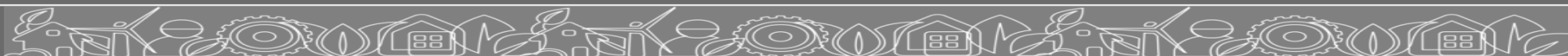




# Green Infrastructure Supplementary Guidance

November 2014

Perth & Kinross Council - The Environment Service





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The guidance is available to download from the Councils website at [www.pkc.gov.uk/greeninfrastructure](http://www.pkc.gov.uk/greeninfrastructure).

For further information please see the above website or contact the Local Development Plan Team at [developmentplan@pkc.gov.uk](mailto:developmentplan@pkc.gov.uk) or on 01738 475300.

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## INTRODUCTION

### What is this guidance for?

Local Development Plan Policy NE4: Green Infrastructure requires all development proposals to contribute towards green infrastructure. This guidance explains what green infrastructure is, why it is important, and where and how it should be taken into account in the development process.

### Why this guidance needed?

Perth and Kinross has experienced growth for a sustained period of time and the area continues to be one of the fastest growing in Scotland. An increasing population means an increased demand for new housing, employment opportunities and all the associated infrastructure requirements, including green infrastructure. There is a need to ensure that existing infrastructure networks are not fragmented as a result of development, and that the opportunity is taken through development proposals to improve infrastructure and link new development into existing networks. This is as important for 'green' networks as is it for the other 'grey' networks such as roads, drainage or power supplies.

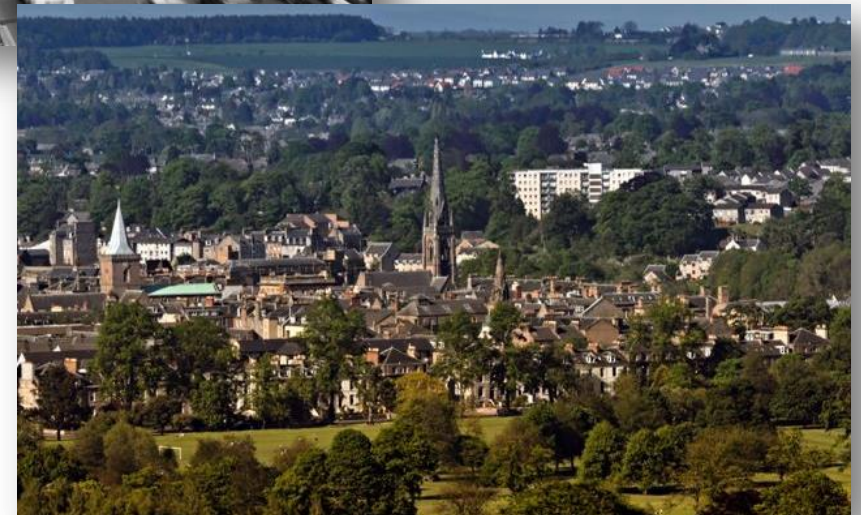
### Who is this guidance for?

This guidance is aimed primarily at developers, agents and others involved in the preparation of planning applications.

### What is the status of this guidance?

This guidance will become statutory supplementary guidance and form part of the Local Development Plan. It will be used alongside the policies of the Local Development Plan and the Strategic Development Plan (TAYplan) to assess development proposals.

***“The urban landscape can be hard, dirty and congested, restricting the quality of life – even the life chances – of people who live and work there. These kinds of places are neither resilient nor prosperous....Imagine instead a green urban landscape: somewhere you can walk or cycle to school or work through car-free, linear greenways; where meadows run alongside offices and shops; where you can see food being grown in the park. A literally greener place improves well-being and mental health. Getting the landscape right changes the very nature of urban life.”<sup>1</sup>***




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<sup>1</sup> “Grey to Green” CABE



### Development Plan policy

Significant emphasis is placed on green infrastructure throughout the Local Development Plan, from the key objectives, to policies, and through to the detailed site specific developer requirements. Achieving the vision will be supported by a wide range of Local Development Plan policies including:

**PM1B: Placemaking** requires proposals to meet a number of placemaking criteria including the incorporation of green infrastructure into new developments and making connections where possible to green networks.

**CF1B: Open Space within New Developments** requires that opportunities are pursued through the development process to create, improve and avoid fragmentation of green networks and core paths networks.

**NE4: Green Infrastructure** requires all new development to contribute to the creation, protection, enhancement and management of green infrastructure by the:

- a) incorporation of green infrastructure into new developments, particularly where it can be used to mitigate any negative environmental impact of the development, and link green infrastructure to the wider green network;
- b) incorporation of high standards of environmental design;
- c) protection of the countryside from inappropriate development whilst supporting its positive use for agriculture, recreation, biodiversity, health, education and tourism.

In addition development should contribute to the protection, enhancement and management of:

- d) open spaces and linkages for active travel or recreation including links between open spaces and the wider

countryside and the provision of new connections where required;

- e) existing species and habitats and the creation of new habitats and wildlife corridors, including trees, hedgerows and woodlands where appropriate; and
- f) watercourses, waterbodies, floodplains and wetlands which are important contributors to the network of blue and green corridors for the alleviation of flood risk, wildlife, recreation and the amenity needs of the community.

