> <li>c) Encourage greater use, health &amp; well-being, reduce stress-related risk of flooding and after-math</li> <li>d) Biodiversity – support diverse range of species through creation and maintenance of a mosaic of habitats</li> </ul>

Site ID	Site Name	Description	Opportunities	Potential Benefits
E4	<b>Coleman Road</b> <b>Site Designations</b> No Local Wildlife Sites <i>Biodiversity Enhancement Sites</i> 55 Lily Marriott Gardens 56 Coleman Road	Amenity and species-poor grassland, scrub, former allotments, pond and mature trees  Bee and pyramidal orchids, calcareous grassland, GCNs	a) Create, enhance and maintain main habitat types and manage street trees b) Improve flood capacity and protection c) Create access and network of paths, cycle routes d) Contributions from local development to enhance green space	a) Improve air quality and carbon storage through tree management b) Biodiversity – support diverse range of species and link to existing wetland c) Recreation and leisure by providing safe network of paths d) Encourage greater use, health & well-being f) Encourage investment in local area
E5	<b>Evington Park</b> <b>Site Designations</b> <i>Local Wildlife Site</i> 23 Ethel Road verge 24 GCN Pond & nature area <i>Biodiversity Enhancement Sites</i> 60 General Hospital, Ethel Rd 61 Evington Park	Amenity grassland and meadow, ponds, scrub and mature trees, shrubs and formal flowerbeds  Bee and pyramidal orchids, calcareous grassland, GCNs	a) Maintain and enhance POS to encourage greater use by local community b) Improve access and network of paths, cycle routes c) Improve flood capacity and protection d) Create, enhance and maintain main habitat types	a) Major flood storage – reduce risk of flooding b) Recreation and leisure by providing safe network of paths and cycle routes c) Improve nature conservation value of existing habitats and improve connectivity to facilitate dispersal along adjacent canal/river network d) Encourage investment in local area e) Increased use of sites from tourism and increased income; f) Encourage greater use, health & well-being
E6	<b>Evington Brook, Leicestershire Golf Course, Spinney Hills</b> <b>Site Designations</b> <i>Local Wildlife Site</i> 25 Leics golf course & adjacent sites <i>Biodiversity Enhancement Sites</i> 58 Spinney Hill Park 59 Evington Brook 62 Evington Lane 63 Leics golf course and sites	Meadows and amenity grassland, spinneys and mature trees, hedgerows, brook and ponds  Bats, badgers, calcareous plants, ferns on abutments	a) Maintain and enhance POS to encourage greater use by local community b) Improve access and network of paths, cycle routes c) Improve flood capacity and protection d) Create, enhance and maintain main habitat types e) Major investment in regeneration areas/former industrial sites	a) Major flood storage – reduce risk of flooding b) Recreation and leisure by providing safe network of paths c) Improve nature conservation value of existing habitats and improve connectivity to facilitate dispersal along adjacent canal/river network e) Encourage investment in local area f) Encourage greater use, health & well-being
E7	<b>Mainline/Ivanhoe Railway Junction</b> <b>Site Designations</b> <i>Local Wildlife Site</i> 26 Ivanhoe mainline & railway line, Saffron lane verges 27 Welford Road Cemetery <i>Biodiversity Enhancement Sites</i> 51 Mainline railway (Welford Rd to Ulvescroft Rd) 77 Gas works, Aylestone Rd 78 St Mary's allotments	Early successional communities, scrub and woodland, meadow, mature trees, built structures  Bats, badgers, calcareous plants, ferns on abutments	a) Protect and enhance designated areas and improve connectivity to other green space b) Improve path network to encourage multiple use c) Increase usage of sites for recreation and public amenity d) Create flood alleviation measures e) Tree planting and effective management of natural green space	a) Biodiversity – support diverse range of species through creation and maintenance of a mosaic of habitats b) Recreation and leisure by providing safe network of paths for commuting and leisure c) Encourage greater use, health & well-being d) Increased carbon storage and ameliorate climate change

Site ID	Site Name	Description	Opportunities	Potential Benefits
E8	<b>Saffron Brook and Mainline Railway South</b> <b>Site Designations</b> <i>Local Wildlife Sites</i> 32 Knighton Spinney <i>Biodiversity Enhancement Sites</i> 91 Mainline railway south & adj land 92 Saffron Brook, Knighton Bridge 93 Saffron Brook, Knighton village 94 Saffron Brook, Knighton Park	Scrub, grassland, herbs, brook, ponds, woodland and spinneys  Badger, common lizard	a) Naturalise the channel (meanders etc) e.g. Knighton Park, Wash Brook NR b) Create additional flood storage areas e.g. former site of St Marys Allotments c) Incorporate natural and biodiversity features into flood alleviation schemes d) Increase public amenity value e) Create sustainable, cost-effective schemes f) Create a safer environment	a) Increase flood storage, improve water quality b) Reduced risk of flooding in surrounding housing and businesses – encourage investment c) Encourage greater use, health & well-being, reduce stress-related risk of flooding and after-math d) Biodiversity – support diverse range of species through creation and maintenance of a mosaic of habitats
E9	<b>Eyres Monsell and Saffron Hill</b> <b>Site Designations</b> <i>No Local Wildlife Sites</i> <i>Biodiversity Enhancement Sites</i> 96 Grange Spinney 97 Queen's Park Way and Featherstone Drive 98 Saffron hill Cemetery & Linwood Playing Fields 99 Two Acre Spinney	Meadows, scrub, tall herbs, spinneys, hedgerow and mature trees	a) Use principles of urban design to assess the current green space and its functions and usage and identify opportunities for improvements b) Improve connectivity of paths and access around residential housing, businesses and link to/through POS c) Enhance biodiversity value of natural green space through good management d) Work with local community to raise funding/grants for local projects and encourage localism e) Use contributions from local development to improve play and natural green space, access routes e.g. Home Farm	a) Recreation and leisure by providing safe network of paths b) Encourage greater use, health & well-being c) Biodiversity – support diverse range of species through creation and maintenance of a mosaic of habitats d) Learning opportunities through increased use by local schools and groups

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## APPENDIX I

### A1 Mapping Methodology

A similar methodology for mapping Green Infrastructure to that used and tested by the City of Liverpool and Mersey Forest team ([http://www.ginw.co.uk/liverpool/Technical\\_Document.pdf](http://www.ginw.co.uk/liverpool/Technical_Document.pdf)) has been adopted within the City of Leicester. The methodology has been refined to take account of the existing digitised datasets.

Mapping for this strategy falls into five main stages:

- Typology
- Functionality
- Benefits

Other strategies have then gone onto identify areas where the needs or requirements of those benefits have been fulfilled or not fulfilled and to then identify target areas where actions can be recommended to implement GI and so provide those needs where most required.

- Needs – fulfilled and not fulfilled
- Targeting

The remit for the Leicester GI Strategy was carefully considered and, given the level of accuracy of maps showing needs fulfilled and not fulfilled; resources and commitments to the Strategy and detailed local knowledge, it was not deemed appropriate to complete additional data analysis and mapping of needs and targeting using this approach.

The Needs and Targeted areas for GI have been recommended in Section 6, based largely on local knowledge, but further work is required to prioritise the areas depending on recommendations and objectives from the GI Forum (to be set up to agree on priorities and approaches to implement GI in Leicester).

## A 1.1 Typology

### A 1.1.1 Typology of GI assets

The first step was to classify all of the land in the city boundary as either **not green infrastructure** (NGI), or one of a list of **green infrastructure types**, which are defined below.

- Land ownership and access e.g. public or private
- Location e.g. central urban or rural setting
- Type of use e.g. allotments, parks, private gardens, institutional grounds
- Land type e.g. wetland, grassland/scrub, woodland

#### **Agricultural land**

Land managed for agriculture, including grazing lands, crop production fields and hedgerows. Potentially irregular field margin trees may be included.

#### **Allotment, community garden or urban farm**

Allotments are small plots which collectively make up a larger green space. These plots are available for members of the public to rent for the cultivation of fruit, vegetables and flowers. Community gardens and urban farms are community-managed projects ranging from wildlife gardens, to fruit and vegetable plots on housing estates, community polytunnels, to large city farms. They exist predominantly in urban areas and are often community led projects, created in response to a lack of access to green space. They combine a desire to encourage strong community relationships and an awareness of gardening and farming. Most projects provide food-growing activities, training courses, school visits, community allotments and community businesses. Dedicated orchards are classified separately.

