

Green Living Spaces Plan

September 2013

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We live in a global marketplace where Birmingham, like many cities around the world, must deal with huge pressures - economic, social and environment. Birmingham is the youngest, most ethnically diverse city in the UK and, as a responsible city, we have a duty to our current and future citizens to ensure we build a positive and sustainable legacy for all.

Birmingham's ambition is to be one of the world's leading green cities. Some progress has been made in the last few years, but we need to accelerate our plans and measure ourselves internationally against other leading green cities such as Stockholm and Copenhagen in Europe, Portland in the USA, and be a partner in the development of green innovations being driven forward in China.

We need to do more to become a truly leading green city - we must prepare ourselves for a world that is already facing energy and resource shortages and dramatic climate change impacts.

It is in this context that Birmingham wishes to adopt this clear Green Living Spaces Plan within which we aim to secure, enhance and ensure the effective long term maintenance of the city's natural green and water spaces, which are so essential for an adapted and healthy city.

This Green Living Spaces Plan introduces a new approach that of valuing all the city's natural spaces and features as Natural Capital, by applying the latest scientific thinking behind the National Ecosystem Assessment.

As part of the Green Commission's Green Vision for Birmingham this Green Living Spaces Plan becomes the vehicle through which the City can adopt a comprehensive approach to Natural Capital, as a thread that must run through all its future considerations, for the economy, its spatial planning, its health care and its low carbon future.

No other UK city has undertaken such a comprehensive combined evaluation and mapping exercise. This has produced a totally new map series of the city that show our current relationship with the natural environment - what nature gives us for free (ecosystem services) and where in the city the supply of these services is not meeting the multiple challenges or demands made upon it. It is these new evidence bases that the city must work with, in the near future with all its stakeholders, public, private and citizens to collectively address these leading green city challenges.

This Plan should not be seen as just an ideas document; although it does offer a fresh perspective on the city. This Plan is also about changing the way we do things; joining up agendas, agencies, services and funding; and re-positing the importance of Parks. This Plan's seven principles will help shape all future development in the city as they will be enacted through the draft Your Green and Healthy City SPD.

What's important is that people feel better about what it's like to live in the city - so like all great green cities around the world - Birmingham will be judged as to whether or not it becomes a City of Green Living Spaces.

Councillor James McKay

Chairman of Birmingham's Green Commission.
Cabinet Member Green, Safe and SMART City.

Endorsements

This Green Living Spaces Plan has been subject to extensive consultation across Birmingham and has been shared with UK Government Departments, agencies scientists and had some responses from further afield. Below are some of these endorsements:

A healthy natural environment is not a luxury - something that we think about after we have fixed the economy, or problems with physical and mental health and education. The natural environment provides the fundamental underpinnings for a healthy, successful society. Nature's services include cleaning up water and air, free pollination for crops, soil to grow food and fibre, locking up carbon dioxide from the air in wood and peat, flood-control, and the infinite pleasure we get from contact with the living world, with well-proven benefits for health and well-being. Birmingham's Green Living Spaces Plan is visionary in recognising the fundamental value of the City's natural capital, and how the services this capital provides underpin economic opportunities. 'Pioneering' and 'best practice' can be over-used terms. But not here. The City is to be congratulated in recognising the value of green living spaces, and making them fundamental to its future.

Professor Sir John Lawton, CBE, FRS.
Author of 'Making Space for Nature' (2010).



A city's green infrastructure has the power to lift the spirits of its people and the fortunes of its economy. Tree-lined footpaths, verdant parks and cooling roof gardens all play their part. Their visual appeal draws businesses and visitors to the area, offering space for people to relax and enhance their wellbeing. Green infrastructure also provides clean air and water, reduces the threat from flooding and pollution and gives wildlife the chance to thrive. Birmingham rightly sees itself as a Green City and is making great strides in becoming an example to the rest of the world. Leading the way in building a new green infrastructure is the City Council, whose exciting Birmingham Green Living Spaces Plan contains the evidence and vision needed to make it happen. Natural England fully supports this vision and will continue to support Birmingham City Council, its partners, stakeholders and residents to make this a reality.

Poul Christensen
Chairman Natural England.



Trees and woodland are an essential component of delivering healthy cities, and the Woodland Trust welcomes their prominence in Birmingham's Green Living Spaces Plan.

Sue Holden
Chief Executive of the Woodland Trust.



Cities today face a myriad of issues, from very bad air quality, the need to adapt to climate change, a variety of health-related problems from diet, rising obesity and a lack of physical activity.

These are complex and challenging issues to deal with and one potential solution is to explore and develop more integrative, holistic models that seek to tie-together these problems, and develop solutions that are integrative and catalytic.

Insights in how to begin to do this can be found across the Atlantic, in the UK. In early March (2013) I visited the former industrial City of Birmingham, which is now on the cusp of developing a new approach and strategies that will explicitly connect health, nature, and economy.

Birmingham’s approach veers into the innovative.

It is making new connections between health and nature, and exploring new ways to forge co-investments in these things and in developing economic flows that can acknowledge and reward the ways in which urban conservation and nature improves residents’ health.

Much of this new philosophy can be seen in the City’s proposed Green Living Spaces Plan.



Tim Beatley, PhD.
Teresa Heinz Professor of Sustainable Communities,
University of Virginia;
American Association of Planning, ‘Evergreen’ columnist.
Author of ‘Biophillic Cities’ (2013).

The most significant public health challenge that we face in Birmingham today is that of obesity - it is a sad fact that 1 in 4 children are obese by the age of 10. Our environment influences our opportunities to make healthy choices. Without a healthy environment, more people in Birmingham will suffer ill health because they don’t have the opportunity to make the right choices. Our environment also contributes to positive mental wellbeing - we need to enjoy our lives and have fun in our City.

It is therefore extremely encouraging that we are able to contribute to a Green Living Spaces Plan for Birmingham, one that considers a joined up approach to public health, spatial planning and other variables such as climate change. I look forward to seeing the outcomes from this work, including; extension of the Be-Active offer, Natural Health Improvement Zones, Community Food Growing, Walking and Cycling options for Neighbourhoods - and other opportunities for Birmingham children and adults to make healthier lifestyle choices.



Adrian Philips
Director of Public Health, Birmingham.

Introduction and Birmingham's green vision

Vision

Birmingham's Green Commission has begun to build a new framework for the future. We believe the time is right to drive Birmingham forward as:

- A leading green City and so help create prosperity, fairness, good health.
- A more attractive City in which to work, live and enjoy. Efficient in its use of scarce resources.
- A better City for the delivery of green finance and business.

This Green Living Spaces Plan provides a key ingredient in that vision by linking the issues of climate change, public health and spatial planning.

The Green Living Spaces Plan also introduces to Birmingham the notion of Natural Capital - just how dependent we are as a city on the services we get from nature - often for free, or under-valued.

By applying the same scientific valuation mechanism as the National Ecosystem Assessment, Birmingham becomes the first city in the UK to map what nature can supply and where the demands for those services are at their greatest against the multiple social, economic and environmental needs - so demonstrating the benefits green living spaces contribute in the city to human well being.

National Policy Context

The National Planning Policy Framework refers to Green Living Spaces as Green Infrastructure, here is its definition:

"Green Infrastructure: A network of multifunctional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities".

The Marmot Review of Health Inequalities, provides this policy steer:

"Fully integrate the planning, transport, housing, environmental and health systems to address the social determinants of health in every locality. Prioritise policies and interventions that both reduce health inequalities and mitigate against climate change".

The UK Climate Risk Assessment (2012) provides the first comprehensive national level assessment of potential risk and opportunities for the UK arising from climate change.

The Adaptation Sub-Committee recommends for local authorities to highlight:

- Land use planning.
- Flood risk, green infrastructure and sustainable urban drainage systems.
- Managing natural resources of ecology and water.

The Lawton Report, 'Making Space for Nature', found that:

"Nature in England is highly fragmented and unable to respond effectively to new pressures such as climate and demographic change."

The Natural Environment White Paper (2011):

"The Economics of Ecosystems and Biodiversity Study shows that - protected natural areas can yield returns many times higher than the cost of their protection."



Sparkhill Park

The UK Government -
 “We will put natural capital at the centre of economic thinking and at the heart of the way we measure economic progress.”

“We will mainstream the value of nature across society; strengthen the connections between people and nature to the benefit of both.”

The European Commission communications to the European Parliament, The Council, The European Economic and Social Committee and the Committee of the Regions; Green Infrastructure (GI) - Enhancing Europe’s Natural Capital, (2013) - concludes that: “Green Infrastructure can contribute significantly to achieving many of the EU’s key policy objectives.” and an EU-Strategy on Adaptation to Climate Change, (2013) concludes: “This Strategy sets out a framework and mechanism for bringing the EU’s preparedness for the current and future impacts of climate change up to a new level. It is proposed to do this by encouraging and supporting action by the EU Member States on adaptation, by creating a basis for better informed decision-making on adaptation in years to come, and by making key economic and policy sectors more resilient to the effects of climate change.”

Local policy context

The Green Commission welcomes the priority given to the Birmingham Development Plan (BDP) and the ‘Your Green and Healthy City’ - supplementary planning document (SPD), both form part of the Council’s Local Development Framework (LDF); the BDP states:

“An integrated and systemic approach to linking the city’s physical transformation and development to the carbon and environmental challenges, is a fundamental requirement of becoming a leading green city.”

The green vision states:
 “The level of growth proposed, based upon recent trends, is greater than has previously been considered and presents a significant challenge for planning the future homes and jobs the city needs. A leading green city must balance the pressures from a growing population with its environmental and socioeconomic sustainability.” and “Quantitative modelling for the green economy demonstrates that greening cannot only generate increases in natural capital, but also produce a higher rate of Gross Domestic Product (GDP) growth.”



Pond dipping

This Green Living Spaces Plan, introduces seven key principles, that are cross-cutting in their nature to help drive the required integrated approach; to further embed these seven principles are adopted across the wider planning framework, within the draft Your Green and Healthy City SPD.

The NIA states:

“One of the first twelve Nature Improvement Areas in England, managed by a partnership of over 50 organisations that have come together to deliver significant improvements to the natural environment of Birmingham, Dudley, Sandwell, Walsall and Wolverhampton. The vision of the Partnership is to achieve long-term environmental gains for the wildlife and people of Birmingham and the Black Country, by delivering targeted biodiversity projects at a landscape scale. The initiative is intended to create an urban landscape permeated by a network of high quality green space, which is rich in wildlife and provides a valued recreation facility for the people who live and work in the city. This project represents a cutting-edge approach to move away from site focused nature conservation, to a joined-up and longer-term landscape-scale approach”.

<http://www.bbcwildlife.org.uk/NIA>

Local Nature Partnership

Birmingham and the Black Country are not only recognised as a Nature Improvement Area but it has also a fully constituted Local Nature Partnership in place. This body is to operate at this sub regional - landscape scale to help co-ordinate activities, policies and delivery of the Government’s commitment to protecting natural capital particularly through growth and economic activity.

The Green Commission also recognises that measuring and publishing progress on the City’s Green Vision is absolutely vital.

It is essential that a wider view is taken of the city’s green progress, and the Commission recommends that an urgent review of existing reference frameworks should be undertaken alongside the work in progressing the Green Vision.

This should for example include taking advantage of the work of the C40 Group, the European Reference Framework for Sustainable Cities and also learning from best practice through ICLEI and the Business Council for Sustainable Development. As Birmingham is a signatory to the European Covenant of Mayors, then such reporting is essential.

This will also need to link to the existing Annual Monitoring Report undertaken for the current Local Development Framework and Local Development Scheme, but with a clearer web-based and accessible monitoring framework.

With an effective reporting mechanism in place this will significantly improve the evaluation of delivery mechanisms over time.