**In other words, not only should development contribute towards new green infrastructure as the need arises as a result of individual developments, a contribution should also be made towards existing green infrastructure, by improvement or enhancement and / or by ensuring that there is no adverse impact or fragmentation of existing green infrastructure as a result of development.**

These are requirements placed on developers by Local Development Plan policy. However there is also a growing demand from the public for developers to create places which are healthier, more attractive and pleasant, more sustainable and better able to withstand the effects of climate change, and which work with nature and the environment rather than against it. High quality green infrastructure can greatly enhance the perceived value of an area to homebuyers and business alike and so for developers investing time, effort and resources in green infrastructure makes economic sense.

The Local Development Plan conforms with the Strategic Development Plan (TAYplan) and this supplementary guidance has been developed in line with the approved TAYplan and the work which is underway on the emerging new TAYplan. Once the new TAYplan has been approved there will be an opportunity to review this supplementary guidance if required.

## What are we trying to achieve?

*Our Vision is that green infrastructure across Perth and Kinross will be high quality and multifunctional, allowing the free and easy movement of people, animals and plants, and delivering a wide range of ecosystem services.*

To achieve this vision there are four key aims which are to:

- **Protect, enhance and prevent the fragmentation of existing green infrastructure**
- **Require the creation of new green infrastructure where the need arises as a result of development**
- **In conjunction with development proposals, maximise the role of green infrastructure to improve the quality of the environment to benefit people, animals and plants alike**
- **In conjunction with development proposals, maximise the role of green infrastructure in addressing climate change and adapting to its impacts**



## BACKGROUND

### What is green infrastructure?

Infrastructure supports our lives and our livelihoods. Many different elements make up an area's infrastructure. The following diagram shows that in addition to what we traditionally think of as 'grey' infrastructure, such as roads and rail networks, drainage systems, gas and electricity networks or telephone line networks, there are also a range of 'green' networks and these 'green' networks form an equally critical part of the infrastructure of our towns and cities. 'Green' networks include blue features such as rivers and wetlands.



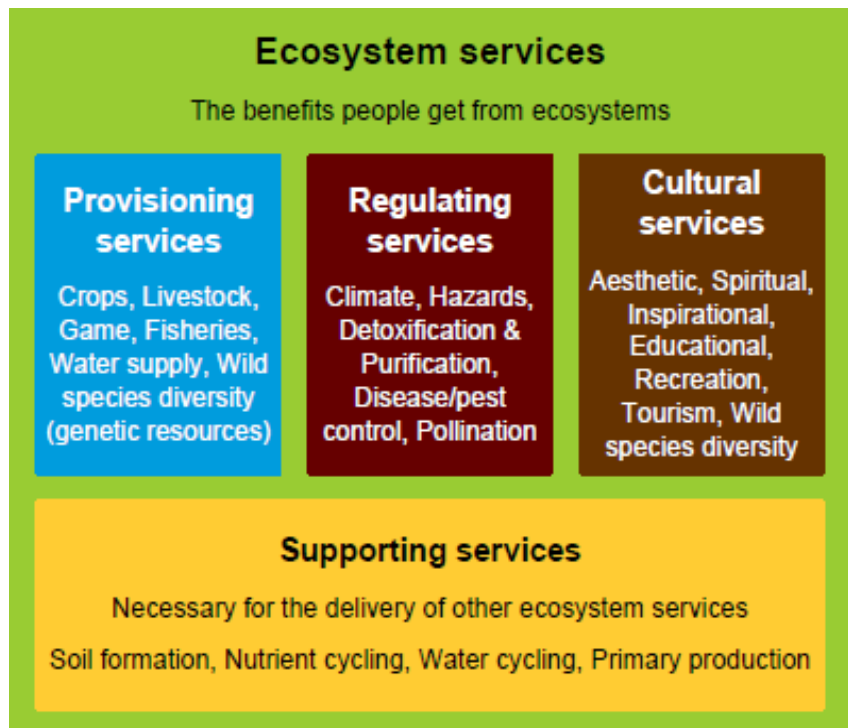
There is no single definition of green infrastructure but for the purposes of this supplementary guidance **green infrastructure** is defined as **the network of natural and semi-natural areas, features and spaces that lie within and between our towns and cities and which provide multiple social, economic and environmental benefits. Included are natural 'green' and 'blue' features such as parks, woodlands, street trees, wildlife habitats, allotments, rivers, wetlands and ponds, and man-made features such as cycle and core paths, and green roofs.**





### What does green infrastructure do?

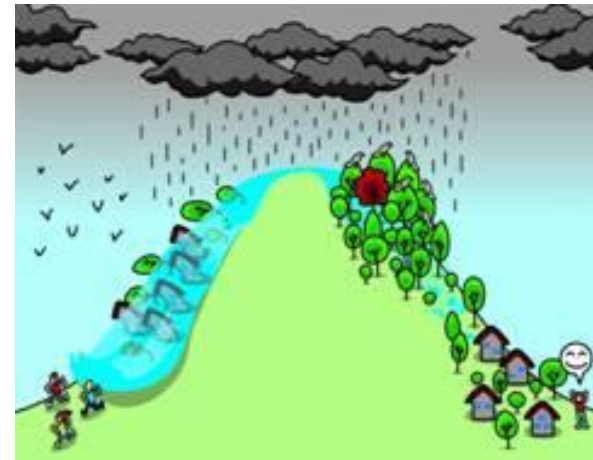
Green infrastructure allows the essential benefits of nature to be provided to people. These essential benefits are known as **Ecosystems Services** and include the provision of food, clean air and water, regulating the effects of climate change, and cultural benefits such as providing opportunities for recreation and exercise.