#### **Cemetery, churchyard or burial ground**

Land used as burial grounds, including cemeteries and churchyards, usually grass covered with occasional shrubs and trees.

#### **Derelict land**

Land which has been disturbed by previous development or land use but is now abandoned - Waste or derelict land is often re-colonised by processes of natural succession. Land is classed as derelict whilst it is in the early stages of natural succession. As succession proceeds land that may be officially classified as derelict land by the local authority, will have a different green infrastructure type e.g. grassland or woodland (or will fall under non green infrastructure).

#### **General amenity space**

Usually publicly owned and managed, and always accessible for public enjoyment. Their function is usually as a green “landscape backdrop” but their landscape value can sometimes be minimal because of poor design. They include the „left over“

green spaces within housing and other forms of development, as well as most road verges. Most commonly, but not exclusively in housing areas - including informal recreation spaces, green spaces in and around housing, and village greens.

#### **Grassland or scrubland**

Grassland which is not agriculturally improved - Could include established vegetation on reclaimed derelict land which is not part of a formal recreation green space. Includes downlands, commons and meadows - likely to include some commons within urban areas - Scrubland areas predominantly consist of shrubs, with grasses and herbs also present.

#### **Green roof**

Roofs of buildings, bus shelters or any other form of construction which are partially or completely covered with vegetation. Vegetation may be sedums, plants, perennials, grasses, trees and shrubs.

#### **Institutional grounds**

Green space in the grounds of institutions such as schools, universities and colleges, hospitals and nursing homes, and associated with commercial and industrial premises. Land usually consists of expanses of grass, scattered trees, hedgerows and shrubs. Outdoor sports facilities are not included.

#### **Orchard**

Areas populated with fruit bearing trees, can be publicly or privately owned, could be for commercial selling or local community use.

#### **Outdoor sports facility**

Includes sports pitches, school and other institutional playing fields, golf courses and other outdoor activities - Usually consist of vegetated sports surface and boundary shrubbery, trees and hedges. Can be publicly or privately owned and often occur within parks.

#### **Park or public garden**

Includes urban parks, country parks and formal gardens (including ones where you may have to pay for access). Generally designed for public access and enjoyment, combining a variety of landscape and horticultural elements - Extraneous facilities for the public may be present onsite which enhance visitor attraction.

#### **Private domestic garden**

Privately owned green space within the curtilage of individual dwellings, which is generally not publicly accessible. These plots of private land vary in size but often make up a significant part of the green fabric of urban areas. Land may include trees, shrubs, grass and flowering plants.

#### **Street trees**

Generally in urban areas, a row/collection of individual trees along the side of a road - Trees will vary in size and species depending on location and size of street. Usually located on the pavement edge in tree pits, requires reasonably wide pavements. Tree pits may be planted with small flowering plants.

### Water body

Expanses of open water, including large lakes, small ponds, reservoirs and harbours

### Water course

All areas of running water, including large rivers, small streams, canals and aqueducts

### Woodland

All forms of woodland including deciduous woodland (both ancient semi-natural and woodlands of more recent origin) and mixed and coniferous woodland (including plantations and shelterbelts). Includes newly planted woodland. Small clusters of trees will be classed as woodlands.

Note: Two categories used by the Mersey Forest Team were not used within the typology identification. These were coastal (for obvious reasons of Leicester being located in the middle of the country) and wetland – excluded as these were areas classified as marsh, bog and fen. Where such conditions do persist they are in such small quantities to not merit inclusion as a separate typology and have been included under grassland or waterbody. It was also considered that a more detailed mapping analysis at a site local or site GI scale would identify such areas and take into consideration at the Project management stage.

This list was developed from the Planning Policy Guidance 17 typology to cover all green infrastructure in broad, functionally distinct categories. This mapping gives a complete picture of the green infrastructure resource of the city. Additional information was provided using polygons from Ordnance Survey's MasterMap Topography Layer and from digitised records from a Phase 1 Habitat Survey 2006-2008 completed by Leicester City Council. Collectively, this provided a bespoke detailed dataset from which to produce a typology map.

The dataset was analysed and checked for accuracy and updated where necessary. This also included updating attributes for the mapped layers. Where there were gaps in the data, the mapping was digitized by officers with local knowledge of the green space sites using a combination of Ordnance Survey Mastermap data and up-to-date aerial photographs (as at 2011). The mapped layers were merged to create one Typology layer and this was used to map the typology for Leicester.

## A 1.1.2 Functionality

The GI **functions** simply describe what the GI type does. A GI land **type** may provide one function or a range of functions depending on the spatial scale or location of an individual site. The types of functions that have been considered include provision for recreation, water interception and storage, habitat for wildlife and carbon storage. GI Planning aims to identify any existing or potential areas of green space that can provide high levels of multiple-functions where possible. Where a site can only provide a single or more limited functionality, their conservation may only be considered appropriate if this is a function that is required by legislation or is of strategic significance.

The next step was to determine which polygon areas currently perform one or more functions from the list of functions. The functions are defined below with caveats as to when they may apply sometimes, but not all the time.

### **Recreation – public**

Anyone can use for recreational purposes (formal/informal and active/passive), without having to pay or have access to keys. Can include areas which are closed at night, on specific days, or seasonally but a judgement call will be required as to whether this restricts public use -Can include sports fields, fishing lakes, playgrounds, etc, and open access land.

### **Recreation – private**

Land which is used for recreation but only by owners of the land or those invited by the owners to use -This includes private gardens and other privately owned green spaces to which access for the public is prohibited.

### **Recreation public – with restrictions**

Public use for recreational purposes (formal/informal and active/passive) is allowed but is restricted to those who pay or have keys. Can include sports fields, golf courses, fishing lakes, allotments, etc, but not public rights of way

### **Green travel route**

Off road routes through greenery for pedestrians and cyclists (for recreational purposes as well as for getting between places), can include public rights of way, Sustrans, and private routes which are not on roads. Useful in urban areas and often located close to large centres of population - Also includes the green infrastructure which surrounds green travel routes, making them an attractive alternative route.

### **Aesthetic (CABE, 2005)**

Improves the image of an area for people as they arrive, and for those who reside there - Examples may include street trees, trees along major roads, etc. - Applies equally to towns, cities and the rural landscape. Green infrastructure can make the town/village etc. a more attractive place to live and visit. The improved aesthetic which green infrastructure can provide will be reflected in surrounding property prices.

### **Shading from sun (Huang et al. 2006, Parker, 1981)**

Shading of people, buildings, and surfaces from solar radiation to reduce temperatures and increase comfort levels. Usually provided by trees and taller plants and vegetation - Particularly found in urban areas to reduce the urban heat island, this function will become more critical as we have to adapt to a changing climate. Green infrastructure which provides shade will also be important for protecting agricultural land and other species from solar damage.

### **Evaporative cooling (Kramer & Kozlowaki, 1960)**

As plants transpire water is evaporated from their surfaces cooling their immediate locality. All types of green infrastructure can provide this function, including open water. Plants with a larger leaf area are likely to be better than those with a smaller leaf area. During a drought, irrigation is likely to be necessary to maximise this function in plants, whilst open water will continue to be valuable in its own right.



### **Trapping air pollutants (Hill, 1971, Beckett et al., 1998, Smith, 1990, Hewitt et al., 2005)**

Removal of pollutants, especially ozone, nitrogen dioxide and particles from the air, through uptake via leaf stomata and deposition on leaf surfaces - Once inside the leaf, gases diffuse into intercellular spaces and may be absorbed by water films to form acids or react with inner leaf surfaces. This function is usually associated with more urban areas, especially close to travel routes.

### **Noise absorption (Fang & Ling, 2002)**

Screening of noise, especially from major transport routes. Requires certain types of green infrastructure which are tall enough to intercept and absorb sound waves. This function is usually associated with more urban areas, especially close to travel routes.

### **Habitat for wildlife**

Providing a habitat for wildlife – a place to live with a source of food - Different types of green infrastructure will provide habitats for a widely different range of species. The range of species will also be dependent on other factors such as climate and disturbance.

### **Corridor for wildlife (Benedict & McMahon, 2006)**

Conduit of green and blue spaces through which wildlife can disperse to and from habitat spaces. This function will increase in importance in the future; species will need the capacity to move upwards and northwards as the climate changes. Connectivity is vital for this function. Different types of green infrastructure will provide a corridor for a widely different range of species. Range of species will also be dependent on other factors such as climate and disturbance.