Relaxing in a Park

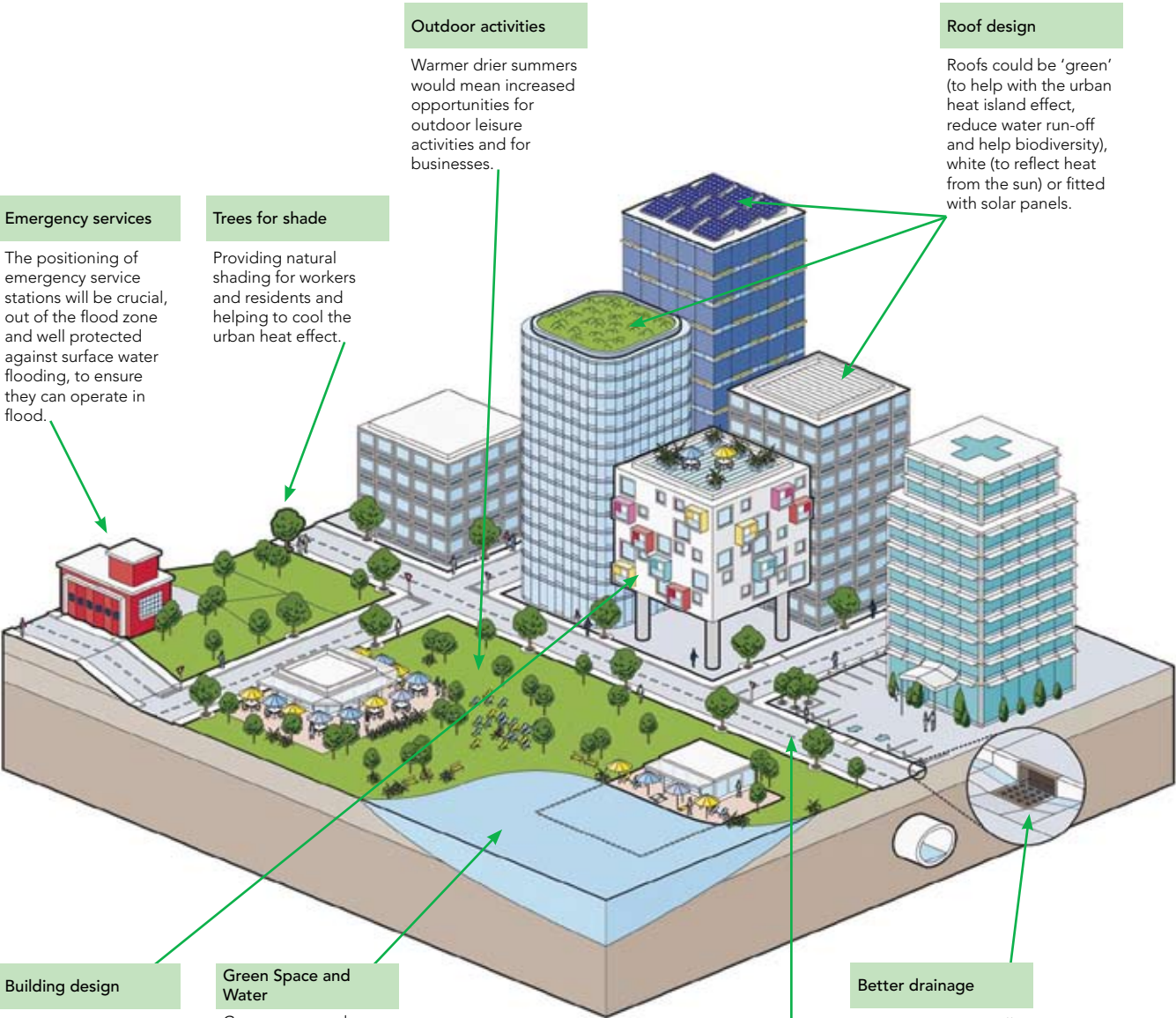


FIGURE 1 Birmingham's Green Vision

The seven green living spaces principles

Principle	Outcomes
An Adapted City	Retain City's top ranking for adaption
	<ul style="list-style-type: none"> • Ensure all future growth is 'adapted'. • Trees for cooling and thermal insulation. • Green roofs, walls and street canyon research.
The City's Blue Network	Adopt water sensitive urban design
	<ul style="list-style-type: none"> • Integrated SuDS, flood and water management solutions. • 'Blueprint' for enhanced walking and cycling network. • Blue Corridor/network policy with Canal River Trust.
A Healthy City	Adopt Natural Health Improvement Zones (NHIZ)
	<ul style="list-style-type: none"> • Integrate the delivery of health and green living spaces. • Continue to extend the Be-active offer. • Public health as key partners in planning.
The City's Productive Landscapes	Embrace urban forestry and urban food growing
	<ul style="list-style-type: none"> • Continue to promote allotments. • Facilitate community food growing and orchards. • Promote the multiple benefits of urban forestry.
The City's Greenways	Change gear - to a walking and cycling City
	<ul style="list-style-type: none"> • Create walkable/cyclable neighbourhoods. • Citywide signed routes linked to public transport.. • Link healthcare activities and prevention programmes.
The City's Ecosystems	Birmingham as a biophilic City
	<ul style="list-style-type: none"> • City to adopt an ecosystem services approach. • Partners to lead on District NIA continuation plans. • Birmingham to join global Biophilic Cities network.
The City's Green Living Spaces	Birmingham an international City of Green Living Spaces
	<ul style="list-style-type: none"> • Adopt the 7 principles across Planning Framework. • Green Infrastructure and Adaption Delivery Group. • Work with business partners on green economy.

Incorporating features designed to reduce the effects of the negative impacts of climate change and exploit the opportunities. This illustration is designed to provoke thought about what good adaption to climate change could entail - it does not attempt to provide and definate answers or solutions.



Emergency services

The positioning of emergency service stations will be crucial, out of the flood zone and well protected against surface water flooding, to ensure they can operate in flood.

Trees for shade

Providing natural shading for workers and residents and helping to cool the urban heat effect.

Outdoor activities

Warmer drier summers would mean increased opportunities for outdoor leisure activities and for businesses.

Roof design

Roofs could be 'green' (to help with the urban heat island effect, reduce water run-off and help biodiversity), white (to reflect heat from the sun) or fitted with solar panels.

Building design

Innovative building designs will be needed to guard against an increased risk of flooding and ensure comfort for occupants in higher temperatures. Cooling measures, natural ventilation and insulation will all play a part.

Green Space and Water

Green space and water help to reduce the urban heat island effect and protect against flooding. Sustainable Drainage Systems will provide a more sustainable approach to draining surface water.

Road surface

Road surface is made from materials that are able to cope with hotter temperatures and intense rainfall.

Better drainage

Drainage systems will need to be able to cope with increased heavy bursts of rainfall. Increased use of Sustainable Drainage Systems will provide a more sustainable approach to draining surface water.

This illustration does not necessarily depict past, present or future Government policy. The illustration concentrates on adaptation actions and does not highlight mitigation and other sustainable development measures.

FIGURE 2 DEFRA Cityscape 2030



Policy reference

The national Adaptation Sub Committee (ASC) and UK Climate Change Risk Assessment 2012

Climate change will have a range of impacts across the UK, from increases in summer temperatures to increased risks of flooding and drought.

Local Authorities have a role in preparing for climate change, using planning and other policy levers to ensure that buildings and infrastructure are resilient to increased risk of flooding and heat stress, natural resources are managed to increase ecological resilience, and emergency plans are in place.

There are five areas identified by the ASC as priority sectors for adaptation effort:

- Land use planning.
- Designing and renovating buildings.
- Managing natural resources.
- Providing infrastructure.
- Emergency planning.

In 2013 the EU Strategy on Adaptation to climate change introduces 8 key areas for action; and introduces new funding mechanisms that will seek to help fund adaptation initiatives particularly in urban areas and across boundaries.

CASE STUDY**BUCCANEER**

Birmingham Urban Climate Change Adaptation with Neighbourhood Estimates of Environmental Risk - Lord Stafford Award Winner 2012 Environmental Sustainability.

The BUCCANEER is an interactive online tool for enhancing decision making amongst planners, public health and developers to deliver a more sustainable future for Birmingham; created in partnership with the University of Birmingham and Birmingham City Council. For the first time decisions can be taken with consideration of the varying heat stress across the City caused by the urban heat island and the likely impacts of climate change up to the year 2100. Layers of socioeconomic and environmental vulnerability highlight areas of high risk to help prioritise future action.

Thanks to BUCCANEER, and the follow-on studies Birmingham has become recognised by the EU as a Peer City; and the City is building an international reputation for its climate modelling.

Birmingham is set to extend this knowledge base with a formal extension of the BUCCANEER initiative - funded by the Natural Environment Research Council 2013-16.

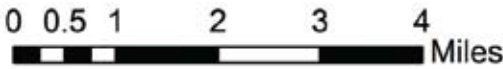
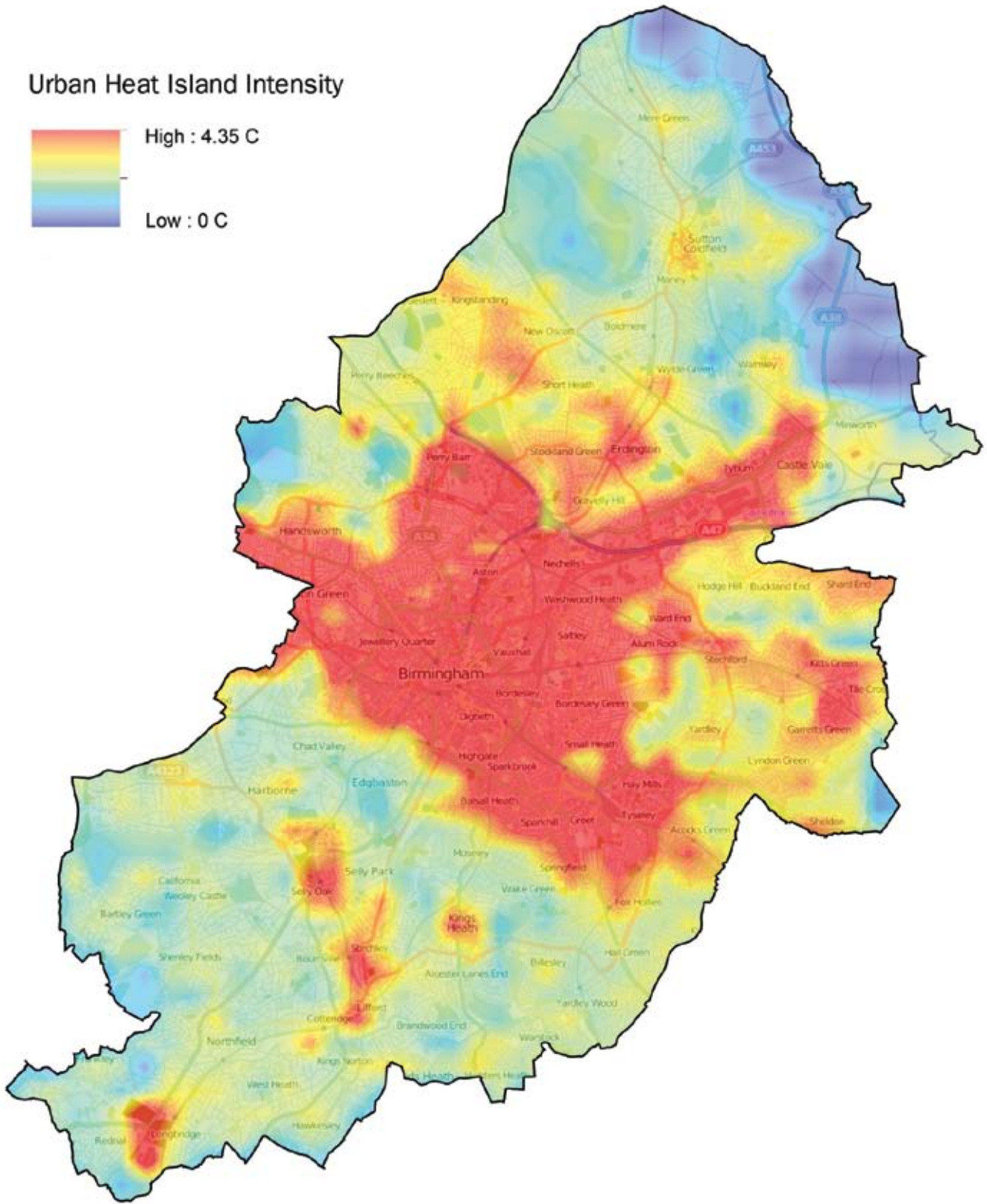
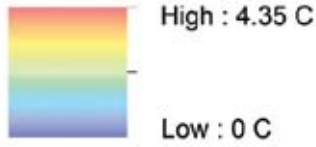
What it means for Birmingham - outcomes

- For Birmingham to maintain its national and international lead on climate adaptation.
- Ensure all future growth is 'adapted', and look to retrofit to reduce the urban heat island effect, flood risk, whilst protecting our natural and built heritage.
- Embrace sustainable land management principles.

