2010

LIVERPOOL

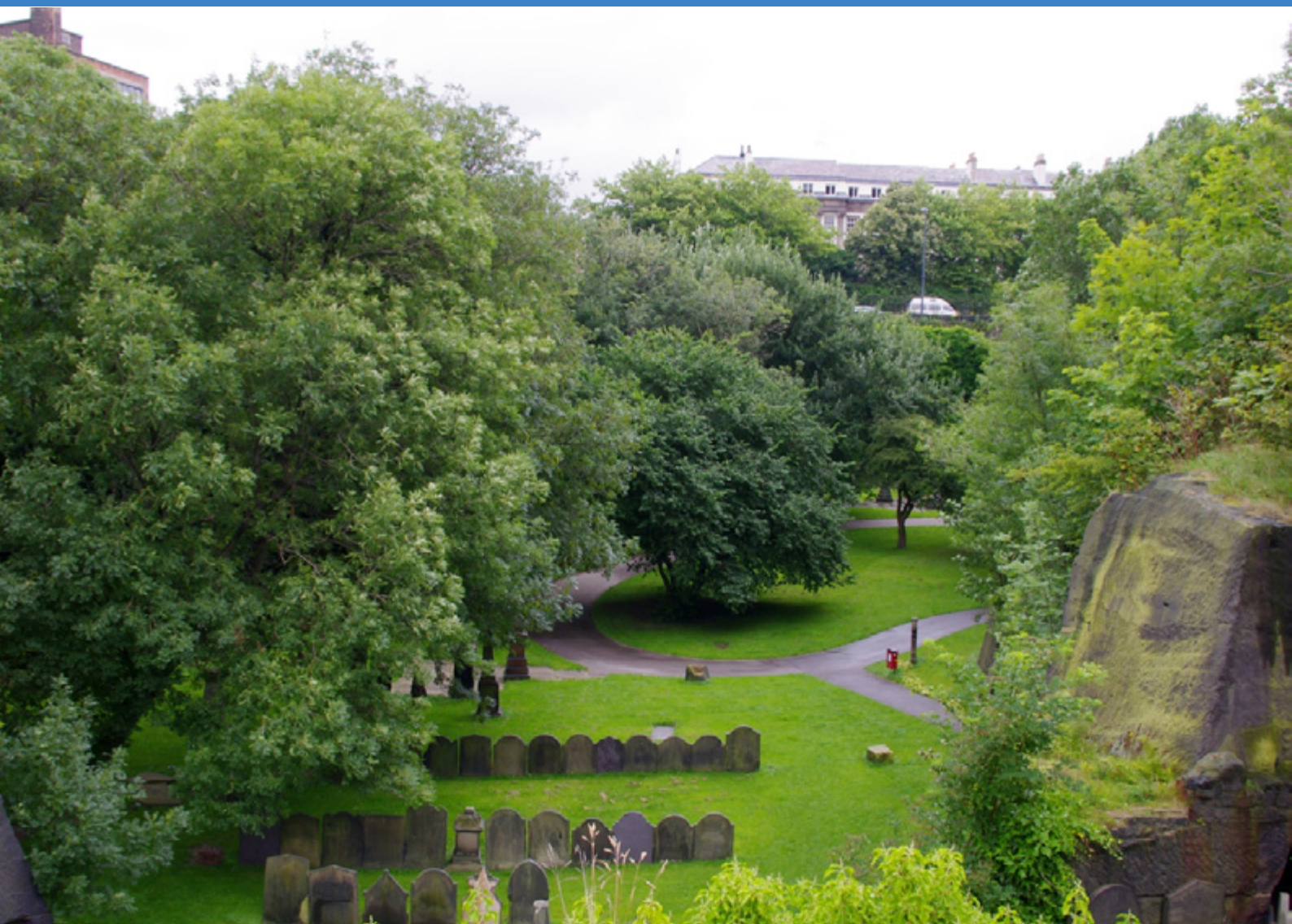
GREEN INFRASTRUCTURE STRATEGY

ACTION PLAN

VERSION 1.0

CONTENTS

1 INTRODUCTION



1. INTRODUCTION

1.1. Overview

1.1.1. This document sets out the actions that are recommended to deliver the Liverpool Green Infrastructure vision that:

Green infrastructure is planned in Liverpool to support a safe, more inclusive, sustainable and enjoyable city; to provide essential life support functions for a world class city, that is adapted to climate change and where healthy living is a natural choice.

1.1.2. Specifically the actions help to support five priorities that have been identified for the city. Four of these have a spatial dimension whilst the cross-cutting fifth deals with design and quality.

- PRIORITY 1 **A sustainable city** – supporting business, regeneration and housing growth within environmental limits.
- PRIORITY 2 **A city providing natural choices for health** – supporting improved physical and mental health.
- PRIORITY 3 **A cool city** – adapted to projected climate change.
- PRIORITY 4 **A green and biodiverse city** – supporting good quality of life for all.
- PRIORITY 5 **A city where green infrastructure is well-planned** – green infrastructure as a critical infrastructure

1.1.3. The actions focus on influencing the planning and health sectors in particular. There is a further aim to embed the actions more widely, within the Local Strategic Partnership for example, in order to achieve the scale of change that is required. Some examples of the types of organisations that have a role to play in delivering the actions in this strategy are shown in Figure 1.

1.1.4. The level of information gathered to develop the strategy and this action plan supports the aspirations under a new planning system to *"give neighbourhoods much greater ability to determine the shape of the places in which their inhabitants live"*[1] by providing a data resource to inform local decisions.

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1 http://www.planningportal.gov.uk/england/professionals/news/archive/2010/july2010/2010_07_week_3/150710_1

Figure 1. Targets to influence

1.2. Key messages

1.2.1. Green infrastructure can support some of the main objectives of the city in a cost effective way. From the analysis of the information that has been gathered for this strategy a number of key messages emerge:

- **62% of the city is green infrastructure**. Liverpool is a green city and should use this fact for marketing and competitive advantage.
- **The largest individual type is private domestic gardens** at 16% of the area of the city. These represent a real asset for the city, and which local residents and communities have a direct responsibility for and influence over.
- **The City Centre and Inner Areas are key targets for future investment in the city, but have low levels of green infrastructure** and that which is available is of low functionality.
- **Green infrastructure is not equally distributed across the city**. 22% of the areas has 80% of the total accessible green infrastructure and some areas have no accessible green infrastructure.
- **The most affluent areas of the city have 18% more green infrastructure** than the most deprived.
- **Green infrastructure is an £8bn asset for the city** that is often overlooked, but which can continue to contribute significantly to the delivery of Liverpool's plans for

sustainable growth.

- **Low levels of green infrastructure occur in areas of the city with a higher incidence of:**
    - Coronary heart disease
    - Poor mental health
    - Poor air quality
- **Green infrastructure interventions will help tackle some of Liverpool's most pressing problems.**
- **The most effective actions will be those that concentrate on making the best use of the existing green infrastructure resource through appropriate management.**

1.2.2. The Health is Wealth Commission[2] highlighted the need for greater integration between the health sector, land use planning and transport to reduce the need for travel and promote sustainable modes of transport. The Commission emphasised the need to place health at the heart of planning, and promoted greening the physical environment to provide health and wellbeing benefits.

1.3. Document structure

1.3.1. The Liverpool Green Infrastructure Strategy consists of three main elements:

- A Technical Document, which contains the background information and evidence base.
- An Action Plan, this document, providing information on where in the city action needs to be targeted in order to maximise the benefits that can be delivered from the city's green infrastructure.
- An Executive Summary, a high level overview of the strategy.

1.3.2. This Action Plan is set out in five sections, made up of this introduction followed by:

- An overview of green infrastructure
- A brief overview of the green infrastructure assessment for Liverpool
- Actions for the city
- Implementation of the actions

2 Health is Wealth, 2009, Health is Wealth Commission

2

WHAT IS GREEN INFRASTRUCTURE?

2. WHAT IS GREEN INFRASTRUCTURE?

2.1. Definition

2.1.1. Green Infrastructure is defined as:

the city's life support system – the network of natural environmental components and green and blue spaces that lies within and around Liverpool which provides multiple social, economic and environmental benefits.[3]

2.1.2. Green infrastructure is increasingly referred to as "critical infrastructure", a key part of the fabric of our towns and cities, which supports the economy and communities. It needs to be planned and managed in a sustainable manner and given the same level of attention as other critical infrastructures such as waste, energy, transport, and water.

2.2. Policy framework

2.2.1. There is now a strong policy framework supporting a green infrastructure approach. This ranges from a proposed EU Green Infrastructure Directive through to National Planning Policy Statements and Guidance. Planning Policy Statements (PPS) and Guidance (PPG) set out the Government's national policies on different aspects of spatial planning. Of particular relevance are:

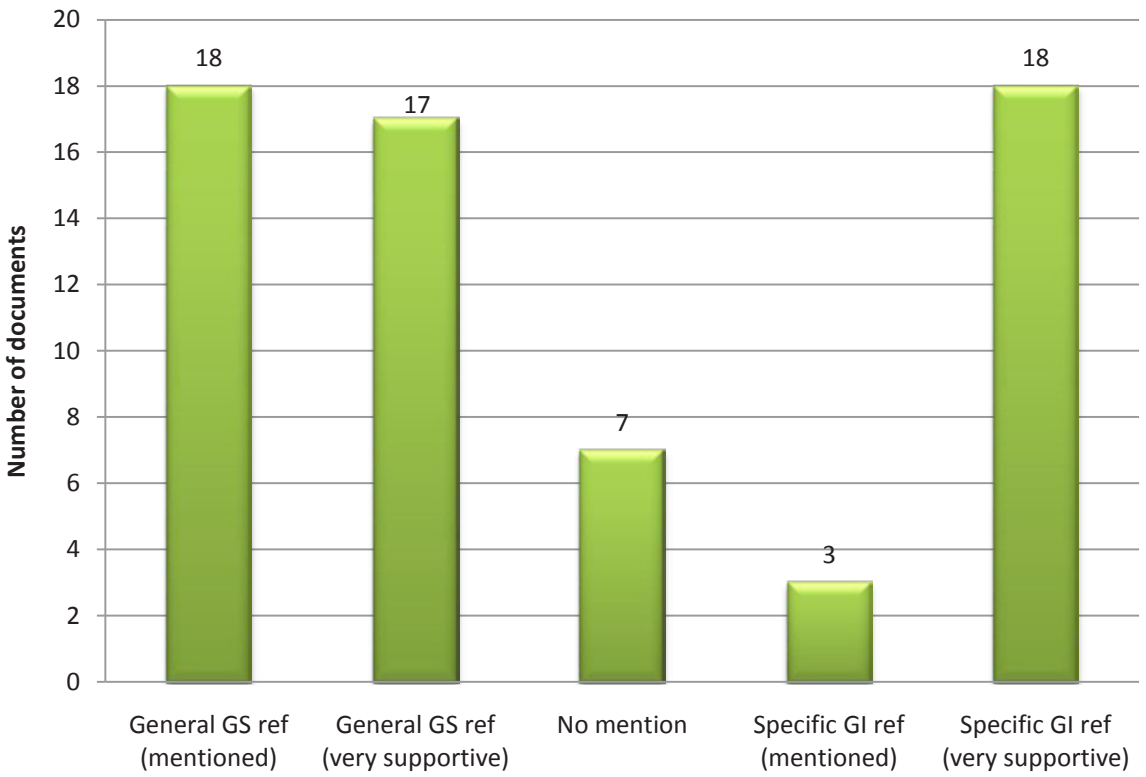
- **PPS1** – Delivering Sustainable Development and Climate Change Supplement
- **PPS7** – Sustainable Development in Rural Areas
- **PPG17** – Planning for Open Space, Sport and Recreation
- **PPS9** – Biological and Geological Conservation
- **PPS25** – Development and Flood Risk

3 Adapted from Northwest Green Infrastructure Guide.

2.2.2. In addition, although not yet finalised, two recent PPS consultations may have implications for this strategy. Planning for a Natural and Healthy Environment reinforces the importance of planning for green infrastructure; Planning for a Low Carbon Economy in a Changing Climate states that local planning authorities should plan green infrastructure as part of wider networks so as to optimise its many benefits, including supporting local biodiversity, healthy living environments, urban cooling, local flood risk management and local access to shady outdoor spaces. However, as a result of a change in Government, these draft PPSs as well as all the existing PPSs and PPGs are subject to review.

2.2.3. Figure 2 shows the level of support that was found for green infrastructure (GI) and green space (GS) in the 64 documents that were assessed as part of this strategy. The assessment can be viewed at http://www.ginw.co.uk/liverpool.

Figure 2. Green infrastructure policy support



2.3. Types, functions, benefits and values

2.3.1. A standard approach to describing green infrastructure has developed in the Northwest. It is based on a model that describes green infrastructure in terms of types, functions, benefits and values:

2.3.1.1. Types[4] – A description of the elements that make up Liverpool's green infrastructure. In developing a typology, PPG17 has been used as a starting point, with the addition of a number of additional types so that all land cover is included. For each green infrastructure type a range of functions can be identified.

2.3.1.2. Functions[5] – Describes what the green infrastructure type does; it could range from intercepting water to reducing noise. In all 28 functions have been identified. Multiple functions can be provided by a single green infrastructure type and one of the aims of green infrastructure planning is to achieve high levels of multi-functionality where possible.

2.3.1.3. Benefits – Green infrastructure planning is set firmly in the context of public benefit. There are many ways of identifying and categorising benefits. The Natural Economy Northwest[6] project developed a model of eleven benefits that has now been taken up by a range of organisations in the region and across the country. This is used in this strategy.

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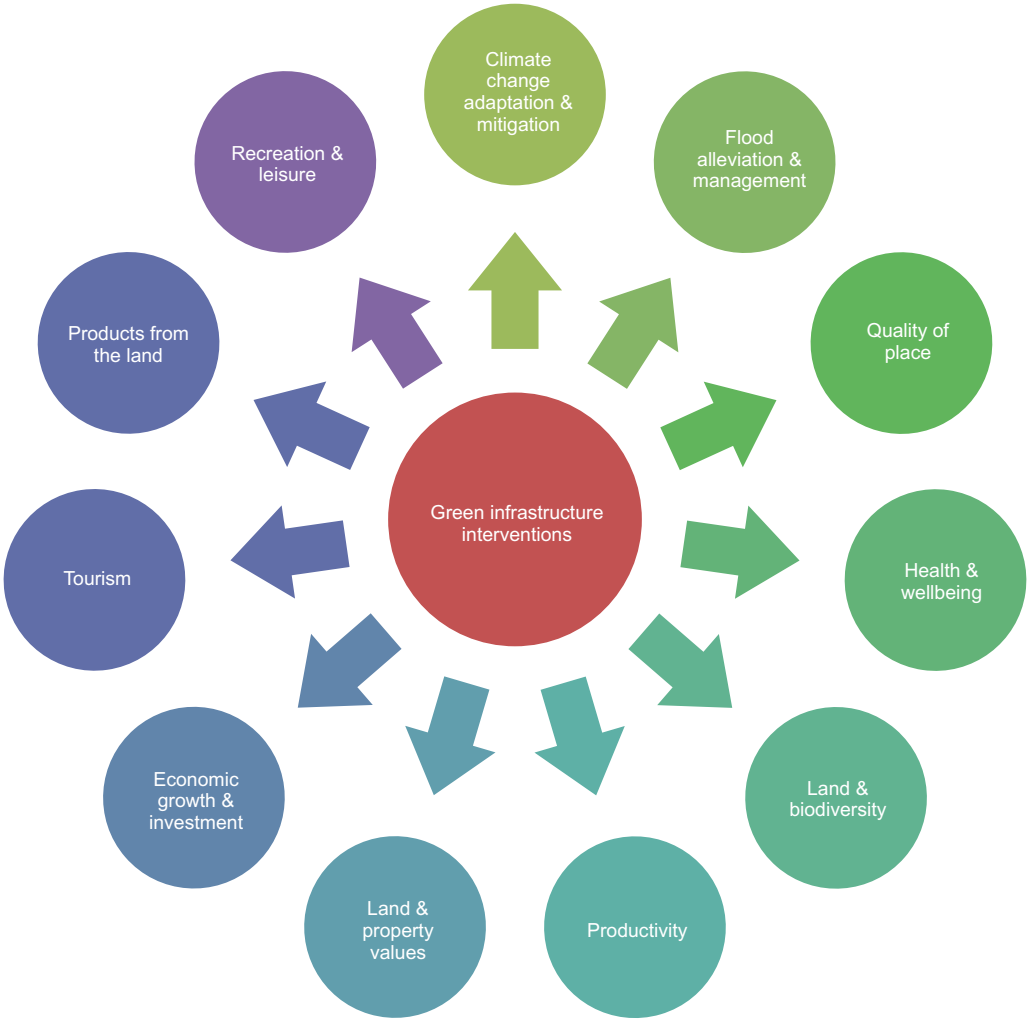
4 See Liverpool Green Infrastructure Strategy, Technical Document, Appendix 1, 15.2

5 See Liverpool Green Infrastructure Strategy, Technical Document, Appendix 1, 15.3

6 The Economic Benefits of Green Infrastructure, 2008, Ecotec, NENW

Figure 3. The eleven benefits model for green infrastructure



2.3.1.3.1. Each benefit is a mix of several functions. For example, the flood alleviation and water management benefit is provided by four functions – water conveyance, water storage, water interception and evapotranspiration. Similarly, each function may contribute to several benefits.

2.3.1.4. Values – It is important to be able to show the value of green infrastructure in the same monetary terms used by the target audience for decision making on other investments. Techniques continue to be developed in order to achieve these valuations[7].

7 Draft Green Infrastructure Valuation Toolbox, 2010, GENECON

2.4. Assets and the eight principles

2.4.1. In this strategy, we have used the term "asset" to describe green infrastructure that is delivering a function or functions in an area of identified need. For example, woodland that is intercepting and storing water in an area of flood risk is a water management asset; it is providing functions that help to reduce the risk of flooding.

2.4.2. Finally, eight principles of green infrastructure planning, design and implementation have been proposed, based on the original work from the U.S., which have been built into the Recommended Actions.

- Identify and protect green infrastructure assets before development.
- Engage diverse people and organisations from a range of sectors.
- Linkage is key; connecting green infrastructure components with each other and with people.
- Design green infrastructure systems that function at different scales and across boundaries.
- Green infrastructure activity must be grounded in good science and planning practice.
- Fund green infrastructure up-front as a primary public investment.
- Emphasise green infrastructure benefits are afforded to all; to nature and people.
- Green infrastructure should be the framework for conservation.

2.5. Basis of actions

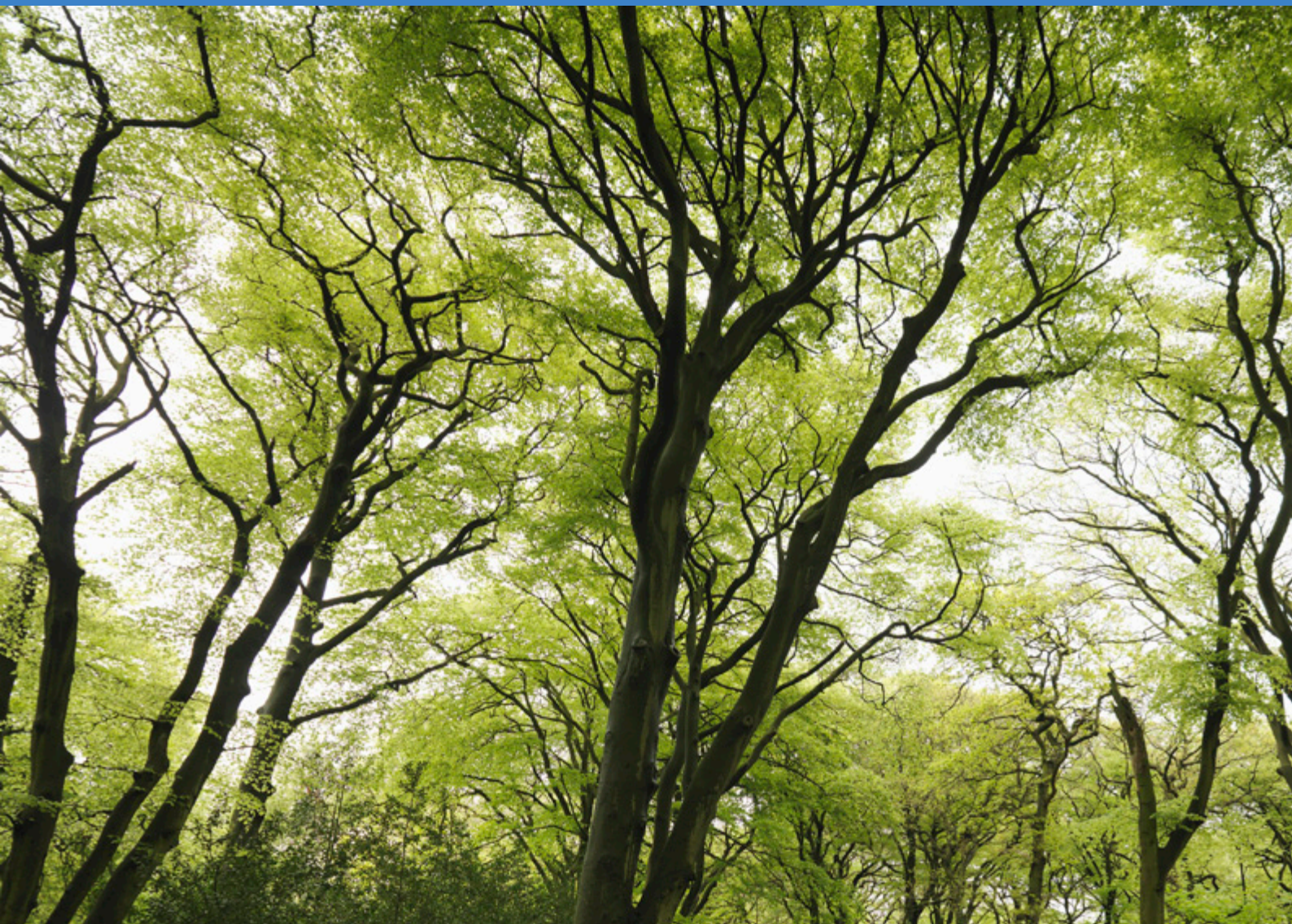
2.5.1. The actions set out in this document are based on findings from a detailed assessment of Liverpool's green infrastructure set out in section 13 of the Technical Document including:

- The key issues (or needs) for the city and the evidence that green infrastructure planning and delivery can help to address them
- The range of policies and strategies that green infrastructure interventions could help to support.
- The spatial distribution and types of the city's green infrastructure.
- The functions performed by the green infrastructure.
- The key actions for the city and an assessment of how they can be delivered, either through existing mechanisms, or proposed new options.

2.5.2. More information on the reasoning behind targeting a particular area for an action can be found in section 13 of the Technical Document, as can the thresholds that have been used, details of the mapping techniques and the analysis of the results in the light of policy and evidence.

3

GREEN INFRASTRUCTURE IN LIVERPOOL



3. GREEN INFRASTRUCTURE IN LIVERPOOL

3.1. Mapping the city - findings

3.1.1. Green infrastructure mapping of the city reveals:

- 62% of the city is green infrastructure.
- The largest individual type is private domestic gardens at 16% of total land area, these represent a real asset for the city, though it is hard to influence management.
- The maritime character of the area is reflected in coastal habitats totalling 9.7%.
- The city has a very restricted rural hinterland within its boundary, with agricultural land accounting for just 1.2%.
- Green infrastructure is not equally distributed across the city. For example, 22% of the Super Output Areas have 80% of the total accessible green infrastructure and some Super Output Areas have no accessible green infrastructure.
- The most affluent Super Output Areas of the city have 18% more green infrastructure than the most deprived.

3.1.2. The distribution of green infrastructure across the city reflects the historical development of Liverpool. The traditional commercial, dock and industrial areas being in the north, and the leafier areas - the result of the creation of public parks, "Brodie" Avenues, garden estates and houses with larger gardens - to be found in the south and east of the city.

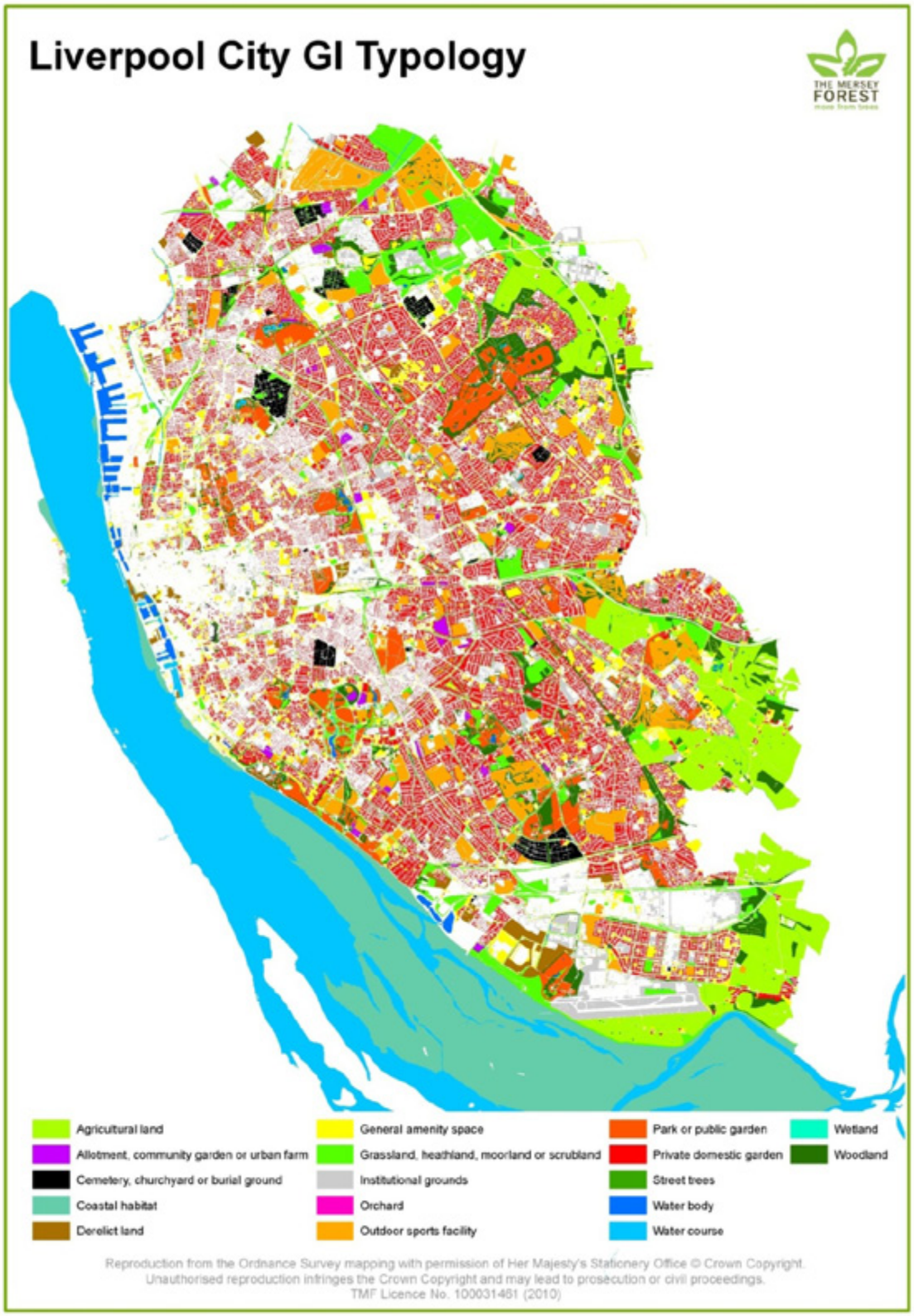
3.1.3. Table 1 shows the total area of each type of green infrastructure. This also includes the areas that have not been classified as green infrastructure, the buildings, roads, etc. and identifies the percentage cover of each type.