### **Soil stabilisation (Barker, 1995)**

Root structures of all vegetation can help improve the strength and stability of soil, holding together the top soil and preventing it from eroding.

### **Heritage**

Historic links in the landscape (including ancient woodland , canals, designated sites and monuments). Heritage is "that which is inherited".

### **Cultural asset**

Green space used for cultural purposes, the hosting of public art, events and festivals. Examples include international garden festivals and sculpture parks.

### **Carbon storage (Milne & Brown, 1995)**

Removing carbon from the atmosphere and storing it in plants, trees and soils. Trees and peat soils are particularly important types of green infrastructure for storing carbon. Varying types of green infrastructure will take different amounts of time to sequester carbon; some types of green infrastructure are slow growing in nature and therefore will take longer to sequester carbon. Stored carbon in trees will stay locked away inside the wood if felled for material substitution.

### **Food production (TCPA, 2008)**

Land used for growing crops or the grazing of animals.

### **Wind shelter**

Green infrastructure can provide shelter from winds at a local level by slowing or diverting currents.

### **Learning**

Opportunities for lifelong learning - Green infrastructure can provide a backdrop for outdoor classrooms and learning outside of the indoor school environment, and also a setting for learning new skills that may help adults back to work.

### **Inaccessible water storage**

Water stored in soils and vegetation. Certain types of sustainable urban drainage systems and soils will store large amounts of water. Certain soils such as clay and peat will store more water than others. This water is inaccessible for human use or for irrigation.

### **Accessible water storage**

Water stored in ponds, lakes, reservoirs and certain wetlands. This water is accessible for human use and for irrigation should it be required.

### **Water interception (Centre for Urban Forest Research, 2002)**

Interception of rainwater before it reaches the ground, e.g. by the leaves of trees and plants. This will slow the flow of water to the ground. All types of green infrastructure will intercept water in some way, though certain types with a greater leaf area will intercept a greater amount and slow its flow to greater extent. This can help to reduce the risk of flooding.

### **Water infiltration**

Vegetation and roots aid in the movement of rainwater and floodwater into the ground - Green infrastructure will help water to drain naturally into the soil (Includes both surface infiltration and deep infiltration). Green infrastructure is a permeable surface as opposed to hard surfacing such as concrete. It aids in the natural passage of water to the ground – helping reduce the risk of flooding.

### **Water conveyance**

Green infrastructure can transport water to areas which are in need of water and also away from areas at risk of saturation or flooding. Examples include rivers and canals. Irrigation ditches in agricultural land are another example of water conveyance.

### **Pollutant removal from soil/water (Barret et al. 2005)**

Vegetation can remove pollutants from soil and water. For example green infrastructure at the side of the road can clean contaminated road runoff (reducing concentrations of pollutants such as heavy metals), and certain plants can remove pollutants from contaminated soil.

### **Flow reduction through surface roughness**

The speed and amount of water passing through a site can be reduced by vegetation. If the site has a varied green topography as opposed to hard standing, water will be retained onsite for longer, potentially helping to reduce flooding. Some types of green infrastructure perform this function more than others – for example, a woodland floor tends to be rougher than grass

The following table shows which types of green infrastructure perform which functions:

- Where a cell contains a value of 1.00, land of the type in question **almost always** performs the function in question to a level above a notional threshold (where it becomes 'significant'), so all polygons of that type can simply be said to perform that function.
- Where a cell contains a value of 0.00, land of the type in question **almost never** performs the function in question to a level above the threshold, so all polygons of that type can simply be said not to perform that function and given no value or "0".
- Where there is a letter in a cell, land of the type in question sometimes performs the function in question to a level above the threshold and **sometimes** doesn't, depending on other factors. The conditions in the second part of the table were used to determine whether each polygon of that type would be said to perform that function. To simplify the dataset those cells were allocated a value of 0.5