Projects and future outputs

- City Centre heat island modelling, in conjunction with the Met Office's Weather Station.
- Connecting the outputs from cutting edge research of the Hi-Temp and Hi-Mort studies to inform future transport and health policy and delivery.
- Further develop Birmingham's Green Roof Partnership - maintain and update planning advice notices and extend to include Green Walls.
- Better understand the roles and the adaptation contribution of urban trees and all greening methods - together with Street Canyon research.
- Enhancing green spaces and connections in future partnership with District Energy schemes and supply networks.
- Ensure adaptation is fully considered in all future growth and development in the City and the retro-fitting of existing vulnerable neighbourhoods.
- Ensure connectivity between all climate study work and the Birmingham Energy Savers programme.

Urban Heat Island Intensity



© OpenStreetMap contributors, CC-BY-SA

PLAN 1 Birmingham's Estimated Heatwave Urban Heat Island (18th July 2006, 01:00)

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Policy reference

EU-Water Framework Directive (2003) - has established a legal framework for the protection, improvement and sustainable use of water bodies.

It requires all water bodies to be measured against good status by 2015, and for all to have achieved by 2027.

Floods and Water Management Act (2010) - all lead Local Authorities must undertake a comprehensive risk assessment of flood risk, for rivers and surface water; and devise an integrated action plan.

CASE STUDY**Longbridge**

Watercourse improvements and green infrastructure measures which provide WFD benefits have been integrated into the Masterplan for the Longbridge redevelopment scheme alongside the River Rea in Birmingham.

Birmingham City Council and the developer St Modwen, with advice from the Environment Agency have included features such as opening up of the previously culverted River Rea and reinstating an open channel, remediation of contaminated land and creation of a green corridor.

This will attenuate flows and reduce flood risk downstream on the River Rea, help improve water quality and ecology, as well as providing amenity and leisure benefits.

What it means for Birmingham - outcomes

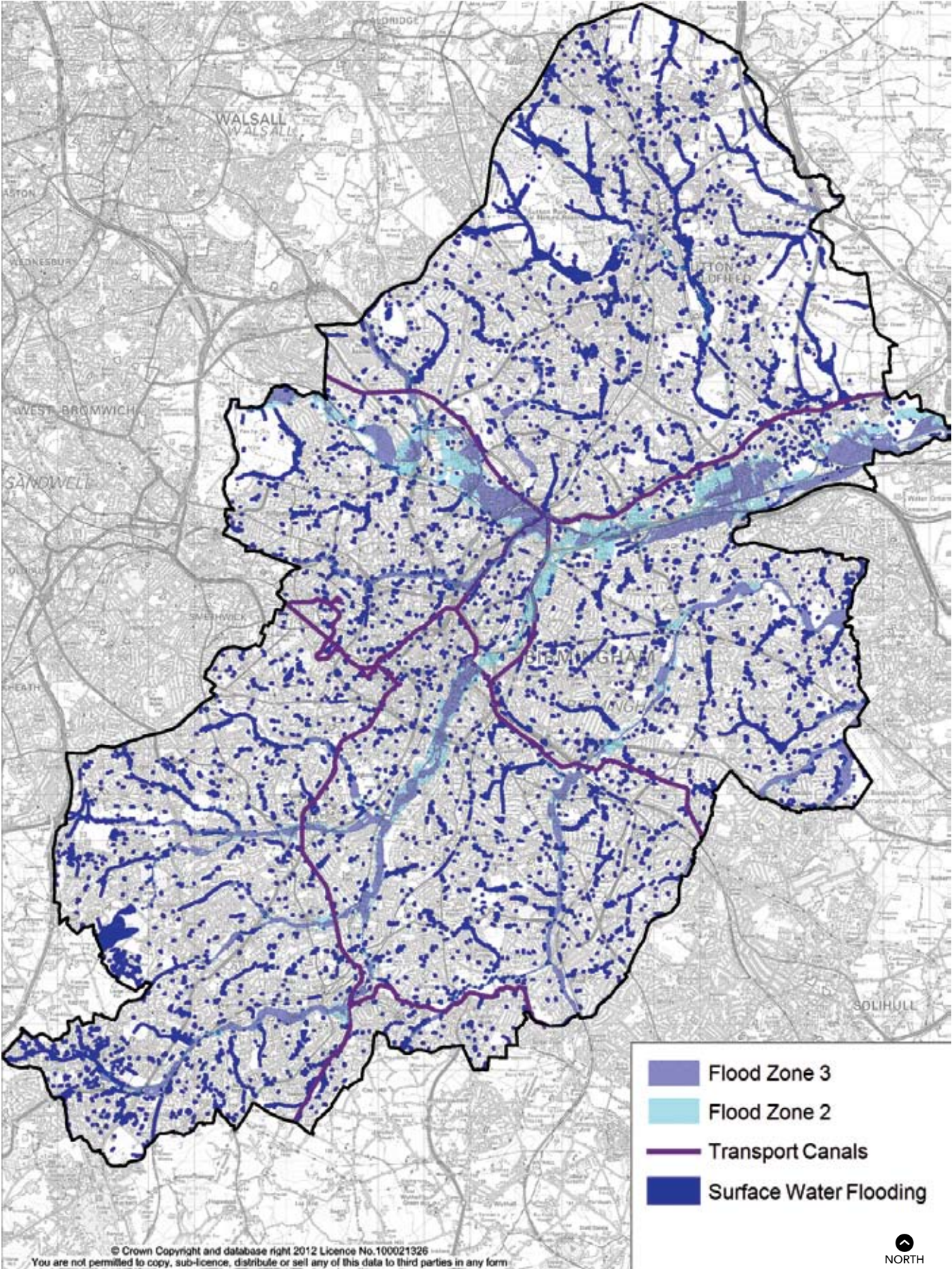
- Facilitate a Blue Corridor/ Network Policy - in conjunction with the Canals and Rivers Trust.
- Seek integrated solutions for Sustainable Urban Drainage Schemes (SUDS), rain water harvesting, flood risk, water management and habitat (wetland) creation, with WFD and water sensitive urban design.
- Let Birmingham's Blue Network provide the basis for enhanced walking and cycling provision.

Projects and future outputs

- Continue to the partnership approach to water across Birmingham, for flood risk, water management, WFD and pollution e.g. MURCI waters.
- Nature Improvement Area, (NIA) - Corridor Theme includes - wetland and watercourse habitat improvement priorities to link to Forestry Commission Wet Woodland study.
- Continue to support the SAB - Suds Advisory Board and explore:
 - Third sector SUDs management.
 - Principles behind 'Green Alleys/ Streets'.
- Continue to support the Canals and Rivers Trust and Catchment Management Plan Working Groups.
- Continue to support the Outdoor Learning Service's city-wide use of water based activities.
- Look to adopt Water Sensitive Urban Design; and South West Water's 'Upstream Thinking' approach to water management.



Artists impression - Longbridge Centre



PLAN 2 The City's Blue Network

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Policy reference**Public Health Outcomes Framework (2011)**

To improve and protect the nation's health and well being, and improve the health of the poorest fastest.

Strategic Review of Health Inequalities in England post 2010

Fully integrate the planning, transport, housing, environmental and health systems to address the social determinants of health in each locality; prioritise policies and interventions that both reduce health inequalities and mitigate against climate change.

Birmingham's JSNA 2012-15

The Joint Strategic Needs Assessment (JSNA) is an overview of the health and social care needs of an area.

Birmingham's introduces 7 top priorities, 3 of which directly relate to the Green Living Spaces Plan, they are:

- Ensure healthy standard of living for all:
Living Well - Healthy Lives across the Lifecourse.
- Create and develop healthy and sustainable places and communities:
Communities are important for both physical and mental health.
- Strengthen the role and impact of ill health prevention:
Living Well - Healthy Lives across the Lifecourse.

The Environmental Noise (England) Regulations 2006; allows for the designation of 'Quiet Areas'.

CASE STUDY**Natural Health Improvement Zones**

This is a cutting edge idea to be piloted in Birmingham.

Essentially targeting an area that combines poor air quality, health statistics and environmental quality, (derived from the multi-layered challenge map).

To work in partnership with different agencies to intensively green these areas, seek to alter or enhance local walking and cycling choices.

Link all this work to the local GP surgeries by the deployment of smart technology, to monitor patient improvements over time. Couple this with local air quality measurements, in line with the Low Emissions Towns and Cities Programme.

These routes could also take in local urban brooks or canals, where work programmes could be aligned.

What it means for Birmingham - outcomes

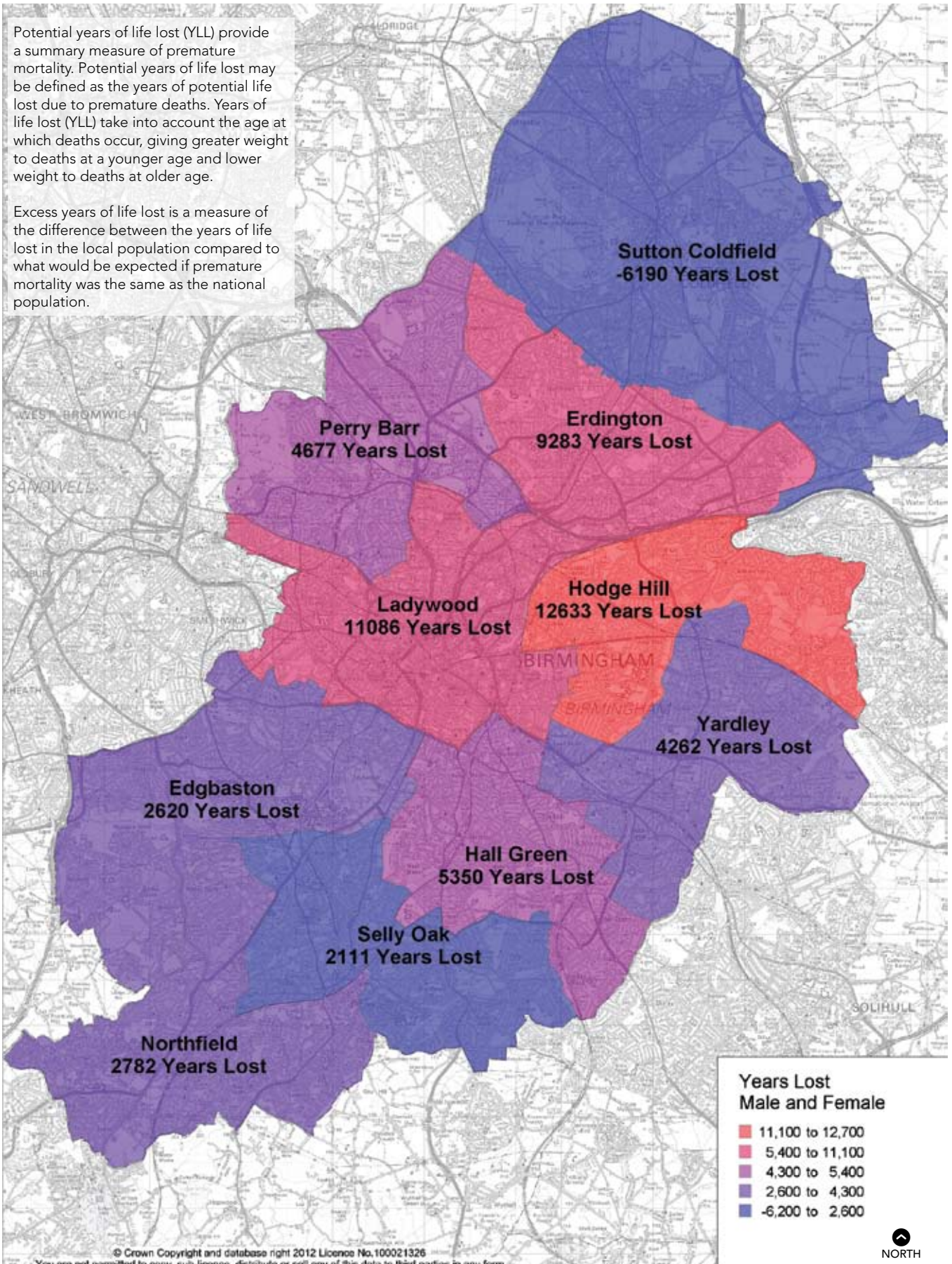
- Work in partnership with Public Health to achieve the HWBB Strategy aims; the JSNA targets - for Birmingham; and the Public Health Outcomes Framework objectives.
- Develop and trial Natural Health Improvement Zones in Birmingham - with Public Health England's and other partners support.
- Find ways to extend the 'Be-Active' offer to more Neighbourhoods.