Table 1. Green infrastructure types in Liverpool

TYPE	TOTAL AREA (HA)	PERCENTAGE
Not green infrastructure	5,113.0	38.12%
Private domestic garden	2,162.3	16.12%
Coastal habitat	1,298.2	9.68%
Water course	892.4	6.65%
General amenity space	645.5	4.81%
Grassland, heathland, moorland or scrubland	618.3	4.61%
Outdoor sports facility	569.8	4.25%
Park or public garden	518.4	3.87%
Woodland	456.8	3.41%
Institutional grounds	413.1	3.08%
Agricultural land	165.5	1.23%
Cemetery, churchyard or burial ground	154.2	1.15%
Derelict land	129.1	0.96%
Street trees	111.4	0.83%
Water body	106.3	0.79%
Allotment, community garden or urban farm	57.0	0.42%
Orchard	0.8	0.01%
Total city area	13,412.1	100%

3.1.4. Map 1 shows the distribution of these types across the city.

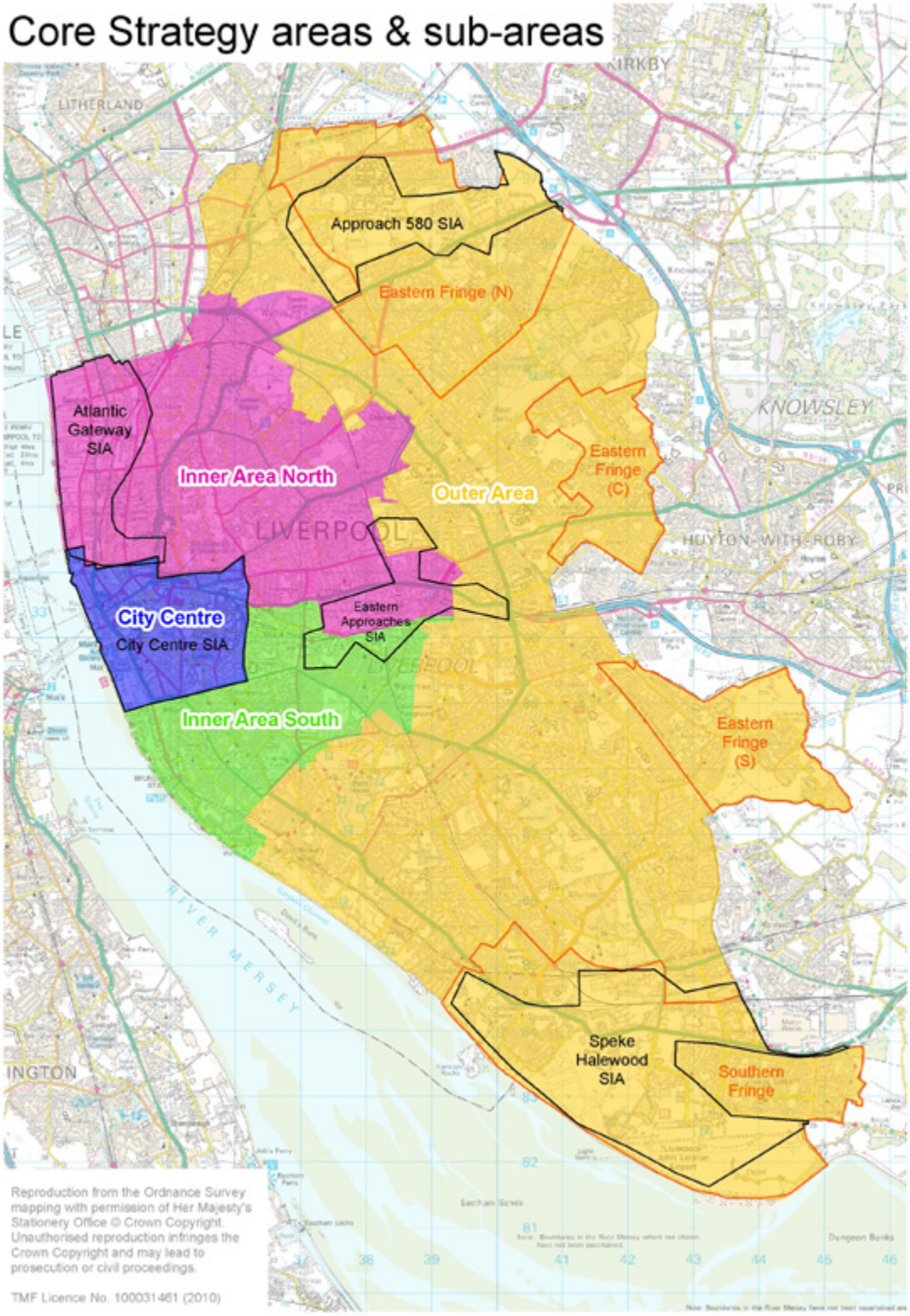
Map 1. Liverpool Green Infrastructure Typology[8]



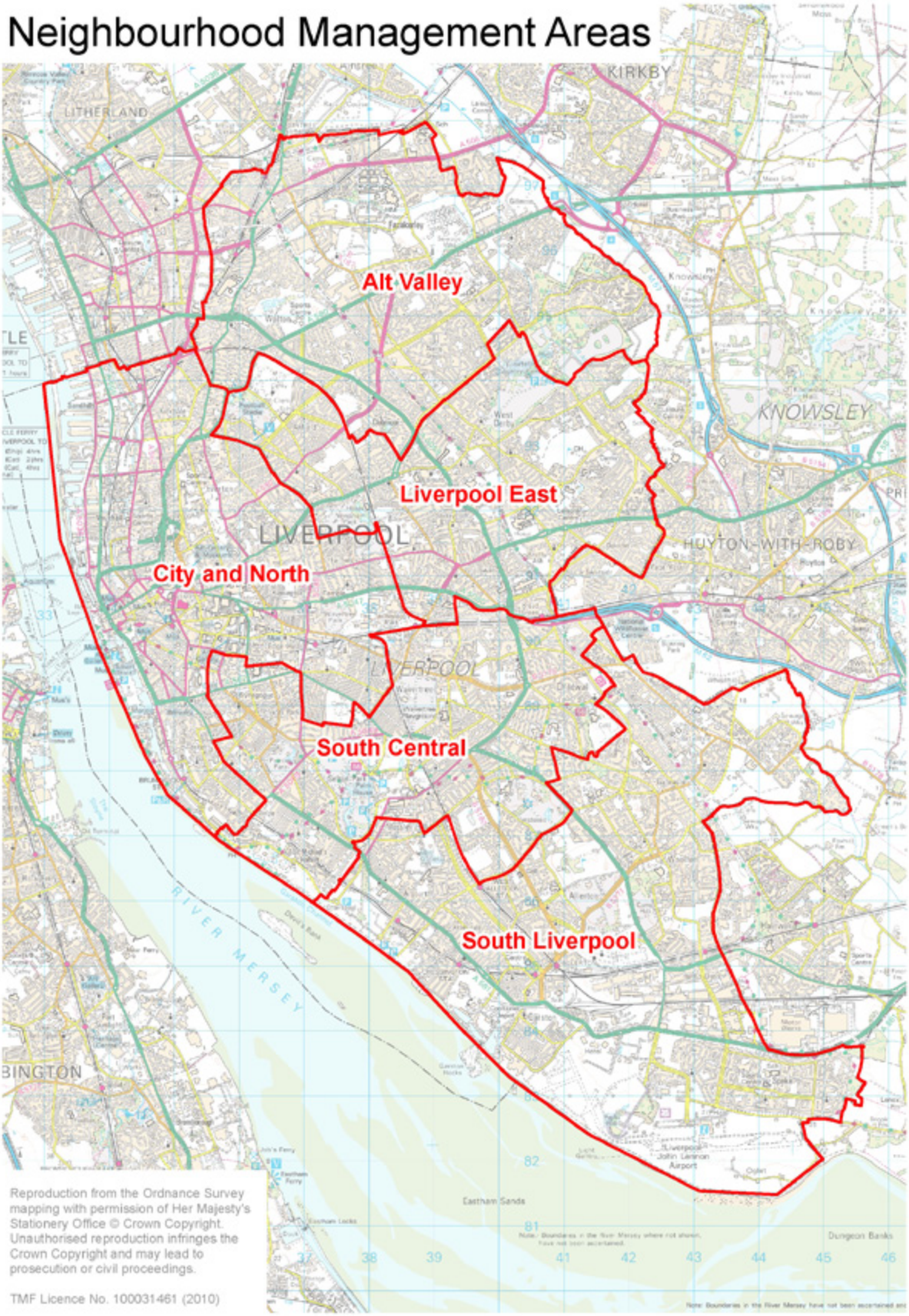
8 Anything with no colour assigned is not green infrastructure and represents the built surfaces of the city.

3.1.5. Map 2 shows the distribution of Core Strategy Sub Areas across the city, including Strategic Investment Areas and Eastern and Southern Fringe housing zones. Map 3 shows the distribution of Neighbourhood Management Areas across the city.

Map 2. Core Strategy areas and sub areas



Map 3. Neighbourhood Management Areas



3.1.6. Table 2 provides an overview of the green infrastructure in the Core Strategy Sub Areas (CSSAs). The Core Strategy identifies three sub areas of the city: City Centre, Inner Area and Outer Area. These incorporate a number of smaller areas including those that are likely to undergo greatest change due to housing growth or strategic investment for economic growth. Table 2 shows the total geographic extent and the percentage green infrastructure cover in each of these sub areas.

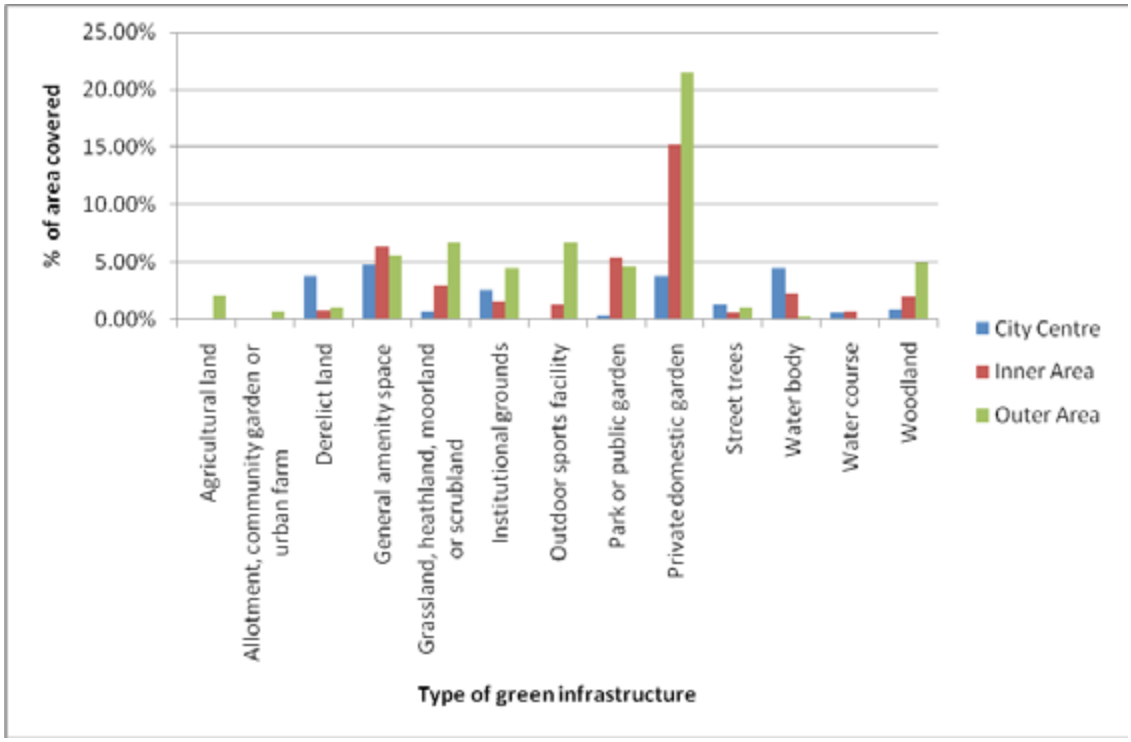
Table 2. Green infrastructure percentages in Core Strategy areas and sub areas

AREA	GEOGRAPHIC AREA EXTENT (KM²)	% GREEN INFRASTRUCTURE
City Centre	**4.6**	**24%**
Inner Area	**27.8**	**41%**
Inner Area North	19.3	42%
Atlantic Gateway SIA	8.5	39%
Inner Area South	3.6	31%
Eastern Approaches SIA	2.8	37%
Outer Area	**79.4**	**62%**
Approach 580 SIA	4.3	66%
Speke Halewood SIA	8.9	53%
Eastern Fringe (C)	3.6	59%
Eastern Fringe (N)	11.4	64%
Eastern Fringe (S)	4.5	68%
Southern Fringe	14.1	58%

3.1.7. Figure 4 shows the proportion of each green infrastructure type in the three main core strategy areas and reveals:

- The concentration of private gardens in the Outer Area
- The extremely low proportion of parks and gardens in the city centre
- The high proportion of derelict land and general amenity land in the city centre, both low functionality and potential environmental detractors
- Woodland increases as one moves outwards from the city centre, but in contrast, there is a higher proportion of street trees in the city centre compared to the Inner Area and broadly similar to the Outer Area
- The Inner Area has a slightly higher proportion of parks and gardens than the outer areas

Figure 4. Distribution of types of green infrastructure in each of the core strategy areas.



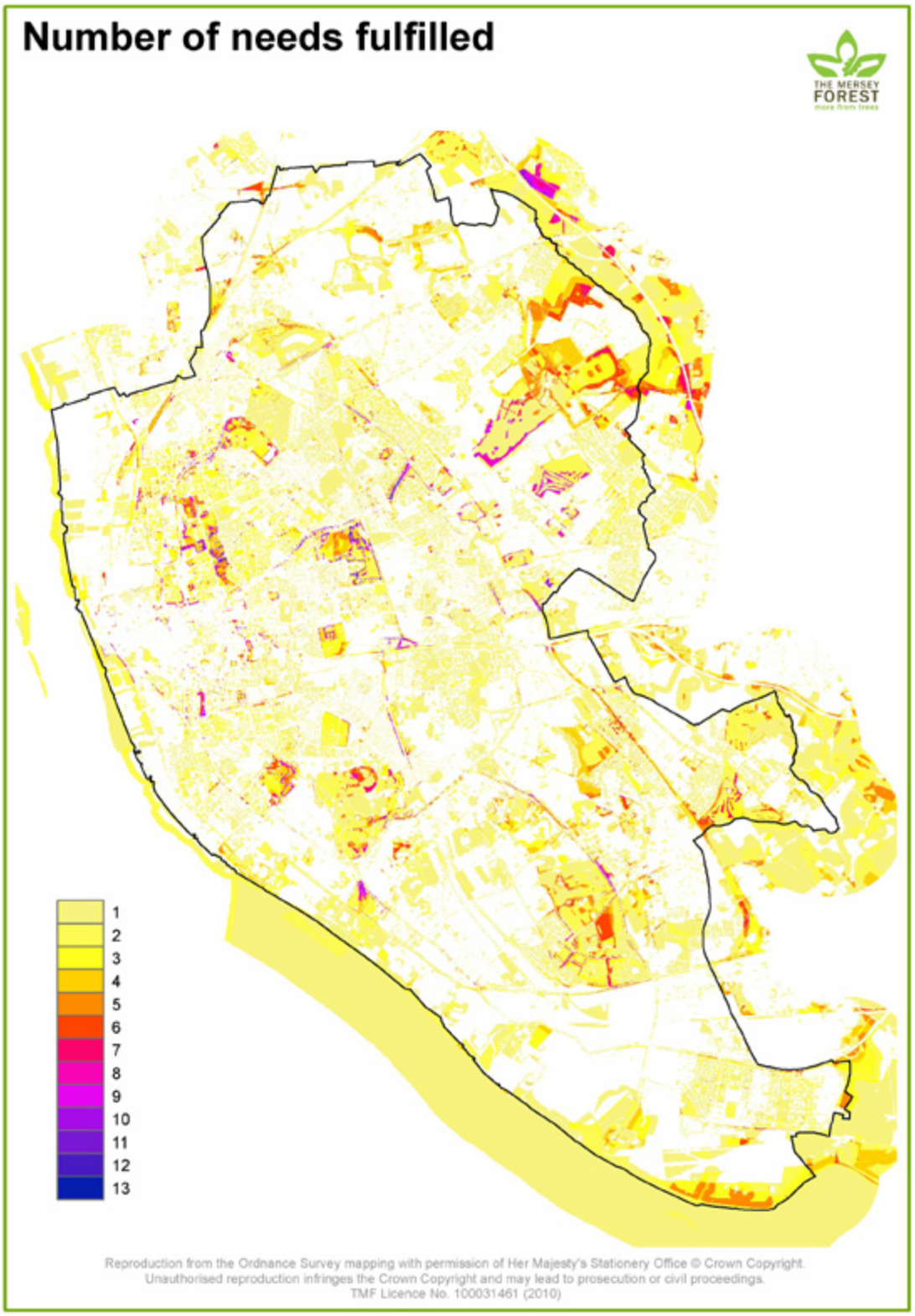
3.1.8. The Technical Document provides more analysis of these areas and the further subdivisions within the inner and outer areas of the city.

3.2. Liverpool's green infrastructure key assets

3.2.1. The green infrastructure assets in Liverpool are the areas that have functionality, such as intercepting water, recreation, aesthetic, etc, and fulfil the greatest need for these functions. Indicators of need for each of the functions have been selected, and greatest need is defined as the areas of the city where these are highest. For example where there are trees along main transport routes that can absorb pollutants or reduce noise. Table 3 provides an overview of these assets for each of the CSSAs.

3.2.2. Map 4 indicates the extent of all green infrastructure key assets across the city which fulfil needs for the priorities of the strategy.

Map 4. Green Infrastructure assets – green infrastructure that fulfils identified greatest needs[9]



9 This analysis compares where there is greatest need for each function with provision; the functions considered are: recreation – public, recreation – private, recreation – public with restrictions, green travel route, aesthetic, shading from the sun, evaporative cooling, trapping air pollutants, noise absorption, habitat for wildlife, corridor for wildlife, soil stabilisation, heritage, cultural asset, carbon storage, food production, timber production, biofuels production, wind shelter, learning, inaccessible water storage, accessible water storage, water interception, water infiltration, coastal storm protection, water conveyance, pollutant removal from soil/water, flow reduction through surface roughness.

3.2.3. Map 5 shows those areas where identified needs are not currently met by existing green infrastructure functionality, areas where there are a lack of key assets. Recognising that these are an amalgamation of needs, some broad conclusions can be drawn:

- The importance of parks such as Sefton, Calderstones and Croxteth as major assets for the city.

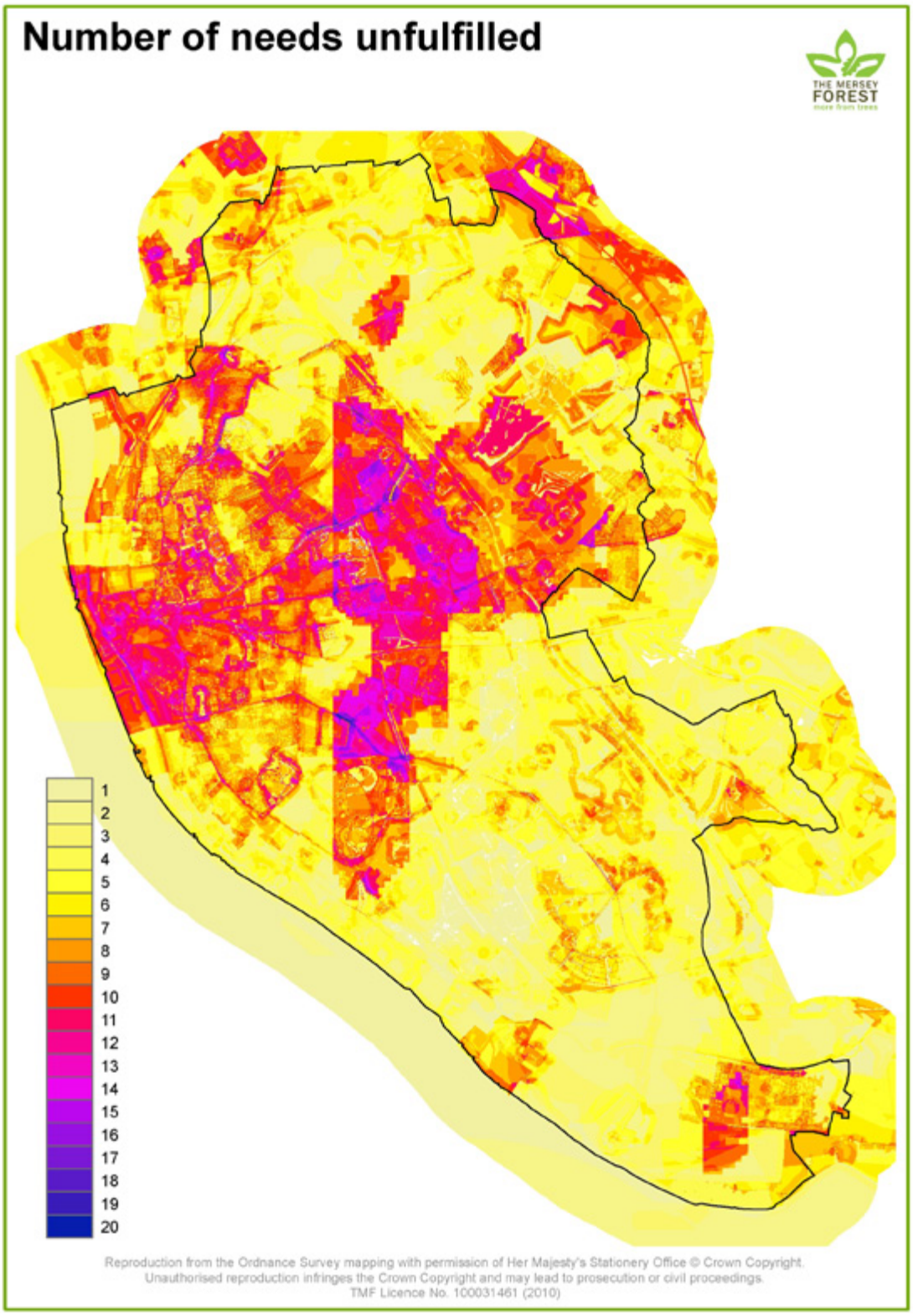
- The areas having the greatest number of needs requiring action to improve green infrastructure functionality are concentrated in the City Centre and Inner Areas. It is here that a co-ordinated approach to protecting and enhancing green infrastructure could make the greatest contribution to the city's needs and aspirations, such as assisting in securing improvements to health and preparing the city to ameliorate the anticipated impacts of climate change

- The Inner Areas coincide with the most significant proposed regeneration activity such as the Housing Market Renewal Area, Growth Point and Atlantic Gateway Strategic Investment Area. Supported by design guidance this provides an opportunity to improve green infrastructure functions, for example and not exclusively, by introducing green roofs, private gardens, street trees and well designed access routes and public realm

- The maps illustrate the need for increased green infrastructure functionality in the city centre, but potentially understate two important factors. Firstly, the importance of the River Mersey, raising the issue of how the impressive improvements in accessibility can be extended to other waterfront areas outside the city centre; and secondly, the importance of well designed public realm including small scale and attractive spaces which in combination with green infrastructure can make an enormous contribution to the quality of place.

- The area with a large number of needs unfulfilled in the centre of the map primarily relates to several of the water functions, such as water interception and flow reduction through surface roughness. Greatest need for these functions has been defined as located upstream of historic flooding, amongst other things. There is a disproportionately large number of water-related functions, which is not necessarily reflected in the city's priorities.

Map 5. Number of needs unfulfilled at present[10]



10 This analysis compares where there is greatest need for each function with provision; the functions considered are: recreation – public, recreation – private, recreation – public with restrictions, green travel route, aesthetic, shading from the sun, evaporative cooling, trapping air pollutants, noise absorption, habitat for wildlife, corridor for wildlife, soil stabilisation, heritage, cultural asset, carbon storage, food production, timber production, biofuels production, wind shelter, learning, inaccessible water storage, accessible water storage, water interception, water infiltration, coastal storm protection, water conveyance, pollutant removal from soil/water, flow reduction through surface roughness.

3.3. Overview of green infrastructure in the Core Strategy sub areas

3.3.1. Table 3 provides an overview of green infrastructure in the Core Strategy sub areas.

Table 3. Overview of green infrastructure in the Core Strategy sub areas

CORE STRATEGY SUB AREA (CSSA)	TYPOLOGY	FUNCTION	ASSETS	ISSUES
City Centre	The City Centre is dominated by the Mersey. There are higher levels of general amenity space and derelict land than any other type of green infrastructure. Often these are areas that have been left over after development or incidental green spaces. This area has a low percentage of parks, outdoor sports, woodland and private gardens compared to other CSSAs. It has the highest percentage of street trees. Overall there is a low percentage of green infrastructure in the City Centre.	This area has low functionality. The lowest levels of public recreation, aesthetic and evaporative cooling functions are present here. Functionality is low for all functions, and is below average for all functions except inaccessible and accessible water storage, water infiltration and heritage. Conversely heritage is highest in the City Centre.	This is one of two areas where there are nine functions with few assets present. These are the corridor for wildlife, green travel route, noise absorption, recreation of all types, shading and trapping air pollutants functions. The key green infrastructure assets in this area are the cathedral grounds, St John's Gardens, the docks and elements of the incidental green space.	There are generally high levels of issues in this area, especially relating to housing growth and regeneration, gateways and routes, walkability, access to green space, derelict and vacant land, mental health, hospitals and health centres, and habitat for wildlife.

CORE STRATEGY SUB AREA (CSSA)	TYPOLOGY	FUNCTION	ASSETS	ISSUES
Inner Area	The Inner Area has a relatively high percentage of private domestic gardens and parks. There are also high levels of general amenity space and grassland but a low percentage of street trees and woodland.	The heritage and cultural asset functions are comparatively high in the Inner Area. Water infiltration is high as is inaccessible water storage. However, the climate change functions are around average in this area.	In this area there are few assets relating to green travel routes, trapping air pollutants, shading and the recreation functions. The key green infrastructure assets in the Inner Area are Princes Park, Newsham Park, Everton Park, Wavertree Park, Stanley Park & Anfield Cemetery and Walton Hall Park.	There are generally high levels of issues in this area, especially relating to housing growth and regeneration, walkability, and mental health.
Inner Area North	Private gardens are the highest percentage cover in the Inner Area North, along with high levels of general amenity space and grassland. The area has moderate levels of street trees, outdoor sports, cemeteries and woodland.	This area has the highest levels of soil stabilisation, which is well above average. It has high levels of public recreation. Water infiltration is high as is inaccessible water storage. All other functions are around average.	Inner Area North has few assets relating to green travel routes, recreation of all types, trapping air pollutants and shading functions. The key green infrastructure assets here are Stanley Park & Anfield Cemetery, Everton Park, Newsham Park and the tree lined street Muirhead Avenue.	There are generally high levels of issues in this area, especially relating to housing growth and regeneration, walkability, mental health, hospitals and health centres, and habitat for wildlife.
Atlantic Gateway SIA	The Mersey dominates in this CSSA and accounts for 15% of the area, the highest cover in comparison to the other areas. It also has the lowest percentage cover for allotments, cemeteries, institutional grounds and woodland.	Atlantic Gateway has the lowest functionality of all the areas. It has the lowest functionality of all areas for the green travel route, shading, pollutant control, timber and biofuels production, and wildlife functions. However it has the highest amount of accessible water storage.	In this area there are few assets relating to the aesthetic, habitat & corridor for wildlife, evaporative cooling, green travel route, noise absorption and shading functions. The only key green infrastructure asset in the Atlantic Gateway SIA is the railway corridor.	There are generally high levels of issues in this area, especially relating to housing growth and regeneration, walkability, access to green space, derelict and vacant land, mental health, coronary heart disease, obesity, diabetes, hospitals and health centres, the urban heat island effect (especially as it affects older people and those with limiting long-term illnesses), and tree cover.

CORE STRATEGY SUB AREA (CSSA)	TYPOLOGY	FUNCTION	ASSETS	ISSUES
Inner Area South	There is a high percentage of private gardens and general amenity space in the Inner Area South. In comparison to the other CSSAs there are a high percentage of cemeteries and a low percentage of woodlands.	Private recreation is above average but other forms of recreation and green travel route are low. Habitat for wildlife is very low; corridor is slightly higher but is still well below average.	In Inner Area South there are few assets relating to inaccessible water storage, noise absorption, trapping air pollutants and the recreation functions. The key green infrastructure assets here are Princes Park and Toxteth Park Cemetery.	There are generally high levels of issues in this area, especially relating to housing growth and regeneration, gateways and routes, walkability, mental health, drought, and habitat for wildlife.
Eastern Approaches SIA	The area has a moderate percentage of private gardens, woodland and grassland, but a reasonably high percentage of parks and derelict land.	This area is the only area to have no learning functionality. It also has low public recreation with restrictions and accessible water storage function. It scores above average though for heritage and cultural functionality. Most water management functions are below average.	In this area there are few assets relating to water infiltration and storage (accessible & inaccessible), flow reduction through surface roughness, green travel route, and public recreation with restrictions. The key green infrastructure assets here are Wavertree Park, Wavertree Technology Park and private gardens.	There are generally high levels of issues in this area, especially relating to housing growth and regeneration, gateways and routes, walkability, mental health, coronary heart disease, diabetes, the urban heat island effect, SUDS, habitat for wildlife, and habitat connectivity.
Outer Area	This area has an above average percentage cover of woodland, allotments and agricultural land, but a relatively low percentage of blue infrastructure cover. This is one of only four areas which contain orchards and one of only two areas to contain coastal habitat.	The Outer Area is above average for nearly all functions. Carbon storage, evaporative cooling, wind shelter and aesthetic are notably high. Private recreation is also very dominant here. Food production is relatively high. Functions relating to water management are below average.	In the Outer Area there are few assets relating to accessible water storage, flow reduction through surface roughness, food production, habitats and public recreation (with restrictions) functions. The key green infrastructure assets in this area are Craven Wood, Croxteth Country Park, Allerton, Childwall & Lee Park Golf Courses, Sefton Park and Rice Lane City Farm	There are generally low levels of issues in this area, although there are quite extensive issues relating to water management.