**Table A1.1: Number of Functions Performed by Each Land Type (as defined by Liverpool 2010)**

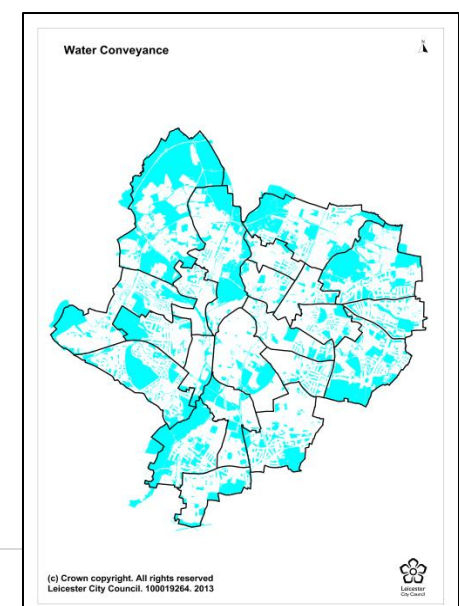
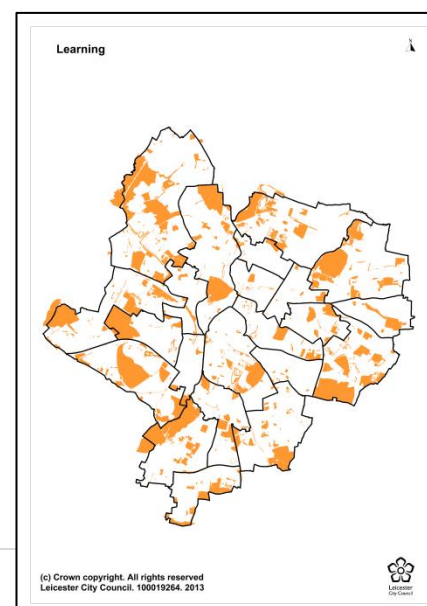
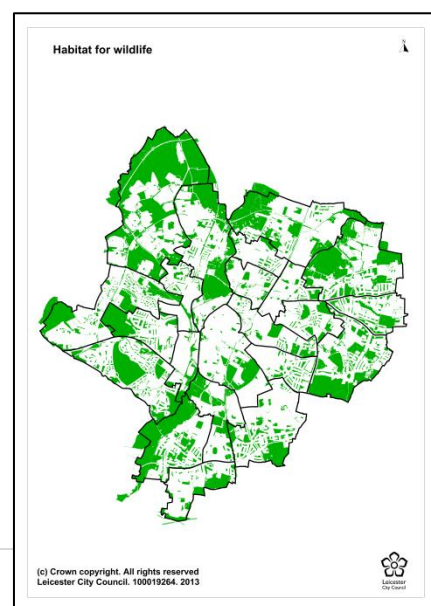
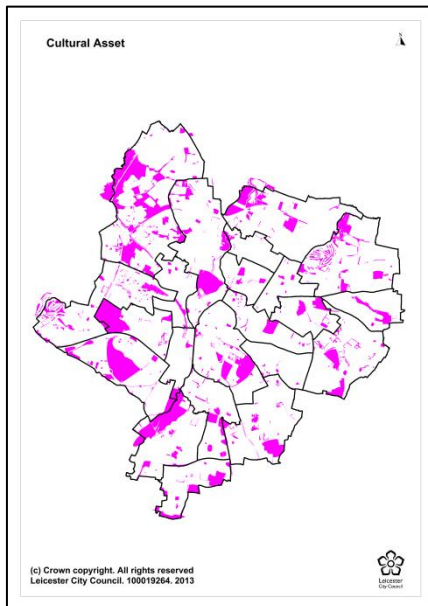
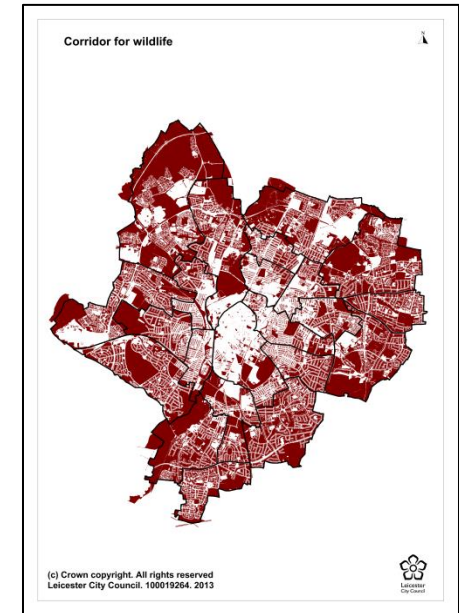
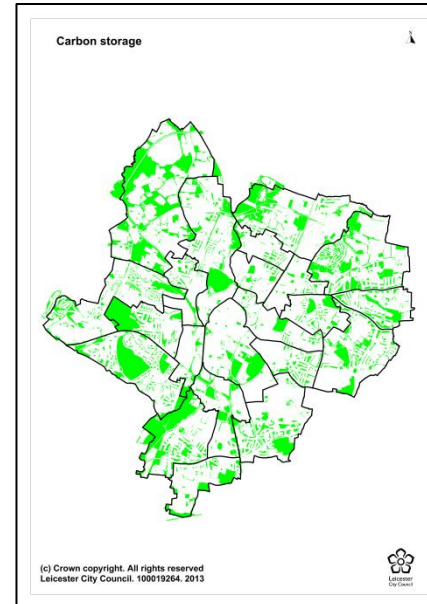
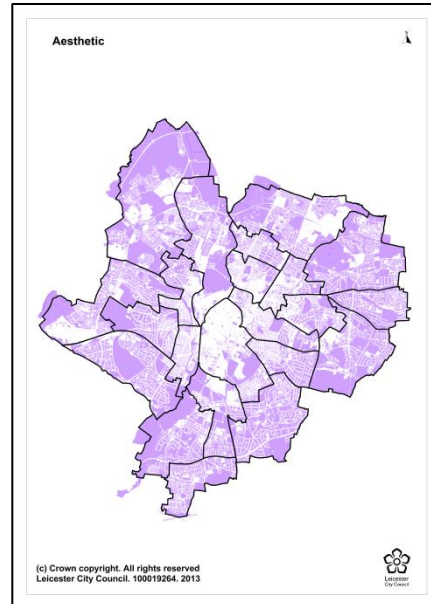
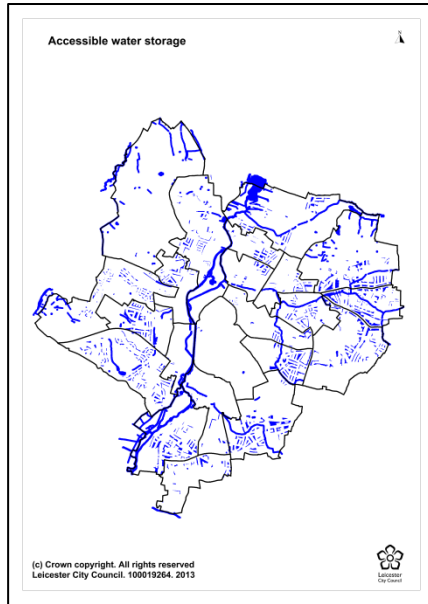
TYPE	FUNCTIONS																									SCORE
	Recreation - public	Recreation - private	Green travel route	Aesthetic	Shading from sun	Evaporative cooling	Trapping air pollutants	Noise absorption	Habitat for wildlife	Corridor for wildlife	Soil stabilisation	Heritage	Cultural asset	Carbon storage	Food production	Wind shelter	Learning	Inaccessible water storage	Accessible water storage	Water interception	Water infiltration	Water conveyance	Pollutant removal from soil/water	Flow reduction through surface roughness		
Park or public garden	0.5	0	0.5	1	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0	0.5	0.5	0.5	0	0	0.5	0.5	0.5	0	11	
General amenity space	1	0	0	1	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0	0.5	0	0.5	0	0	0.5	0.5	0.5	0	10	
Outdoor sports facility	0.5	0	0	1	0	1	0	0	0.5	0.5	0.5	0.5	0	0	0	0	0.5	0.5	0	0	0.5	0.5	0.5	0	7	
Woodland	0.5	0.5	0.5	1	1	1	1	0.5	1	0.5	0.5	0.5	0.5	1	0	1	0.5	1	0	0.5	0.5	0.5	1	16		
Water course	1	0	0.5	1	0	1	0	0	0.5	0.5	0	0.5	0	0	0	0	0	0	0.5	0	0	1	0.5	0	7	
Water body	0.5	0.5	0.5	1	0	1	0	0	0.5	0.5	0	0.5	0	0	0	0	0	0	0.5	0	0	0.5	0.5	0	6.5	
Grassland or scrubland	0.5	0	0.5	1	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0	0.5	0	0.5	0	0.5	0	0	0.5	0.5	0.5	1	10.5	
Agricultural land	0	0	0.5	1	0	1	0	0	0.5	0.5	0	0.5	0	0	1	0	0	0.5	0	0	0.5	0.5	0.5	0	7	
Allotment, community garden or urban farm	0.5	0	0.5	1	0	1	0	0	0.5	0.5	0	0.5	0	0	1	0	0.5	0.5	0	0	0.5	0.5	0.5	0	8	
Cemetery, churchyard or burialground	1	0	0.5	1	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0	0.5	0	0.5	0	0	0.5	0.5	0.5	0	11	
Derelict land	0	0	0	1	0	1	0	0	0.5	0.5	0.5	0.5	0	0	0	0	0	0.5	0	0	0.5	0.5	0.5	0	6	
Private domestic garden	0	1	0	1	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0	0.5	0	0.5	0	0.5	0	0	0.5	0.5	0.5	0	9.5	
Institutional grounds	0	0	0	1	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0	0.5	0	0.5	0.5	0.5	0	0	0.5	0.5	0.5	0	9	
Orchard	0.5	0	0.5	1	1	1	1	0.5	1	0.5	0.5	0.5	1	1	1	1	0	1	0	0.5	0.5	0.5	1	0.5	16	
Street trees	0	0	0.5	1	1	1	1	0.5	1	0.5	0.5	0.5	0	1	0	1	0	0.5	0	0.5	0.5	0	0.5	0	11.5	
Green roof	0.5	0.5	0	1	0.5	1	0.5	0.5	1	0	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0	0	0	0	1	0	9.5	
Non GI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