Projects and future outputs

- Public Health Birmingham will undertake a Health Impact Assessment of this Green Living Spaces Plan and its evidence sets, to devise joined up future work programmes.
- Continue the work of the Healthy Urban Development Group for Birmingham, to integrate the Planning Framework and Policy with Health outcomes.
- In step with the city's ambition to become a leading green city - look to establish Birmingham as the first UK Biophillic City - in the new emerging global cities network that are embracing health and nature.
- Through the Liveable Cities programme, seek to engage with the Healthy Village pilots.
- As a leading green city quality of life and well being must be improved - these are vital issues that help attract Foreign Direct Investment and retain high skilled workers.
- Tackle obesity levels and poor nutrition, through a Birmingham Food Council and Food Charter, (see Principle 4 Productive Landscapes).

Potential years of life lost (YLL) provide a summary measure of premature mortality. Potential years of life lost may be defined as the years of potential life lost due to premature deaths. Years of life lost (YLL) take into account the age at which deaths occur, giving greater weight to deaths at a younger age and lower weight to deaths at older age.

Excess years of life lost is a measure of the difference between the years of life lost in the local population compared to what would be expected if premature mortality was the same as the national population.



PLAN 3 A Healthy City - Excess Years of Life Lost Compared to England (2006-2010)

Policy reference**Trees in Townscape (2012)**

"Trees make places work, look and feel better - as well as playing a role in climate proofing our neighbourhoods and supporting human health and environmental well being, trees can also help to create the conditions for economic success."

Treaty of EU - Articles 152,153

It is a legal obligation for broader public health issues, including nutrition, and CAP to be at the heart of UK Food Policy.

The Green Food Project - Defra (2012)

"Producing more food for less is going to require creative approaches, such as urban and peri-urban agriculture, including community supported agriculture, planting fruit and nut trees in public spaces, green roofs, permaculture and hydroponics."

Jim Paice, MP.

CASE STUDY**The Birmingham Forest and Birmingham Tree Bond**

Birmingham is fortunate to have inherited a very large urban tree population, covering something close to 23% of the City; although not evenly distributed; so presenting a challenge for the future location large trees in the City.

Scientific research has now established the multiple benefits derived from urban forests, particularly helping towns and cities adapt to a changing climate; but also bringing proven health and economic benefits.

For this reason the City will seek to adopt a more wholesale management approach of this entire urban tree population to be referred to as the Birmingham Forest; so conveying the landscape scale affect of trees upon the City.

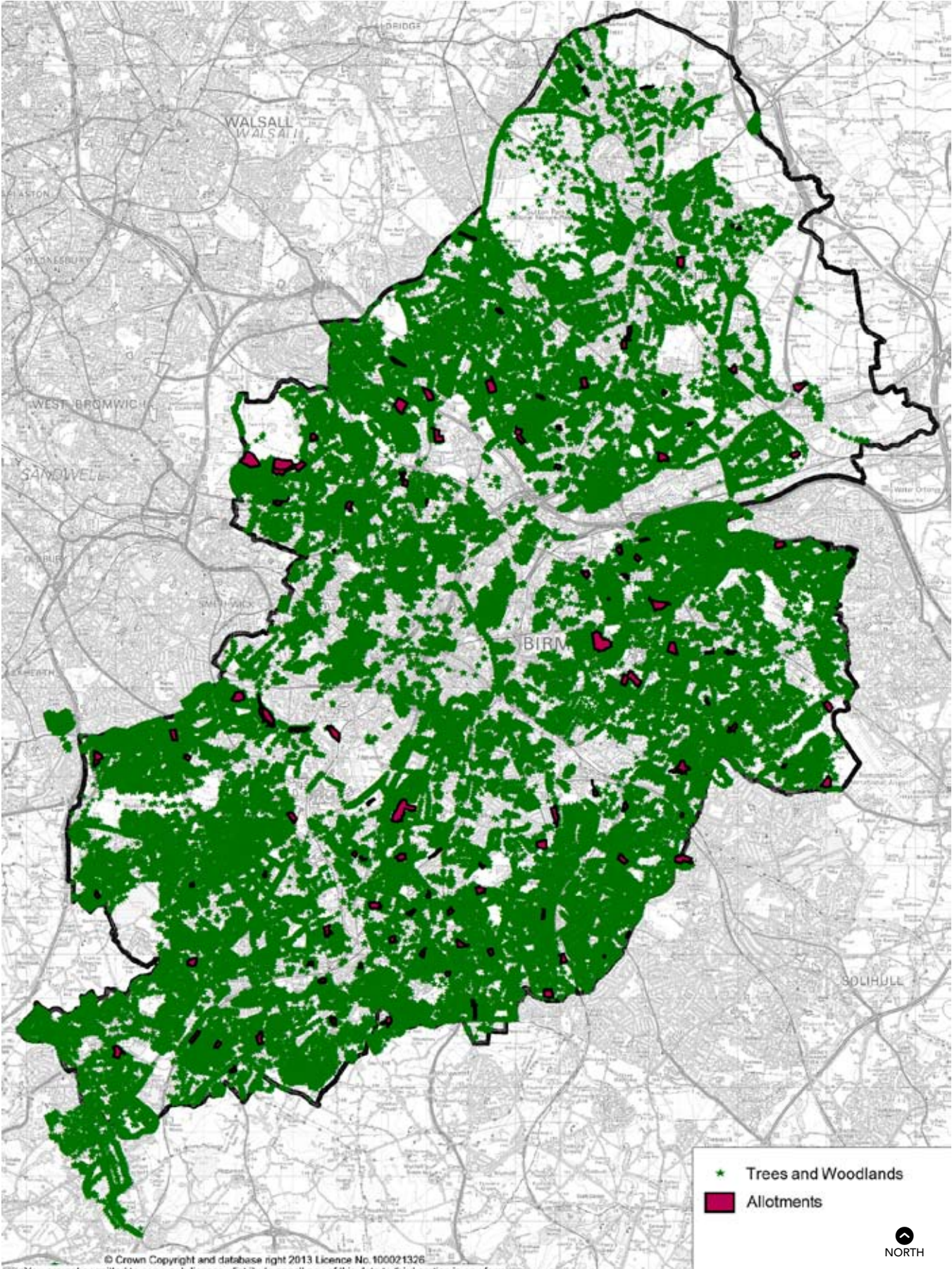
New funding mechanisms will be sought that will seek to link energy procurement and use with low carbon development as part of the City's moves towards adopting Carbon Budgets; and so explore the establishment of a Birmingham Tree Bond.

What it means for Birmingham - outcomes

- Adopt an Urban Forest approach and explore a Tree Bond.
- Create a Birmingham Food Council, and adopt a Food Charter.
- Facilitate allotments community growing, orchards, 'edible landscapes'.

Projects and future outputs

- Work within the Carbon Budget Framework to explore a potential Tree Bond.
- In liaison with Public Health, and a wide partnership, establish a far reaching Food Charter for the City.
- Support and promote allotments and community food growing; whilst being mindful of land contamination in the City.
- Continue to support community engagement in tree and woodland planting; and support the Nature Improvement Area approach to future habitat creation and enhancement.
- Support the development of a robust and unambiguous Biomass Policy (Air Pollution) for the City.
- Explore links with EBRI - European Bioenergy Research Institute and the City's low carbon future in the development of sustainable biofuels linked to green waste.



PLAN 4 The City's Productive Landscapes

the seven green living spaces principles / green living spaces plan

Policy reference**The Birmingham Big City Plan (2010)**

Creating an outstanding pedestrian environment that is well connected, safe and a pleasure to use, putting the needs of pedestrians at the heart of the movement strategy for the City Centre.

Public Health Outcomes Framework (2011)

Utilisation of green space for exercise/health reasons. Proportion of physically active and inactive adults.

The Birmingham Low Carbon Transport Policy (2012)

In partnership with local health organisations and sustainable travel charities, creating a local cycling and walking culture.

CASE STUDY**A new urban mobility**

Many leading green cities around the world have excellent walking and cycling networks and provision; Birmingham aspires to match this. One natural advantage Birmingham has is the considerable network of urban brook courses (some 400km) together with the city's canals. This creates a literal 'blueprint' to connect people and communities across the City. Not only do they represent an opportunity to connect people, they also represent an opportunity to connect many agendas.

Flood risk is of increasing concern in the city, with uncertain weather patterns, coupled with failing water quality standards; many of these brooks are lined with trees that traditionally have been uneconomic to manage. The health benefits from more active lifestyles is well understood; and the City is keen to extend its quiet roads and 20mph zones. Finally the City wants to move to a low carbon future requiring the implementation of District Energy grids and digital networks.

All these agendas have the potential to be synergistic; the trick will be to re-align thinking

and practice - a changing of gear - to achieve truly sustainable travel choices for the citizens of Birmingham.

What it means for Birmingham - outcomes

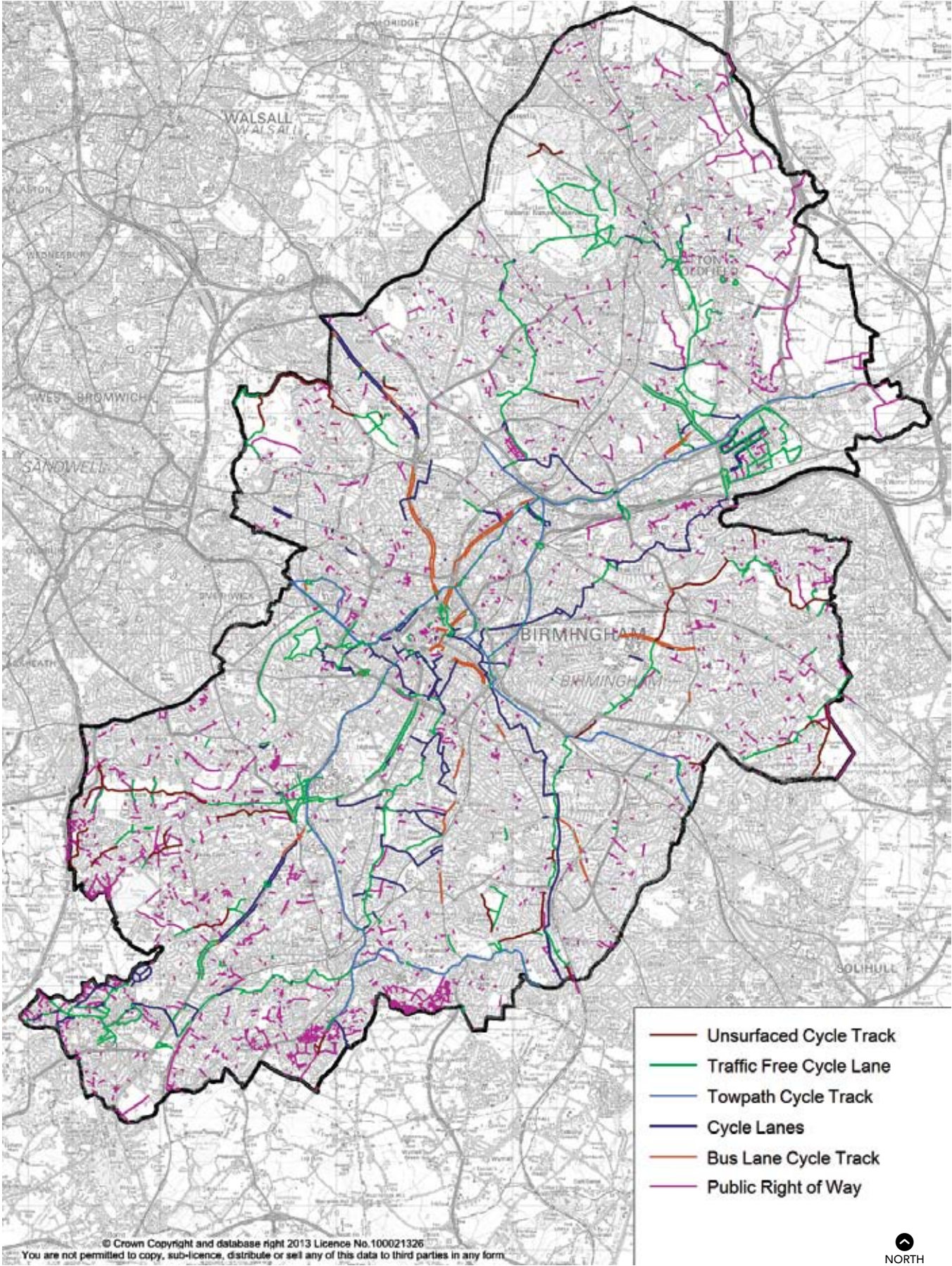
- A new urban mobility, with the positive choice of walking and cycling.
- An integrated, well signed network that permeates the City and connects to public transport.
- Link health care with activity and prevention programmes.