<sup>2</sup> 'Green Infrastructure – Valuation Tools Assessment' Natural England Commissioned report NECR126

These ecosystem services are 'free' and as a result are often undervalued and taken for granted. But could we afford to replace them? With the ever increasing costs of maintaining grey infrastructure and the increasing pressure on the environment resulting from urban expansion, the value of these services from nature are increasingly being recognised and appreciated.

***“Road systems are crucial because we demand transportation services; electrical grids are important because we depend on reliable supplies of electricity to power our society. Likewise, green infrastructure systems provide ecosystem services that are vital, to our communities and economy.”<sup>3</sup>***



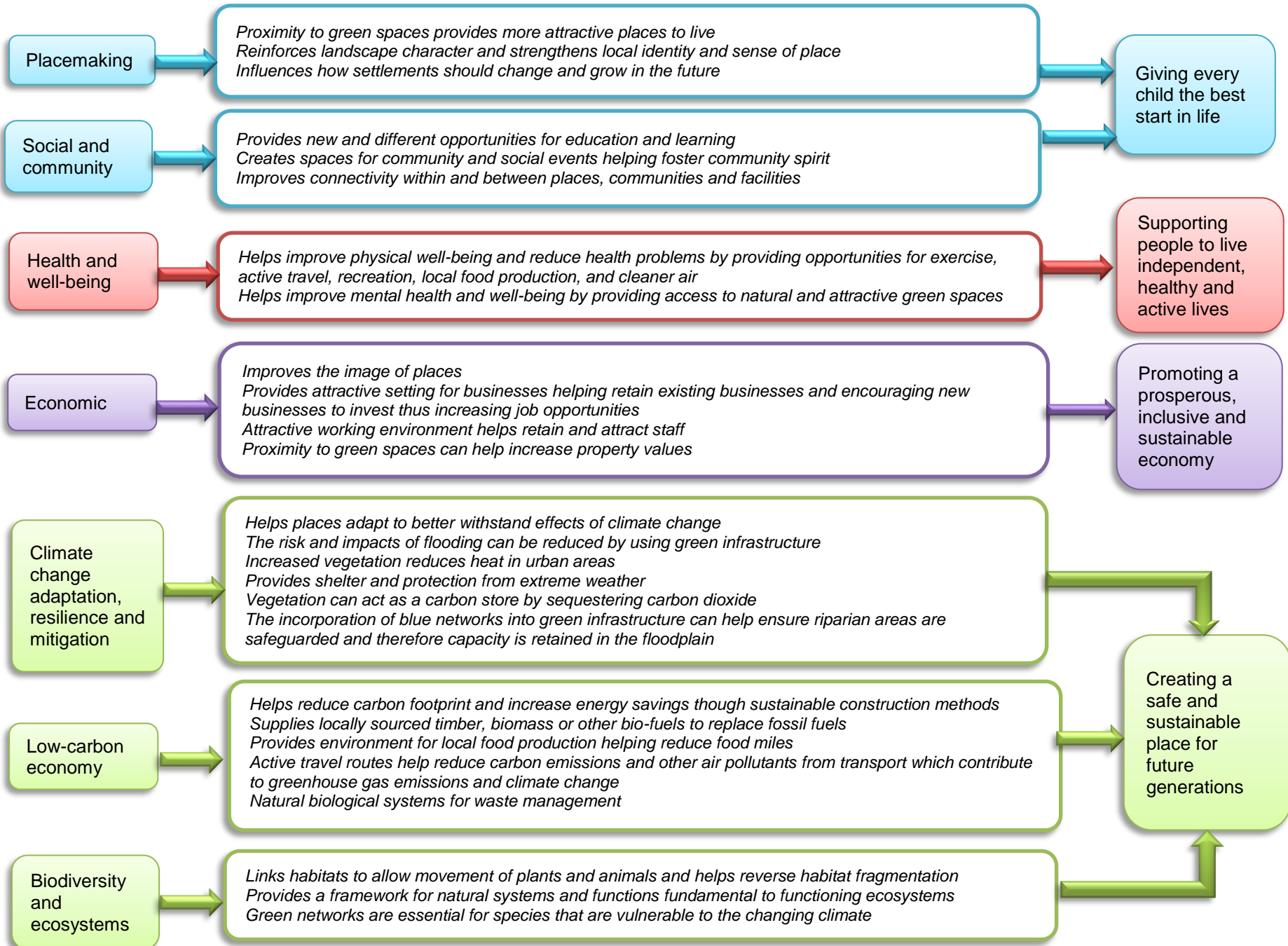
As well as delivering ecosystem services, green infrastructure provides a wide range of benefits to both the functioning of our towns and cities and to us as individuals in terms of our health and well-being. In this respect green infrastructure can also help achieve a number of the Council's Community and Corporate Plan strategic objectives as shown in the following diagram.

<sup>3</sup> 'Greening the Grey – Green Infrastructure for Sustainable Development'

<sup>4</sup> Illustration showing regulating effects of trees - from EU website:  
<http://ec.europa.eu/environment/nature/ecosystems/illustrations.htm>

## GREEN INFRASTRUCTURE FUNCTIONS / BENEFITS

## PERTH &amp; KINROSS STRATEGIC OBJECTIVES



### Green infrastructure principles

Key to green infrastructure are the principles of **multifunctionality** and **connectivity**.

**Multifunctionality is the integration of different land uses and activities within the same site in order to maximise the benefits and make the most efficient use of land**

Often 'grey' infrastructure is designed to perform a single function, such as a flood control or drainage system. A key benefit of green infrastructure on the other hand, is its multifunctionality: green infrastructure can perform several functions and provide several benefits on the same piece of land or water. These functions or benefits can be:

- Environmental e.g. help conserve biodiversity or improve an area's resilience to the effects of climate change
- Social e.g. provide a park or sustainable urban drainage system
- Economic e.g. provide an attractive setting for business or help to increase property prices.