CORE STRATEGY SUB AREA (CSSA)	TYPOLOGY	FUNCTION	ASSETS	ISSUES
Approach 580 SIA	This area has the highest percentage cover of allotments, orchards and grassland. The amount of grassland in this area is markedly higher. This area is the only area not to contain parks.	This area has high functionality, having the highest functionality percentage for seven functions including the green travel route, aesthetic, shading, food production, evaporative cooling and pollutant management functions. Carbon storage, timber and biofuels production and wind shelter are also high here.	In the Approach 580 SIA there are few assets relating to food production, water conveyance, habitat for wildlife and pollutant removal from soil and water functions. The key green infrastructure assets in this area are Fazakerley Brook and Playing Fields and Sugar Brook.	There are generally low levels of issues in this area, although there are exceptions relating to coronary heart disease, obesity, tree cover, drought, and deculverting of watercourses.
Speke Halewood SIA	This area has the highest percentage of institutional grounds, notably higher than other areas. It also has the highest percentage of derelict land. Agricultural land is also present. It has the lowest amount of private gardens, and a moderate amount of grassland, woodland and general amenity space.	Pollutant removal from soil and water is high here. Most functions are about average. Recreation of all forms is below average. Water management functions are average or below average. The main exceptions being green travel route, aesthetic, evaporative cooling, habitat and corridor for wildlife which are above average.	In this area the key green infrastructure assets are Speke Hall and farm and the Oglet.	There are generally low levels of issues in this area, although there are exceptions relating to access to green space, obesity, drought, and deculverting of watercourses.

CORE STRATEGY SUB AREA (CSSA)	TYPOLOGY	FUNCTION	ASSETS	ISSUES
Eastern Fringe (C)	This area has by far the largest percentage of private gardens; it also has comparatively high levels of street trees and allotments. It has a very low percentage cover of blue infrastructure.	The highest percentage of private recreation is here. The aesthetic and evaporative cooling functions are also above average. The habitat and corridor for wildlife functions are below average. Soil stabilisation and water storage are particularly low.	One of two areas where there are nine functions with few assets is present. These are the green travel route, flow reduction through surface roughness, habitat for wildlife, shading, public recreation and public recreation with restrictions, water conveyance, infiltration and storage functions. The key green infrastructure assets in this area are school grounds and private gardens.	There are generally low levels of issues in this area, although there are exceptions relating to gateways and routes, SUDS, drought, and deculverting of watercourses.
Eastern Fringe (N)	This area has the highest percentage of cemeteries and a high percentage of private gardens, grassland and allotments. There is moderate cover of woodland, general amenity space and outdoor sports.	Functionality is high in the Eastern Fringe (N), in particular aesthetic, evaporative cooling, timber and biofuels production and pollutant control. Water infiltration is lowest here; other water management functions are also below average.	In the Eastern Fringe (N) there are few assets relating to food production, green travel route and water conveyance functions. The key green infrastructure assets are Dam Wood and the cemetery.	There are generally low levels of issues in this area, although there are exceptions relating to tree cover, drought, and deculverting of watercourses.
Eastern Fringe (S)	Outdoor sports and general amenity space dominate in the Eastern Fringe (S); both the highest percentages for these types of green infrastructure are present here, along with the highest woodland cover of all the CSSAs. This area is the only area with no cemeteries and a low percentage of derelict land.	This area has the highest functionality; the highest percentage for each of these functions appears here: the recreation with restrictions, aesthetic, corridor for wildlife, timber and biofuels production and water interception and conveyance functions. Yet this area has no functionality for heritage.	In this area there are few assets relating to accessible water storage, food production, habitat for wildlife and pollutant removal from soil and water. The key green infrastructure assets are Childwall and Lee Park Golf Courses.	There are generally low levels of issues in this area, although there are exceptions relating to derelict and vacant land, SUDS, tree cover, drought, and deculverting of watercourses.

CORE STRATEGY SUB AREA (CSSA)	TYPOLOGY	FUNCTION	ASSETS	ISSUES
Southern Fringe	One of only two areas containing coastal habitat, and the only area containing wetland. It also has the highest percentage of agricultural land. There is a high percentage of institutional grounds and a moderate percentage of all other green infrastructure types.	The area has low recreational function, it scores highly as a habitat, and for food production and highest for coastal storm protection. All other functions are around average.	In the Southern Fringe there are few assets relating the inaccessible water storage. The key green infrastructure assets are Speke Hall and farm, the Oglet, Mill Wood & Alderwood, and the private domestic gardens.	There are generally low levels of issues in this area, although there are exceptions relating to access to green space, drought, and deculverting of watercourses.

4

ACTIONS FOR LIVERPOOL

4. ACTIONS FOR LIVERPOOL

4.1. Actions overview

4.1.1. Table 4 shows the issues that have been identified for the city based on data from a range of sources for the four spatial priorities of the Green Infrastructure Strategy. The fifth priority is to do with design and management and so underpins each of the spatial priorities. The evidence provided in the Technical Document demonstrates that green infrastructure can help address these issues.

Table 4. Issues

PRIORITY	ISSUE
A sustainable city	Improving quality of place for projected housing growth and major regeneration programmes in order to attract investment, encouraging people to live and work in the city as well as increase the number of visitors to Liverpool. Increasing levels of productivity across the city. Developing a low carbon economy, including improving the opportunities for walking and cycling as part of everyday life in the city.
A city providing natural choices for health	Tackling health deprivation and health inequality across the city and in particular help tackle the issues of coronary heart disease, obesity, and diabetes to help to reduce numbers of premature deaths. Increase levels of physical activity. Reduce the high levels of poor mental health across the city. Reduce levels of air pollution. Improve mental health.

PRIORITY	ISSUE
A cool city	Use of green infrastructure to manage urban heat island effect particularly as it affects vulnerable communities. Managing water to provide irrigation for drought susceptible areas of green infrastructure to sustain their cooling function for the city. Incorporating SUDS into new developments to manage surface water. Retrofitting green infrastructure to adapt to high temperatures in the city centre, providing shade and passive cooling. The provision of corridors for species movement as climate changes.
A green and biodiverse city	Protecting core biodiversity areas Creating expansion areas and wildlife corridors Ensuring that green infrastructure delivery programmes contribute to the delivery of biodiversity action plan habitat targets

4.1.2. The following section sets out the actions to address the issues that have been identified for Liverpool under each priority. The actions are categorised as land change, support or guidance actions. The types of action are related to the issues for each priority and the evidence that green infrastructure (and in some cases specific types of green infrastructure) can play a role in addressing the issue.

4.1.3. Appendix 2 provides part of the logic chain that has been developed to show how the actions in this plan can help to address the issues that have been identified for the city.

4.1.4. Where appropriate, the areas of the city have been mapped to target for the actions, based on the functionality and needs assessment. The maps are provided in the Technical Document.

4.1.5. Appendix 1 provides guidance on types of green infrastructure that may be appropriate in specific areas of the city based on consideration of issues such as existing character and land availability.

4.1.6. When implementing actions, a high level of importance should be given to ensuring high quality design, providing for long term management, improving urban landscape character and contributing to biodiversity.

4.1.7. Actions are grouped under the five priorities which aim to fulfil the vision for Liverpool.

4.1.8. The actions are set out in the following way:

- An introduction to the issues for Liverpool
- Long term goal for the priority – desired scenario in twenty years' time
- The actions, with an indication of the key wards of the city where the actions are required

4.1.9. At the end of each priority, a table and map show the actions as they apply to each of the Core Strategy Sub Areas. Equivalent tables and maps for the Neighbourhood Management Areas are included in Appendix 4.

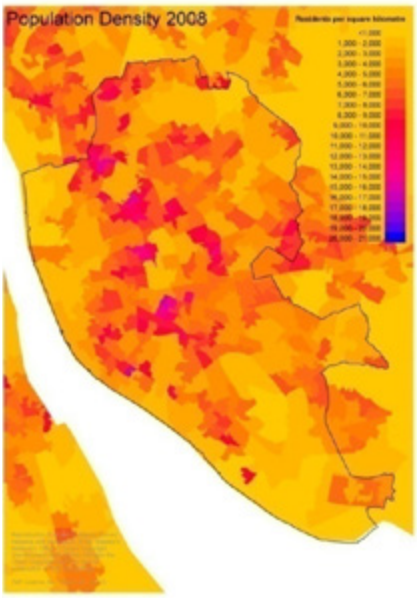
4.1.10. Where appropriate the land change actions take into account the projected population increases anticipated for city, as set out in the Core Strategy document.

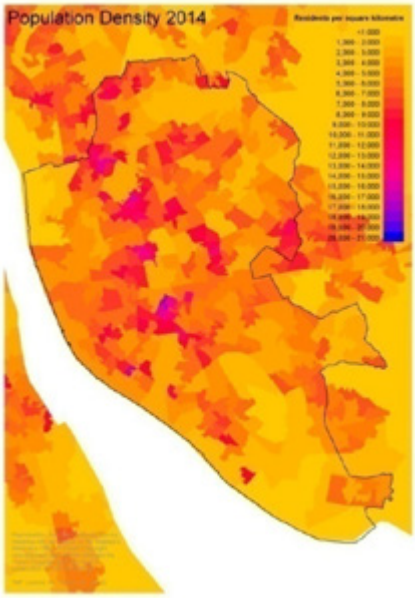
4.1.11. Map 6, Map 7 and Map 8 show that in line with the preferred option, population increases most rapidly in the City Centre and North Liverpool. The changes to the inner and outer zones are more subtle and less obvious on these maps.

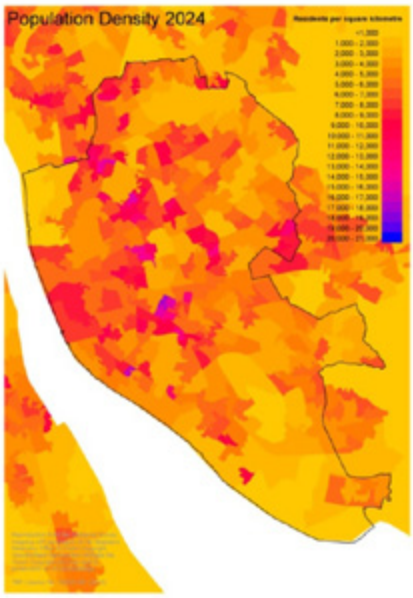
Map 6. Liverpool population density 2008

Map 7. Liverpool projected population density 2014

Map 8. Liverpool projected population density 2024







4.2. PRIORITY 1: A sustainable city

4.2.1. Introduction

4.2.1.1. The key strategic documents for Liverpool all set out ambitious goals to develop Liverpool as a leading international city: *"..one of the best places to live, work, invest and enjoy life"*[1].

4.2.1.2. The review[2] of the main strategic documents for Liverpool highlights the need to tackle a range of economic issues across the city, to build on areas of strength by attracting new business investment in the high tech and knowledge economy sectors, and to provide a place where people choose to live and work. This will increase the population to reverse the decline of recent decades, in particular ensuring that the city retains talented graduates from its universities.

4.2.1.3. There are also ambitious plans to build on the success of Capital of Culture and continue to increase the numbers of visitors to the city as a visitor destination. There is a need to improve economic performance, not just by increasing the numbers of jobs, although that is important, but also by increasing skill levels and productivity in a low carbon economy.

4.2.1.4. The City Centre has seen enormous recent improvements and will continue to be a focus for investment. To the north and east, the Atlantic Gateway Strategic Investment Area and Housing Market Renewal Initiative will witness major regeneration activity. These coincide with the City's Growth Point programme where 3000 of the city's 40,000 new homes are to be provided.

4.2.1.5. Major developments, such as Super Port and Liverpool Knowledge Quarter[3] will provide opportunities for green infrastructure interventions. The redevelopment of Alder Hey hospital is already using such an approach, looking to maximise the benefits from green infrastructure in terms of the image of the area and the health and wellbeing of the children and parents using the hospital.

4.2.1.6. In addition, there is a need to ensure that key gateways and routes to the city are of high quality and promote a positive image for Liverpool.

4.2.1.7. Liverpool is currently ranked 11th in the list of sustainable cities[4] in England. The aspiration to compete as a world class city will not only require green infrastructure planning

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1 Liverpool Vision (2009). People Place and Prosperity: An economic prospectus.

2 See Liverpool City Green Infrastructure Strategy Technical Document.

3 Liverpool Knowledge Quarter - see Technical Document for case study.

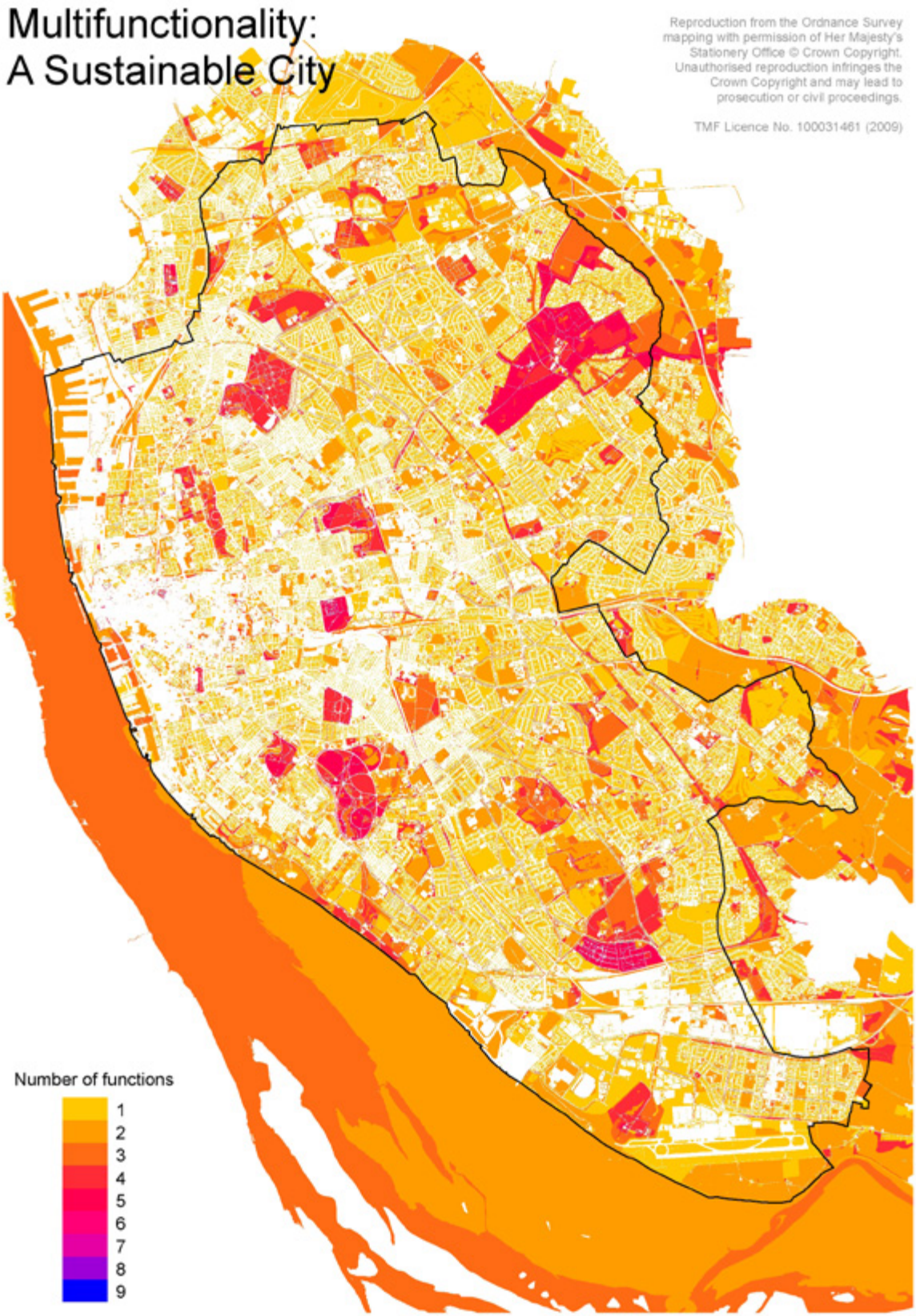
4 http://www.forumforthefuture.org/projects/sustainable-cities09

and delivery to help achieve a higher ranking within England, but will need to look at the way in which competitor cities worldwide use their green infrastructure for competitive advantage.

4.2.1.8. Liverpool is one of a group of cities in the CABE initiative "Sustainable Cities". The city is also seen as potentially a leading local authority in delivering another CABE initiative "Grey to Green". The actions below support the objectives of both these national programmes as well as the city's key priorities.

4.2.1.9. Map 9 shows the overall distribution of those green infrastructure functions that can support sustainable housing growth and regeneration across the city. This shows that the areas with high functionality tend to concentrate around the periphery of the city with the city parks prominent nearer the centre of the city. By contrast the areas with low functionality are mainly around the City Centre, Atlantic Gateway SIA along with other industrial areas north of Speke.

Map 9. Multifunctionality for A Sustainable City[5]



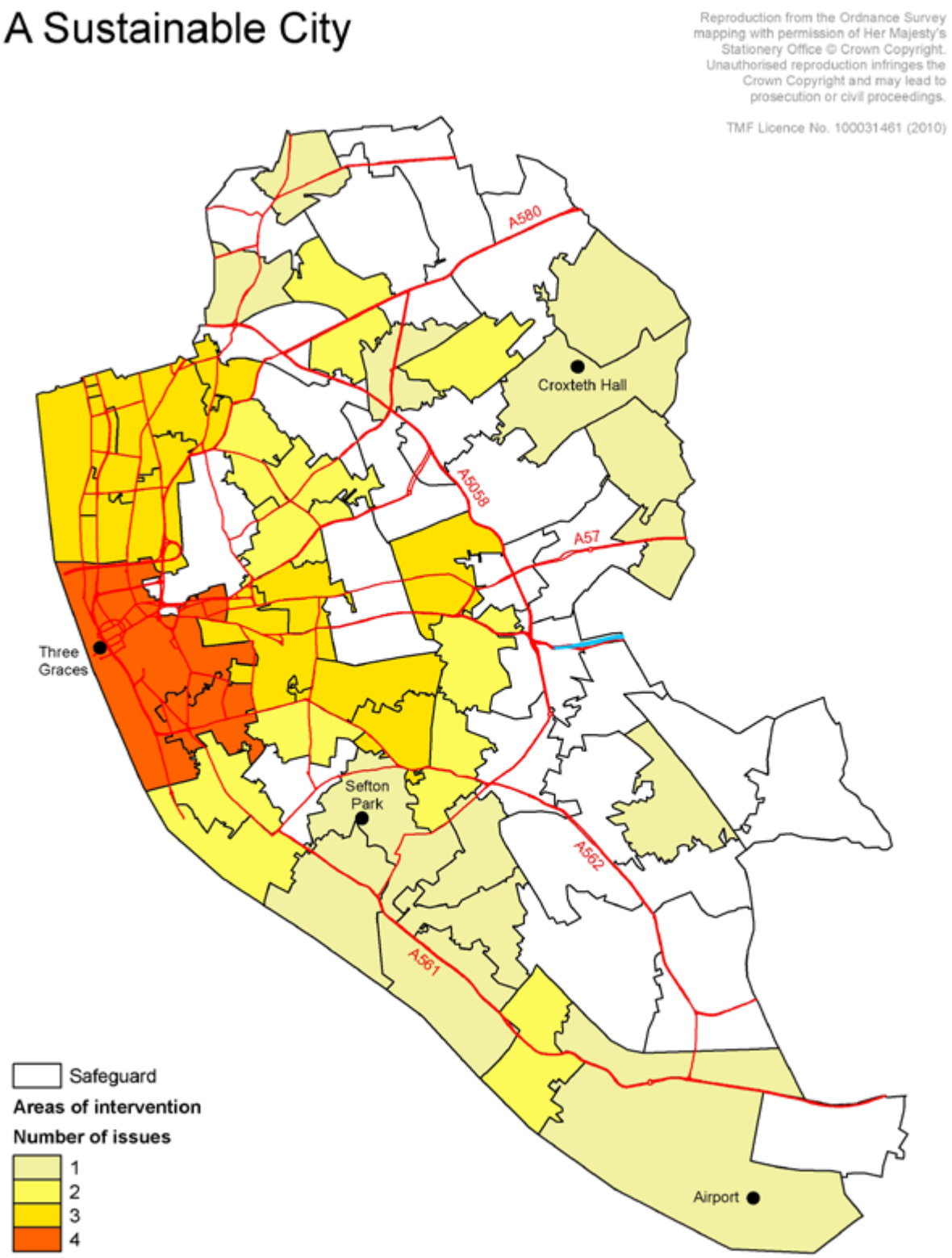
5 The functions included in this analysis are: recreation – public, green travel route, aesthetic, heritage, cultural asset, wind shelter, learning.

4.2.1.10. Map 10 confirms that those areas where there is a concentration of issues requiring action to increase green infrastructure functionality are in the inner and Northwestern parts of the city. The areas that are not coloured on the map do not mean that no action is required, but rather where the emphasis will be more on the safeguarding and enhancement of existing functions.

4.2.1.11. The issues relating to this priority are:

- Improving quality of place for projected housing growth and major regeneration programmes in order to attract investment, encouraging people to live and work in the city as well as increase the number of visitors to Liverpool.
- Increasing levels of productivity across the city.
- Developing a low carbon economy, including improving the opportunities for walking and cycling as part of everyday life in the city.

Map 10. Targeting of actions for Priority 1 issues across Super Output Areas



Issues
- Super Output Areas with <50% green infrastructure cover that intersect Strategic Investment Areas, Growth Point wards, HMR areas or Housing SPD Fringe Areas
- Super Output Areas with <30% green infrastructure cover in Environmental Improvement Corridors and near key gateways
- Super Output Areas with <5% green travel route functionality cover that intersect Growth Point wards, HMR areas or Housing SPD Fringe Areas
- Super Output Areas where five or more ANGSt or Space for People standards are not completely fulfilled

4.2.1.12. The imbalance between green infrastructure function and location of key regeneration proposals raises a number of challenges, compounded by the fact that there will be extremely limited opportunities for creating new areas of traditional greenspace within the urban core. These challenges are taken forward through the recommended actions in this strategy for consideration in subsequent policy development. These include:

- Protection and enhancement of green infrastructure already in place
- Incorporating green infrastructure into new development including green roofs and green walls
- Increasing, where appropriate, private garden space in the development of family housing
- Developing a high quality public realm attractive to the pedestrian, incorporating street tree planting
- Ensuring new development contributes to the delivery of high quality environments including green infrastructure through the preparation of design guidance and arrangements for developer contributions. Include requirements for green infrastructure plans to accompany major developments and targets for development to achieve
- Targeting major access routes for green infrastructure improvements

4.2.1.13. Natural England highlights green infrastructure as a primary consideration in planning, developing and maintaining new developments, with a policy statement that states: *"Necessary housing growth should be accommodated with minimum impact on the natural environment and deliver maximum benefits for the natural environment and people together."*[6] It sets out guidelines for Growth Point areas, which outlines a 'Green Test' against which all new developments should be measured[7].

4.2.2. Long term goal

4.2.2.1. Green infrastructure complements 'grey infrastructure' planning, creating high quality new housing environments and regeneration. Liverpool capitalises on and values its green infrastructure, maximising functionality to gain competitive advantage and support prosperity and grows within environmental limits.

6 Natural England (2009). Housing Growth and Green Infrastructure Policy.

7 Natural England (2008). Green Infrastructure Strategies: An Introduction for Local Authorities and their Partners.

4.2.3. Recommended Actions

4.2.3.1. The actions have been colour coded to indicate whether they are land change (dark blue), supporting (medium blue) or guidance (light blue) actions.

ACTION 1.1

4.2.3.2. 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. In particular see Appendix 8 of the Technical Document.

Areas with greatest need for this action include (by Core Strategy Sub Area):	
City Centre	Central
Inner Area	Anfield, County, Everton, Kensington and Fairfield, Kirkdale, Picton, Princes Park, Riverside
Outer Area	Old Swan, Wavertree, Yew Tree

ACTION 1.2

4.2.3.3. Opportunities are taken to improve green infrastructure around major gateways and routes into the city such as through Atlantic Gateway SIA and along the A580. The City Region Green Infrastructure Framework looks to extend this action across local authority boundaries.

Areas with greatest need for this action include (by Core Strategy Sub Area):	
City Centre	Central
Inner Area	Kirkdale, Picton, Riverside
Outer Area	Croxteth, Greenbank, Wavertree

ACTION 1.3

4.2.3.4. Green infrastructure is used as a mechanism to help create "walkable" neighbourhoods, linking green infrastructure with wider public realm to encourage walking and cycling. In particular, there is an opportunity to develop this approach in the New Heartlands and Growth Point programme areas.

Areas with greatest need for this action include (by Core Strategy Sub Area):	
City Centre	Central
Inner Area	Everton, Kensington and Fairfield, Kirkdale, Picton, Princes Park, Riverside
Outer Area	Norris Green, Old Swan, Wavertree

ACTION 1.4

4.2.3.5. Access to good quality open spaces is an important part of quality of place and life. The Access to Natural Green Space target (ANGST[8]) and The Woodland Trust Space for People[9] targets have been used to identify areas of Liverpool that meet these aspirational standards and those that at present do not.

Areas with greatest need for this action include (by Core Strategy Sub Area):	
City Centre	Central
Inner Area	Kirkdale, Riverside
Outer Area	Church, Cressington, Greenbank, Mossley Hill, Speke-Garston, St Michael's

ACTION 1.5

4.2.3.6. Require detailed green infrastructure plans for all major developments. An example is provided in Appendix 2 of the Technical Document. The plan should be prepared by the project proposer, showing how the development will contribute to the Liverpool Green Infrastructure Strategy[10].

ACTION 1.6

4.2.3.7. The Green Infrastructure Target (an approach to ensure that development uses green infrastructure to best effect) is developed and used for all development in Liverpool with specific targets for each of the Core Strategy Sub Areas.

ACTION 1.7

4.2.3.8. Develop a Design Guide, as a Supplementary Planning Document to support green infrastructure delivery across the city.

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8 Handley, J. et al. (2005). Accessible Natural Green Space Standards in Towns and Cities: A Review and Toolkit for their Implementation, English Nature Research Report No. 526.

9 Woodland Trust (2005). Space for People.

10 Green Infrastructure Plans should bring together a number of studies that would normally be required for a major development such as ecological assessments, landscape proposals, water management, travel plans, etc. The Plan should not entail a great deal of additional work, but will require a new approach to assessing the information gathered so that the focus is on a coordinated assessment of the functionality of the proposals in relation to the identified needs for the area.

4.2.4. Core Strategy Sub Areas

4.2.4.1. Table 5 indicates which of the land change actions from the list above are required in each of the Core Strategy's Sub Areas. The support and guidance actions apply to all areas of the city.

4.2.4.2. The targeting score that is shown for each action is a simple measure of the extent to which the action is required to meet the needs that have been identified in each Core Strategy Sub Area. A score of 0 indicates that no part of the Sub Area has been identified for targeting, whereas a score of 1 indicates that the whole of the Sub Area has been identified for targeting. Details of how the score is determined are provided in Appendix 1 of the Technical Document. The score does not however take account of quality of the green infrastructure. A high score indicates an area for high priority.

4.2.4.3. For example, the whole of the City Centre has been identified for targeting for Actions 1.1, 1.2 and 1.3, and two thirds of it have been identified for Action 1.4. The sum of these figures (3.7 rounded) is given in the TOTAL column for the City Centre and indicates that this is the Sub Area that should have the highest concentration of targeting for this Priority, as shown by Map 11.

4.2.4.4. As this strategy does not look at quality, it will be important to ensure that the detailed design plans that are developed for areas such as Approach 580 SIA and the Eastern Fringe (south) consider how the quality of the existing green infrastructure can be improved, using the data from this strategy to identify the functions that are needed to address local needs.