Projects and future outputs

- Establish mechanisms and systems to deliver the recommendations in the Changing Gear Report (2013).
- Support the development of an Urban Mobility Plan for Birmingham, working with other significant partner organisations.
- Forge links between Public Health and the active lifestyle agenda, together with improved provision and monitoring.
- Prioritise and connect broken links in existing greenway networks; identify opportunities within the highways maintenance PFI to coordinate tree replacement and planting to maximise and support green infrastructure connectivity with green corridors.
- Maximise future opportunities to improve, enhance or add to greenway networks through Planning and Development.
- Explore alternative future funding mechanisms for both the provision of more greenways and for the maintenance of both existing and future greenways.



Eastside City Park



PLAN 5 The City's Greenways

the seven green living spaces principles / green living spaces plan

Policy reference**Natural Environment White Paper (2011)**

The Economics of Ecosystems and Biodiversity Study - shows that protected natural areas can yield returns many times higher than the cost of their protection.

- We will put natural capital at the centre of economic thinking and at the heart of the way we measure economic progress.
- We will establish an independent Natural Capital Committee.
- We will set up a business-led Ecosystem Markets Task Force.
- We will mainstream the value of nature across society; strengthen the connections between people and nature to the benefit of both.

The Lawton Report, 'Making Space for Nature', found that nature in England is highly fragmented and unable to respond effectively to new pressures such as climate and demographic change.

Local policy context

Birmingham is served by a Local Biodiversity and Geodiversity Partnership; a Local Nature Partnership; and between 2012-2015 Birmingham and the Black Country are designated a Nature Improvement Area.

CASE STUDY**Ecosystem evaluation**

In 2011 the Government published a National Ecosystem Assessment (NEA) that for the first time sought to better understand our dependence on nature and where feasible derive an economic assessment of that benefit.

Birmingham is the first city in the UK to undertake a comprehensive assessment of the City's environment, using this same assessment framework. See Appendix 1

At the national level, the Natural Capital Committee has been established to advise Government on the consequences for the environment, the economy and our social well being; by taking an ecosystem services approach.

In Birmingham a second study has mapped these consequences, across a range of key issues, to literally re-map the City; from a totally fresh perspective. Birmingham is the first city in the world to do this; see Appendix 2.

This now positions Birmingham as the first city that could now move to Natural Capital accounting; through a risk based approach; allowing these new data sets and consequence maps to influence future development of the City; and be made available at a District scale to influence District services and third sector action. This work really helps to demonstrate the leading green city ambitions of Birmingham.

What it means for Birmingham - outcomes

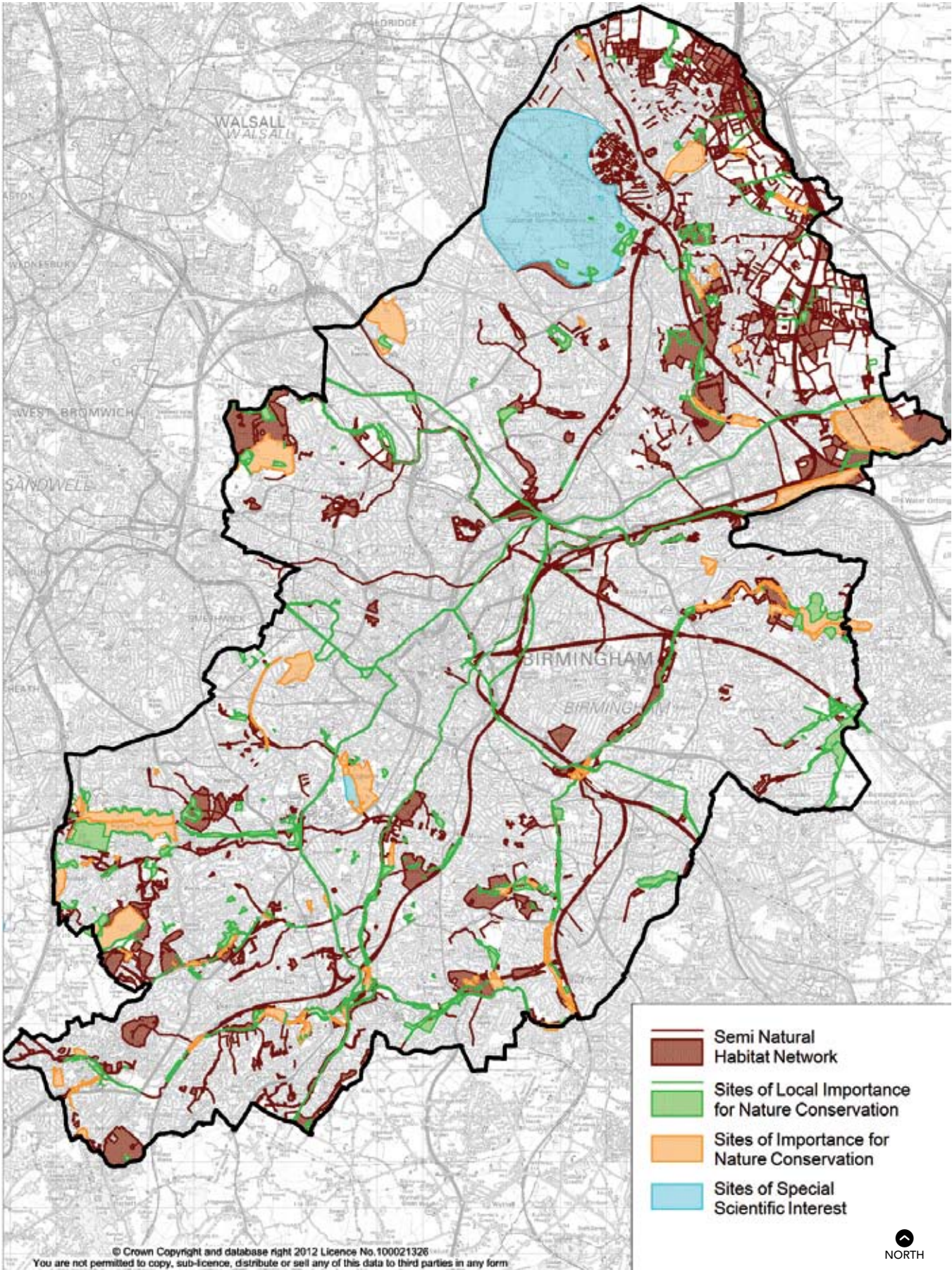
- Embrace an Ecosystem Services Approach.
- The district scale plans will enable Birmingham to mainstream

the Nature Improvement Area approach, matching Biodiversity Opportunity with community needs.

- Birmingham to become the first UK, Biophillic City; a global network of aspiring green cities.

Projects and future outputs

- Support the Local Biodiversity and Geodiversity Partnership.
- Take advice from the Birmingham and Black Country Local Nature Partnership.
- Embrace the Catchment Management Plan approach and local pilots.
- Work with Birmingham Open Spaces Forum and the local Wildlife Trust over the future District Plan approach to NIA programme delivery and mainstreaming.
- Partner the local Universities and national agencies in continued research and development of future policy, best practice, cutting edge knowledge transfer.
- Undertake a citywide I-tree-Eco assessment.
- Continue to work with the Business Council for Sustainable Development UK and the World BCSD, Government agencies and partners on a Birmingham Development Site Tool - based on ecosystem services/Natural Capital.
- Partner the local Universities and national agencies in continued research and development of future policy, best practice, cutting edge knowledge transfer; including EU Project PLUS findings and ongoing Lighting and Ecology studies.



PLAN 6 The City's Ecosystems

the seven green living spaces principles / green living spaces plan

Policy reference**National Planning Policy Framework - 2012**

"Green infrastructure: A network of multi-functional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities."

EU-Green Infrastructure (Gi) Enhancing Europe's Natural Capital (2013)

"Green Infrastructure stands to improve quality of life in many ways, through its environmental, social and economic credentials, based on the multifunctional use of natural capital:

- Protecting ecosystems state and biodiversity.
- Improving ecosystem functioning and promoting ecosystem services.
- Promoting societal wellbeing and health.
- Supporting the development of a green economy, and sustainable land and water management."

Leaders Statement 2012

"Adopting a clear Green Living Spaces Plan - a policy to secure, enhance and ensure the effective long term maintenance of the City's natural green and water spaces, which are an essential feature of healthy cities".

Strategic Review of Health Inequalities in England post 2010

Prioritise policies and interventions that both reduce health inequalities and mitigate climate change by:

- Improving active travel across the social gradient.
- Improving access and quality of open and green spaces available across the social gradient.
- Improving local food environments across the social gradient.
- Improving energy efficiency of housing and reducing fuel poverty.

CASE STUDY**Natural Capital City Model**

Birmingham has extensive growth plans for the City, the work undertaken here in the development of a Natural Capital Site Tool, with external partners and the Business Council for Sustainable Development - UK and the World BCSD, has been supported by Defra.

This may prove to be both a nationally and internationally significant piece of work.

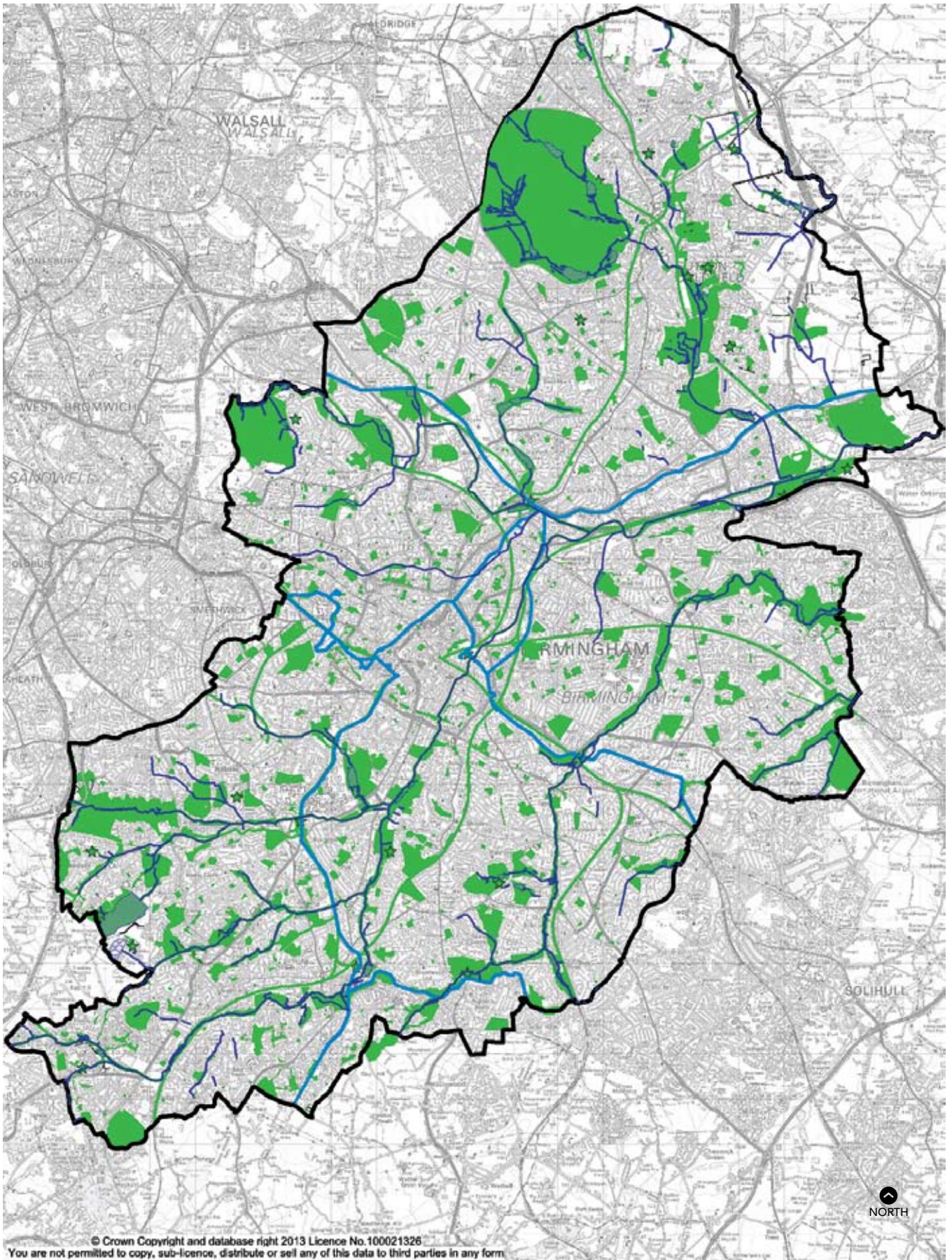
It looks at future development from an outcomes perspective and links it to ecosystem services. In so doing it identifies multiple potential benefits and additional stakeholders and co-investors. In this way development can be ensured to bring the maximum viable benefits, with staggered returns on investments. A different model for a different - green - future.