**Green infrastructure has the potential to tackle several issues or problems at once whilst providing the maximum amount of benefits.**

**Example:** A network of green roofs, bioswales, urban forests, and rain gardens can capture, infiltrate, filter and store rain, and thus reduce the investment required in engineering storm water treatment systems. At the same time, this green infrastructure network is reducing energy consumption by shading and insulating, improving public health by providing open space access to

underserved populations, sequestering carbon, creating habitat for wildlife, birds and insects, and improving property values<sup>5</sup>



***“By maintaining healthy ecosystems, reconnecting fragmented natural areas and restoring damaged habitats, green infrastructure offers an economically viable and sustainable infrastructure that provides goods and services by which multiple objectives can be addressed.”<sup>8</sup>***

<sup>5</sup> From ‘Greening the Grey – Green Infrastructure for Sustainable Development’ Center for Leadership in Global Sustainability at Virginia Tech

<sup>6</sup> Photo of green roofs from ‘The Multifunctionality of Green Infrastructure’ Science for Environment Policy

<sup>7</sup> Photo from ‘Rain Garden Guide’ Bray, Gedge, Grant & Leuthvilay

<sup>8</sup> ‘Design, Implementation and Cost Elements of Green Infrastructure Projects’



**Connectivity is the linking together of green areas, features and spaces to enable people, animals and plants to move between them**

Many of the elements of green infrastructure are already in place across Perth & Kinross and these are shown on the 'Existing Green Infrastructure' map on the following page. However, like other forms of infrastructure such as roads or power supplies, their true value relies on them being linked together as part of a network.

***“A lone stretch of road or a single phone pole, disconnected from a larger network, are not considered infrastructure. Likewise, a single green roof or a random scattering of street trees are not going to produce the level of ecosystem services required to support vibrant and sustainable cities....green infrastructure is... a connective network of features building on each other to provide essential ecosystem services to the communities it serves.”<sup>9</sup>***

It is sometimes easier for the planning process to deliver particular types of green areas, features, or spaces for example, a sports field or a play area. However to function as green infrastructure such spaces need to be high quality, deliver a range of functions, and form part of a network.

**Example:** An urban park inside a city might well be considered an integral part of green infrastructure if it acts as a cool air corridor, absorbs excess water run-off and offers an attractive outdoor area for recreation and wildlife. On the other hand, a patch of uniform grass that contains no other environmental features is unlikely to qualify as green infrastructure.<sup>10</sup>



**✗ Single function open space unlikely to class as green infrastructure in its current state. Opportunities could be explored to enhance this space to provide multiple green infrastructure benefits**