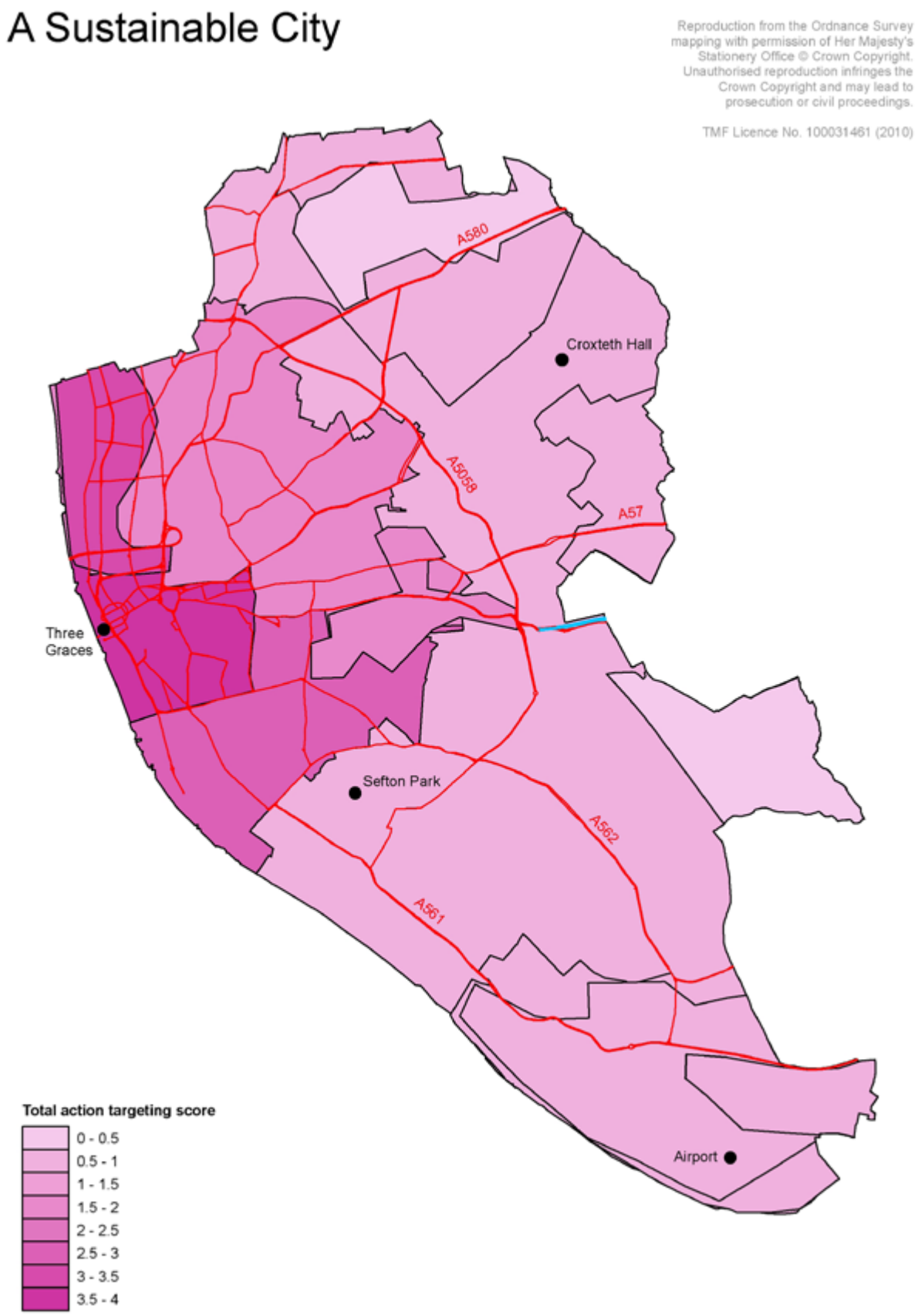
4.2.4.5. Due to the low levels of green infrastructure and the high levels of identified need, the City Centre and Atlantic Gateway SIA are shown as key target areas for this priority. Map 11 maps the TOTAL score shown in Table 5. Map 12 is based on the assessment of assets for this priority and provides a detailed view of where needs are not currently being met by green infrastructure functions. This shows exactly where within the Core Strategy Sub Areas functionality is missing to enable better targeting.

4.2.4.6. The GIS that has been developed to support this strategy can provide additional information on the nature of the needs that have not been fulfilled at a detailed scale if required for individual plans and master plans.

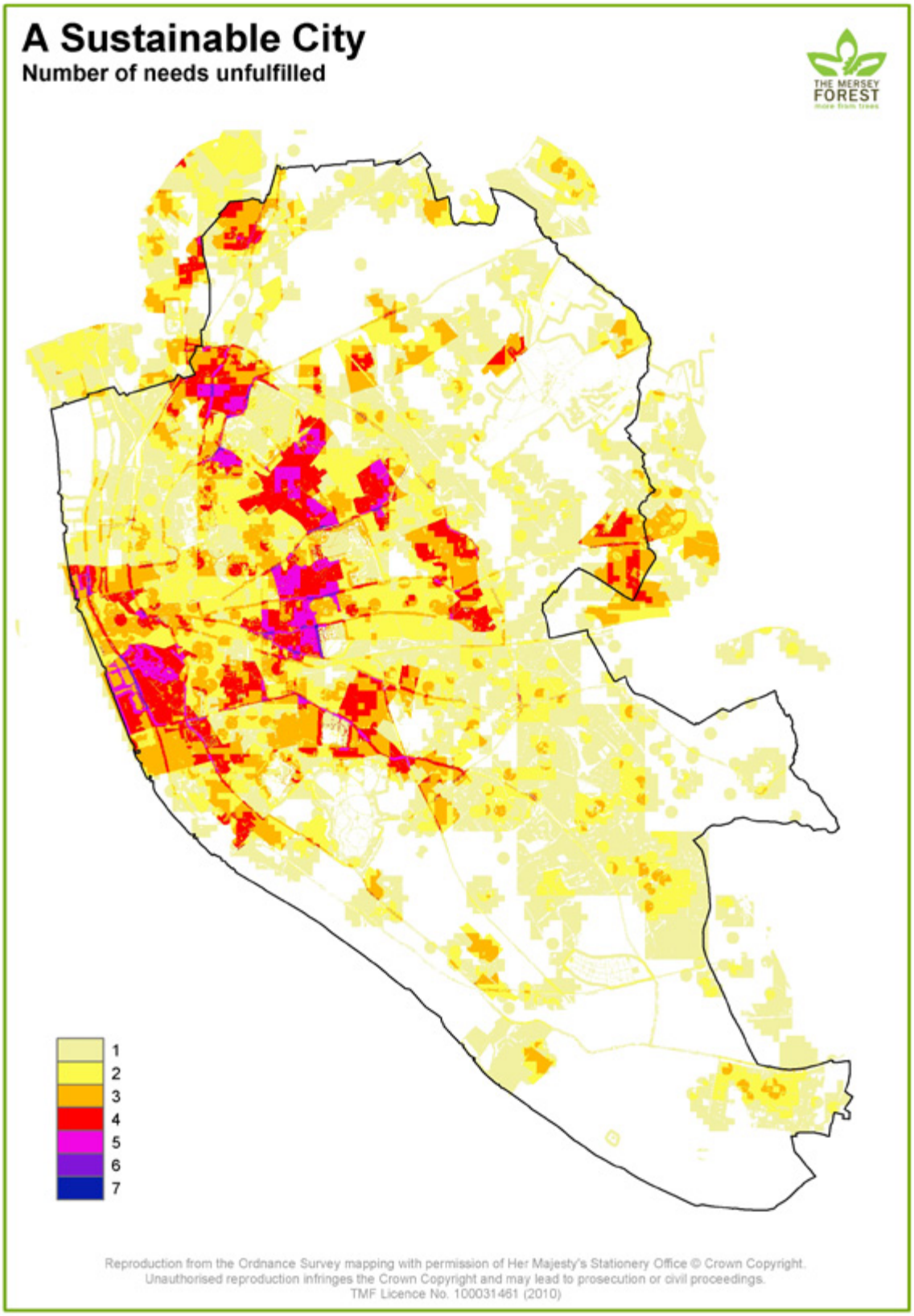
Table 5. Priority 1 targeting score for each land change action by Core Strategy Sub Area

	ACTIONS				
CORE STRATEGY SUB AREA	**1.1**	**1.2**	**1.3**	**1.4**	**TOTAL**
City Centre	**1.00**	**1.00**	**1.00**	**0.67**	**3.7**
Inner Area	**0.72**	**0.36**	**0.64**	**0.16**	**1.9**
Inner Area North	0.67	0.33	0.56	0.17	1.7
Atlantic Gateway SIA	1.00	0.33	1.00	1.00	3.3
Inner Area South	0.89	0.56	0.89	0.22	2.6
Eastern Approaches SIA	0.75	0.50	0.75	0.00	2.0
Outer Area	**0.18**	**0.18**	**0.18**	**0.18**	**0.7**
Approach 580 SIA	0.25	0.00	0.25	0.00	0.5
Speke Halewood SIA	0.25	0.00	0.00	0.75	1.0
Eastern Fringe (C)	0.00	0.50	0.25	0.00	0.8
Eastern Fringe (N)	0.25	0.25	0.38	0.00	0.9
Eastern Fringe (S)	0.00	0.00	0.00	0.00	0.0
Southern Fringe	0.17	0.00	0.00	0.50	0.7

Map 11. Total targeting score for Priority 1 by Core Strategy Sub Area



Map 12. Needs unfulfilled at present for Priority 1[11]



11 This analysis compares where there is greatest need for each function with provision; the functions considered are: recreation – public, green travel route, aesthetic, heritage, cultural asset, wind shelter, learning.

4.3. PRIORITY 2: A city providing natural choices for health

4.3.1. Introduction

4.3.1.1. Improving health and wellbeing is a key priority for Liverpool.

4.3.1.2. *"Our city faces some of the greatest health challenges in the country. It has some of the highest levels of deprivation and lowest levels of life expectancy. It has a high burden of disease and a relatively low take up of healthy lifestyles."*[12]

4.3.1.3. Whereas in England the life expectancy rates are 77 years for males and 82 years for females, the life expectancy rates in Liverpool are only 74 years for males and 78 years for females. Health statistics show that 27 of Liverpool's 30 wards are included in the national pentile of wards that have the lowest life expectancy at birth.

4.3.1.4. Similarly health inequalities within Liverpool are high. A male born in a disadvantaged ward can expect to live 10.9 years less than males born in the most affluent areas[13]. This inequality across the city almost mirrors the inequality for the whole of the UK. Of the 26 indicators shown in Liverpool's health profile[14], including mental health, only one is better and 22 are worse than the England average.

4.3.1.5. Liverpool has a long history of leading the public health agenda[15] and is part of the "Healthy Cities" programme[16]. Liverpool has designated 2010 as the Year of Health and Wellbeing, promoting five key actions; Connect, Be Active, Take Notice, Keep Learning and Give[17].

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12 Liverpool Primary Care Trust (2009). Primary Care Trust Strategic Commissioning Plan 2009 – 2014.

13 http://www.liverpool.gov.uk/Environment/Environmental_health/healthyhomes/programme_intervention/index.asp (15.03.10)

14 NHS (2007). Liverpool Health Profile.

15 http://www.liverpool.gov.uk/Images/tcm21-98273.pdf

16 http://www.euro.who.int/healthy-cities

17 http://www.2010healthandwellbeing.org.uk

4.3.1.6. The evidence that green infrastructure can improve health and well-being and contribute to many of these key actions is extensive[18] and an overview of this evidence with links to original studies is provided in the Technical Document. The evidence points to five main areas of health benefit that can be achieved through green infrastructure planning, management and delivery.

- Increasing physical activity
- Improving air quality
- Opportunities for growing food locally
- Improving mental health
- Social cohesion

4.3.1.7. As well as a human cost in terms of "Quality of Life", poor health also has an economic cost directly related to the issues discussed in the section on A Sustainable City and the drive to increase productivity in the city. The Health is Wealth Commission[19] set out the challenge of poor health in the City Region, and called for a greater use of the natural environment as a part of the solution.

4.3.1.8. The recent Marmot Review[20] identified that reducing health inequalities will require action on six policy objectives:

- Give every child the best start in life
- Enable all children young people and adults to maximise their capabilities and have control over their lives
- Create fair employment and good work for all
- Ensure healthy standard of living for all
- Create and develop healthy and sustainable places and communities
- Strengthen the role and impact of ill health prevention

4.3.1.9. The review also supports the idea that green infrastructure improves mental and physical health and has been shown to reduce health inequalities.

4.3.1.10. This is also supported by the government's strategy for mental health, New Horizons, which highlights that access to green spaces is important for mental health. The strategy also identifies the design of neighbourhoods as being a key issue.

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18 DEFRA (2010). Benefits of Green Infrastructure (awaited).

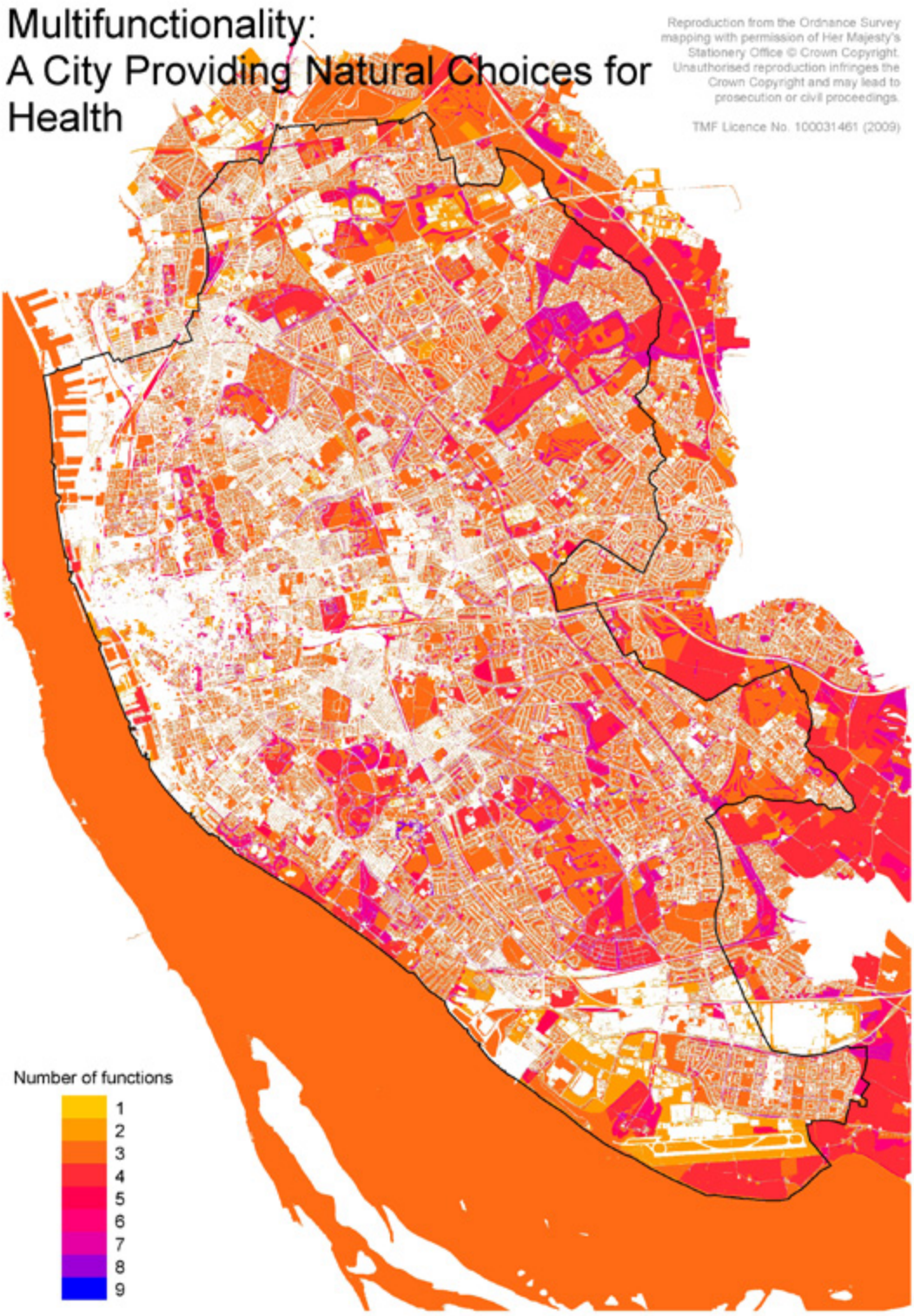
19 Health Is Wealth Commission (2008). Health is Wealth.

20 http://www.nhsconfed.org/OurWork/latestnews/Pages/Marmott-Review.aspx

4.3.1.11. In this plan actions have been developed that can contribute to making healthy lifestyles a simple, natural choice. This means looking at a range of issues such as proximity of accessible green spaces, size and linkage to hubs of activity such as shops and commercial centres. Equally important to provision are quality of design and safety of areas. The barriers to choosing healthy lifestyles are not solely about availability but also linked to perception, culture and attitudes. As with many of the key issues for the city, it is only through taking action to address all the major factors affecting an issue that will enable a transformation to take place.

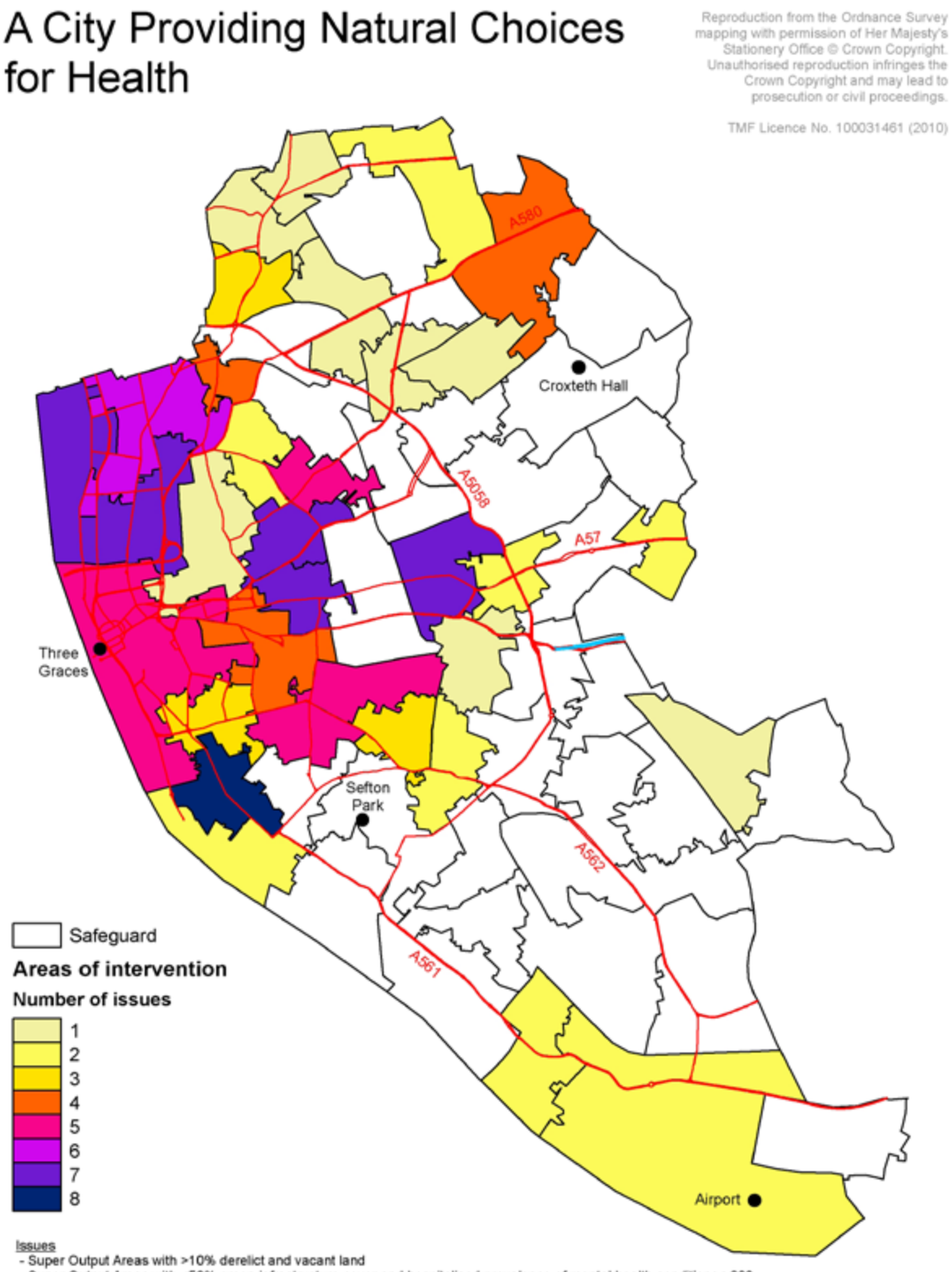
4.3.1.12. Map 13 and Map 14 show firstly the overall distribution of existing green infrastructure functions that can support good health across the city, and secondly the areas of the city that have been targeted for one or more of the possible land change actions for this priority. Map 14 shows areas for both intervention and safeguarding.

Map 13. Health Multifunctionality[21]



21 The functions included in this analysis are: recreation – public, recreation – private, recreation – public with restrictions, green travel route, aesthetic, shading from the sun, evaporative cooling, trapping air pollutants, noise absorption, food production, learning.

Map 14. Targeting of actions for Priority 2 issues across Super Output Areas



Issues
- Super Output Areas with >10% derelict and vacant land
- Super Output Areas with <50% green infrastructure cover and hospitalised prevalence of mental health conditions >200
- Super Output Areas with >10% greatest need for trapping air pollutants cover, <5% of which is fulfilled
- Super Output Areas with <40% recreation functionality cover and hospitalised incidence coronary heart disease >150
- Super Output Areas with <40% recreation functionality cover and >20% population is obese
- Super Output Areas with <40% recreation functionality cover and hospitalised prevalence of diabetes >300
- Super Output Areas with <50% green infrastructure cover and 2 or more hospitals or health centres
- Super Output Areas with <5% green travel route functionality cover that intersect Growth Point wards, HMR areas or Housing SPD Fringe Areas

4.3.1.13. The lack of functionality in the City Centre and North Liverpool area is clear, as is the importance in terms of health function of many of the green wedge areas on the city boundary and extending into neighbouring authorities. Other obvious features are the city parks and the loop line.

4.3.1.14. Whilst there are needs to improve health cross the city, Map 14 identifies the City Centre and the Inner Area of the city as having the greatest numbers of issues. Again it is important to highlight that the other areas are not to be ignored. Safeguarding and enhancing these areas will help to maintain their value for public health.

4.3.1.15. For the actions that look to increase physical activity, the actual use of sites is affected by a range of issues including several that are looked at in this strategy, but also by quality, which is not. However, the Open Space Study[22] looked at quality and a combination of the data from these two pieces of work can provide a clear picture of where improvement in quality is required as well as indicating where there are issues of provision and quality that have a negative impact on health.

4.3.2. Long term goal

4.3.2.1. The city is planned so that taking healthy options for all for everyday living is a natural choice.

4.3.3. Recommended Actions

4.3.3.1. The actions have been colour coded to indicate whether they are land change (dark blue), supporting (medium blue) or guidance (light blue) actions.

ACTION 2.1
4.3.3.2. Planning and other strategies support the temporary use of vacant or derelict land for food and fuel growing or other suitable uses, as part of the Liverpool City Council "Greening the City" programme.

Areas with greatest need for this action include (by Core Strategy Sub Area):	
City Centre	Central
Inner Area	Everton, Kirkdale, Princes Park, Riverside

22 Liverpool Open Space Study, Atkins, 2005

ACTION 2.2

4.3.3.3. Increase the quality and quantity of green infrastructure to provide places of relative tranquillity in areas where there are higher levels of poor mental health. The evidence suggests that like productivity benefits, the benefits from mental health come not just from specific area interventions but also from a general improvement in quality of green infrastructure.

Areas with greatest need for this action include (by Core Strategy Sub Area):	
City Centre	Central
Inner Area	Anfield, Everton, Kensington and Fairfield, Kirkdale, Picton, Princes Park, Riverside

ACTION 2.3

4.3.3.4. Green infrastructure is used to reduce air pollution along main road routes into the city.

Areas with greatest need for this action include (by Core Strategy Sub Area):	
City Centre	Central
Inner Area	Kensington and Fairfield, Kirkdale, Princes Park, Riverside
Outer Area	Greenbank

ACTION 2.4

4.3.3.5. Target provision of green infrastructure and improve accessibility of existing green infrastructure towards areas of the city that have high incidence of coronary heart disease, obesity and/or diabetes and low levels of accessible green infrastructure.

Areas with greatest need for this action include (by Core Strategy Sub Area):	
City Centre	Central
Inner Area	County, Everton, Kensington and Fairfield, Kirkdale, Picton, Princes Park, Riverside
Outer Area	Fazakerley, Old Swan, Speke-Garston

ACTION 2.5

4.3.3.6. Take the opportunity provided by redevelopment of hospitals and health centres through programmes such as LIFT[23], to maximise the opportunity to use green infrastructure as part of an approach to improving health outcomes and sustainability, by creating attractive settings and maximising views of "green". Alder Hey and Liverpool Knowledge Quarter provide examples and opportunities of what could be achieved. Health centres, hospitals and GP surgeries across the city should all be targeted to ensure that they contribute to the delivery of green infrastructure improvements to meet local need and are encouraged to make use of green infrastructure to help to improve health outcomes.

Areas with greatest need for this action include (by Core Strategy Sub Area):	
City Centre	Central
Inner Area	Everton, Kensington and Fairfield, Kirkdale, Riverside
Outer Area	Greenbank

ACTION 2.6

4.3.3.7. Ensure planning applications for new developments at all scales always prioritise the need for people (including those whose mobility is impaired) to be physically active as a routine part of their daily life and where possible use green infrastructure to enable this.

ACTION 2.7

4.3.3.8. Ensure local facilities and services are easily accessible on foot, by bicycle and by other modes of transport involving physical activity. Ensure children can participate in physically active play and use green infrastructure to develop natural play opportunities.

Areas with greatest need for this action include (by Core Strategy Sub Area):	
City Centre	Central
Inner Area	Everton, Kensington and Fairfield, Kirkdale, Picton Princes Park, Riverside
Outer Area	Norris Green, Old Swan, Wavertree

23 LIFT Programme

ACTION 2.8

4.3.3.9. Maximise opportunities for support to be provided to programmes such as Green Gyms, Sport and Physical Activity Alliance (SPAA) programmes, Forest Schools, horticultural therapy, etc. to develop a network of opportunities for health improvement for those in need of support.

ACTION 2.9

4.3.3.10. Maximise opportunities to support the public parks as part of the "Natural Health Service", highlighting the fact that public health was a key reason for the development of the public parks. This can be supported by the use of the health and green infrastructure functionality data gathered for this strategy in the development of the Parks Strategy for Liverpool.

4.3.4. Core Strategy Sub Areas

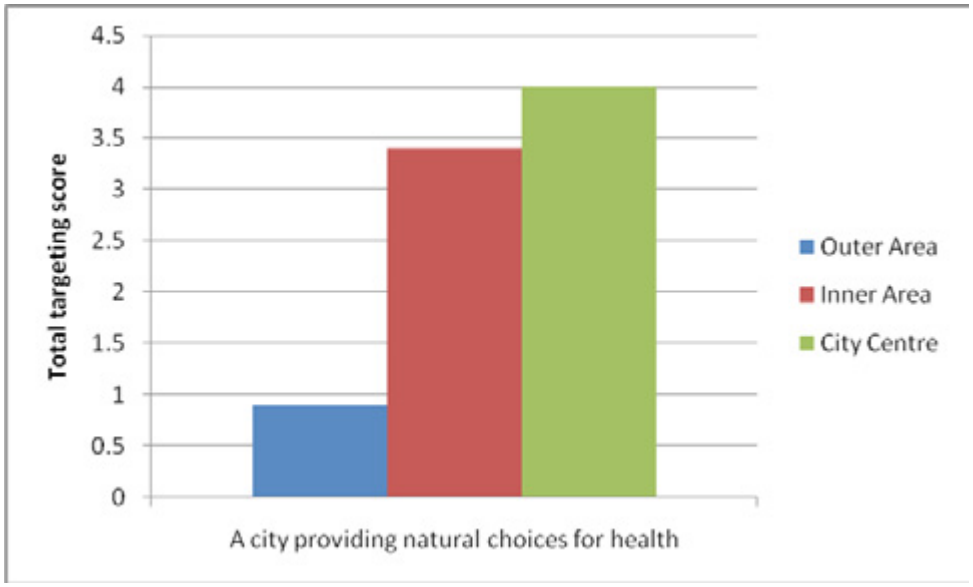
4.3.4.1. Map 15 shows a very stark contrast between the action targeting score for the Outer Area of the city against the Inner Area and City Centre. The image is almost one of a set of concentric circles of need for action around the area with the highest score, Atlantic Gateway SIA, within Inner Area North.

4.3.4.2. Many of the health issues for Liverpool such as high levels of poor mental health and obesity and coronary heart disease are highest in the City Centre and Inner Areas, the areas with the lowest proportion of accessible green infrastructure and also areas where there are opportunities to improve "walkability" to GP surgeries. Action 2.7 is closely aligned to that of Action 1.3.

4.3.4.3. The City Centre and Inner Area also have the highest levels of derelict land providing opportunities for "meanwhile" uses that not only could help to improve health, but also help to improve the image of these areas too if well managed.

4.3.4.4. Figure 5 shows the great difference in targeting scores between the Outer Area and the City Centre/Inner Area reflecting a great difference in need for action to help improve public health.

Figure 5. Total targeting score for health in the three main Core Strategy areas



4.3.4.5. Table 6 indicates which of the land change actions from the list above are required in each of the Core Strategy's Sub Areas. The support and guidance actions apply to all areas of the city.