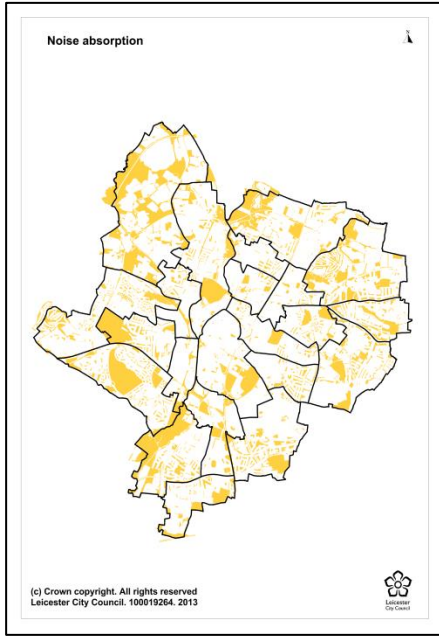
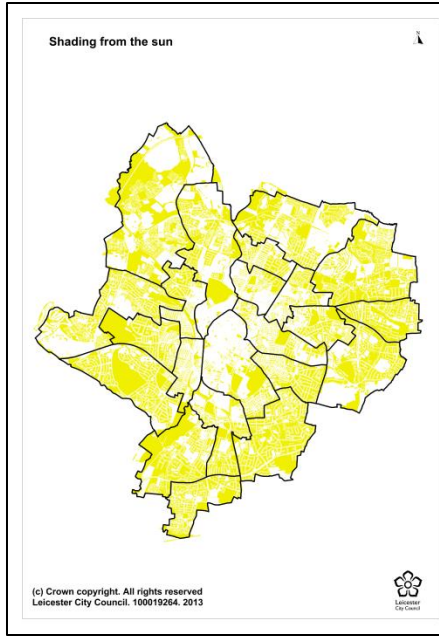
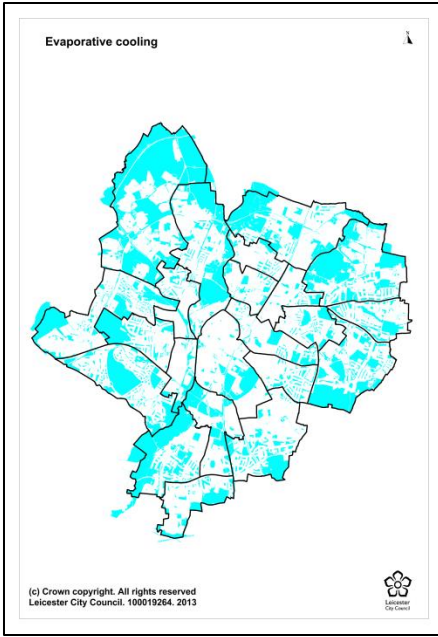
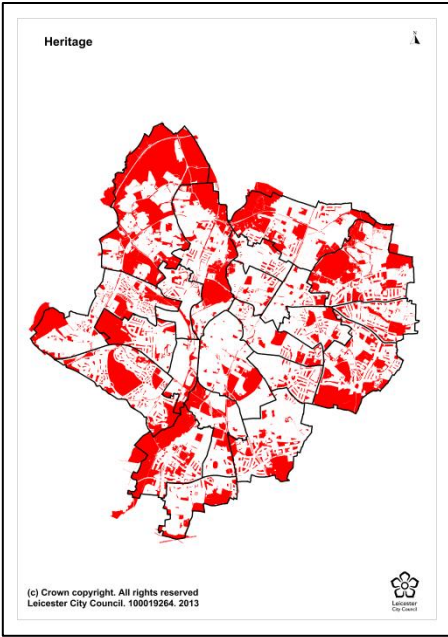
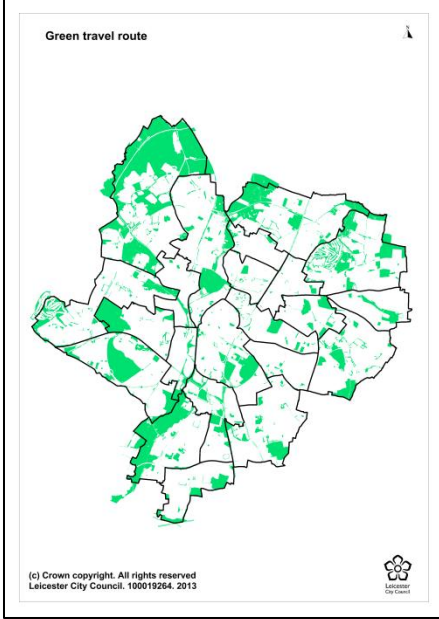
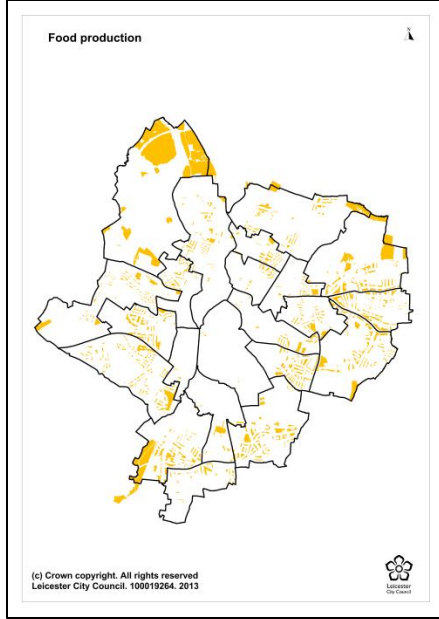
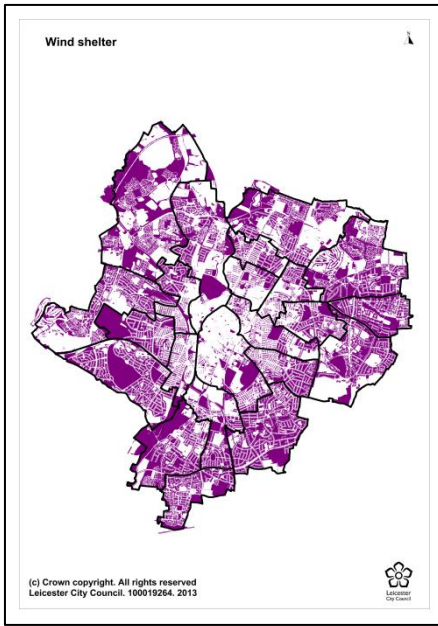
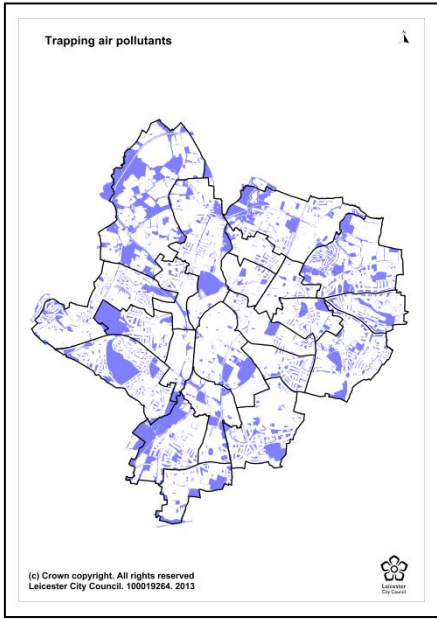
The types of functions can also lead to a number of benefits as identified from the priorities and are linked to economic growth, climate change, biodiversity and health and well-being.

	FUNCTION																								
	Recreation - public	Recreation - private	Green travel route	Aesthetic	Shading from sun	Evaporative cooling	Trapping air pollutants	Noise absorption	Habitat for wildlife	Corridor for wildlife	Soil stabilisation	Heritage	Cultural asset	Carbon storage	Food production	Wind shelter	Learning	Inaccessible water storage	Accessible water storage	Water interception	Water infiltration	Water conveyance	Pollutant removal from soil/water	Flow reduction through surface roughness	
Sustainable City - Setting the Scene for Growth																									
Supporting Adaptation to Climate Change																									
Providing Recreation, Leisure and Tourism																									
Enhancing the Ecological Network																									
Supporting Health and Well-Being																									

## APPENDIX II – FUNCTION MAPS

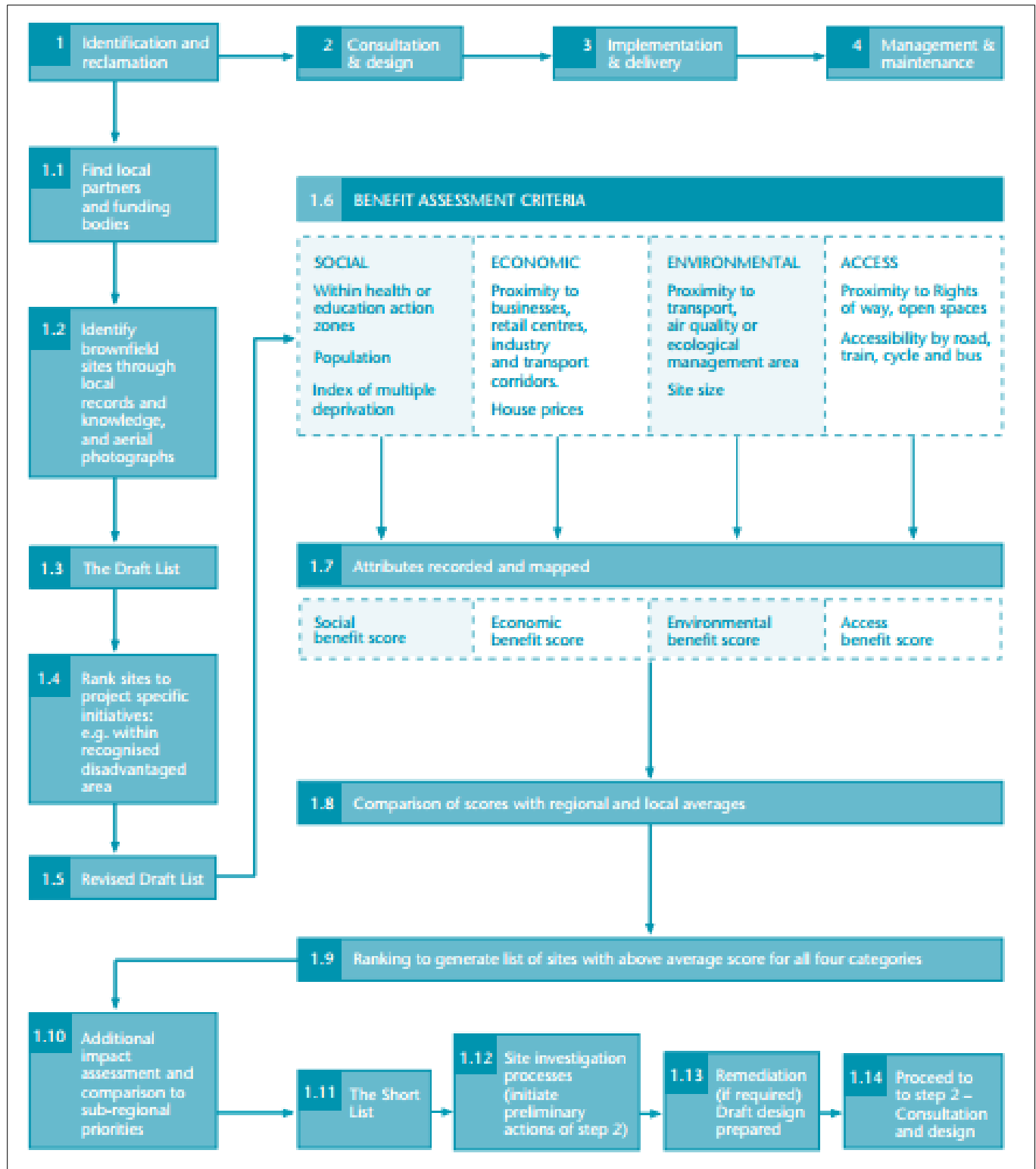
An overall function map was produced for Leicester (Figure 2.5), but examples of individual function maps have been produced to show how the distribution of functions can change across the City depending on the type of landuse.