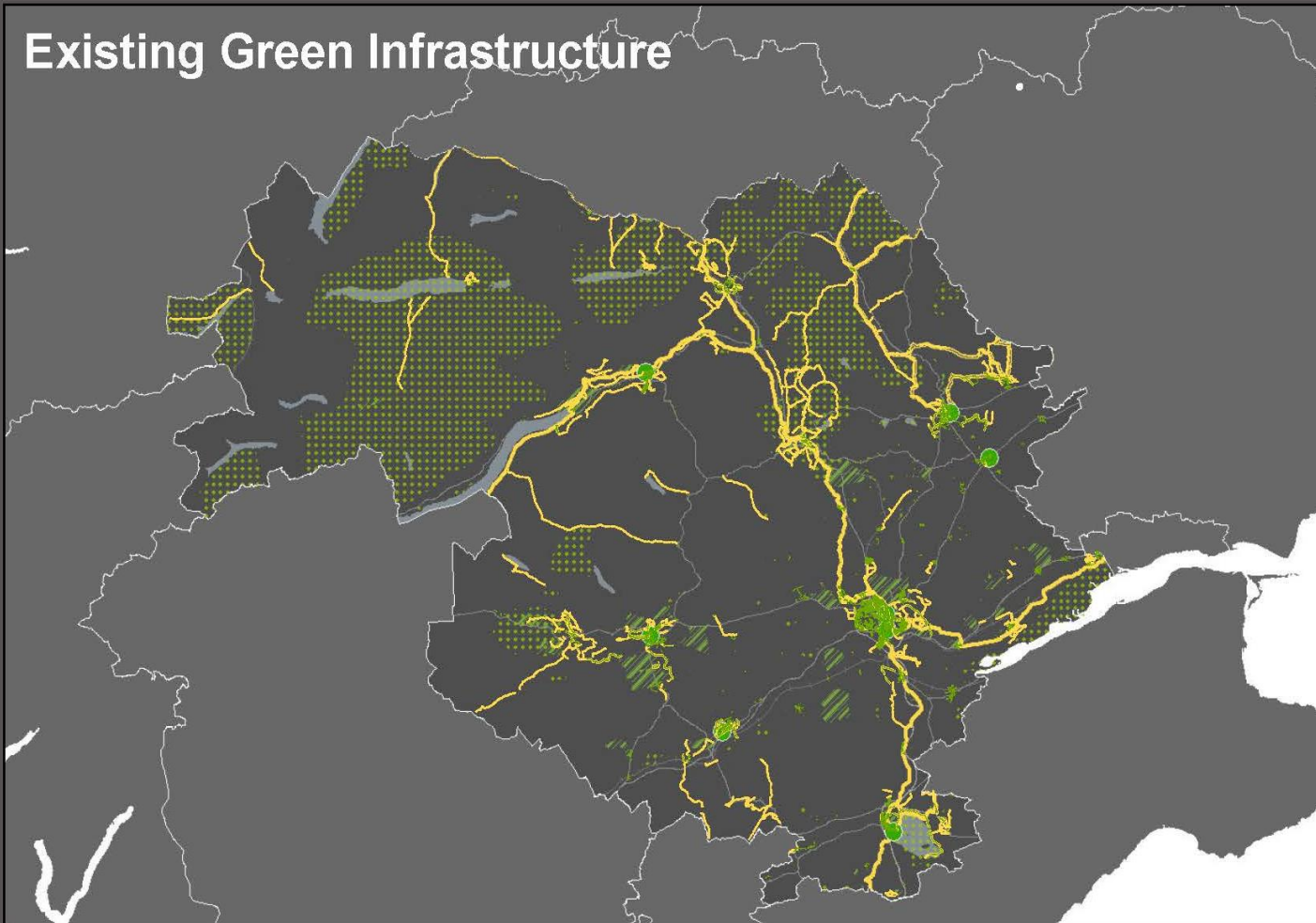


**✓ Open space at North Inch incorporating range of green infrastructure functions**

<sup>9</sup> 'Greening the Grey – Green Infrastructure for Sustainable Development'

<sup>10</sup> Example from 'Building a Green Infrastructure for Europe'

## Existing Green Infrastructure



Maintained open space



Protected sites  
(NSA, NP, SAC,  
SPA, Ramsar, SSSI)



Gardens and  
designed  
landscapes



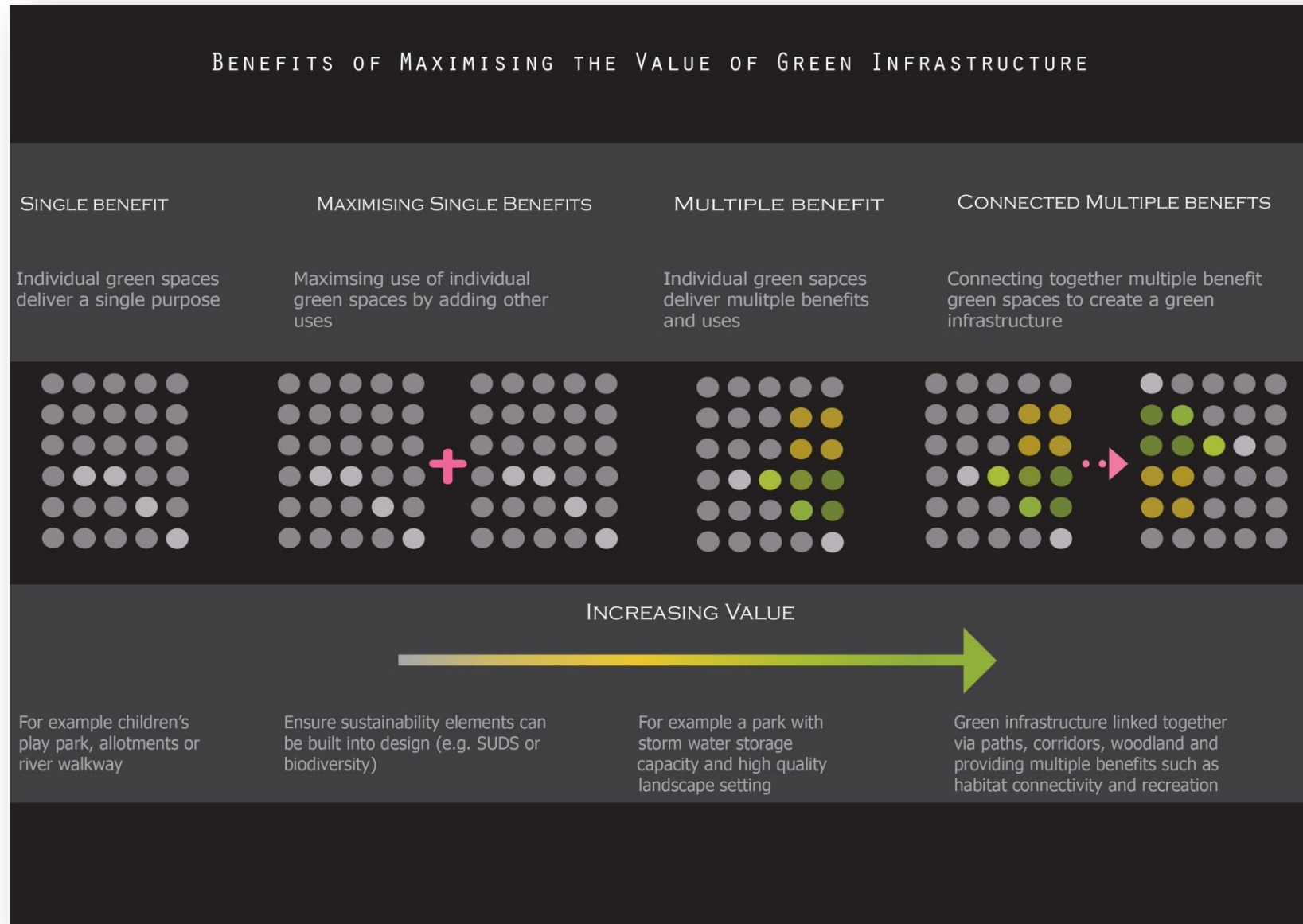
Major Parks



Access - Core and signposted  
paths, long distance routes and  
cycleways

This diagram demonstrates how the benefits of individual green areas, features and spaces can be maximised by connecting them together. The illustrations in this diagram correspond with those

used in the green infrastructure strategy maps in the following section.