4.3.4.6. The targeting score that is shown for each action is a simple measure of the extent to which the action is required to meet the needs that have been identified in each Core Strategy Sub Area. A score of 0 indicates that no part of the Sub Area has been identified for targeting, whereas a score of 1 indicates that the whole of the Sub Area has been identified for targeting. Details of how the score is determined are provided in Appendix 1 of the Technical Document. The score does not however take account of quality of the green infrastructure. A high score indicates an area for high priority.

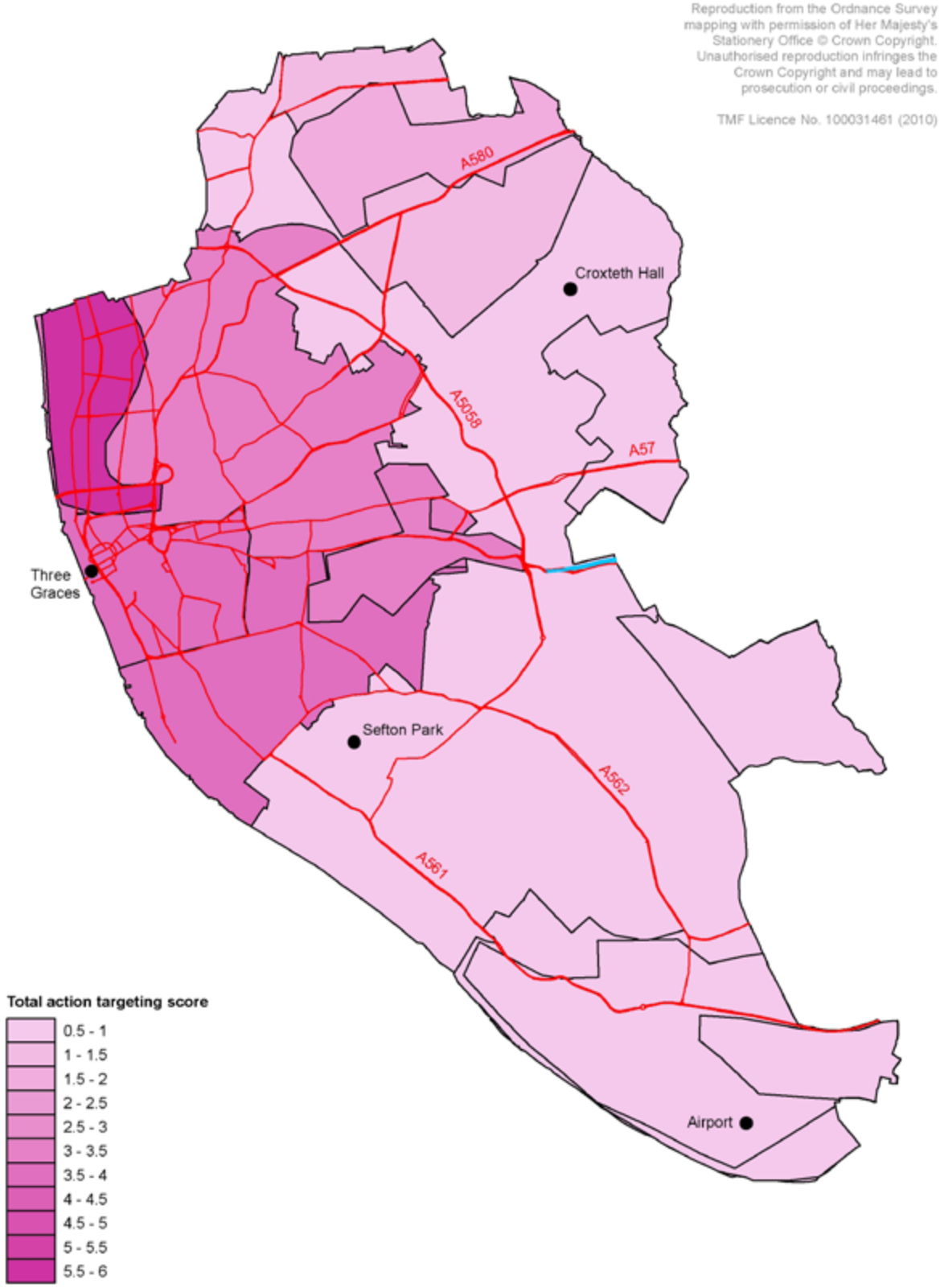
4.3.4.7. For example, the whole of the Atlantic Gateway SIA has been identified for targeting for Actions 2.2, 2.5 and 2.7, and one third of it has been identified for Action 2.3. The sum of all the targeting scores for the Atlantic Gateway SIA (6.0) is given in the TOTAL column and indicates that this is the Sub Area that should have the highest concentration of targeting for this Priority, as shown by Map 15.

Table 6. Total targeting score for Priority 2 by Core Strategy Sub Area

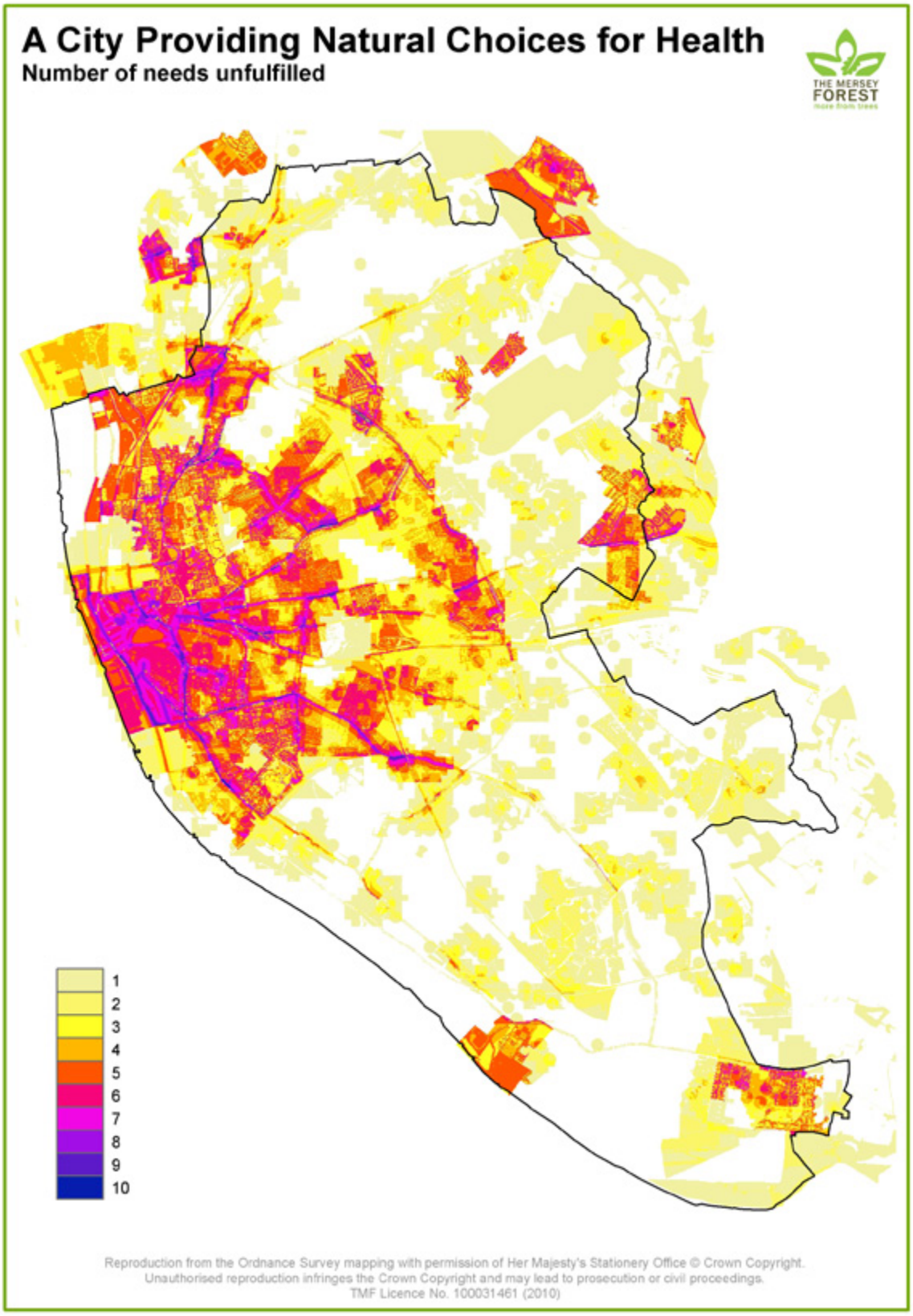
CORE STRATEGY SUB AREA	ACTIONS								
	2.1	2.2	2.3	2.4 CHD	2.4 OBESITY	2.4 DIABETES	2.5	2.7	TOTAL
City Centre	**0.67**	**1.00**	**0.33**	**0.00**	**0.00**	**0.33**	**0.67**	**1.00**	**4.0**
Inner Area	**0.24**	**0.52**	**0.36**	**0.40**	**0.44**	**0.36**	**0.44**	**0.64**	**3.4**
Inner Area North	0.17	0.50	0.33	0.44	0.44	0.33	0.50	0.56	3.3
Atlantic Gateway SIA	0.67	1.00	0.33	0.67	0.67	0.67	1.00	1.00	6.0
Inner Area South	0.44	0.67	0.44	0.22	0.33	0.44	0.44	0.89	3.9
Eastern Approaches SIA	0.25	0.50	0.25	0.50	0.25	0.50	0.25	0.75	3.3
Outer Area	**0.07**	**0.02**	**0.14**	**0.14**	**0.18**	**0.05**	**0.09**	**0.18**	**0.9**
Approach 580 SIA	0.25	0.00	0.00	0.50	0.50	0.25	0.00	0.25	1.8
Speke Halewood SIA	0.25	0.00	0.00	0.25	0.50	0.00	0.00	0.00	1.0
Eastern Fringe (C)	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.25	0.5
Eastern Fringe (N)	0.13	0.00	0.13	0.25	0.25	0.13	0.00	0.38	1.3
Eastern Fringe (S)	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.5
Southern Fringe	0.17	0.00	0.00	0.17	0.33	0.00	0.00	0.00	0.7

Map 15. Target score by Core Strategy Sub Areas

A City Providing Natural Choices for Health



Map 16. Number of needs unfulfilled at present[24]



24 This analysis compares where there is greatest need for each function with provision; the functions considered are: recreation – public, recreation – private, recreation – public with restrictions, green travel route, aesthetic, shading from the sun, evaporative cooling, trapping air pollutants, noise absorption, food production, learning.

4.4. PRIORITY 3: A cool city

4.4.1. Long term goal

4.4.1.1. Liverpool uses its green infrastructure to cool the city, manage risk of flooding and protect vulnerable communities from the impacts of projected climate change

4.4.2. Introduction

4.4.2.1. Tackling the negative impacts of climate change, whilst taking advantage of opportunities that it may bring, is a key issue for the city. A Climate Change Adaptation Action Plan is currently being developed by Liverpool City Council; this strategy can help support that document.

4.4.2.2. Climate change will bring hotter and drier summers, warmer and wetter winters, rising sea levels, and more extreme weather events such as heat waves, drought, storms, and floods. Such changes will impact on Liverpool; on people, the economy and the natural environment. They will present a range of risks, but there will also be some opportunities and potential benefits.

4.4.2.3. Green infrastructure has a significant role to play in adapting Liverpool to some key impacts of climate change:

- Increased extreme precipitation could lead to surface water flooding – green infrastructure helps through rainwater interception, infiltration and storage.
- Increased high temperatures could affect the urban population's health – green infrastructure helps by providing evaporative cooling and shading, and this is especially important in the city centre and where vulnerable populations are located.
- Increased tourism and a shift to more outdoor orientated lifestyles – maximising on Liverpool's waterfront and using attractive green infrastructure to manage high temperatures
- Habitat loss – using green infrastructure to increase the permeability of the city to wildlife
- Higher summer temperatures could lead to discomfort in buildings and an increased demand for summer cooling – shading of buildings will reduce internal temperatures.

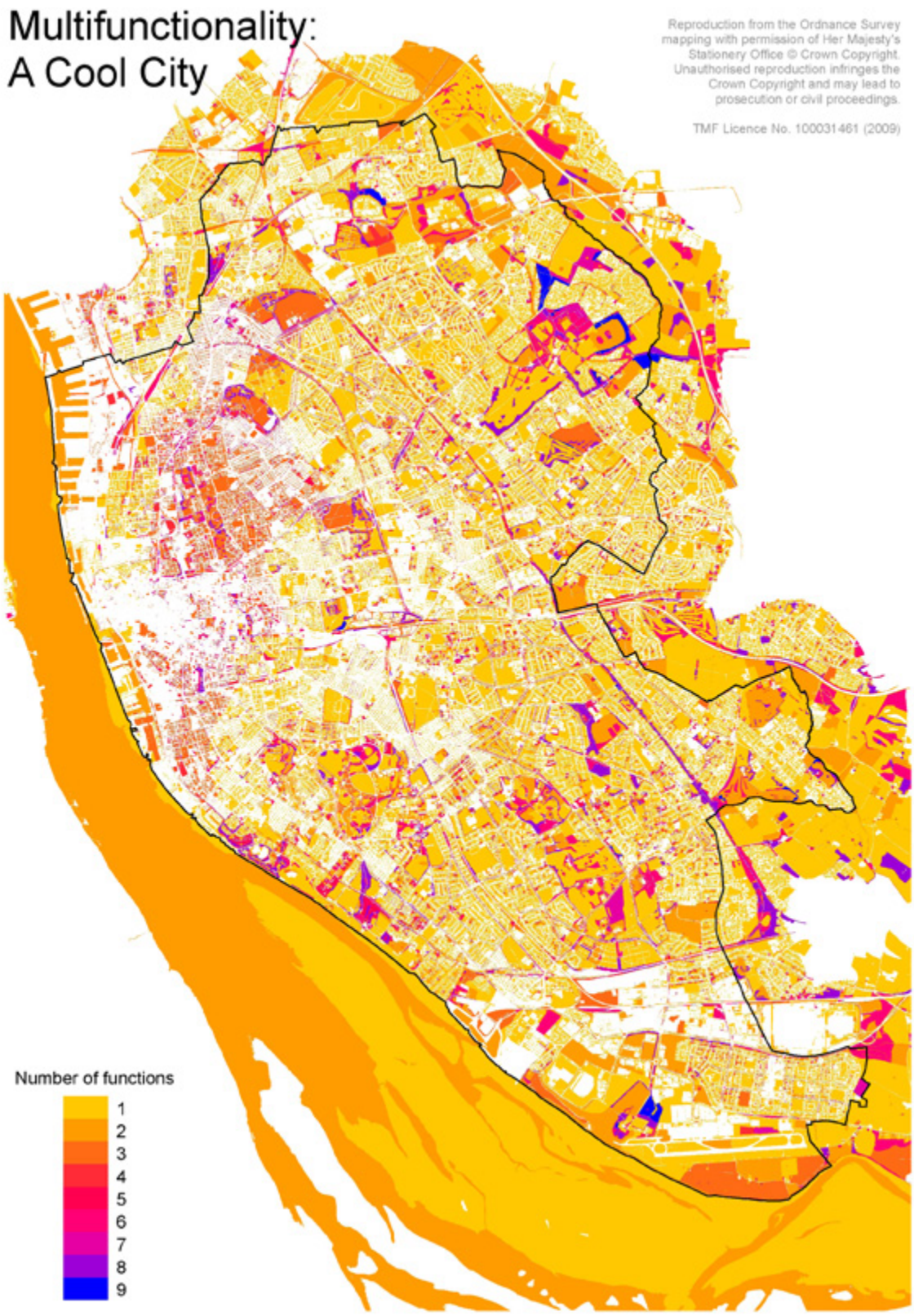
4.4.2.4. Map 17 shows where green infrastructure across Liverpool is delivering functions which will help in adapting to climate change; this functionality should be safeguarded across the city. The outer areas have a higher level of functionality, with the River Mersey also providing important functionality. The areas of low functionality can be seen as surrounded by areas of higher functionality. The areas of projected increasing population, the City Centre and Inner

Area north, have the lowest levels of functionality. Here, the importance of the canal and gardens stand out as of higher functionality.

4.4.2.5. Map 18 shows areas where actions should be taken here to increase green infrastructure and its functionality in terms of climate change adaptation. Key areas for action include the City Centre and Atlantic Gateway, as well as areas of flood risk around the A580 and the eastern fringes of the city.

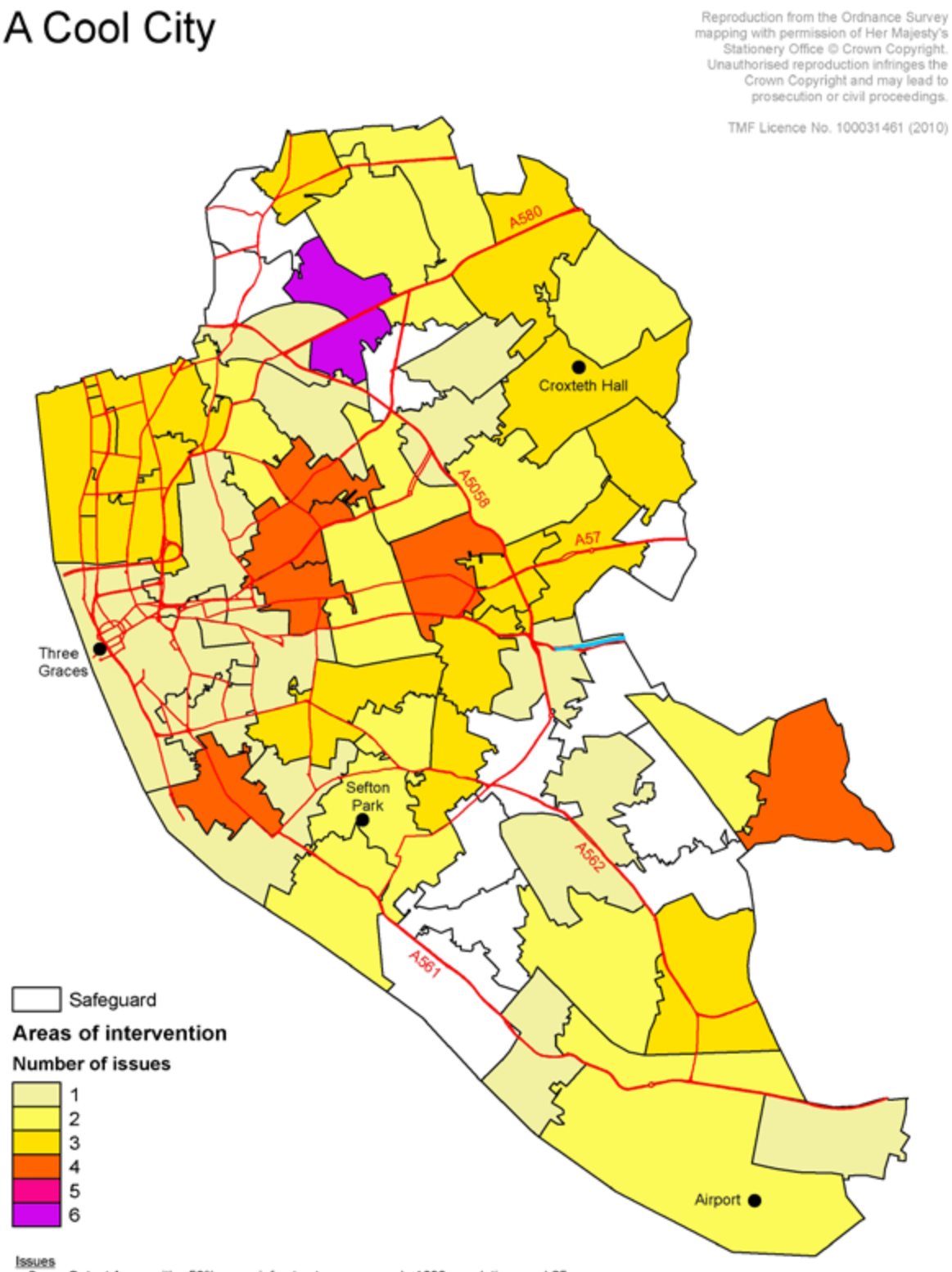
4.4.2.6. In addition to climate change adaptation, safeguarding green infrastructure will also help to lock up carbon, so it also acts as a climate change mitigation measure for the city. The climate change mitigation services provided by green infrastructure are dealt with in other sections of this report. For example, the 'Sustainable City' section covers reducing the need to travel by car.

Map 17. Cool city multifunctionality – where green infrastructure is delivering functions which will help in adapting to climate change[25]



25 The functions included in this analysis are: shading from the sun, evaporative cooling, wind shelter, inaccessible water storage, accessible water storage, water interception, water infiltration, water conveyance, pollutant removal from soil/water, flow reduction through surface roughness.

Map 18. Cool city action areas – areas to take action to increase green infrastructure and its functionality (and to safeguard it) for climate change adaptation, by Super Output Area



Issues
- Super Output Areas with <50% green infrastructure cover and >1000 population aged 65+
- Super Output Areas with <50% green infrastructure cover and >2000 population with limiting long-term illness
- Super Output Areas with <50% green infrastructure cover and >400 population aged 0 - 4
- Super Output Areas with SUDS targeting score >1
- Super Output Areas where tree cover is >2 percentage points lower than TMF Plan target
- Super Output Areas with <1% accessible water storage functionality cover and >10% high drought susceptibility green infrastructure cover
- Super Output Areas with >1km of culverted watercourses and functional floodplain

4.4.3. Recommended Actions

4.4.3.1. The actions have been colour coded to indicate whether they are land change (dark blue), supporting (medium blue) or guidance (light blue) actions.

ACTION 3.1

4.4.3.2. Use green infrastructure to help to reduce the urban heat island effect. Safeguard areas which are of importance for evaporative cooling and increase green infrastructure in areas with the most vulnerable communities, including older people, those with chronic and severe illness, those who are unable to adapt their behaviour to keep cool (including young children). See Figure 6 for some examples of green infrastructure for cooling.

Areas with greatest need for this action include (by Core Strategy Sub Area):	
City Centre	Central
Inner Area	Anfield, Everton, Kensington and Fairfield, Kirkdale, Princes Park, Riverside
Outer Area	Old Swan

ACTION 3.2

4.4.3.3. Actively encourage sustainable drainage systems (SUDS) in policy to help to reduce the needs for additional grey infrastructure and the pressure on existing water management infrastructure[26]. Safeguard and, where possible, increase green infrastructure on permeable soils as part of the city's water management system. This action will also help to protect the water environment from deterioration and help improve water bodies to good status.

Areas with greatest need for this action include (by Core Strategy Sub Area):	
Inner Area	Picton, Tuebrook and Stoneycroft
Outer Area	Croxteth, Greenbank, Knotty Ash, Old Swan, St Michael's, Wavertree, West Derby, Yew Tree

26 The areas for action have been identified with supporting data in the Strategic Flood Risk Assessment.

ACTION 3.3

4.4.3.4. Promote green roofs, particularly in areas of the city centre that are undergoing redevelopment. Green roofs, along with urban trees, offer the best opportunity to create new green infrastructure in these areas for some of the cooling functions that are needed, as well as contributing towards surface water management[27].

ACTION 3.4

4.4.3.5. Deliver The Mersey Forest Plan for Liverpool, to provide additional woodland and urban trees in the areas of greatest need for shade and cooling.

Areas with greatest need for this action include (by Core Strategy Sub Area):	
City Centre	Central
Inner Area	County, Everton, Kensington and Fairfield, Kirkdale
Outer Area	Fazakerley

ACTION 3.5

4.4.3.6. Make provisions for sustainable irrigation for green infrastructure to reduce the impacts of drought; planning now for projected increase in drought frequency. Drought can reduce the ability of plants to transpire and so provide the evaporative cooling function when it is most needed. Potential sources include rising groundwater levels, and the storage and re-use of rainwater.

Areas with greatest need for this action include (by Core Strategy Sub Area):	
Inner Area	Everton, Kensington and Fairfield, Princes Park, Riverside
Outer Area	Allerton and Hunts Cross, Belle Vale, Croxteth, Fazakerley, Greenbank, Speke-Garston, St Michael's, Yew Tree

ACTION 3.6

4.4.3.7. Incorporate green infrastructure planning and appropriate actions into the Liverpool Climate Change Adaptation Strategy (Action 5.7 also covers this point).

27 See Technical Document for information on the potential for green roofs in Liverpool.

ACTION 3.7

4.4.3.8. Incorporate climate change adaptation design principles into all planning and development briefs and documents. This may be included in the design guide (Action 1.7).

ACTION 3.8

4.4.3.9. Take advantage of the waterfront location of Liverpool for its urban cooling and potential to provide an attractive and comfortable visitor attraction in a warmer climate.

ACTION 3.9

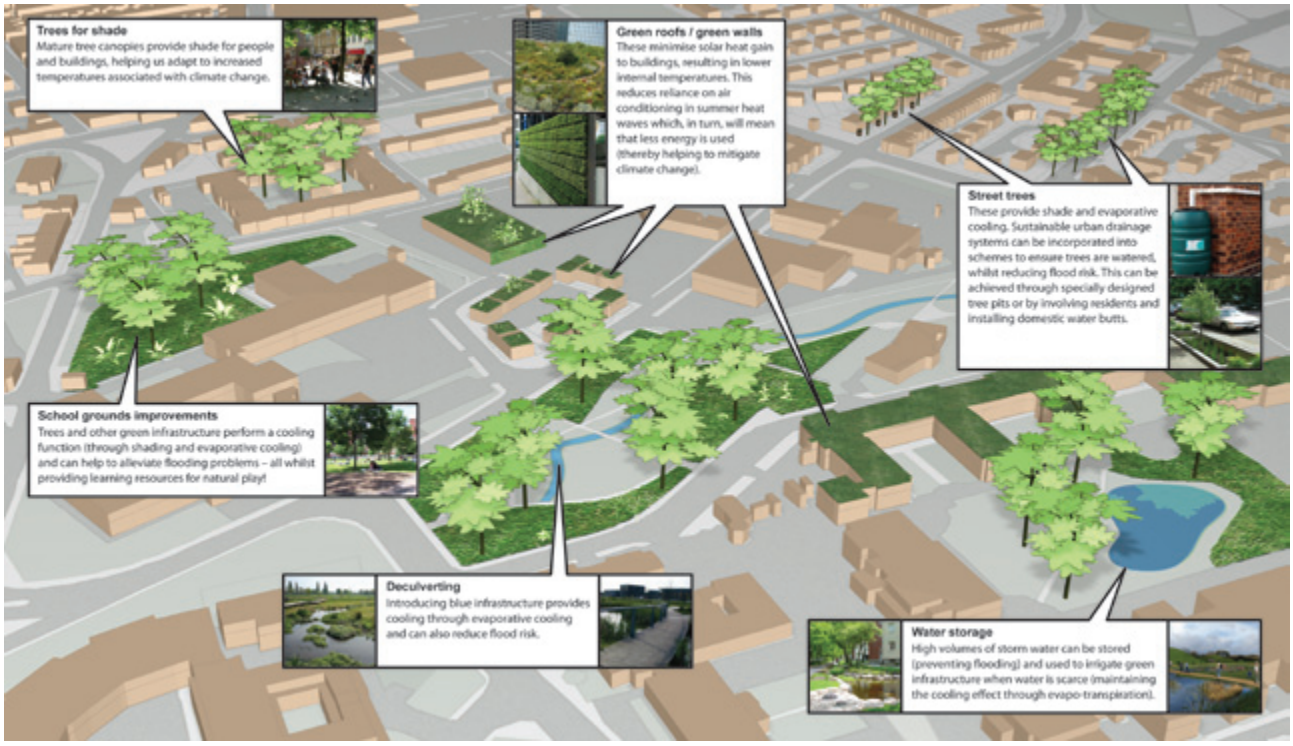
4.4.3.10. Protect green infrastructure assets which encourage air flow into urban areas and align new development and restructuring to encourage air flows.

ACTION 3.10

4.4.3.11. Take opportunities to de-culvert watercourses and re-naturalise floodplains.

Areas with greatest need for this action include (by Core Strategy Sub Area):	
Outer Area	Allerton and Hunts Cross, Belle Vale, Cressington, Croxteth, Fazakerley, Knotty Ash, Speke-Garston, West Derby, Yew Tree

Figure 6. Examples of green infrastructure for city cooling in the City Centre



4.4.4. Core Strategy Sub Areas

4.4.4.1. Table 7 and Map 19 show the areas for intervention across the Core Strategy Sub Areas. The support and guidance actions apply to all areas of the city. Eastern Approaches, Atlantic Gateway and Approach 580 SIAs have high targeting scores as they all have high populations vulnerable to urban heat island. The City Centre does not score highly, because it has low flood risk as set out in the SFRA and also has low levels of vulnerable communities. However, it does require additional urban tree cover, to provide shade and shelter and will require water storage to irrigate its green infrastructure and provide the existing levels of cooling. Because we have focussed on areas of greatest need, the areas of the city with the highest levels of vulnerable population have scored highly.