APPENDIX III

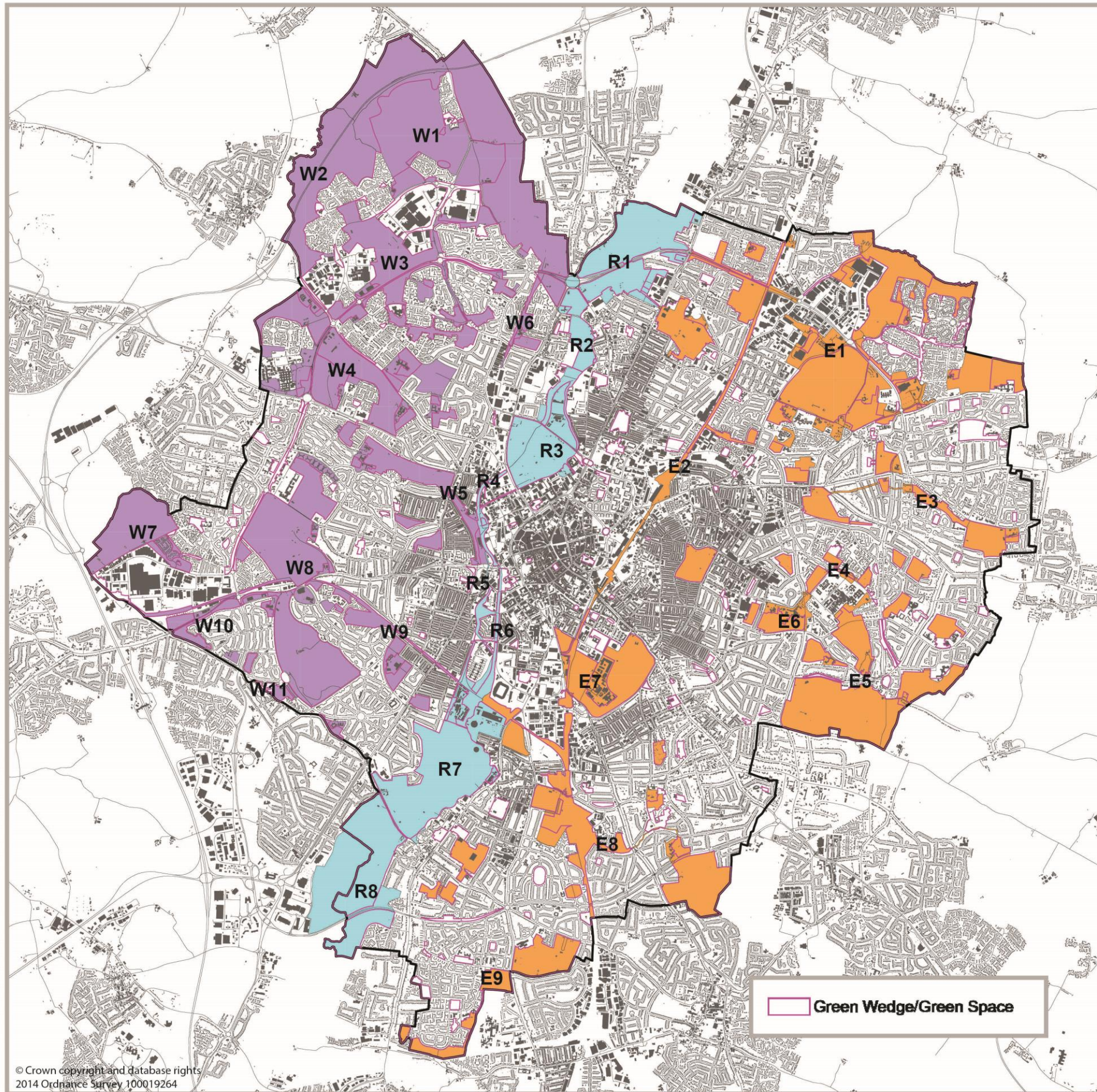
Process used to identify and prioritise brownfield sites for GI Projects (Forestry Commission 2007)



**APPENDIX IV**

City of Leicester Green Infrastructure Map Showing Opportunities for GI (Referred to in Section 6)





## Green Infrastructure Opportunities and Potential Benefits

(See tables in section 6 for more details)

### River Soar and Grand Union Canal Network

Site ID	Site Name
R1	Watermead Park to Thurcaston Rd: includes Leicester Marina, Belgrave Meadows, Outdoor Pursuit Centre
R2	Thurcaston Rd to Belgrave Lock: includes former John Ellis Playing Fields, Belgrave Gardens, Beaumanor OS
R3	River – Belgrave Lock to Evans Weir: includes Abbey Park Allotments, Swans Nest Weir, Belgrave Lock, former Wolsey Island and Abbey Meadows sites
R4	Canal – Belgrave Lock to Evan’s Weir: includes Soar Island and Hitchcocks Weir
R5	Old River Soar - Richard III Rd to Bede Park and Great Central Way
R6	Mile Straight - Evan’s Weir to Twelve Arches Bridge - Ivanhoe Railway at Twelve Arches, Bede Island South, Great Central Way and sidings
R7	Aylestone North Twelve Arches Bridge to Marsden Lane
R8	Aylestone South – Marsden Lane to Blue Bank Lock

### Sites West of River Soar

Site ID	Site Name
W1	Ashton Green
W2	Rothley Brook and Castle Hill Country Park
W3	Beaumont Leys Green Space
W4	Anstey Green Wedge: includes Goss Meadows, City Farm
W5	Stokeswood Park, The Rally Park and Green Space: includes Gilroes Cemetery
W6/R2, 3, 5, 7, 8	Former Great Central Railway and Red Hill (northern section)
W7	Kirby Frith: includes Western Golf Course, Kirby Frith LNR and POS
W8	Braunstone Park and Western Park
W9	Braunstone Brook; includes Westcotes Park and Fosse Rd Recreation Ground
W10	Ivanhoe Railway Line and Sidings: includes Hockley Farm Rd
W11	Ratby Lane and Braunstone Lane Corridor: includes Highway Spinney & Meynells Gorse, St Peters, Coalpit Spinney

### Sites East of River Soar

Site ID	Site Name
E1	Melton Brook, Humberstone, Hamilton and Gipsy Lane Brickworks
E1a	Hamilton Meadows LWS
E1b	Hamilton greenways and swale park
E1c	Hamilton Park
E1d	Melton Brook floodplain LWS
E1f	Gipsy Lane SSSI
E1g	Appleton Park and Peebles Way Nature Reserve
E2	Mainline Railway North
E3	Scraftoft Brook and Willow Brook
E4	Coleman Road
E5	Evington Park
E6	Evington Brook, Leicestershire Golf Course, Spinney Hills
E7	Mainline/Ivanhoe Railway Junction
E8	Saffron Brook and Mainline Railway South
E9	Eyres Monsell and Saffron Hill

## APPENDIX V - GLOSSARY OF TERMS

### **106 Agreements**

Legal agreements or undertakings under section 106 of the Town and Country Planning Act that provide a means of ensuring developers contribute towards the infrastructure and services that are necessary to facilitate proposed development - also known as Planning Obligations.

### **Accessible Natural Green space Standards (ANGSt)**

These standards recognise the importance of nature in the urban context in terms of improving the quality of people's lives and people's entitlement to have access to, and experience of, nature near to where they live.