## PERTH & KINROSS GREEN INFRASTRUCTURE STRATEGY

The land use planning system is one of the most important means of protecting and delivering green infrastructure. It provides a spatial perspective to co-ordinate individual actions in order to create and reinforce the network of walking and cycling routes, recreation areas, habitats, green corridors and townscapes. It helps ensure that the right kinds of green areas, features and spaces are created in the right place, and that they give the widest possible range of benefits.<sup>11</sup>

This section sets out the process for developing a green infrastructure strategy for Perth and Kinross and how this has been used to identify the main opportunities for improving green infrastructure across the Council area.

**Strategic Development Areas** are those areas where green infrastructure is most likely to be planned and implemented through the Plan process and designed in through the masterplanning process. These Strategic Development Areas are the areas which will see the greatest change and therefore have the potential to make an important contribution to the expansion of strategic green infrastructure. The Local Development Plan identifies the site specific developer requirements for each of these Strategic Development Areas and these requirements will be expanded upon through the masterplanning process. Note – for the development at Oudenarde (Perth Core South East) an approved masterplan is already in place. An example of this process for Perth Core Area North West is shown in the next section.

### Opportunities mapping: using the strategy maps

The Green Infrastructure Opportunities Mapping analysis undertaken by Perth and Kinross uses GIS based analysis to identify areas of correlation between four data layers. These data layers collectively represent the current extent and composition of the green network. They also show where the network should be expanded in terms of habitats, access and health, landscape, and water management where this coincides with land use change which may present a delivery mechanism, for example through development. The four layers consist of the following:

- Analysis of the strategic biodiversity opportunities utilising integrated habitat models;
- Analysis of active travel opportunities with a particular focus on access to greenspace using integrated access models
- Analysis of the water environment using water quality and flood information
- Analysis of cultural heritage and landscape assets
- Focus on growth opportunities using **Strategic Development Areas** and **wider Perth and Kinross development sites**.

**Wider Perth and Kinross development sites** represent those areas identified through the Local Development Plan and the related Strategic Environmental Assessment (SEA) where an opportunity exists to strengthen green infrastructure through proposed development. However all development proposals are an opportunity to help towards maintaining, enhancing and preventing fragmentation of green infrastructure.

<sup>11</sup> TAYplan Topic Paper 4: Strategic Place Shaping, Green Networks, Climate Change Adaptation and Town and City Centres

The cumulative GIS analysis of green infrastructure organises and analyses the above-mentioned data to examine, characterise, and quantify the combined benefits of green infrastructure for the delivery of multiple services for people and the environment. The assessment was undertaken by overlaying strategic *landscape level* opportunities in a GIS to produce a cumulative or multiple benefits green infrastructure map. Further detail can be found in the Technical Appendix. These green infrastructure strategy maps are provided at the strategic scale and for each of the main settlements in Perth and Kinross. Identified geographical locations, or 'hotspots', where the opportunity exists to deliver multiple green infrastructure benefits are illustrated on maps 1 to 8 and summarised in table 1 below.

**Maps 1a – 8a:** Green infrastructure across Perth and Kinross is shaded from grey through to green depending on the number of green infrastructure functions or benefits delivered in each area. The maps highlight those areas or 'hotspots' which data analysis has identified as having the highest degree of opportunity to deliver a range of benefits through the enhancement of green infrastructure. Map 1a shows the *strategic green infrastructure opportunities* identifying those areas across Perth & Kinross which have the greatest potential to deliver multiple green infrastructure benefits. The analysis is focussed on urban development areas where the most opportunity exists to deliver green infrastructure through development. It shows a concentration of opportunities in conjunction with development proposals around the Strategic Development Areas in the Perth Core but also opportunities in wider Perth and Kinross at Dunkeld / Birnam, Aberfeldy, Pitlochry, Kinross / Milnathort, Crieff and the Carse of Gowrie (maps 2a – 8a).

**Maps 1b – 8b:** The data outputs were generated primarily to inform the Local Development Plan and are high level and strategic in nature. However, underpinning each of the 'hotspots' is a wealth of data which can be interrogated at a much finer resolution to understand more fully what the specific opportunities associated with an area are and how they might be delivered. Maps 1b – 8b

detail the type and extent of those strategic opportunities which helped to identify the 'hotspots'.

An example of the application of the green infrastructure strategy at a site scale is included in the following section.