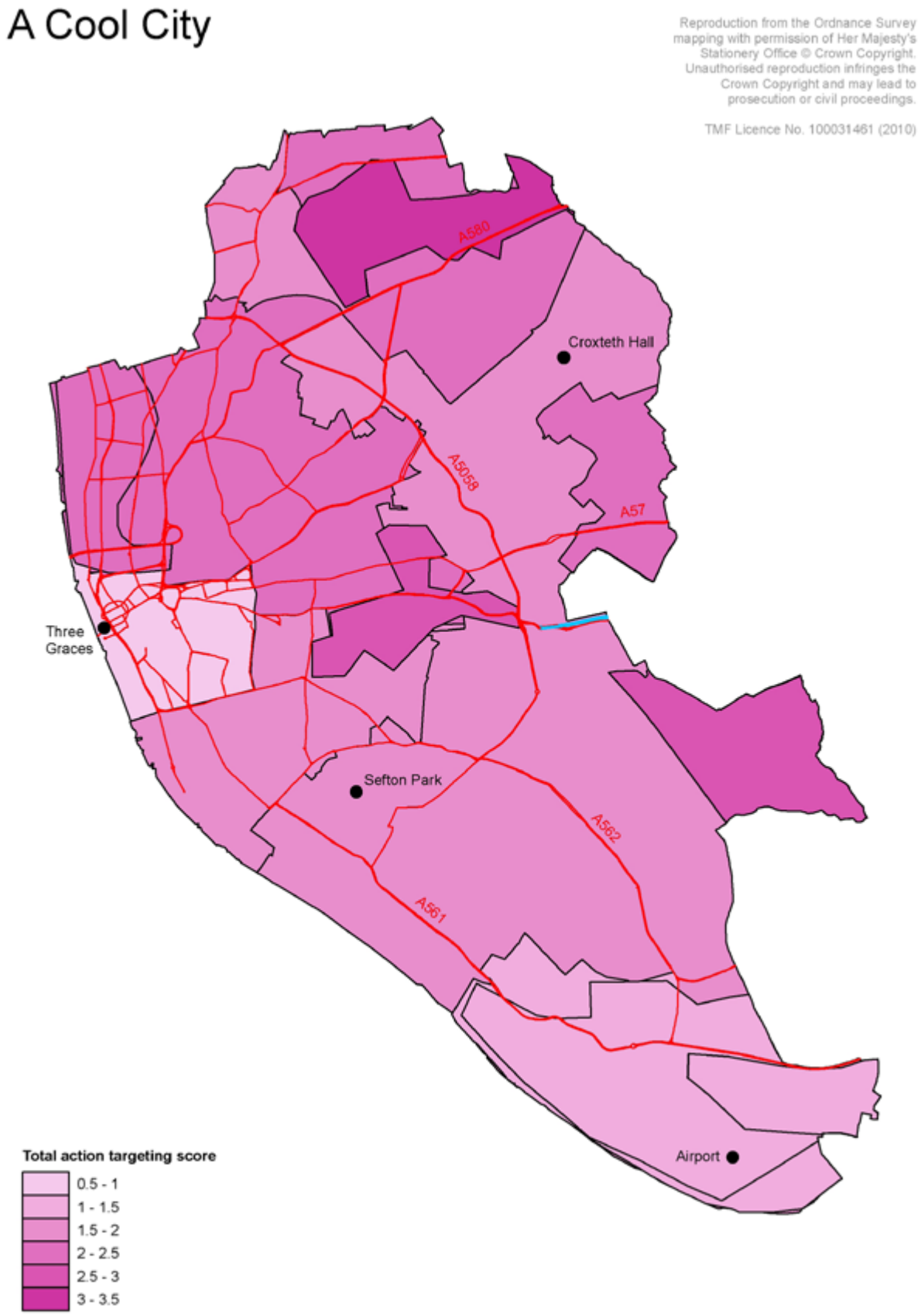
4.4.4.2. The targeting score that is shown for each action is a simple measure of the extent to which the action is required to meet the needs that have been identified in each Core Strategy Sub Area. A score of 0 indicates that no part of the Sub Area has been identified for targeting, whereas a score of 1 indicates that the whole of the Sub Area has been identified for targeting. Details of how the score is determined are provided in Appendix 1 of the Technical Document. The score does not however take account of quality of the green infrastructure. A high score indicates an area for high priority.

4.4.4.3. For example, the whole of the Eastern Approaches SIA has been identified for targeting for Action 3.2, and three quarters of it has been identified for the Young Children aspect of Action 3.1. The sum of all the targeting scores for the Eastern Approaches SIA (3.0) is given in the TOTAL column and indicates that this is the Sub Area that should have the highest concentration of targeting for this Priority, as shown by Map 19.

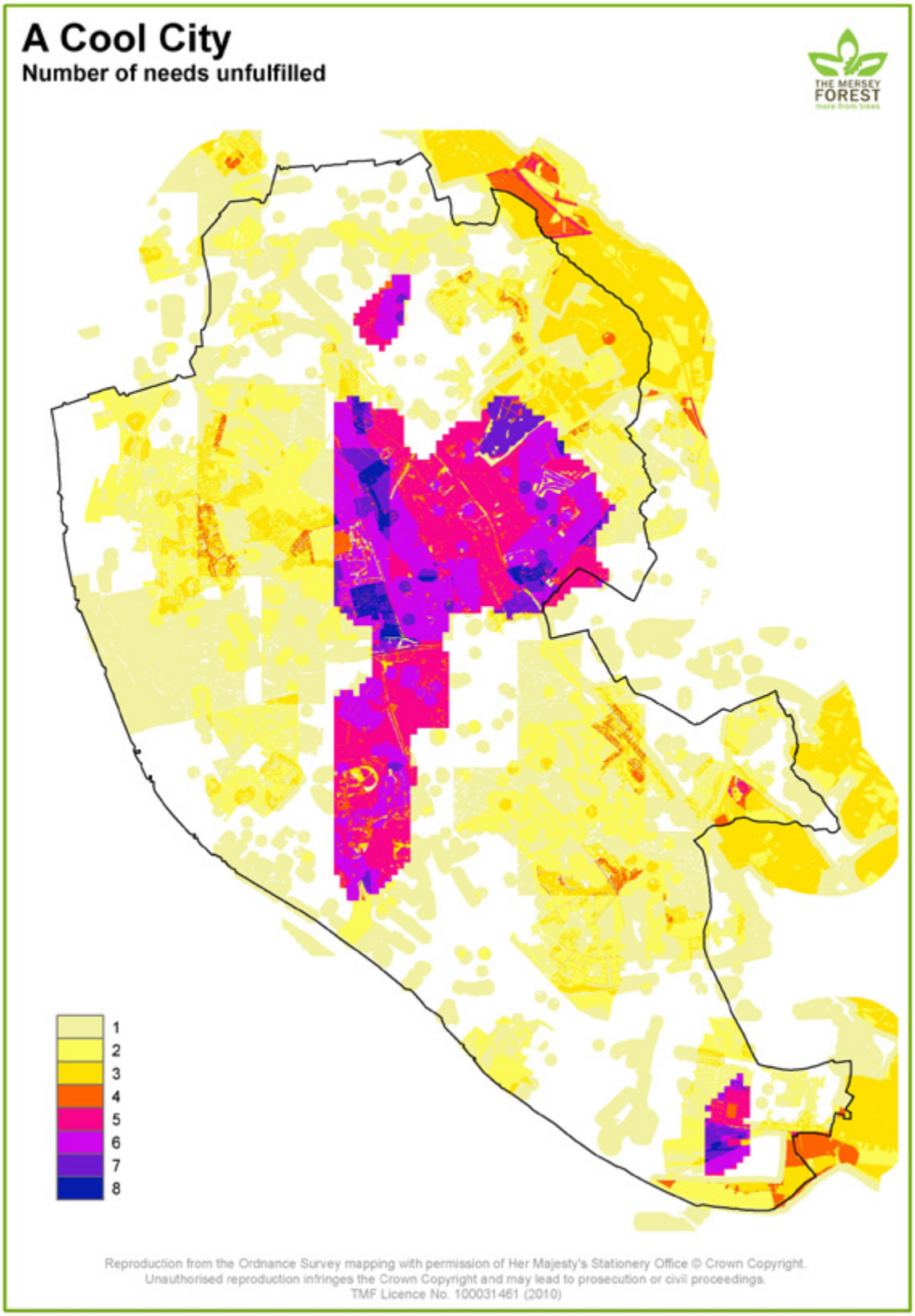
Table 7. Total targeting score for Priority 3 by Core Strategy Sub Area

	ACTIONS							
CORE STRATEGY SUB AREA	3.1 OLDER PEOPLE	3.1 LIMITING LONG TERM ILLNESS	3.1 YOUNG CHILDREN	3.2	3.4	3.5	3.10	TOTAL
City Centre	**0.00**	**0.33**	**0.00**	**0.00**	**0.33**	**0.33**	**0.00**	**1.0**
Inner Area	**0.28**	**0.40**	**0.44**	**0.28**	**0.32**	**0.36**	**0.08**	**2.2**
Inner Area North	0.33	0.44	0.39	0.28	0.39	0.22	0.11	2.2
Atlantic Gateway SIA	0.67	0.67	0.33	0.00	0.67	0.00	0.00	2.3
Inner Area South	0.11	0.33	0.44	0.22	0.22	0.56	0.00	1.9
Eastern Approaches SIA	0.50	0.50	0.75	1.00	0.00	0.00	0.25	3.0
Outer Area	**0.09**	**0.05**	**0.14**	**0.36**	**0.16**	**0.43**	**0.43**	**1.7**
Approach 580 SIA	0.25	0.25	0.25	0.25	0.75	0.50	1.00	3.3
Speke Halewood SIA	0.00	0.00	0.00	0.00	0.25	0.50	0.75	1.5
Eastern Fringe (C)	0.00	0.00	0.00	0.75	0.00	0.75	0.75	2.3
Eastern Fringe (N)	0.13	0.13	0.25	0.25	0.50	0.63	0.50	2.4
Eastern Fringe (S)	0.00	0.00	0.00	0.50	0.50	1.00	1.00	3.0
Southern Fringe	0.00	0.00	0.00	0.00	0.17	0.67	0.67	1.5

Map 19. Targeting score for Priority 3



Map 20. Number of needs unfulfilled at present[28]



28 This analysis compares where there is greatest need for each function with provision; the functions considered are: shading from the sun, evaporative cooling, wind shelter, inaccessible water storage, accessible water storage, water interception, water infiltration, water conveyance, pollutant removal from soil/water, flow reduction through surface roughness.

4.5. PRIORITY 4: A green and biodiverse city

4.5.1. Long term goal

4.5.1.1. The network of green infrastructure in the city supports thriving wildlife populations and healthy habitats that provide essential and valued services for the city.

4.5.2. Introduction

4.5.2.1. Nearly all of the land change actions in this strategy can help to improve biodiversity in Liverpool. These benefits can be maximised by making sure that the actions to increase/manage green infrastructure have guidance on opportunities for connectivity, species choice and spatial layout.

4.5.2.2. Liverpool is a green city; more than 60% of the city is green infrastructure if private gardens are included. A number of studies have been carried out to assess habitats and biodiversity across the city including the 2006 Phase 1 Habitat Survey[29]. Currently Merseyside Environment Advisory Service (MEAS) are undertaking work at the city region scale to develop an ecological framework[30].

4.5.2.3. The city has areas of high biodiversity value with 25 Local Wildlife Sites, four Local Nature Reserves, one SSSI, and the Mersey Estuary, which also has the highest level of designation, as it is both a Special Protection Area and a Ramsar site. The 2008 Ecological Framework for Liverpool identified 608 ha of Core Biodiversity Areas; these are the areas of the city that are most important in nature conservation terms.

4.5.2.4. All public bodies are required to consider biodiversity conservation; this is referred to as the "biodiversity duty"[31]. The national target to halt the decline in biodiversity by 2010 has not been achieved and actions will have to continue to meet the target in the future.

4.5.2.5. The North Merseyside Green Infrastructure Habitat Action Plan[32] provides an excellent starting point to guide the implementation of green infrastructure in all of the actions identified in this plan to support the biodiversity needs of the city.

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29 White Young Green (2006). Liverpool Space for Nature – Phase 1 Habitat Survey Report.

30 MEAS (2010). Liverpool City Region Ecological Framework (draft for consultation).

31 The Natural Environment and Rural Communities (NERC) Act (2006): Section 40 of the Act requires all public bodies to have regard to biodiversity conservation when carrying out their functions.

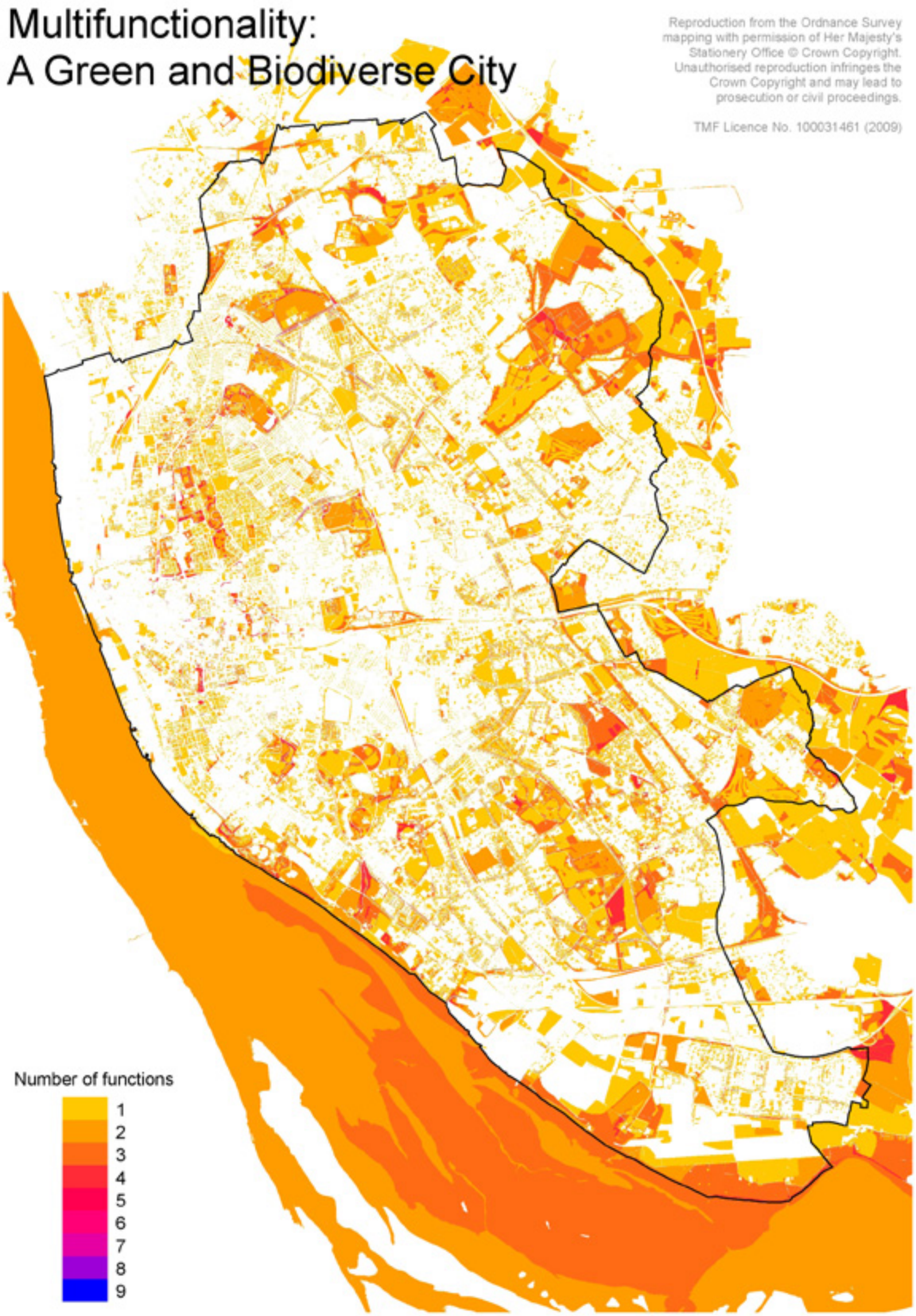
32 MEAS (2008). North Merseyside Green Infrastructure Habitat Action Plan.

4.5.2.6. Biodiversity is in part a measure of the health of the city's green infrastructure resource. A thriving green infrastructure is likely to have a range of well sustainably managed habitats that support a wide range of species. Providing connectivity offers opportunities for species movement, habitat expansion and enables south-north movement of species as climate warms.

4.5.2.7. 2010, as well as being the Liverpool year of Health and Wellbeing, is also the International Year of Biodiversity. One of the objectives for the year is to highlight the importance of biodiversity to policy makers. This strategy can help to deliver part of this aspiration for Liverpool.

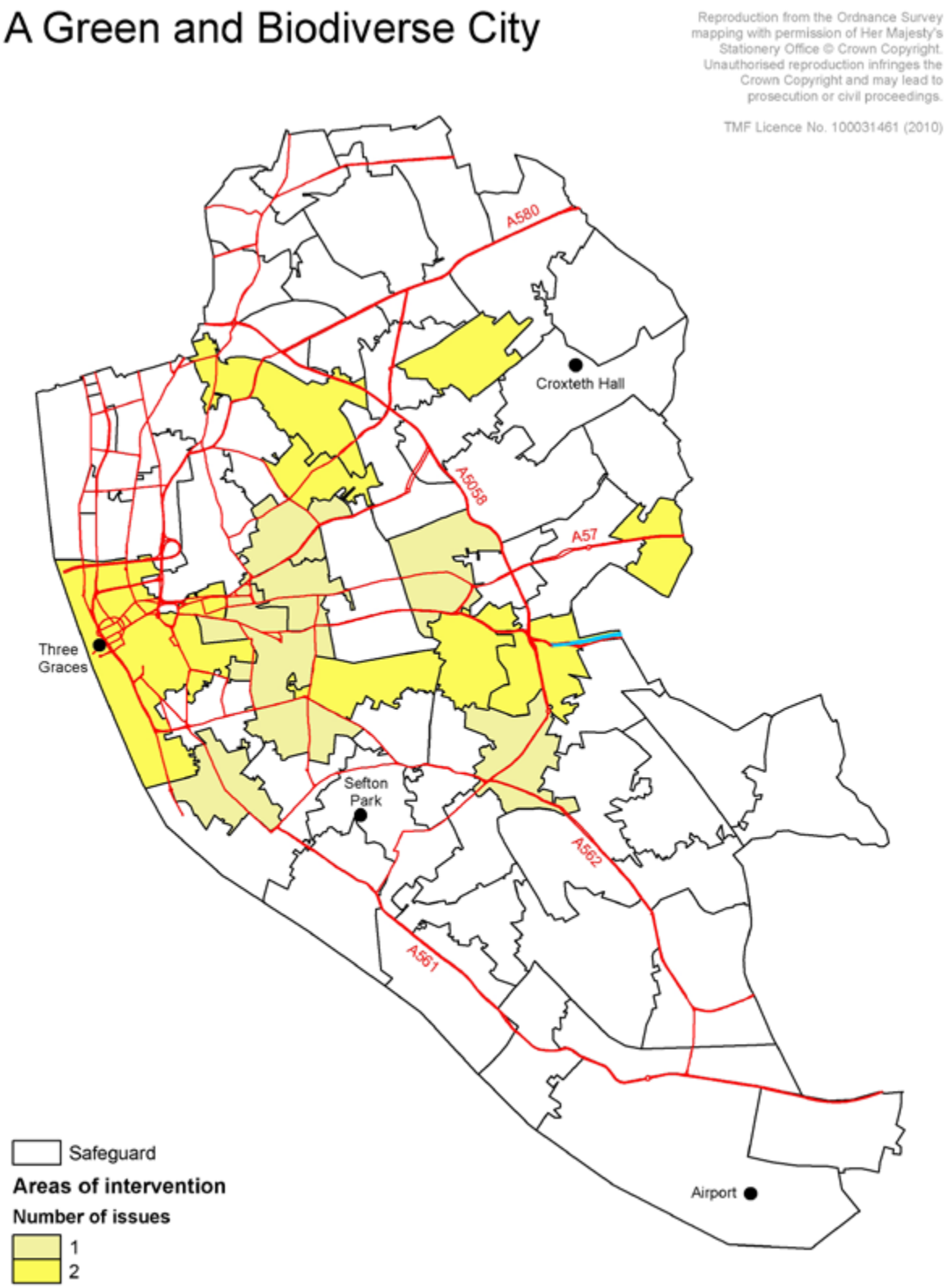
4.5.2.8. Map 21 and Map 22 show firstly the overall distribution of existing green infrastructure functions that can support biodiversity across the city and secondly the areas of the city that have been targeted for either or both of the Land Change actions for this priority.

Map 21. Green and biodiverse city multifunctionality[33]



33 The functions included in this analysis are: habitat for wildlife, corridor for wildlife, soil stabilisation, pollutant removal from soil/water.

Map 22. Targeting of actions for Priority 4 issues across Super Output Areas



Issues
- Super Output Areas with <1% Core Biodiversity Areas cover
- Super Output Areas with habitat connectivity score <0.001

4.5.2.9. Existing functionality again highlights the importance of the Green Wedges, The River Mersey, the parks and loop line. The Ecological Framework that is being prepared by MEAS will provide additional information on areas to target for expansion of habitat. This expansion can be supported by all of the actions that are set out in the action plan for this strategy.

4.5.3. Recommended Actions

4.5.3.1. The actions have been colour coded to indicate whether they are land change (dark blue), supporting (medium blue) or guidance (light blue) actions.

ACTION 4.1

4.5.3.2. The existing ecological network should be safeguarded.

Areas with greatest need for this action include (by Core Strategy Sub Area):	
City Centre	Central
Inner Area	Anfield, Kensington and Fairfield, Kirkdale, Picton, Princes Park, Riverside
Outer Area	Childwall, Old Swan, Wavertree

ACTION 4.2

4.5.3.3. Connectivity of habitats supported through planning based on identification of areas for habitat expansion. The methodology set out to assess this action is provided in Appendix 1 of the Technical Document. Connectivity of parks has been identified as an opportunity to provide for species movement.

Areas with greatest need for this action include (by Core Strategy Sub Area):	
City Centre	Central
Inner Area	Anfield, Kirkdale
Outer Area	Wavertree

ACTION 4.3

4.5.3.4. Biodiversity by Design principles[34] are developed for Liverpool as part of the Design Guide (Action 1.7).

34 Town & Country Planning Association (2004). Biodiversity by design, A guide for sustainable communities.

ACTION 4.4

4.5.3.5. Support the North Merseyside Green Infrastructure Habitat Action Plan targets in the city by ensuring that they are taken into account in the delivery of all of the green infrastructure intervention actions. This could be taken forward as an element of the design guide (Action 1.7).

4.5.4. Core Strategy Sub Areas

4.5.4.1. The City Centre and Eastern Approaches score highly in this targeting due to the fact that the areas of recommended action cover large proportions of what are small geographic areas. The scale of recommended activity in the Outer Area is greater, but it is dispersed over a wider geographic area.

4.5.4.2. Table 8 indicates which of the land change actions from the list above are required in each of the Core Strategy's Sub Areas. The support and guidance actions apply to all areas of the city.

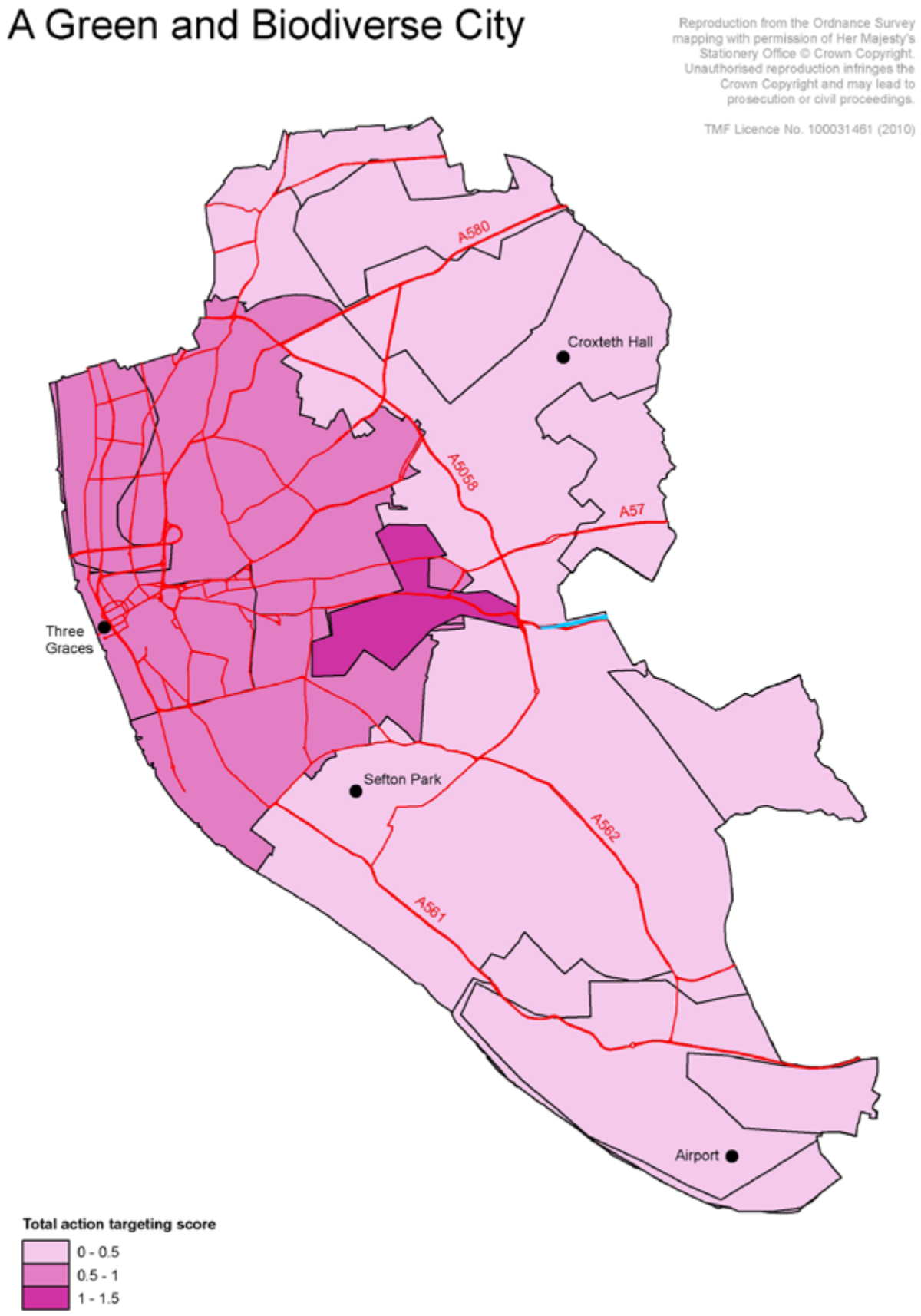
4.5.4.3. The targeting score that is shown for each action is a simple measure of the extent to which the action is required to meet the needs that have been identified in each Core Strategy Sub Area. A score of 0 indicates that no part of the Sub Area has been identified for targeting, whereas a score of 1 indicates that the whole of the Sub Area has been identified for targeting. Details of how the score is determined are provided in Appendix 1 of the Technical Document. The score does not however take account of quality of the green infrastructure. A high score indicates an area for high priority.

4.5.4.4. For example, three quarters of the Eastern Approaches SIA has been identified for targeting for Action 4.1, and half of it has been identified for Action 4.2. The sum of all the targeting scores for the Eastern Approaches SIA (1.3 rounded) is given in the TOTAL column and indicates that this is the Sub Area that should have the highest concentration of targeting for this Priority, as shown by Map 23.