### **Backland Development**

"Backland development" is defined as development on land that lies to the rear of an existing property that often, but not in all cases, fronts a road. The term usually applies to housing and is normally associated with small-scale development, usually one or two plots. Access can be from the road serving the original properties from the front or from the side

### **Biodiversity Enhancement Sites (BES)**

Sites which are of wildlife value, but do not meet the LWS criteria, but have potential to be improved to enhance their biodiversity value. The sites usually provide a function to protect sites as a buffer to a LNR or LWS or link areas of green space by providing a corridor to assist with dispersal

### **Blue Infrastructure**

This term is sometime used to describe riverine and coastal environments with a green infrastructure network.

### **Blue Links**

These fulfil the same functions as green links but their proximity to floodplain and wetland may require different approaches to design and management

### **Campaign to Protect Rural England (CPRE)**

Not-for-profit organisation and national charity devoted to protecting and enhancing rural England. Encourages the sustainable use of land and other natural resources in town and country

### **Capital Costs**

Cost for investment activities e.g. implementation of projects (including construction and enabling clearance and demolition or remediation works)

### **Climate Change Adaptation**

The ability of a place to adapt to both extreme weather events and long-term changes to climate patterns

**Community Infrastructure Levy (CIL)**

Is a new planning charge, introduced by the Government through the Planning Act 2008, which allows local authorities to raise funds from developments to pay for the infrastructure that is needed as a result

**Community Strategies**

District and county authorities have a duty to prepare Community Strategies under the Local Government Act 2000. These identify the needs and aspirations of local communities and opportunities for realising them. Community Strategies are prepared by LSPs where established.

**Constraints Map**

Map showing the location of important resources and receptors that may form constraints to development.

**Development Plan Document (DPD)**

Any part of the Local Development Framework that forms part of the statutory development plan – these are: Cores Strategy, area wide policies, topic policies, area action plans, proposals map and site allocations but would not include Statement of Community Involvement or Supplementary Planning Documents.

**Ecological Footprint**

A measure of how much productive land and water an individual, a city, a country or humanity requires to produce the resources it consumes and to absorb the waste it generates, using prevailing technology. The land could be anywhere in the world, is measured in global hectares (gha) and always refers to one year. If the footprint refers to one person the unit is given in global hectares per capita (gha/cap).

**Ecological Network**

Identification of key wildlife corridors and opportunities for connectivity/strategic links in implementing/delivering BAP targets and to assist in reversing habitat fragmentation

**Ecosystem Services**

The essential services and benefits that are derived from a fully functioning natural environment, including the management of basic resources such as water, and the sequestration of carbon

**GI**

Commonly used acronym for green infrastructure

**Geographical Information System (GIS)**

Computerised database of geographical information that can easily be updated and manipulated.

**Green Flag Award**

The national standard or “benchmark” for parks and green spaces within England and Wales

**Green Infrastructure**

Green infrastructure is the network of natural environmental components and green and blue spaces that lies within and adjacent to the City of Leicester and its administrative boundary and which provides multiple social, economic and environmental benefits. In the same way that the transport infrastructure is made up of a network of roads, railways, airports etc. green infrastructure has its own physical components, including parks, rivers, street trees and moorland.

**Green Infrastructure Study**

A report which assimilates baseline information for GI for a given location e.g. local standards, initiatives and establishment of environmental character; Such a study may go as far as investigating deficiency and need based on projected growth and identifying opportunities.

**Green Infrastructure Strategy**

Builds on the GI study approach to develop a GI hierarchy and identification/prioritisation/phasing of projects through an Action Plan or Implementation Strategy; It provides information on the capital and revenue costs, management needs, funding streams and delivery partners, but can vary with the scale of the strategy. This often forms the evidence base for the SPD/AAP

**Green Network**

The linking together of natural, semi-natural and man-made open spaces (which may include leisure or recreational facilities) to create an interconnected network that provides opportunities for physical activity, increases accessibility within settlements and to the surrounding countryside while enhancing biodiversity and the quality of the external environment.

**Growth Point**

Growth Points are a means by which local authorities can pursue large scale, sustainable growth, in partnership with central government and other local partners. They are based on four key principles, and these are i) early delivery of housing as part of the growth plans, ii) supporting local partners to achieve sustainable growth, iii) working with local partners to ensure that infrastructure and service provision keep pace with growth, and iv) ensuring effective delivery.

**Green Space**

A key component of a green infrastructure network, often classified within the typology devised by Planning Policy Guidance 17 (PPG17): Planning for Open Space, Sport and Recreation. Currently being reviewed in Leicester

**Green Space Strategies**

These evaluate publicly accessible open space provision within these typologies at the local authority scale, noting issues in relation to condition, quality and access, often to inform a strategy and action plan that sets out future management and regeneration policies

### **Green Space Supplementary Planning Document (Green Space SPD)**

This document supports the City Council Core Strategy and local policy CS 13 "Green Network". It outlines the process for determining the amount of green space that new development would need and the mechanism for calculating the amount of developer contributions to enhance existing green space if it is not possible to provide on-site green space.

### **Green Wedge**

An area of land designated in Development Plans that restricts new built development in order to achieve a number of specific purposes, such as preventing the sprawl of large built-up areas. Green Belts are expected to offer long-term certainty, with their boundaries being altered only in exceptional circumstances.

### **Heat Island Effect**

As urban areas develop, changes occur in their landscape. Buildings, roads, and other infrastructure replace open land and vegetation. Surfaces that were once permeable and moist become impermeable and dry. These changes cause urban regions to become warmer than their rural surroundings, forming an "island" of higher temperatures in the landscape.

### **Higher Level Stewardship (HLS)**

is one element of the Environmental Stewardship ( ES ) scheme - a government scheme that is open to all farmers, land managers and tenants in England. It is a voluntary scheme, designed to deliver significant environmental benefits in **high** priority areas.

### **Housing & Community Agency (HCA)**

The Homes and Communities Agency (HCA) is the housing and regeneration agency for England. As a national Agency that works locally its purpose is to contribute to economic growth by helping communities to realise their aspirations for prosperity and to deliver quality housing that people can afford

### **Housing Market Area (HMA)**

This is a geographical area which is relatively self-contained in terms of reflecting people's choice of location for a new home i.e. a large percentage of people settling in the area will have sought a house only in that area

### **Landcover**

Combinations of land use and vegetation that cover the land surface

### **Landscape Analysis**

The process of breaking the landscape down into its component parts to understand how it is made up. The method is often used in landscape ecology based studies and methodologies.

**Landscape Capacity**

The degree to which a particular landscape character type or area is able to accommodate change without unacceptable adverse effects on its character. Capacity is likely to vary according to the type and nature of change being proposed.

**Landscape Character**

The distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and how this is perceived by people; It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement. It creates the particular sense of place of different areas of the landscape.

**Landscape Character Assessment (LCA)**

An approach to assessing and recording those features and characteristics that constitutes a particular landscape as a basis for informed planning and policy decisions that respect and enhance that character and a local sense of place. Natural England has completed such an assessment across England, but does not include urban green site assessment.

**Landscape Classification**

A process of sorting the landscape into different types or typologies using selected criteria but without attaching relative values to the different kinds of landscapes

**Local Strategic Partnership (LSP)**

Is a **partnership** that brings together organisations from public, private, community and voluntary sector in a **local** authority area. The key objective of the **LSP** is to improve the quality of life in that area.

**Landscape Quality / Condition**

Based on judgements about the physical state of the landscape, and about its intactness, from visual, functional, and ecological perspectives; It also reflects the state of repair of individual features and elements which make up the character in any one place.

**Landscape Sensitivity**

The extent to which a landscape can accept change of a particular type and scale without unacceptable adverse effects on its character

**Leicestershire & Rutland Wildlife Trust (LRWT)**

Not-for-Profit charitable organisation – part of national Wildlife Trust, but local branch covers Leicester, Leicestershire & Rutland. Manage own nature reserves, encourages volunteers, conducts surveys, provides advice and comments on local and national nature conservation issues.

**Local Biodiversity Action Plans (LBAPs)**

These are produced by local partnerships, reflecting local priorities for action to conserve wildlife habitats, geological features and landforms that contribute to local, regional and national biodiversity. They recognise the contribution of biodiversity to quality of life and local distinctiveness, contributing to the well-being of local communities.