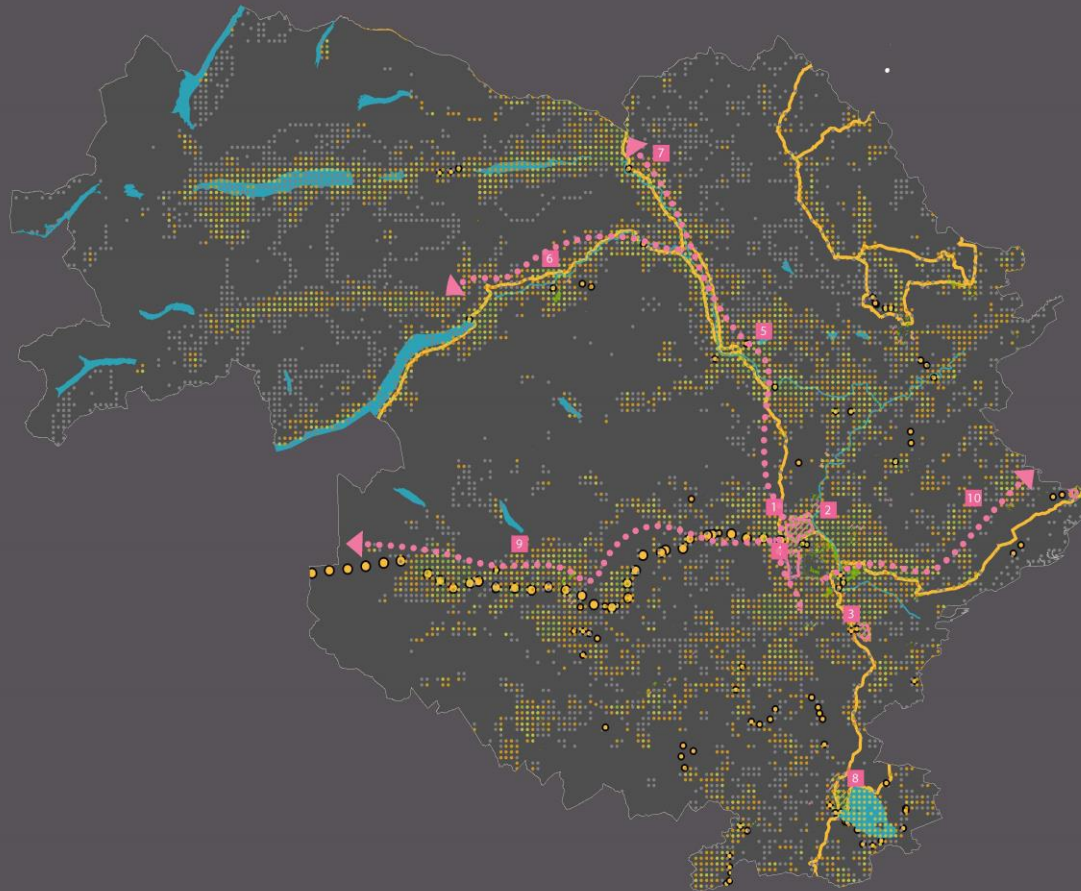
The following colour key is used throughout the maps and associated table 1 to represent the key themes to be delivered through this guidance.



This work will help us clearly target and communicate green infrastructure areas with the highest opportunity to deliver multiple benefits. A clear picture of what we hope to retain and enhance will help us shape growth and development to improve the quality of life for Perth and Kinross communities.

For all maps the proposed accesses shown are future paths and cycleways as identified by the Council and / or Tactran. Proposed open spaces are those identified in the Local Development Plan.

Map 1a: Strategic scale green infrastructure map



Potential green infrastructure linkages are landscape level linkages to deliver green infrastructure multiple benefits and connect strategic opportunity areas (as identified in table 1 below)

#### Multiple benefit green network

##### Number of benefits

- 1 - 2
- 2 - 4
- 3 - 6
- 6 or more

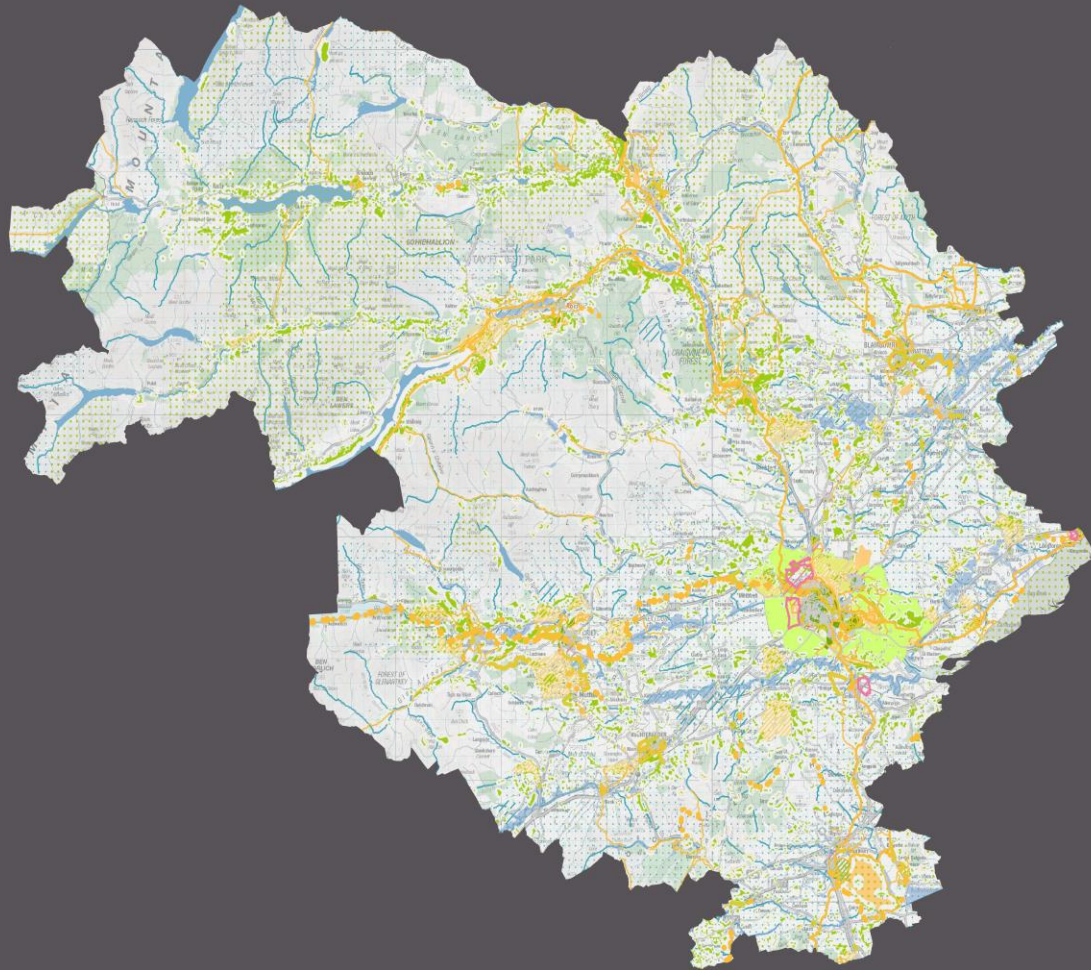
- Access - Core and signposted paths, long distance routes and cycleways
- Proposed access
- Blue way
- Potential green infrastructure linkages