What it means for Birmingham - outcomes

- Adopt the 7 Green Living Spaces Principles in the draft Your Green and Healthy City SPD.
- Liaise with Public Health on the future joint delivery aspects of this Plan.
- Birmingham to adopt a Natural Capital approach as part of its leading green city ambitions; including the Natural Capital City Site Tool.

Projects and future outputs

- Maintain the Green Infrastructure and Adaptation Delivery Group, reporting to the Green Commission, as the main delivery agency for this Plan.
- Devise a Work Plan for the Delivery Group linking the Community Infrastructure Levy and Infrastructure Delivery Plan.
- Work with the European Investment Bank and others on future funding to implement this Plan.
- Continue to liaise with the UK Government's Natural Capital Committee.
- As part of the Green Commission's Green Vision - introduce Natural Capital as an essential element to future Carbon Budgeting for Birmingham.
- Work with Business Council for Sustainable Development UK and the World BCSD, and partners to green the Birmingham economy.



PLAN 7 Green and Blue Infrastructure

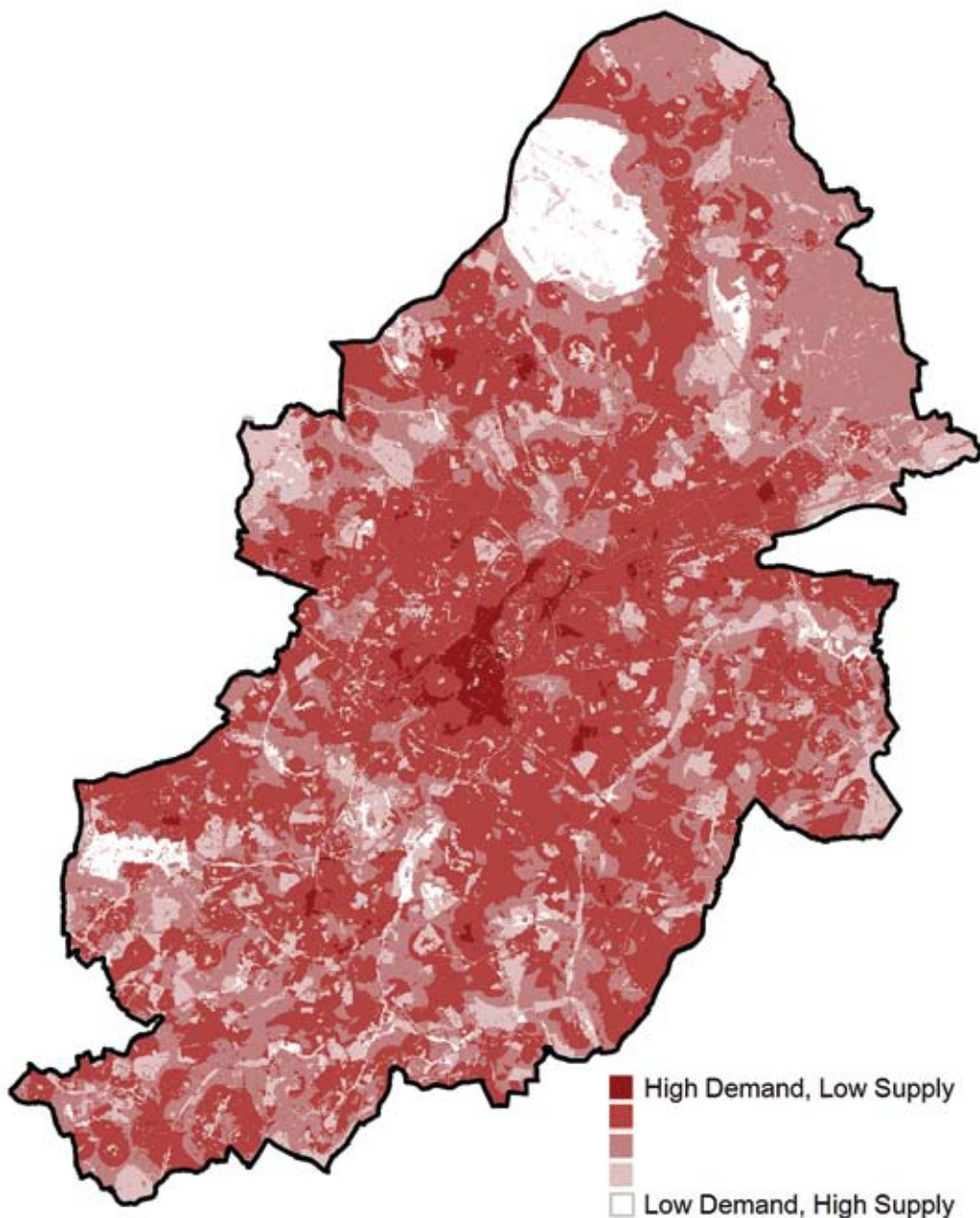
the seven green living spaces principles / [green living spaces plan](#)

The Multi-layered Challenge Map for Birmingham

What this represents is how the City is performing from an ecosystem services perspective, and how the multiple functions of the Green Living Spaces are meeting their full potential. The science behind this picture is complex, so in order to simplify its depiction, the map only shows the multiple effects from a supply and demand point of view. So what parts of the City are well served by accessible natural capital and where people can gain those benefits, so the ability of the natural

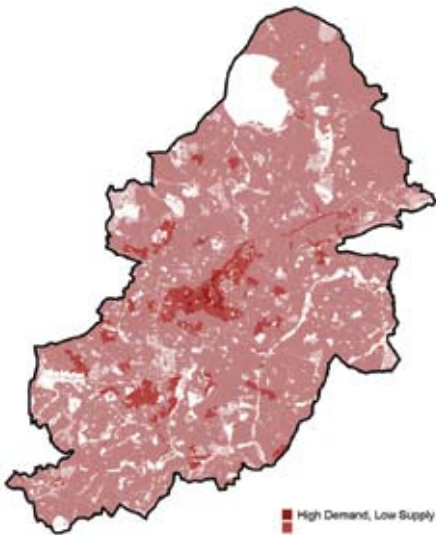
environment to 'supply' or meet the needs of the local population. Where the demands being made from the local population are not being met, in full by their local environment.

This is the first map of its kind of any city in the world. The map is a composite of the 6 maps on the opposite page. These maps show how the City's ecosystem services are currently providing for, education, recreation, local climate control, flood risk, biodiversity and aesthetics and mobility.

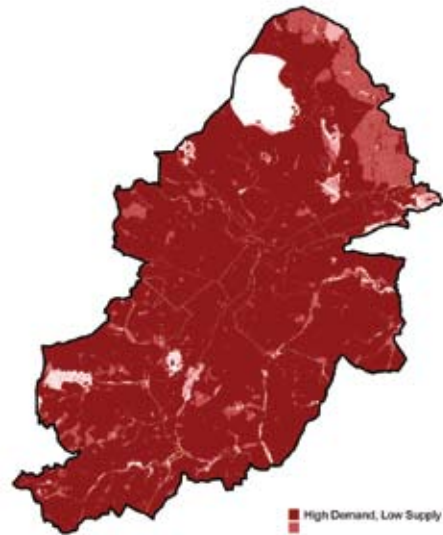


NORTH

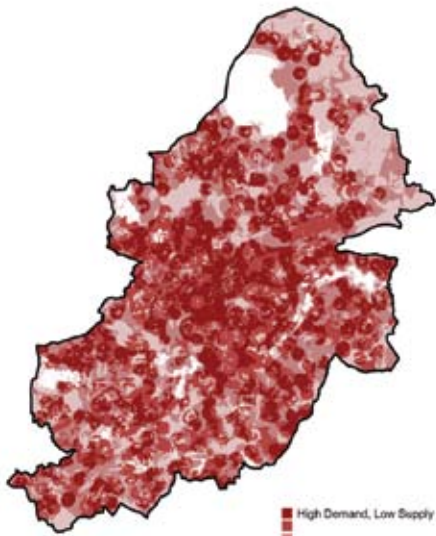
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PLAN 9 Aesthetic and mobility services supply and demand



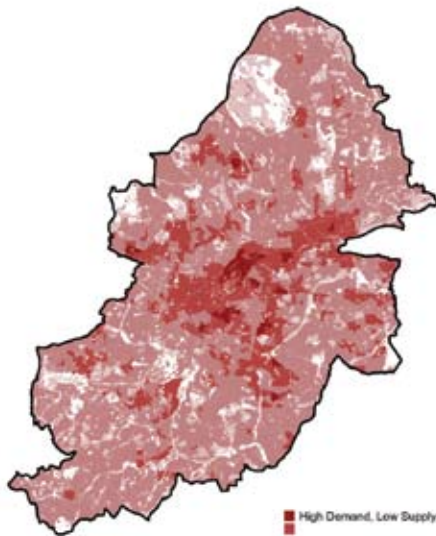
PLAN 10 Biodiversity services supply and demand



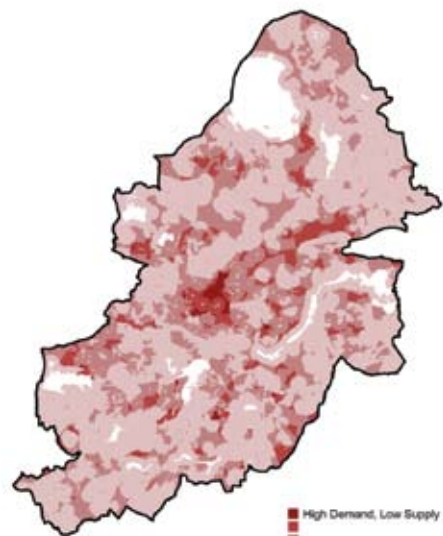
PLAN 11 Local climate services supply and demand



PLAN 12 Recreation services supply and demand



PLAN 13 Education services supply and demand



PLAN 14 Flood risk services supply and demand

Implementation and funding

Governance

The Green Commission’s Green Vision works via four strands:

- Carbon reduction.
- Ecosystem services.
- Adapting to climate change.
- The green economy.

Achieving integration across these areas is the mark of a leading green city.

The pioneering work of the Green Infrastructure and Adaptation Delivery Group is recognised by the Green Commission; to whom it now reports.