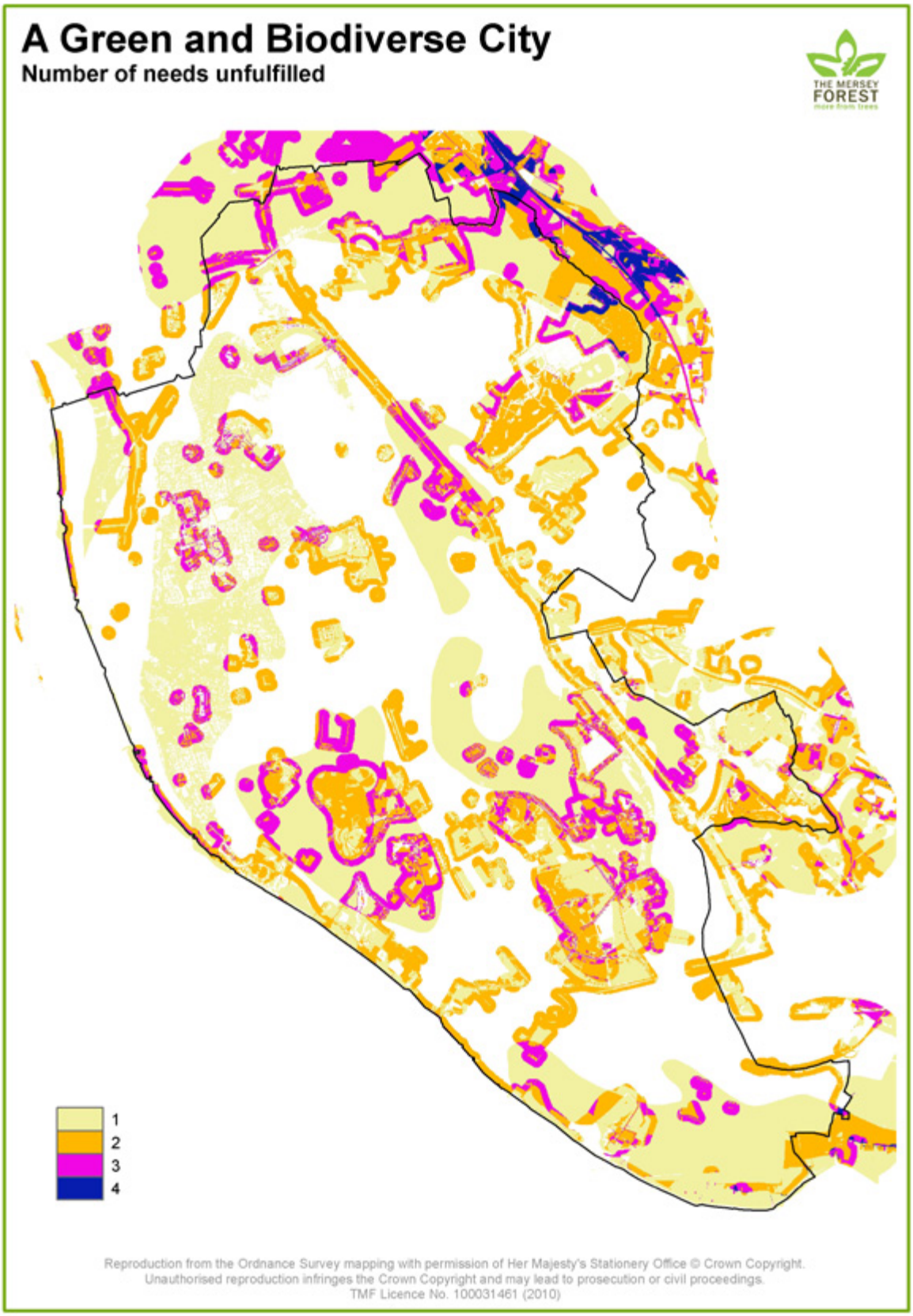
Table 8. Targeting score for Priority 4 by Core Strategy Sub Areas

	ACTIONS		
CORE STRATEGY SUB AREA	4.1	4.2	TOTAL
City Centre	**0.67**	**0.33**	**1.0**
Inner Area	**0.48**	**0.24**	**0.7**
Inner Area North	0.50	0.28	0.8
Atlantic Gateway SIA	0.33	0.33	0.7
Inner Area South	0.56	0.22	0.8
Eastern Approaches SIA	0.75	0.50	1.3
Outer Area	**0.16**	**0.11**	**0.3**
Approach 580 SIA	0.00	0.00	0.0
Speke Halewood SIA	0.00	0.00	0.0
Eastern Fringe (C)	0.25	0.25	0.5
Eastern Fringe (N)	0.13	0.13	0.3
Eastern Fringe (S)	0.00	0.00	0.0
Southern Fringe	0.00	0.00	0.0

Map 23. Target score by Core Strategy Sub Areas



Map 24. Number of needs unfulfilled at present[35]



35 This analysis compares where there is greatest need for each function with provision; the functions considered are: habitat for wildlife, corridor for wildlife, soil stabilisation, pollutant removal from soil/water.

4.6. PRIORITY 5: A city where green infrastructure is well-planned and designed

4.6.1. Introduction

4.6.1.1. Green infrastructure planning can support the way in which Liverpool develops by influencing decisions that are made at the city scale, where to target resources to enhance or safeguard green infrastructure for instance. It can also inform urban design, for example as has been the case for Liverpool Knowledge Quarter, and it should form an integral part of new development as seen at Chavasse Park and now planned at Alder Hey. This type of approach needs to be championed so that it becomes the norm and not, as is the case presently, the subjects of case study.

4.6.1.2. There is an opportunity to link green infrastructure planning with that for grey infrastructure, to gain long term and multiple benefits for the city. CABE have identified the benefits of this joined up approach and launched the Grey to Green campaign in Liverpool in 2010[36]. Good planning will link up the areas of green infrastructure across the city with the public spaces to develop a seamless public realm that will encourage walking and cycling[37].

4.6.1.3. This Green Infrastructure Strategy for Liverpool sets out for the first time a full picture of the benefits that the city derives from its green infrastructure as well as highlighting where it can be used to even greater effect in tackling some of the most pressing needs for the city.

4.6.1.4. However, the actions set out above will require an effective framework within which they can be delivered. This will include:

- Effective planning policy and development management.
- Economic value of green infrastructure incorporated into decision making[38].
- Influencing a range of other policies and strategies to build the actions into key documents enabling them to be delivered.
- Coordination of activity/sharing of available resources to ensure that they are used to target the areas of greatest need.
- Focus on multifunctionality – one of the strengths of a green infrastructure approach is that it can be used to deliver several functions from a single intervention. For example, the opportunity to expand a key habitat may also provide an opportunity to

36 CABE (2010). Grey To Green.

37 Cabinet Office Strategy Unit (2009). Quality of Place: improving the planning and design of the built Environment.

38 Valuation toolbox, 2010, Genecon, NENW and Partners

improve water management, improve image and capture air borne pollution. Often, because the wider functions are not considered, the opportunities to get more value from an intervention are not taken.

4.6.1.5. The actions below set out ways in which these points could start to be addressed and provide a better framework for the delivery of the other actions set out in this document.

4.6.2. Long term goal

4.6.2.1. Green infrastructure is valued and planned, so that maximum benefits are gained to support sustainable development, taking opportunities to provide multiple functions. There is a clear understanding of the value of green infrastructure amongst key decision makers and coordinated actions by delivery organisations.

4.6.3. Recommended Actions

4.6.3.1. The actions have been colour coded to indicate whether they are land change (dark blue), supporting (medium blue) or guidance (light blue) actions.

ACTION 5.1

4.6.3.2. Use of Section 106 policy to support green infrastructure across the city. A fund is developed that is used to implement critical green infrastructure and in particular focus on addressing the health and wellbeing actions set out in this strategy.

ACTION 5.2

4.6.3.3. The land change actions from this Liverpool Green Infrastructure Strategy included as part of the menu for the Community Infrastructure Levy.

ACTION 5.3

4.6.3.4. A guide, promoting high quality design, taking into account landscape and urban design as well as climate change adaptation and biodiversity by design principles will be developed to support green infrastructure delivery across the city (see Action 1.7).

ACTION 5.4

4.6.3.5. An agreed model is used assess the value of green infrastructure in the city and enable proper evaluation of policy and intervention in line with Future Land Use[39] recommendations.

ACTION 5.5

4.6.3.6. Ensure that the cross boundary issues such as City Region image and the impacts of cumulative development on recreational and nature conservation areas identified in the City Region Green Infrastructure Framework are incorporated into policy.

ACTION 5.6

4.6.3.7. Create a Liverpool Green Infrastructure Forum – or promote a sub regional forum linking to the city region green infrastructure framework and the work promoted by the City Region Environment and Waste Board (see Technical Document for details).

ACTION 5.7

4.6.3.8. Embed this Green Infrastructure Strategy within other city strategic documents including the Local Development Framework, the Sustainable Community Strategy and the range of economic, health, open space, trees and woodlands, tourism and other relevant strategies and plans that are developed for the city.

39 Foresight (2010). Future Land Use Report, 2010. Foresight, Dept for Science

5

IMPLEMENTING THE ACTION PLAN

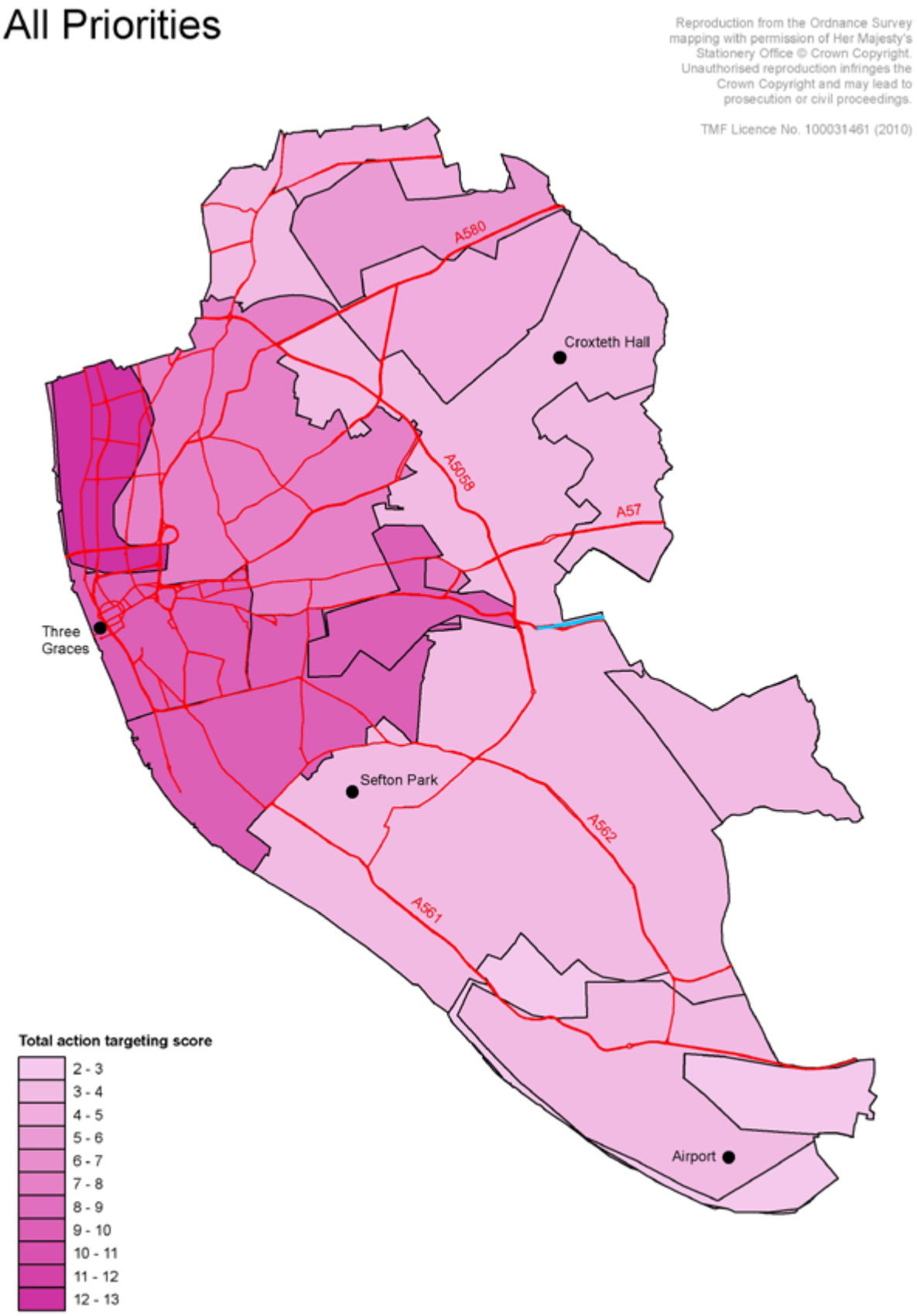
5. IMPLEMENTING THE ACTION PLAN

5.1. Using the Green Infrastructure Strategy

5.1.1. It is proposed that the Green Infrastructure Strategy should not be standalone; it should be used to influence other statutory plans and strategies; it is probably the only way in which it will be fully delivered.

5.1.2. The Local Development Framework provides an excellent opportunity to target actions in particular at the Core Strategy Sub Areas. Map 25 shows the overall targeting score for all of the land change priorities in this strategy across the sub areas.

Map 25. Overall targeting score for all priorities by Core Strategy Sub Area



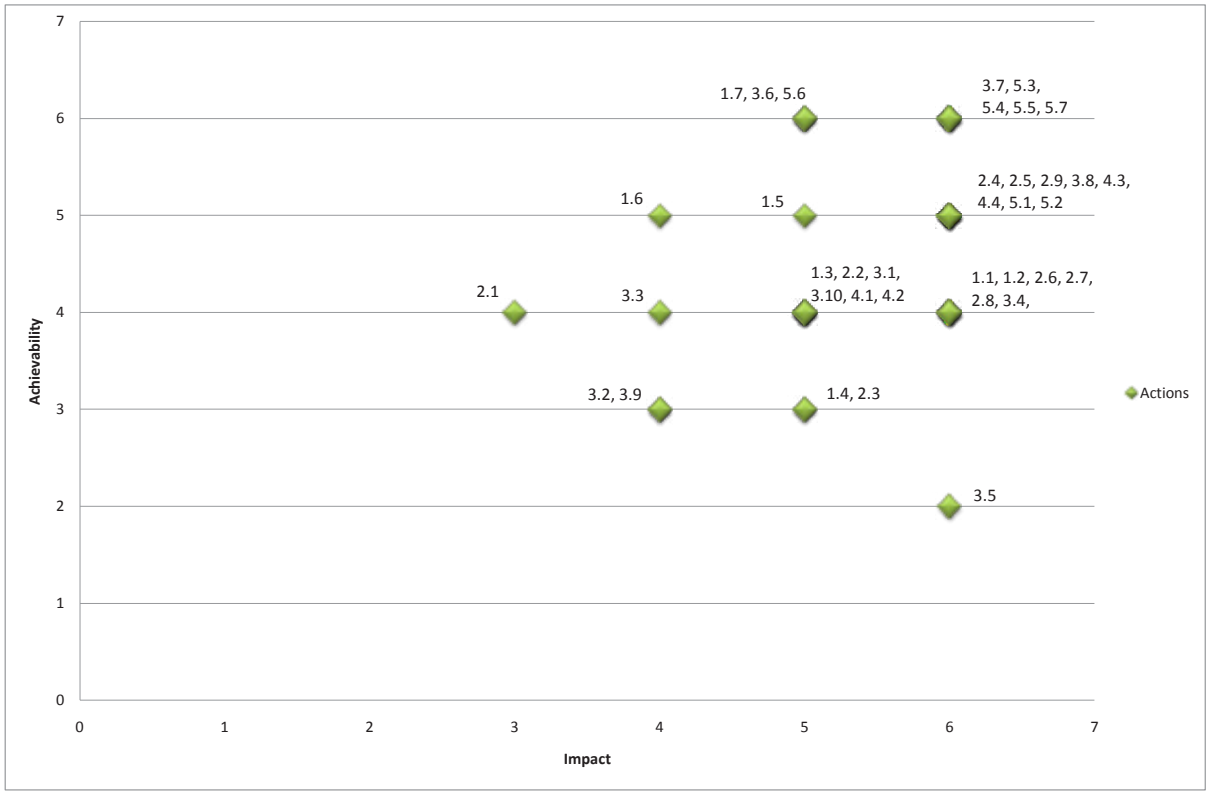
5.2. Deliverability

5.2.1. Appendix 3 provides an overview of all actions for the five priorities identified in this Action Plan. It also provides information on the assessed deliverability of the actions based on a number of criteria:

- **How achievable are the actions?** – An assessment of the technical feasibility or policy support or barriers. A score between 1 and 6 (where 6 means most achievable) is provided for each action.
- **Impact** – What difference would the action make? A score between 1 and 6 (where 6 means highest impact) is provided for each action.
- **Funding** – What resources, in addition to any funds that may be available as a result of planning requirements, to support the implementation of the action? A score between 1 and 6 (where 6 means highest availability of funding) is provided for each action.

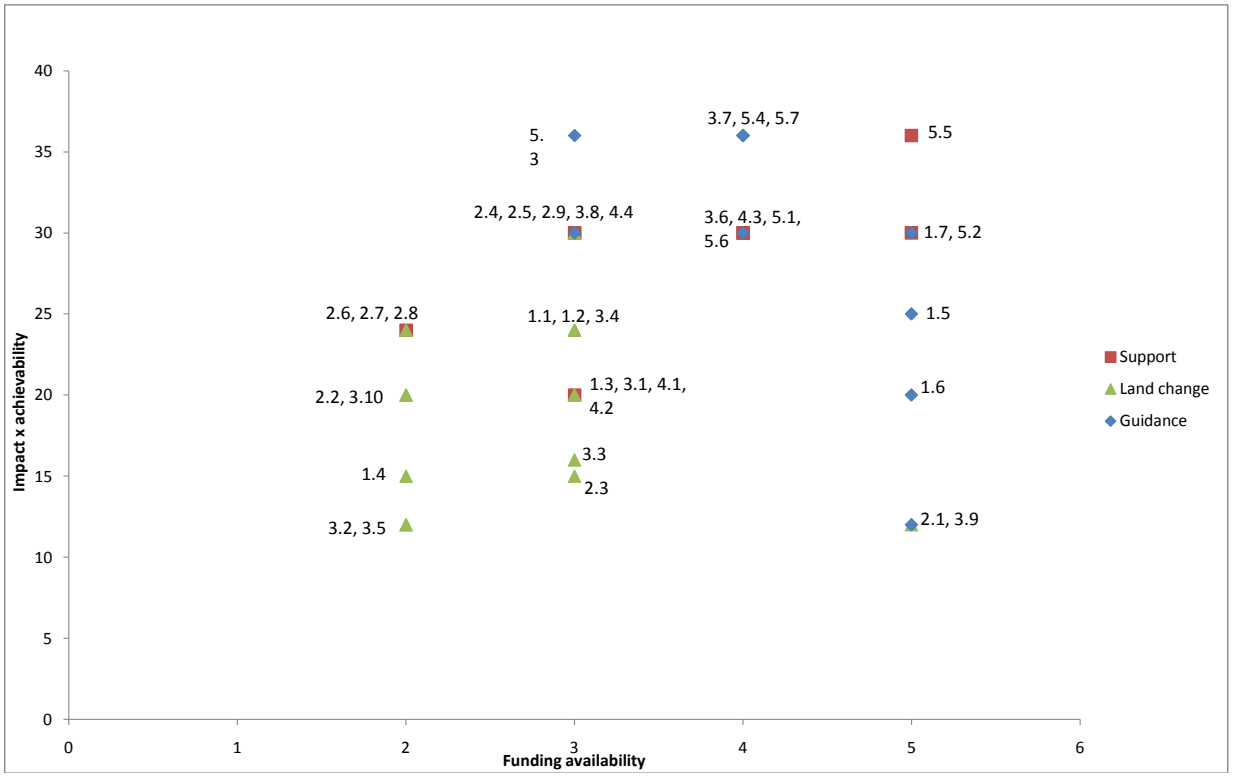
5.2.2. From this assessment, which has been consulted on as part of the development of the Strategy, there are no actions that are considered undeliverable. There are a number that are challenging and which will require significant work both in terms of policy support and resources e.g. SUDS, urban trees and water storage. There are also a number that are straightforward to achieve and could provide early success in the delivery of the Action Plan. Figure 7 shows the achievability and the impact of the different actions.

Figure 7. The achievability and impact of the actions (annotations are action numbers)



5.2.3. Priority actions could be seen to be those that are achievable, high impact actions that have some resources already, or potentially available. Figure 8 shows the shows impact x achievability against funding availability. It should be noted that all actions are seen as important and actions which do not score highly should not be discounted, this exercise simply highlights the "easy wins". Actions achieve a lower score may be more challenging to achieve but this should not lead to them being discounted.

Figure 8. The impact x achievability and availability of funding for each of the actions (annotations are action numbers)



5.2.4. For each action a Lead Agency (Figure 9) along with examples of suggested support agencies have been identified. Again this information has been consulted upon, but the lead agencies are not "signed up" to lead actions.

Figure 9. Potential lead agencies for actions

5.2.5. A Green Infrastructure Forum is proposed that could also operate as an exchange, to link projects that need green infrastructure support with organisations that can provide it. At present there is a similar forum in Cheshire that may be a template for Liverpool. However, it is also suggested that this group perhaps operate at a city region level. Individuals from the agencies in Figure 9, along with the stakeholder group could be invited to be the initial members of the forum.

5.2.6. The action plan not only sets out the specific actions that are needed to deliver the benefits that have been identified, it has identified delivery mechanisms, priorities for action and available resources and links to the existing monitoring framework for the Local Strategic Partnership (LSP).

5.2.7. This forms the basis for programmes that can help to drive forward the actions, but it will require a mandate and a route through to an appropriate body to report progress. It is recommended that this should be the LSP.

Photo credits: Martin Moss (p1 & 33), McCoy Wynne (p5) and Monty Rakusen (p9, 15, 85, 91).

APPENDICES

Appendix 1 Appropriate types of green infrastructure

Table 9 is for guidance to suggest possible green infrastructure types for each of the neighbourhood management areas of the city. It is based on an assessment of what is possible as well as what types may be appropriate based on the urban form, historic context and existing typologies.

Table 9. Green infrastructure types for neighbourhood management areas

	AGRICULTURAL LAND	ALLOTMENT, COMMUNITY GARDEN OR URBAN FARM	CEMETERY, CHURCHYARD OR BURIAL GROUND	COASTAL HABITAT	DERELICT LAND	GENERAL AMENITY SPACE	GRASSLAND, HEATHLAND, MOORLAND OR SCRUBLAND	INSTITUTIONAL GROUNDS	ORCHARD	OUTDOOR SPORTS FACILITY	PARK OR PUBLIC GARDEN	PRIVATE DOMESTIC GARDEN	STREET TREES	WATER BODY	WATER COURSE	WETLAND	WOODLAND
Alt Valley	Unlikely, but possible	Possible on derelict or amenity grassland and possibly areas of parkland				Needs to be well planned and managed in response to local need			Possibly on similar areas to allotments or school grounds					Liverpool has a relatively low level of water bodies, away from the Mersey.	Deculverting as part of regeneration where possible		
City and North		Possible on derelict or amenity grassland and possibly areas of parkland		Unlikely				Unless built into new build of school and hospitals etc.	Possibly on similar areas to allotments or school grounds	Conversion of general amenity space to provide this important type	Unlikely	As part of housing development	Linking to the street tree rich areas and Brodie avenues	Unlikely	Deculverting as part of regeneration where possible	Unlikely	Unlikely

	AGRICULTURAL LAND	ALLOTMENT, COMMUNITY GARDEN OR URBAN FARM	CEMETERY, CHURCHYARD OR BURIAL GROUND	COASTAL HABITAT	DERELICT LAND	GENERAL AMENITY SPACE	GRASSLAND, HEATHLAND, MOORLAND OR SCRUBLAND	INSTITUTIONAL GROUNDS	ORCHARD	OUTDOOR SPORTS FACILITY	PARK OR PUBLIC GARDEN	PRIVATE DOMESTIC GARDEN	STREET TREES	WATER BODY	WATER COURSE	WETLAND	WOODLAND
Liverpool East		Possible on derelict or amenity grassland and possibly areas of parkland													Unlikely	Unlikely	Unlikely to be large: copse like planting or planting to reinforce historic character
South Central		Possible on derelict or amenity grassland and possibly areas of parkland													Unlikely	Unlikely	Unlikely to be large: copse like planting or planting to reinforce historic character
South Liverpool		Possible on derelict or amenity grassland and possibly areas of parkland													Deculverting as part of regeneration where possible		

Key typology to promote in this area

Possible typology depending on exact location

Probably not appropriate or possible

Appendix 2 Evidence and actions

Table 10 provides a summary of evidence that green infrastructure can help to address the issues raised for each priority. The types of actions that can address the issues are also identified and these actions are then further refined for the actions within this action plan.

Table 10. Evidence and actions

PRIORITY	ISSUE	SUMMARY OF EVIDENCE	POTENTIAL TYPES OF GREEN INFRASTRUCTURE ACTIONS - PLANNING OR IMPLEMENTATION
Sustainable housing growth and regeneration	Improving quality of place for projected housing growth and major regeneration programmes	Green infrastructure identified as one of the four components of quality of place (World Class Cities), CABE have highlighted the evidence to support high quality design as key to ensuring that the potential value from green infrastructure is maximised. People choose to live in places that are greener when given a choice and house prices have been shown to be higher in areas that are greener and/or close to public parks. Well planned improvements to green infrastructure can boost commercial trading by up to 40%.	Safeguarding areas that are providing these benefits, through their functionality. We have defined these areas as green infrastructure assets Ensure mitigation of loss of green infrastructure assets Create functions where there is identified need either by managing existing green infrastructure in a different way or by creating new Use vacant and derelict land productively – encourage "meanwhile" use of land Ensure high quality design and management Restructuring and new development should contribute to adding green infrastructure assets to the city Design guide to support implementation of actions to tackle this and other issues Green Infrastructure Target for new development

PRIORITY	ISSUE	SUMMARY OF EVIDENCE	POTENTIAL TYPES OF GREEN INFRASTRUCTURE ACTIONS - PLANNING OR IMPLEMENTATION
	Increasing levels of productivity across the city	Green infrastructure can contribute to improving productivity by reducing absenteeism, lowering turnover rates, improving employee morale. Green cities are a magnet for the highly educated. Green cities attract and retain skilled workers.	Promotion of Liverpool as a Green City See health actions and actions above to be applied across the city
	Attracting investment and people	Green cities are a magnet for the highly educated. Green cities attract and retain skilled workers. Over 35% of companies relocating to the Southwest quoted environmental attractiveness as a key reason for their move.	Promotion Key gateways and routes to the city have high quality green infrastructure Ensure high quality management Increase green infrastructure assets for the city by creation or management
	Aspirations to significantly increase visitor numbers	40% of employment in tourism depends on high quality environment. Green infrastructure identified as one of the four components of quality of place (World Class Cities), CABE have championed the cause of high quality design as key to ensuring that the potential value from green infrastructure is maximised.	Actions for tourism include those for attracting investment and improving quality of place

PRIORITY	ISSUE	SUMMARY OF EVIDENCE	POTENTIAL TYPES OF GREEN INFRASTRUCTURE ACTIONS - PLANNING OR IMPLEMENTATION
	Developing a low carbon economy	Green infrastructure can help to provide "walkable communities", helping to reduce car use by providing attractive and safe routes between housing and areas for shopping and work. See also climate change issues	Increase connectivity of green infrastructure to public realm and transport infrastructure Good design to create safe and attractive places and routes Use green infrastructure to sign post routes through the city. Improve recreation function close to where people live (increasing amount of accessible green spaces)
	Improving walking and cycling routes	Green infrastructure can help to provide "walkable communities", helping to reduce car use by providing attractive and safe routes between housing and areas for shopping and work. Linking accessible green spaces and off road routes seamlessly into the public realm can help to increase the attractiveness of walking and cycling by creating additional connectivity as well as safe and visually attractive routes.	See above Linking to sites across the City Region
Improving health across the city	Health deprivation and inequality	Recent research has shown that there is a link between poor health, areas of health deprivation and the availability of green infrastructure. The research suggests that increasing levels of green infrastructure can help to reduce health inequalities.	Safeguard green infrastructure functions that support health and wellbeing Ensure mitigation of loss of function Enhance function in areas of greatest health deprivation through changing management or creation of green infrastructure with health functionality Enable local food growing

PRIORITY	ISSUE	SUMMARY OF EVIDENCE	POTENTIAL TYPES OF GREEN INFRASTRUCTURE ACTIONS - PLANNING OR IMPLEMENTATION
	High levels of coronary heart disease	Increasing physical activity levels in the population will help prevent or manage coronary heart disease. There is a synergistic effect of green exercise for both physical and mental health	Increase recreation function in areas of high coronary heart disease incidence.
	High levels of obesity in both adults and children	Obesity is linked to increased risk of diabetes and coronary heart disease. Increased physical activity as part of a healthy lifestyle can help to reduce levels of obesity. Research by Natural England has indicated that there is a link between proximity of green infrastructure and levels of activity. Programmes such as Forest School use the natural environment as part everyday living to assist in increasing activity levels, achieved whilst doing "something else", in this case learning.	Increase recreation function in areas of high levels of obesity through management or creation of new areas where there are low levels of green infrastructure. Support Forest Schools, Health Walks and cycling and other programmes that use green infrastructure as the setting for health activities.
	High levels of diabetes	Increasing physical activity levels in the population will help prevent or manage diabetes. (see CHD)	Increase recreation function in areas of high levels of obesity through management or creation of new areas where there are low levels of green infrastructure.
	High levels of poor mental health	Green spaces can have a positive effect on mental well-being and cognitive function through both physical access and usage, as well as through access to views. There is evidence that even the visual presence of green spaces and natural views of elements such as trees and lakes is enough to have a positive effect on stress levels, can promote a reduction in blood pressure and may encourage faster healing in patients following post-surgical intervention.	Increase green infrastructure in areas of high levels of mental illness but low levels of green infrastructure. Improve quality of place (see actions above)
	Low levels of physical activity	Research has shown that levels of physical activity are greatest close to areas of accessible green spaces. Active play by children is encouraged by programmes such as SPAA programmes, military fitness and Forest School and this increase is often passed on to parents and siblings resulting in a wider effect on physical activity.	Support physical activity programmes such as Forest Schools, Military Fitness, Healthy Walking and work of SPAA etc. Increase recreation function close to where people live. Ensure good quality management