**Local Development Framework (LDF)**

Replacements for Structure and Local Plans these are prepared by local planning authorities. LDFs comprise a series of documents including a Core Strategy, Area Action Plans for areas of change or conservation and Supplementary Planning Documents. The Core Strategy and Area Action Plans have statutory 'development plan' status.

**Local Development Scheme (LDS)**

A project management document setting out what the Local Development Framework will contain together with a timetable for its production, proposals for monitoring and review.

**Local Nature Partnership (LNP)**

Are partnerships of a broad range of local organisations, businesses and people who aim to help bring about improvements in their local natural environment

**Local Nature Reserve (LNR)**

Areas of land designated by a local authority under Section 21 of the National Parks and Access to the Countryside Act 1949; they provide protection for sites of special local interest for nature and offer opportunities for both environmental education and community involvement, and for delivering a wide range of benefits to local communities and to visitors.

**Local Planning Authority (LPA)**

A local planning authority is the local authority or council that is empowered by law to exercise statutory town planning functions for a particular area of the United Kingdom

**Local Wildlife Site (LWS)**

These are non-statutory sites of local importance for nature conservation that complement nationally and internationally designated geological and wildlife sites

**Multifunctionality**

The ability to provide multiple or 'cross cutting' functions, by integrating different activities and land usage, on individual sites and across a whole green infrastructure network

**National Planning Policy Framework (NPPF)**

The National Planning Policy Framework sets out the Government's planning policies for England and how these are expected to be applied. It sets out the Government's requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so. It provides a framework within which local people and their accountable councils can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities.

**Office of the Deputy Prime Minister (ODPM)**

Created as a central government department in May 2002; It is responsible for policy on housing, planning, regional and local government and the fire service.

**Planning Obligations**

Legal agreements or undertakings under section 106 of the Town and Country Planning Act; they provide a means of ensuring that developers contribute towards the infrastructure and services that are necessary to facilitate proposed development - also known as 106 Agreements.

**Planning Policy Statements / Planning Policy Guidance (PPS / PPG)**

Set out the Government's national policies on different aspects of planning. The policies in this statement apply throughout England and focus on procedural policy and the process of preparing local development documents. These policies have now been superseded by the National Planning Policy Framework.

**Principle Urban Areas (PUA)**

The term city is also sometimes used to describe an urban area, which is an area of continuous urban development (or an agglomeration or urban footprint). An urban area includes the historical core municipality, and the adjacent suburbs, but not the exurbs, which are not connected by continuous development to the urban area

**Public Open Space**

Open space is defined in the Town and Country Planning Act 1990 as land laid out as a public garden, or used for the purposes of public recreation, or land which is a disused burial ground

**Public Rights of Way (PROW)**

Are paths on which the public have a legally protected right to pass and re-pass. Paths are shown on a Definitive Map as required by The Countryside & Rights of Way Act 2000

**Quality of Life Assessment**

A tool for maximising environmental, economic and social benefits as part of any land-use planning or management decision; it provides a systematic and transparent evaluation framework for all scales of decision making; integrates environmental, economic and social issues, and combines professional and local community views.

**Revenue Costs**

Costs associated with on-going management and maintenance of green infrastructure

**Rights of Way Improvement Plan (ROWIP)**

A statutory responsibility introduced by the Countryside and Rights of Way (CROW) Act 2000. Now subsumed within Local Transport Plans



**Sites of Special Scientific Interest (SSSIs)**

Sites designated under the Wildlife & Countryside Act (1981), as amended, for their outstanding interest in respect of flora, fauna, geology and/or limnology

**Strategic Environmental Assessment (SEA)**

An assessment of the potential impacts of policies and proposals on the environment, include proposals for the mitigation of impacts.

**Stepping Stones**

The Stepping Stones Project has been running since 1992 and represents a partnership working in the parishes surrounding Leicester that aims to improve green space and make high quality Green Infrastructure available to all.

**Supplementary Planning Document (SPD)**

A document which expands or supplements policy in development plan documents, for example design guidance, site development guidance, parking standards etc.

**Surface Water Management Plan (SWMP)**

a plan which outlines the preferred surface water management strategy in a given location. In this context surface water flooding describes flooding from sewers, drains, groundwater, and runoff from land, small water courses and ditches that occurs as a result of heavy rainfall.

**Sustainability Appraisal (SA)**

An appraisal of the impacts of policies and proposals on economic, social and environmental issues; this can also cover the issues required by Strategic Environmental Assessment.

**Sustainable Urban Drainage (SuDs)**

An approach to managing rainfall and run off in developments, with a view to replicating natural drainage; SuDS also aim to control pollution, recharge ground water, control flooding, and often provide landscape and environmental enhancement

**SuDs Approval Body (SAB)**

Is an organisation within County Councils and Unitary Authorities specifically established to deal with the design, approval and adoption of sustainable urban drainage systems (SUDS) within any new development consisting of two or more properties. The SAB is required to approve the SuDs prior to construction commencing; it will produce its own design guidance document and approval/adoption procedures. Statutory consultees of the SAB include Environment Agency, Internal Drainage Board, Canal & River Trust, Highway Authorities and Water Companies.

**Sustainable Urban Environment (SuE)**

are the principal component of housing development plans for regional areas in England and Wales and provided planned housing figures until 2026.

**The Conservation Volunteers (TCV)**

A national not-for-profit charitable organisation with a local Leicester, Leicestershire/Northamptonshire branch which encourages volunteers to take part and learn new skills in nature conservation and organises specific projects with partners to manage land sensitively and sustainably with biodiversity in mind. TCV currently have a Service level Agreement with Leicester City Council to manage some of their Nature Reserves and Local Wildlife Sites.

**Tree Preservation Order (TPO)**

A Tree Preservation Order (TPO) is an Order made by a Council in respect of a tree(s) because the tree is considered to bring amenity value to the surrounding area. The order makes it an offence to cut down, uproot, prune, lop or damage the tree in question without first obtaining the Council's consent. A TPO can apply to a single tree, a group of trees or a woodland.

**Urban Fringe Enhancement Zone (UFEZ)**

Describes the transitional area between the a dense urban environment and the more open rural countryside

**Water Framework Directive (WFD)**

is a European Union directive which commits European Union member states to achieve good qualitative and quantitative status of all water bodies by 2015. It is a framework in the sense that it prescribes steps to reach the common goal rather than adopting the more traditional limit value approach.

## APPENDIX VI

List of personnel/organisations consulted during the drafting of the Green Infrastructure Strategy

Organisation/Specialism	Personnel	Specialism/Interest
Leicester City Council		
	Helen O'Brien	Biodiversity/GI
	Mudrika Patel	IT/GI Mapping
	Chryse Tinsley	Landscape/SuDs
	Nicola Handa	Urban Design/Ashton Green
	Anne Provan	Line Manager/Economic Development
	Richard Kelly	Biodiversity
	Nick Logan	Planning Policy/Green Space
	Elizabeth Logan	Planning Policy/Green Space
	Andy Salkeld	Cycle Routes
	Paul Stanley	PROW
	Stewart Doughty	Parks & Green Spaces
	Bob Mullins	Parks & Green Spaces
	Steve Palethorpe	Parks & Green Spaces
	Alan Dalbe	Trees & Woodlands
	Phil Thompson	Highways/Drainage/Flooding
	Martin Fletcher	Highways/Drainage/Flooding
	Nira Sumaria	Highways/Drainage/Flooding
	Louise Seymour	Economic Development & Regeneration
	Sarah Dunkerley	Health & Well-being
	David Pearce	Health & Well-being
	Anna Dodd	Environment – GI/Climate Change
	Duncan Bell	Environment – Food Strategy
	Louise Buckley	Environment – Climate Change
	Neil Gamble	Property
Leicestershire CC	Graham Whalley	Environment/GI/Biodiversity
	Sue Timms	GI/Biodiversity
	Lesley Eddleston	GI
Oadby & Wigston BC	Carolyn Holmes	GI
Charnwood BC	Francoise Scire	GI
Environment Agency	Jonathan Vann	GI/Flooding
	Dan Widdowson	GI/Biodiversity
Leicestershire & Rutland WT	Mike Jeeves	Biodiversity/GI
	Neill Talbot	Biodiversity/GI
Natural England	Andy Stubbs	GI Co-ordinator
	Kristina Gould	GI
Stepping Stones	Sam Village	GI
	Andy Jackson	GI
University of Leicester	Emma Fieldhouse	Biodiversity/GI