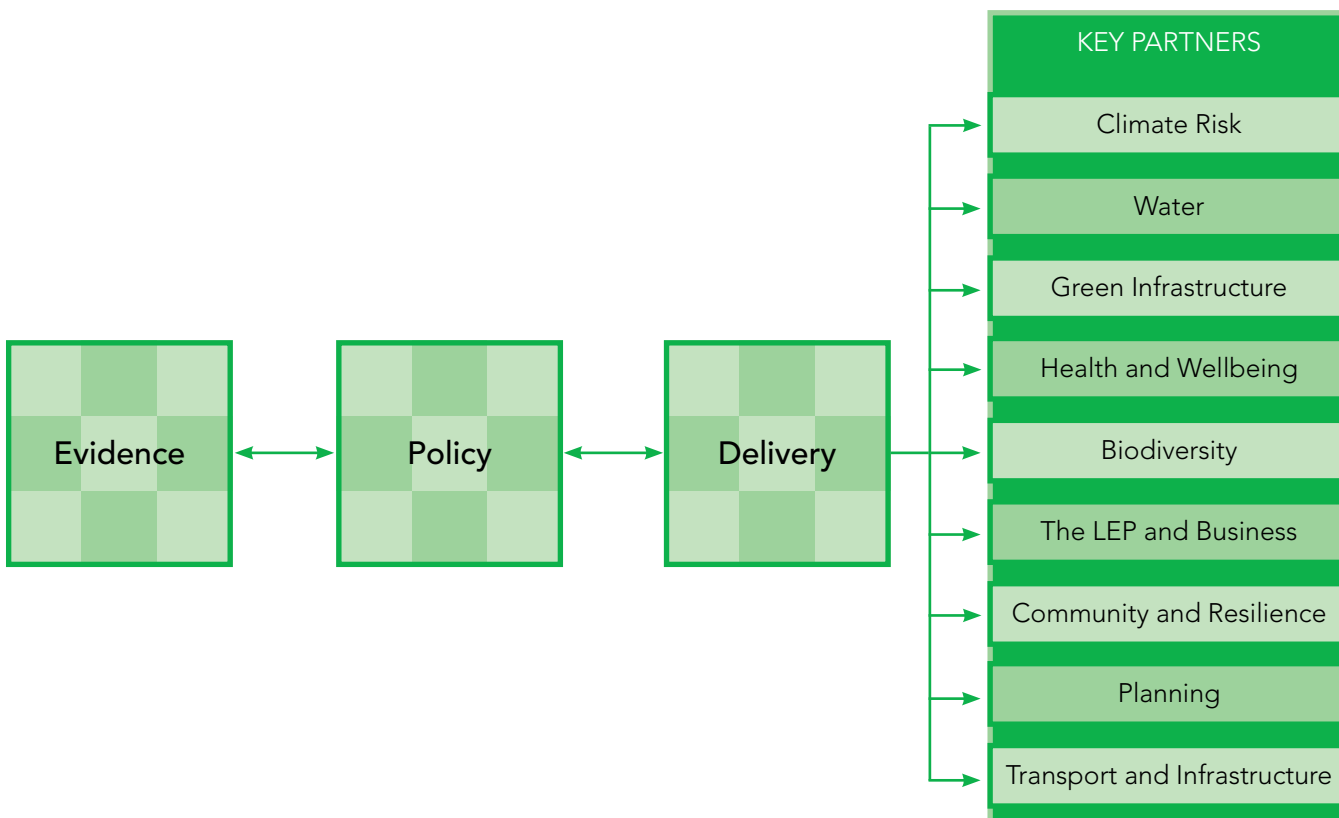
Background

A 9 piece jigsaw approach was used to establish the scope and connectivity between 9 independent fields of work, all with a role to play in climate adaptation and green infrastructure.

At first all their evidence sets were interrogated looking for gaps and synergies; Then the same process was undertaken for their respective areas of policy;

And finally decisions were made as where overlaps existed or could be achieved through their delivery programmes. In order to maximise the degree of connectivity, these work programmes were fitted into the seven principles established in this Plan; as it was through this process of integration that the seven key principles were formulated.

See diagram below.



The key partners are: **Climate Risk** - leading climate scientists at University of Birmingham; **Water** - Environment Agency, City mains drainage and flood risk, and Severn Trent Water plc.; **Green Infrastructure** - City Parks team; **Health and Wellbeing** - Public Health service and Public Health England; **Biodiversity** - Birmingham and Black Country Wildlife Trust, Nature Improvement Area, and Planning ecologist; **The LEP and Business** - Midlands Environment Business Company and Business Council for Sustainable Development - UK; **Community and Resilience** - Birmingham Open Spaces Forum and Birmingham Resilience Team; **Planning** - Development Strategy team; **Transportation and Infrastructure** - Highways team and cycling and walking.

FIGURE 3 The 9 piece jigsaw

Embedded policy

The seven key principles contained in this Plan are now embedded within the draft Your Green and Healthy City SPD; there relationship with this Plan can be seen in the diagram on page 9.

District plans

In order to maximise the potential range of partners and delivery mechanisms to implement this Plan, the citywide multi-layered challenge maps has also been made available at the Parliamentary Constituency (District) scale.

The intention would be for third sector and voluntary organisations, locally, to be able to use these plans to construct future funding bids against, to help deliver improved local provision for green living spaces.

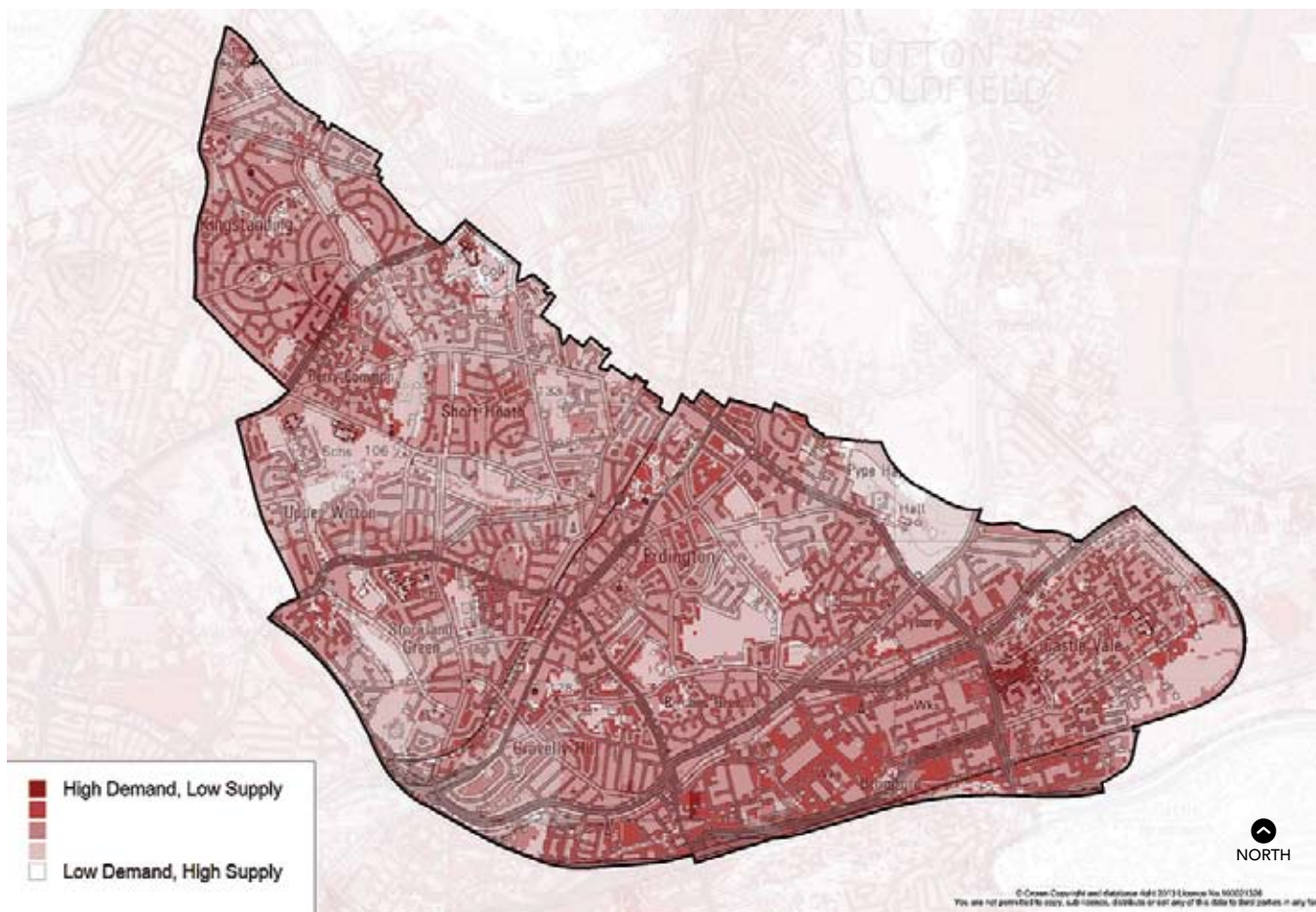
Erdington District Model

As a demonstrator of the above idea, Erdington volunteered to pilot this approach. It has now established a District wide green partnership, that is led from the community, to try to better co-ordinate efforts and galvanise enthusiasm. The results so far have been impressive.

Below is a list of schemes to which community led funding bids have been made across the District; total - £1.5 million;

- Hawthorne Brook - 140,000;
- Perry Brook - 80,000;
- Enderby Park - 110,000;
- Perry Common - 300,000;
- Bleakhill Spur - 300,000;
- Witton Lakes - 400,000;
- Brookvale Park - 100,000;

There are still more schemes in the pipeline, these are the approved ones.



PLAN 15 The multi-layered challenge map for Erdington

Glossary

Active Travel

A term used to indicate walking, cycling or jogging/running.

Be-Active

A Birmingham specific brand applied to multiple activities made available for citizens to undertake to benefit their health.

Biodiversity

The term used to capture all forms of biological life.

Biodiversity Offset

A Government term for establishing the biological impacts from any development and allowing for them to be rectified on another area of land.

Biomass

Any vegetative bulk.

Biomass Wood Fuel

Wood extracted from woodlands or derived from tree pruning operations that is usually reduced to a standard size wood chip or wood pellet, that can then be burnt in specially adapted boilers.

Blue Corridor

A term applied to any water course whether natural (brook, stream, river) or man-made (canal).

CAP

A European term used by the European Union referring to its farming policies, the Common Agricultural Policy.

Catchment Management

A term used within river management studies referring to the entire spread of a river from its source or multiple sources to its outfall. The catchment therefore refers to the entire land area affected by that river and its tributaries.

Community Infrastructure Levy

A new development tax to be applied post 2014, to be collected in all English local authorities; that can then be spent locally.

Ecosystem

Literally the interaction between all parts of the natural world.

Ecosystem Assessments

Measures the interaction between human activities and all natural systems; this can result in a monetary value or a well-being benefit.

Edible Landscapes

A term applied to productive landscapes when their main output is food or edible crops.

Energy Pathways

In this document this refers to physical routes through the City for energy infrastructure, such as overland or underground heating pipes.

Epidemiological Assessments

This is a public health term which refers to assessing the impact on residents' health and well being over an extended time period.

'Forest Brum'

This is a local Birmingham community initiative seeking to encourage more local people to grow their own food, particularly fruit trees and community orchards.

Forest Garden

This is an ecological term and refers to how an area of land can be made as productive as possible by growing plants of different heights, so effectively creating a tiered crop series.

Future-proofing

A generic term referring to how systems need to be risk assessed and re-engineered to address those future risks. It has been used in reference to cities; another similar term for that context is Resilient Cities.

Green Alleys

This is a term coined in the United States of America, where narrow urban streets have been re-laid using engineering systems that absorb storm water very quickly and delay its entry into already overloaded city drainage systems; to prevent local flooding.

Green Roof/Brown Roof

These are where the visible final layer of a building's roof is composed either of living vegetation or in the case of brown roofs - just a neutral substrate that can serve as a dry habitat that might colonise with plant material over time.

Green Walls

These are specially constructed vertical planting screens that are often supported by irrigation systems and can be deployed in confined or inaccessible spaces - but with a high visual impact.

Greenway Network

This refers to off-road routes through towns and cities, that perhaps link areas of parkland with playing fields or riverside walks.

Hi-Mort

This is the name of a University of Birmingham research programme studying all the various factors that are responsible for excess deaths in the City, either caused through high or cold temperatures.

Hi-Temp

This is the name of a University of Birmingham research programme studying the impact of high temperatures in heat waves on the City's infrastructure, roads and rail and energy supplies in particular.

Implementation Plan

This is a planning term that refers to the delivery plan part of the Birmingham Development Plan.

Intelligent Health Smart Routes

These have been piloted in London and Reading, they are signed routes that residents walk, run or cycle through, whilst carrying a smart card that registers their use against detector posts along the route. They can self monitor their health gains or have this operated by their GP Practice.

Local Enterprise Partnership

This is a Government approved body for a local region charged with improving the local economy.

Local Nature Partnership

These are Government approved membership groups that operate over a local region with the aim of improving the status of nature and help coordinate all wildlife actions and activities.

MURCI Waters

An Environment Agency sponsored project operating in urban areas; to reduce urban diffuse pollution of watercourses.

Natural Capital

This is a term now used to imply the economic benefits of the natural world.

Natural Capital City Model

A pilot project being run in Birmingham seeking to link private and public sector activities and development proposals that would bring maximum benefits with minimum demand on natural resources.