PRIORITY	ISSUE	SUMMARY OF EVIDENCE	POTENTIAL TYPES OF GREEN INFRASTRUCTURE ACTIONS - PLANNING OR IMPLEMENTATION
	Reduce levels of air pollution	Trees and woodlands are particularly effective at removing some elements of pollution from the atmosphere thereby reducing pollution levels.	Increase removal of pollution function in areas of poor air quality e.g. appropriate urban trees along main road through the City.
Tackling climate change	Use of green infrastructure to manage urban heat island effect	10 % increase in green infrastructure in high density urban areas has been shown to be able maintain maximum surface temperatures at today's levels and help to reduce the urban heat island effect of projected climate change. The NHS heat wave plan identifies green infrastructure as one of the long term planning (i.e. we can plan and implement ahead of the heat wave) actions that we can take to reduce the impacts of heat wave, particularly on the most vulnerable members of society.	Increase cooling function in areas of greatest need in terms of vulnerable communities as set out in the NHS heat wave plan Safeguard existing functionality Design guide to include climate change adaptation by design principle
	The provision of new infrastructure to provide for species movement	As climate warms species will move northward. Urban areas potentially produce bottlenecks and barriers to this movement. Providing a network of green infrastructure, including road and railway verge corridors can help species movement. Gardens are potentially a key type of green infrastructure to enable some species to move to their "climate space".	Improve corridors for wildlife migration Increase connectivity of parks with urban trees
	Advising on the balance between accommodating new housing development and availability of green infrastructure for cooling and water management	Green Infrastructure provides evaporative cooling that helps to reduce the urban heat island effect. Loss of green infrastructure will lead to increased impacts of the urban heat island. Green infrastructure helps to manage water through rainfall interception, increased soil infiltration, water uptake, water storage and delaying & decreasing peak flows all of which decrease the volume of water so reducing impact of flooding or reducing risk of flooding.	Ensure that new development also provides or safeguards cooling functions and water management functions

PRIORITY	ISSUE	SUMMARY OF EVIDENCE	POTENTIAL TYPES OF GREEN INFRASTRUCTURE ACTIONS - PLANNING OR IMPLEMENTATION
	Incorporating SUDS into new developments to manage surface water in new developments	Green infrastructure helps to manage water through rainfall interception, increased soil infiltration, water uptake, water storage and delaying and decreasing peak flows all of which decrease the volume of water that requires management, Linking grey and green infrastructures can help to maximise benefits. Use of SUDS can help to manage the projected increases in heavy rainfall and flooding events	Support SUDS as part of new development
	Retrofitting green infrastructure to adapt to high temperatures in the City Centre	Providing shade in the City Centre through planting of urban trees is one of the best ways to deal with high temperatures. Shade provided by urban trees can be 13°C cooler on hot summer days. Trees planted on the south side of buildings have been identified as one of most effective ways of dealing with high temperatures and also reducing the need for use of air conditioning (Beat the Heat - ARUP)	Increase urban tree cover in areas of poor tree cover.
Biodiversity	Protecting core biodiversity areas	Core biodiversity areas are a key green infrastructure asset. Habitat size as well as quality is important. The extent of habitat determines species richness and population size. The urban area is potentially more hospitable to wildlife than the intensively managed agricultural areas on the fringes of the city. Non core areas also have a role to play in improving the biodiversity of the city. Parks and gardens in particular play a key role, but are not core biodiversity areas.	Safeguard core biodiversity areas

PRIORITY	ISSUE	SUMMARY OF EVIDENCE	POTENTIAL TYPES OF GREEN INFRASTRUCTURE ACTIONS - PLANNING OR IMPLEMENTATION
	Creating expansion areas and creating corridors	Expansion areas can help to increase habitat area and also provide links to enable species movement. Wildlife corridors may be considered as an aspect of expansion areas providing opportunities for linkage and movement. Private gardens potentially provide a large "nature reserve" for the city as well as helping to create linkage between core biodiversity areas.	Take opportunities through development, regeneration and land management programmes to expand and connect core biodiversity areas.
	Ensuring that green infrastructure delivery programmes contribute to the delivery of biodiversity action plan habitat targets	Key factors influencing the value of green infrastructure for biodiversity are: Typology Quantity Proximity of other sites	Design guide includes recommendations from the Green Infrastructure HAP for North Merseyside. Green Infrastructure Target for new development.

Appendix 3 Summary and deliverability of actions

Table 11 provides information on all of the actions that have been identified including assessment of the technical achievability of the action, its impact, likely leads and support and availability of resources.

The achievability and impact are scored on a scale of 1 to 6 with 1 being not achievable or no impact and 6 being easily achievable and high impact.

Table 11. Information on actions

ACTION	TYPE	ACHIEVABLE (1-6)	IMPACT (1-6)	DELIVERY MECHANISMS (IN ADDITION TO LDF)	LEAD (INITIAL TENTATIVE SUGGESTIONS)	SUPPORT	RESOURCES (EXCLUDING S106 OR CIL)	FUNDING SCORE (1-6)
1.1 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. Map 124 (all maps in this table refer to Technical Document) shows the spatial distribution of areas of greatest need for intervention.	Land change	4	6	Growth Point Plan, Planning Design Briefs for developments in the city. Mersey Waterfront, Green Streets	Liverpool Vision	Green Infrastructure Unit	ERDF NWOP	3
1.2. Opportunities are taken to improve the green infrastructure around major gateways and routes into the city such as the A57 and the A5080. Map 126 indicates the key areas for intervention at ward level, whilst Map 127 provides more detailed information on the specific road corridors and gateways.	Land change	4	6	Local Transport Plan, Adapting the Landscape. The Mersey Forest	Liverpool Vision	LTP, Mersey Forest	LTP	3

ACTION	TYPE	ACHIEVABLE (1-6)	IMPACT (1-6)	DELIVERY MECHANISMS (IN ADDITION TO LDF)	LEAD (INITIAL TENTATIVE SUGGESTIONS)	SUPPORT	RESOURCES (EXCLUDING S106 OR CIL)	FUNDING SCORE (1-6)
1.3. Green infrastructure is used as a mechanism to help create "walkable" neighbourhoods, linking green infrastructure with wider public realm to encourage walking and cycling. In particular, there is an opportunity to develop this approach in the New Heartlands and Growth Point programme areas. Map 129 indicates where this issue is most relevant.	Land change	4	5	Housing and growth point development, Local Transport Plan, public realm strategies	HMR/Liverpool Vision	Sustrans, LTP	LTP/growth point/HMR	3
1.4. Access to good quality open spaces is an important part of quality of place and life. The Access to Natural Green Space target (ANGST) and The Woodland Trust Space for People targets have been used to identify areas of Liverpool that meet these aspirational standards and those that at present do not. Map 132 shows the spatial distribution of these areas.	Land change	3	5	Growth Point Plan, Planning Design Briefs for developments in the city. Mersey Waterfront, Green Streets, LTP	Sustrans	Mersey Forest	Natural England	2
1.5. Require detailed green infrastructure plans for all major developments. An example is provided in Appendix 2. The plan should be prepared by the project proposer, showing how the development will contribute to the Liverpool Green Infrastructure Strategy . (See Action Area 1.1).	Guidance	5	5	ERDF NWOP, Adapting the Landscape, GI HAP, Mersey Forest	GIU		ERDF NWOP	5

ACTION	TYPE	ACHIEVABLE (1-6)	IMPACT (1-6)	DELIVERY MECHANISMS (IN ADDITION TO LDF)	LEAD (INITIAL TENTATIVE SUGGESTIONS)	SUPPORT	RESOURCES (EXCLUDING S106 OR CIL)	FUNDING SCORE (1-6)
1.6. The Green Infrastructure Target (an approach to ensure that development uses green infrastructure to best effect) is developed and used for all development in Liverpool with specific targets for each of the Core Strategy sub areas.	Guidance	5	4	NWDA Sustainable Buildings Policy	GIU	Green Infrastructure Unit	NWDA	5
1.7. Develop a Design Guide, as a Supplementary Planning Document to support green infrastructure delivery across the city.	Guidance	6	5	Liverpool CC	LCC	CABE		5
2.1. Planning and other strategies support the temporary or "meanwhile" use of vacant or derelict land for food and fuel growing or other suitable uses, as part of the Liverpool City Council "Greening the City" programme. Map 134 shows the distribution of vacant and derelict land across the city. The remediation of derelict land is an area of expertise for the Liverpool Universities who could be a key partner in developing and implementing this action. This action also contributes to improving the image of the city, linked to Action 1.1.	Land change	4	3	Greening the City	Liverpool CC, Project Dirt	Mersey Forest	Community grants	5

ACTION	TYPE	ACHIEVABLE (1-6)	IMPACT (1-6)	DELIVERY MECHANISMS (IN ADDITION TO LDF)	LEAD (INITIAL TENTATIVE SUGGESTIONS)	SUPPORT	RESOURCES (EXCLUDING S106 OR CIL)	FUNDING SCORE (1-6)
2.2 Increase the quality and quantity of green infrastructure to provide places of relative tranquillity in areas where there are higher levels of poor mental health. Map 136 indicates the areas of the city where there are high levels of poor mental health, but low levels of green infrastructure. The evidence suggests that like productivity benefits, the benefits from mental health come not just from specific areas interventions but also from a general improvement in quality of green infrastructure.	Land change	4	5	Growth Point Plan, Planning Design Briefs for developments in the city, Liverpool CC	GI Forum including health sector	Mersey Forest	Forestry Commission, Natural England, health sector	2
2.3. Green infrastructure can be used to reduce air pollution along main road routes into the city. Map 138 indicates the lengths of road, focussed on the Environmental Improvement Corridors, where there is a need to increase green infrastructure.	Land change	3	5	AQMA plans	Liverpool CC	Mersey Forest	Mersey Forest	3
2.4. Target provision of green infrastructure and improve accessibility of existing green infrastructure toward areas of the city that have high incidence of coronary heart disease, obesity and/or diabetes and low levels of accessible green infrastructure. Map 141, Map 143 and Map 145 show the distribution of these areas. The areas that require action are extensive and so may more appropriately be termed action areas rather than target areas.	Land change	5	6	Housing and growth point development, Local Transport Plan, public realm strategies, health sector programmes, The Mersey Forest	GI Forum	Mersey Forest	SPAA, Mersey Forest, LTP	3

ACTION	TYPE	ACHIEVABLE (1-6)	IMPACT (1-6)	DELIVERY MECHANISMS (IN ADDITION TO LDF)	LEAD (INITIAL TENTATIVE SUGGESTIONS)	SUPPORT	RESOURCES (EXCLUDING S106 OR CIL)	FUNDING SCORE (1-6)
2.5. Take the opportunity provided by redevelopment of hospitals and health centres through programmes such as LIFT , to maximise the opportunity to use green infrastructure as part of an approach to improving health outcomes and sustainability, by creating attractive settings and maximising views of "green". Alder Hey and Liverpool Knowledge Quarter provide examples and opportunities of what could be achieved. Map 147 shows the distribution of health centres, hospitals and GP surgeries across the city and these should all be targeted to ensure that they contribute to the delivery of green infrastructure improvements to meet local need and encouraged to make use of green infrastructure to help to improve health outcomes.	Land change	5	6	Health sector estates development proposals	Hospital Trusts	Mersey Forest		3
2.6. Ensure planning applications for new developments at all scales always prioritise the need for people (including those whose mobility is impaired) to be physically active as a routine part of their daily life and where possible use green infrastructure to enable this.	Land change	4	6	Liverpool CC/health sector/LTP	Liverpool CC		LCC	2

ACTION	TYPE	ACHIEVABLE (1-6)	IMPACT (1-6)	DELIVERY MECHANISMS (IN ADDITION TO LDF)	LEAD (INITIAL TENTATIVE SUGGESTIONS)	SUPPORT	RESOURCES (EXCLUDING S106 OR CIL)	FUNDING SCORE (1-6)
2.7. Ensure local facilities and services are easily accessible on foot, by bicycle and by other modes of transport involving physical activity. Ensure children can participate in physically active play and use green infrastructure to develop natural play opportunities. Whilst this is a priority across the whole of Liverpool, Map 149 shows the areas that have been assessed as having both poor "walkability" and plans for housing growth or redevelopment that may provide the opportunity to improve access. This action is closely linked to Action 1.3 above.	Land change	4	6	Liverpool CC/health sector/LTP	Liverpool CC		LTP	2
2.8. Maximise opportunities for support to be provided to programmes such as Green Gym Sport and Physical Activity Alliance (SPAA) programmes, forest schools, horticultural therapy etc. to develop a network of opportunities for health improvement for those in need of support.	Support	4	6	SPAA, BTCV, Mersey Forest, Groundwork. LWT, Mind, target Wellbeing	Natural Economy Investment forum	Various	BTCV, SPAA	2
2.9. Maximise opportunities to support the public parks as part of the "Natural Health Service", highlighting the fact that public health was a key reason for the development of the public parks. This can be supported by the use of the health and green infrastructure functionality data gathered for this strategy in the development of the Parks Strategy for Liverpool	Support	5	6	Liverpool PCT Strategy, SPAA	Liverpool CC		LCC	3

ACTION	TYPE	ACHIEVABLE (1-6)	IMPACT (1-6)	DELIVERY MECHANISMS (IN ADDITION TO LDF)	LEAD (INITIAL TENTATIVE SUGGESTIONS)	SUPPORT	RESOURCES (EXCLUDING S106 OR CIL)	FUNDING SCORE (1-6)
3.1. Green infrastructure can help to reduce the urban heat island effect. Safeguard areas of green infrastructure cooling functionality and increase green infrastructure for urban cooling in areas with the most vulnerable communities.	Land change	4	5	Climate change adaptation strategy, ForeStClim, health sector programmes	Climate Change Group	Mersey Forest	City Cooling project, Climate Change adaptation, ForeStClim project, Green Streets	3
3.2. Sustainable drainage systems (SUDS) are actively encouraged in policy to help to reduce the needs for additional grey infrastructure and the pressure on existing water management infrastructure. (The areas for action have been identified with support data in the Strategic Flood Risk Assessment) Safeguard and where possible increase green infrastructure on permeable soils as part of the city's water management system. This action will also help to protect the water environment from deterioration and help improve water bodies to good status. The key areas for this action are shown on Map 157.	Land change	3	4	Green Streets	Environment Agency			2
3.3. Promote green roofs, particularly in areas of the city centre that are undergoing redevelopment. Green roofs, along with urban trees, offer the best opportunity to create space in these areas for some of the cooling functions that are needed, as well as contributing towards surface water management.	Land change	4	4	Private developers, growth point and housing, major regeneration programmes, Adapting The Landscape, Climate Change adaptation strategy, ForeStClim, health sector programmes	Climate Change Group			3

ACTION	TYPE	ACHIEVABLE (1-6)	IMPACT (1-6)	DELIVERY MECHANISMS (IN ADDITION TO LDF)	LEAD (INITIAL TENTATIVE SUGGESTIONS)	SUPPORT	RESOURCES (EXCLUDING S106 OR CIL)	FUNDING SCORE (1-6)
3.4. Deliver The Mersey Forest Plan for Liverpool, to provide additional woodland and urban trees in the areas of greatest need for shade and cooling. Map 159 shows the areas where the existing tree cover is 2% below the target figure set in The Mersey Forest Plan.	Land change	4	6	Mersey Forest Plan, Regional Forestry Framework	Mersey Forest		Mersey Forest	3
3.5. Provide for water storage and use for irrigation to reduce the impacts of drought; planning now for projected increase in drought frequency. Drought can reduce the ability of plants to transpire and so provide the evaporative cooling function. Map 160 identifies the wards across the city where there may be problems obtaining water for irrigation from existing surface water sources, potential areas to target for improved storage in the future.	Land change	2	6	Climate change adaptation strategy	LCC	Environment Agency		2
3.6. Green infrastructure planning and appropriate actions incorporated into the Liverpool Climate Change Adaptation Strategy (Action 5.7 also covers this point).	Support	6	5	Climate change adaptation strategy, ForeStClim	Climate Change Group	Green Infrastructure unit		4
3.7. Incorporate climate change adaptation design principles into all planning and development briefs and documents. This may be included in the design guide, Action 1.7 above.	Guidance	6	6	Liverpool CC	LCC Planning	Green Infrastructure unit		4

ACTION	TYPE	ACHIEVABLE (1-6)	IMPACT (1-6)	DELIVERY MECHANISMS (IN ADDITION TO LDF)	LEAD (INITIAL TENTATIVE SUGGESTIONS)	SUPPORT	RESOURCES (EXCLUDING S106 OR CIL)	FUNDING SCORE (1-6)
3.8. Take advantage of the waterfront location of Liverpool for its urban cooling and potential to provide an attractive and comfortable visitor attraction in a warmer climate. (Closely related to action 1.7)	Guidance	5	6	Atlantic Gateway, Climate change adaptation strategy	Climate Change Group	Liverpool City Council	City Cooling Project, climate change adaptation	3
3.9. Protect green infrastructure assets which encourage air flow into urban areas and align new development and restructuring to encourage air flows.	Guidance	3	4	Climate change adaptation strategy, developers, Liverpool City Council	Liverpool City Council Planning Department	Green Infrastructure Unit	City Cooling Project	5
3.10. Take opportunities to de-culvert watercourses and re-naturalise floodplains.	Land change	4	5	Strategic Flood Risk Assessment, Growth point plan	Environment Agency	Liverpool City council	Environment Agency	2
4.1. The existing ecological network should be safeguarded. Map 162 shows the existing core biodiversity areas. The distribution of the target areas is shown on Map 163.	Support	4	5	Biodiversity Action Plan	MEAS	Various	Natural England	3
4.2. Connectivity of habitats supported through planning based on identification of areas for habitat expansion. Map 164 shows the current connectivity of parks and urban trees. Map 165 shows the areas to target to improve connectivity. The methodology set out to assess this action is provided in Appendix 1. Action 3.5 should be targeted to assist in this action too.	Land change	4	5	Biodiversity Action Plan	MEAS	Various	Natural England	3
4.3. Biodiversity by Design principles are developed for Liverpool as part of the Design Guide (Action 1.8).	Guidance	5	6	Biodiversity Action Plan	MEAS			4

ACTION	TYPE	ACHIEVABLE (1-6)	IMPACT (1-6)	DELIVERY MECHANISMS (IN ADDITION TO LDF)	LEAD (INITIAL TENTATIVE SUGGESTIONS)	SUPPORT	RESOURCES (EXCLUDING S106 OR CIL)	FUNDING SCORE (1-6)
4.4. Support the North Merseyside Green Infrastructure Habitat Action Plan targets in the city by ensuring that they are taken into account in the delivery of all of the green infrastructure intervention actions. This could be taken forward as an element of the design guide (Action 1.8).	Support	5	6	Biodiversity Action Plan	MEAS	Mersey Forest	NMBAP	3
5.1. Use of Section 106 policy to support green infrastructure across the city. A fund is developed that is used to implement critical green infrastructure.	Support	5	6	Liverpool CC	LCC			4
5.2. The land change actions from this Liverpool Green Infrastructure Strategy included as part of the menu for the Community Infrastructure Levy.	Support	5	6	CABE	LCC			5
5.3. A guide, promoting high quality design will be developed to support green infrastructure delivery across the city. (see action 1.8)	Guidance	6	6	Liverpool CC	LCC Planning/ CABE			3
5.4. An agreed model is used to assess the value of green infrastructure in the city and enable proper evaluation of policy and intervention	Guidance	6	6	Green Infrastructure Unit	GIU	Mersey Forest	Genecon	4
5.5. Ensure that the cross boundary issues identified in the City Region Green Infrastructure Framework are incorporated into policy	Support	6	6	City Region Green Infrastructure Framework	GIU	Mersey Forest	City Region board	5

ACTION	TYPE	ACHIEVABLE (1-6)	IMPACT (1-6)	DELIVERY MECHANISMS (IN ADDITION TO LDF)	LEAD (INITIAL TENTATIVE SUGGESTIONS)	SUPPORT	RESOURCES (EXCLUDING S106 OR CIL)	FUNDING SCORE (1-6)
5.6. Create a Liverpool Green Infrastructure Forum – or promote a sub regional forum linking to the city region green infrastructure framework and the work promoted by the City Region Environment and Waste Board.	Support	6	5		Mersey Forest	Liverpool City Council	City Region Board	4
5.7 Embed this Green Infrastructure Strategy within other city strategic documents including the Local Development Framework, the Sustainable Communities Strategy and the range of economic, health, open space, trees and woodlands, tourism and other relevant strategies and plans that are developed for the city	Guidance	6	6	Sustainable Communities strategy, Range of economic, health, open space, trees and woodlands, tourism and other relevant strategies	Liverpool City Council	All	City Region Board	4

Appendix 4 Neighbourhood Management Area storylines

The following storylines summarise the existing green infrastructure resource, issues and priority actions for each Neighbourhood Management Area (NMA). NMAs are allocated their own dedicated team. These teams provide the basis for better and more dedicated support to the work of Neighbourhood Committees and Cluster Partnerships.

The teams have responsibility for, or a role in:

- Neighbourhood Services
- Residents Liaison, including Community Forums, Community Groups and Local Steering Groups
- Environmental Care and Maintenance
- Neighbourhood Wardens
- Local Area Enforcement issues
- Support for Neighbourhood Committees and Cluster Partnerships
- Project Development and Delivery
- JET's (Jobs, Education & Training provision)
- Youth provision
- Community Safety
- Ensuring local PSA (Public Service Agreement) targets - as set out in the Liverpool Neighbourhood Renewal Strategy - are met

Alt Valley NMA

(Contains the wards: County, Fazakerley, Croxteth, Norris Green, Clubmoor and Warbreck)

Overview

The green infrastructure resource

- One of only two neighbourhood management areas with agricultural land
- High levels of private domestic gardens, parks, grasslands and institutional grounds
- Croxteth and Fazakerley have over 50% of the green infrastructure in the NMA and therefore dominate the functionality
- Key assets in this area are Croxteth Country Park, the grounds of University Hospital Aintree in Fazakerley and Walton sports centre grounds

Issues

- The A580 corridor employment area is an important strategic gateway where green infrastructure and tree planting in particular could contribute to raising the profile of the area and the city in general
- Housing development around the Stonebridge estate and Norris Green in particular may provide opportunities to improve green infrastructure functionality through the design process
- Approach 580 is an area vulnerable to the heat island effect
- Although the problem is not as severe as in the inner areas there are issues relating to ensuring green infrastructure is contributing to health improvement through improving accessibility, increasing functionality

Priority actions:

- Encourage the use of SUDS, using swales and de-culverting of water courses, especially in Clubmoor and Croxteth (Action 3.2)
- Increase tree planting in accordance with The Mersey Forest plan, and ensure maintenance, particularly in areas in need of shade: County and Fazakerley (Action 3.4)
- Create water bodies and water courses in Clubmoor, Croxteth and Fazakerley to provide water for irrigation in times of drought (Action 3.5)

City & North NMA

(Contains the wards: Kirkdale, Everton, Central, Riverside, Picton and Kensington & Fairfield)

Overview

The green infrastructure resource

- There are low levels of green infrastructure in this area, it is scattered, with slight concentrations in the far north of the city.
- The city is dominated by the River Mersey, which is surrounded by publicly accessible land.
- There are high levels of general amenity space and derelict land.
- There are low percentages of allotments, outdoor sports facilities, street trees and woodland compared to other areas across the city.

Issues

- Low levels of green infrastructure and functionality
- High levels of vulnerable population with above average levels of health deprivation
- Given limited opportunities to create new greenspace, how best to ensure that the existing green infrastructure be protected and improved to increase its functionality
- This area will be a major focus for new development including housing providing opportunities to secure new and improvements to existing green infrastructure
- The Mersey represents a key resource. The issue will be how best to increase further accessibility to it
- Can new housing development provide opportunities to increase private garden space
- The city centre in particular is likely to suffer from the urban heat island effect in a changed climate
- Concentration of converging transport routes with implications for noise and air pollution

Priority actions

The City & North NMA has a lot of the actions in the Action Plan identified as priority actions, markedly more than any of the other NMAs. Due to this fact we have chosen the top scoring priority actions to list here:

- In all wards take advantage of regeneration and development opportunities to secure the use of street trees and green roofs (Action 1.1)
- Encourage walking and cycling through the provision of attractive and safe walkways and cycle lanes (Action 1.3)
- Increase the quality and quantity of green infrastructure in all wards to reduce poor mental health (Action 2.2)
- Increase opportunity for physical activity by providing attractive public realm and green environments (Action 2.7)

Liverpool East NMA

(Contains the wards: West Derby, Yew Tree, Knotty Ash, Old Swan, Tuebrook and Stoneycroft and Anfield)

Overview

The green infrastructure resource

- Low percentage cover of derelict land and general amenity space
- High levels of outdoor sports facilities and public parks
- Highest proportion of cemeteries and private gardens
- Moderate levels of street trees and woodland
- Much less variable in functionality between wards than other NMAs. Most functions are around average, but the neighbourhood has relatively low carbon storage and water management functions.

Issues

- Strategically located on eastern approaches to city centre with potential for green infrastructure and in particular tree planting to enhance major routes and address issues of noise and air pollution
- Mixed social character with areas of vulnerable population and health deprivation. Housing initiatives such as the HMRI (Stanley Park) and Dovecote Priority Neighbourhood should consider how green infrastructure can be incorporated to improve environmental quality and contribute to health improvement
- Area is vulnerable to the heat island effect
- Croxteth Hall and Country Park straddles boundary with Alt NMA and is an area of high green infrastructure functionality for protection

Priority actions:

- Encourage the use of SUDS, using swales and de-culverting of water courses, especially in Knotty Ash, Old Swan, Tuebrook & Stoneycroft, West Derby and Yew Tree (Action 3.2)
- Protect areas of existing ecological value in Anfield and Old Swan (Action 4.1)
- Take opportunities to de-culvert watercourses and re-naturalise floodplains (Action 3.10).

South Central NMA

(Contains the wards: Princes Park, St Michael's, Greenbank, Wavertree, Childwall and Church)

Overview

The green infrastructure resource

- Heavily influenced by The River Mersey
- High percentage of allotments, private gardens and street trees
- Moderate percentages of woodland, outdoor sports and institutional grounds
- High levels of private recreation and aesthetic functions
- High functionality as a habitat and corridor for wildlife
- It has the lowest percentage of derelict land and general amenity space.

Issues

- The area has above average proportions of parks, outdoor sports and woodland which contribute to the high green infrastructure functionality including Sefton Park and Calderstones Park. The continuation of actions to protect and enhance key assets is a key issue for this area
- There are issues relating to health and the heat island effect
- The area has frontage to the Mersey which is a key resource and opportunities to increase and improve access should be considered
- Several main access routes cross the area with implications for noise and air quality

Priority actions:

- Take advantage of regeneration and development opportunities in Princes Park and Wavertree to secure the use of street trees and green roofs (Action 1.1)
- Encourage walking and cycling in Princes Park and Wavertree through the provision of attractive and safe walkways and cycle lanes (Action 1.3)
- Increase opportunity for physical activity by providing attractive public realm and green environments in Princes Park and Wavertree (Action 2.7)
- Create water bodies and water courses in Greenbank, Princes Park and St Michael's to provide water for irrigation in times of drought (Action 3.5)

South Liverpool NMA

(Contains the wards: Mossley Hill, Cressington, Speke-Garston, Allerton and Hunts Cross, Woolton and Belle Vale)

Overview

The green infrastructure resource

- One of only two NMAs with agricultural land
- High percentage of parks, street trees, gardens, outdoor sports facilities, institutional grounds and cemeteries
- High levels of derelict land and general amenity space
- A great deal of disparity in the functions provided across the neighbourhood. It has well above average levels of food production, and above average levels of function for habitat and wildlife corridors as well as for aesthetic and evaporative cooling, but low for heritage and water management functions.

Issues

- There are issues relating to meeting social and health deprivation in Speke and Garston requiring action to consider how green infrastructure can contribute to their resolution
- The Speke Halewood SIA including the airport is at an important strategic gateway where green infrastructure and particularly tree planting could contribute to raising the profile and image of the area
- The Mersey represents a key resource and a key issue will be continuing efforts to improve accessibility wherever possible

Priority actions:

- Improve accessibility to green space in Cressington, Mossley Hill, and Speke and Garston such as gardens, orchards and allotments (Action 1.4)
- Create water bodies and water courses in Allerton & Hunts Cross, Belle Vale and Speke-Garston to provide water for irrigation in times of drought (Action 3.5)
- Take opportunities to de-culvert watercourses and re-naturalise floodplains (Action 3.10).

FURTHER READING

Read the other documents that make up the Liverpool Green Infrastructure Strategy at www.ginw.co.uk/liverpool

GET IN TOUCH

To discuss or find out more about this document or the Green Infrastructure Strategy as a whole, please contact: Liverpool City Council Planning Service on 0151 233 3000.

THE MERSEY FOREST more from trees

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