NIA - Nature Improvement Area

A Government status awarded to 12 zones of England where the restoration of nature has been made a priority; Birmingham and the Black Country are the only urban NIA.

Permissive Access Rights

This is a planning term relating to rights of access over land, whereby the land owner can grant local access rights, but these rights can be removed if they are abused.

Quiet Roads

A highways term referring to roads that have had their traffic flows reduced and provision for pedestrians and cyclists have been improved.

SAB

Stands for a SUD's Approving Body under the Flood and Water Management Act (2010).

SUDs

Sustainable Urban Drainage schemes, where potential local flood waters are held in check through engineered solutions, only to rejoin a city's drainage network once the storm waters have subsided.

Secondary Woodland

This is a term applied to woodland that has been planted, often in very recent times, so can be immature. They can lack any real structure - without mature trees or wild flowers on the ground.

Street Canyon

A term applied to streets where the buildings constrict the air flow. These can hold air pollution or heat during heat waves; leading to oppressive conditions for the pedestrian.

Urban Heat Island

A term applied to the cores of cities that due to the density of buildings, heat up far more than the outer districts of a town or city. With extended heat wave conditions this can lead to very high night time temperatures, which in turn can lead to excess deaths of citizens.

WFD

An abbreviation for the European Water Framework Directive (2003), concerned with the water quality of all water bodies.

Years Life Lost

Potential years of life lost (YLL) provide a summary measure of premature mortality. Potential years of life lost may be defined as the years of potential life lost due to premature deaths. Years of life lost (YLL) take into account the age at which deaths occur, giving greater weight to deaths at a younger age and lower weight to deaths at older age.

Excess years of life lost is a measure of the difference between the years of life lost in the local population compared to what would be expected if premature mortality was the same as the national population.

www.who.int/whosis/whostat2006YearsOfLifeLost.pdf



GI background - Birmingham context

The identified need for a Green Infrastructure Strategy for Birmingham came from the City's emerging Core Strategy which aims to deliver the strategic outcomes identified in the Sustainable Community Strategy. Green infrastructure has the ability to address many of the identified social, economic as well as environmental agendas needed to improve Birmingham.

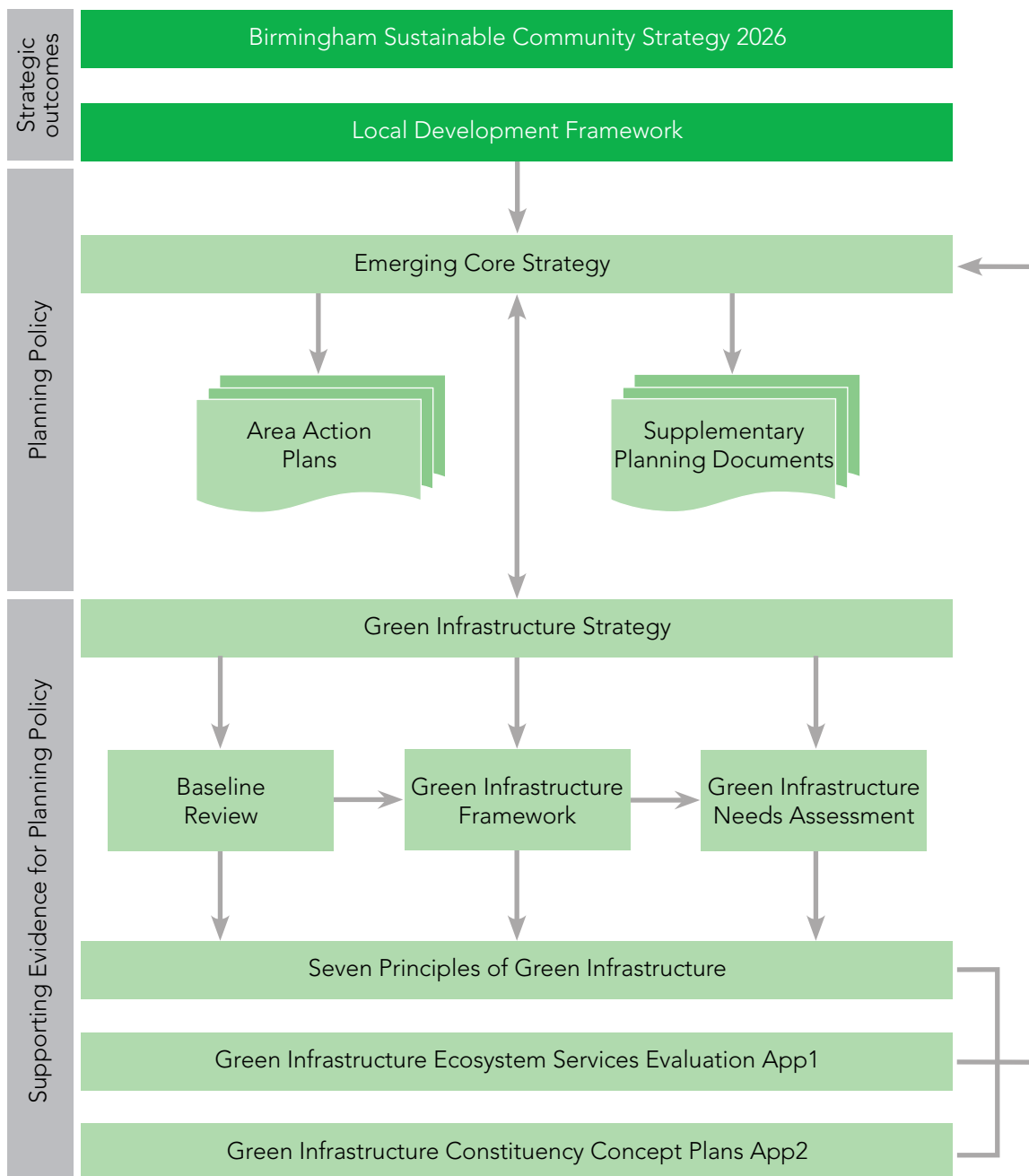


Figure 1 Green Infrastructure Strategy Outputs and Context

Birmingham already has a Parks Strategy (SPD) and Playing Pitch Strategy (SPD) and a Health and Physical Activity Strategy. This suite of plans was originally developed in unison in 2006 and provided a framework for the current and future management of open spaces in the City. The Playing Pitch Strategy has recently been updated to take account of changes in use and needs analysis. What the three individual strategies were not able to fully consider or embrace was the notion of treating the entire network of green spaces, and habitats and trees, together with the city's blue infrastructure, its rivers, brooks and canals; as an entity in its own right. These documents are still relevant, this Strategy does not seek to supersede them, but operates at a strategic level above them. This Green Infrastructure Strategy acknowledges the importance and role of all spaces and connections, from a multi-functional perspective, and so identifies the multiple benefits of this new approach. In 2012 Birmingham and the Black Country were awarded a Nature Improvement Area award, by the Government, in recognition of the appreciation and extent of natural landscapes across the area.



The GI delivery mechanisms and the city's implementation plan

Between 2008-2011 the City operated a Local Area Agreement (LAA) through its Local Strategic Partner, Be Birmingham. The main environmental agenda of the LAA was delivered through the Birmingham Environmental Partnership with a subgroup known as the Climate Change Adaptation Partnership (CCAP) responsible for delivering National Indicator 188, adapting to climate change.

With the successful delivery of NI 188 and administrative changes brought about in 2011, at the end of Local Area Agreements, the City Council expanded the remit of the CCAP and formed a dedicated group to deliver the green infrastructure and adaptation agendas called the Green Infrastructure and Adaptation (GIA) Delivery Group.

The GIA Delivery Group has adopted 'The 9 Piece Jigsaw'; a multi-disciplinary stakeholder forum sharing evidence, formulating policy and joining together in delivery; (see the full GI Strategy). This builds on the LARIA (Local Authority Research and Intelligence Association) award-winning research completed under CCAP.

Responsibility for taking on the policy and delivery of the new Green Infrastructure Strategy will lie with the Cabinet Member for Green, Safe and Smart Cities but in order for it to be a success it must be delivered, by definition, by many, not just the City Council.

The Green Infrastructure and Adaptation Delivery Group have generated an integrated funding submission for the Community Infrastructure Levy, as part of the City's Implementation Plan; (see full GI Strategy)

The "Seven Principles of Green Infrastructure" produced through this Strategy have also been adopted within the City's emerging Core Strategy and within the draft Supplementary Planning Document

(SPD) 'Places for the Future' which provides developers with guidance on sustainable development. All future development in the City will have to address these principles within their design solutions and developments.

A recommendation worthy of highlighting at this stage is that the City has the aspiration to develop the BUCCANEER tool and the Ecosystem Services Evaluation work further and develop a site based tool in the future, to be known as The Birmingham Index (see recommendations for more detail).

Finally the work contained within this strategy is thought to be the state-of-the-art. As such it has attracted a lot of attention from national bodies and working parties. The next step would be to align this work with that happening at a European level; and to have Birmingham as a lead exemplar city for future European green infrastructure best practice.

The key GI recommendations

The following recommendations will ensure that the Green Infrastructure Strategy is deliverable.

No	Recommendation	Description	Action
1	The Birmingham Forest	For the Birmingham Forest to be widely endorsed and adopted not only by the City but across its strategic partners, to deliver a holistic approach to urban forestry and a sustainable future, including the sustainable management of woodland and urban forestry, including street trees.	<ul style="list-style-type: none"> • Establish an accurate map of all of Birmingham's trees; and undertake an "i-tree-Eco" evaluation. • Ensure that this GI Strategy compliments and supports the Core Strategy's Tree Policy. • Develop a Birmingham Tree Bond - linking the funding of urban forestry with the carbon value in partnership with the City's utility providers. • To evaluate and promote "Edible Landscapes" (see Healthy City).
2	Birmingham the UK's first Walkable City	Working with the grain of nature, utilising the natural water courses, overland water flow routes and the city's canal network - devise routes through the city that would aim to penetrate every neighbourhood.	<ul style="list-style-type: none"> • Identify opportunities to both solve drainage, flood risk and water management issues and achieve greater safe public access. • Prioritise the connecting and greening of these new 'Greenways'.
3	Establish an Ecosystem Services Approach to spatial planning and decision-making	The City is to adopt an ecosystem services approach to all future green infrastructure and adaptation considerations; illustrated through the Nature Improvement Area award.	<ul style="list-style-type: none"> • Capture the Ecosystem Services evaluation for GI as an evidence base to the Core Strategy and in so doing build in its future maintenance and monitoring. • Mirror the GI assessment with a comprehensive survey of all of Birmingham's tree stock, through I-tree- eco; and adopt it as an evidence base; as per GI. • Devise a set of Constituency Concept Plans that identify the areas of need and potential.
4	Adopt a Blue Corridor Policy	For Birmingham to work towards an integrated approach to flood risk and water management that prioritises water quality, biodiversity gains and public access.	<ul style="list-style-type: none"> • Working through the Birmingham Water Board and the Birmingham Water Partnership, to maximise the opportunities for joined-up delivery achieving a wider vision. • Look to adopt a zero tolerance to development on flood plains.
5	Adopt The Birmingham Index	<p>For the City to work with partners to devise a site based evaluation tool for all development.</p> <p>For the City to adopt sustainable principles for the future management & maintenance for its GI.</p>	<ul style="list-style-type: none"> • For the City to adopt a Sustainability Checklist to sit within its Places for the Future (SPD). • For the City to undertake primary research with partners to devise The Birmingham Index tool. • To devise and adopt a sustainable tree planting policy. • To pilot the use of a Green Flag checklist for GI maintenance standards, in co-operation with contractors and community.

No	Recommendation	Description	Action
6	Adopt GI solutions to address the Urban Heat Island	<p>To adopt the findings of the BUCCANEER Project and support its continued refinement.</p> <p>To continue to prioritise Birmingham based climate research.</p>	<ul style="list-style-type: none"> • For the City to recognise the BUCCANEER Tool through its Adaptation Plan 2012. • To identify new funding to extend this and other related climate science research. • To liaise with the business community to devise an integrated Adaptation Plan for the city between public and private sectors.
7	Health actions	<p>Agree Natural Health Improvement Zones.</p> <p>Agree an approach to Food Strategy and delivery.</p> <p>Prioritise links between health research and GI and adaptation policy and delivery.</p>	<ul style="list-style-type: none"> • Establish a pilot for a Natural Health Improvement Zone. • Establish a mechanism to integrate land management with health and nutrition. • Adopt Health Impact Assessments for developments as standard.