- Existing maintained greenspace
- Existing green corridor
- Proposed open space
- Strategic development areas
- Development plan proposals

- 1 Perth Core North West
- 2 Perth Core North East
- 3 Perth Core South East
- 4 Perth Core South West
- 5 Dunkeld/Birnam
- 6 Aberfeldy
- 7 Pitlochry
- 8 Kinross/Milnathort
- 9 Crieff
- 10 Carse of Gowrie

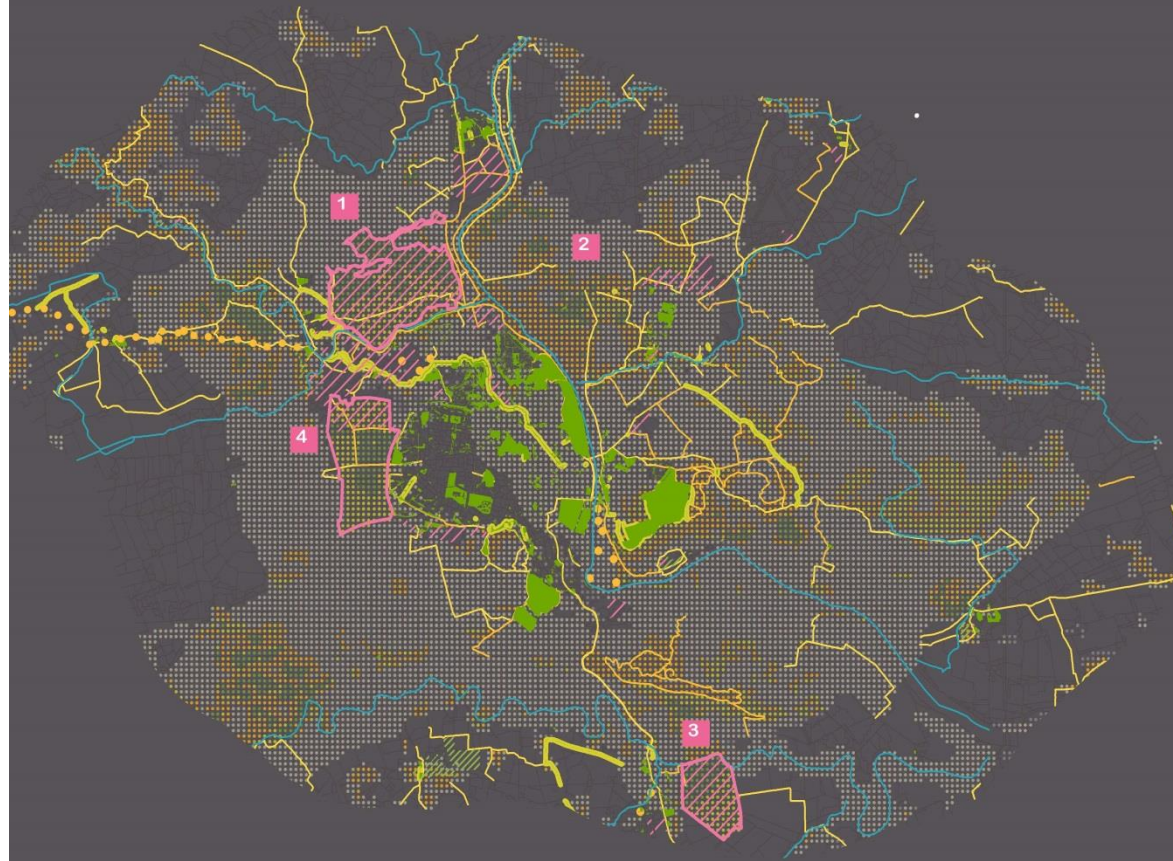


**Map 1b: Strategic scale green infrastructure habitat, cultural and landscape, access and water management priorities**



-  Access - Core and signposted paths, long distance routes and cycleways
-  Proposed access
-  Blue way
-  Existing maintained greenspace
-  Existing green corridor
-  Areas that may flood (medium probability) opportunity area
-  Potentially vulnerable areas and major impact historical flood events (SEPA)
-  Less than good water quality intercatchments
-  Access Network
-  Integrated Habitat Network
-  Proposed open space
-  Gardens and Designed Landscapes
-  Protected sites (NSA, SAC, SPA, SSSI, Ramsar, SSSI)
-  Development plan proposals
-  Strategic Development Areas

Map 2a: Local scale green infrastructure map for the Perth Core Area



Map 2a shows in more detail the Perth Core Area and the Strategic Development Areas within the Core. These areas are expected to make an important contribution to the expansion of green infrastructure.

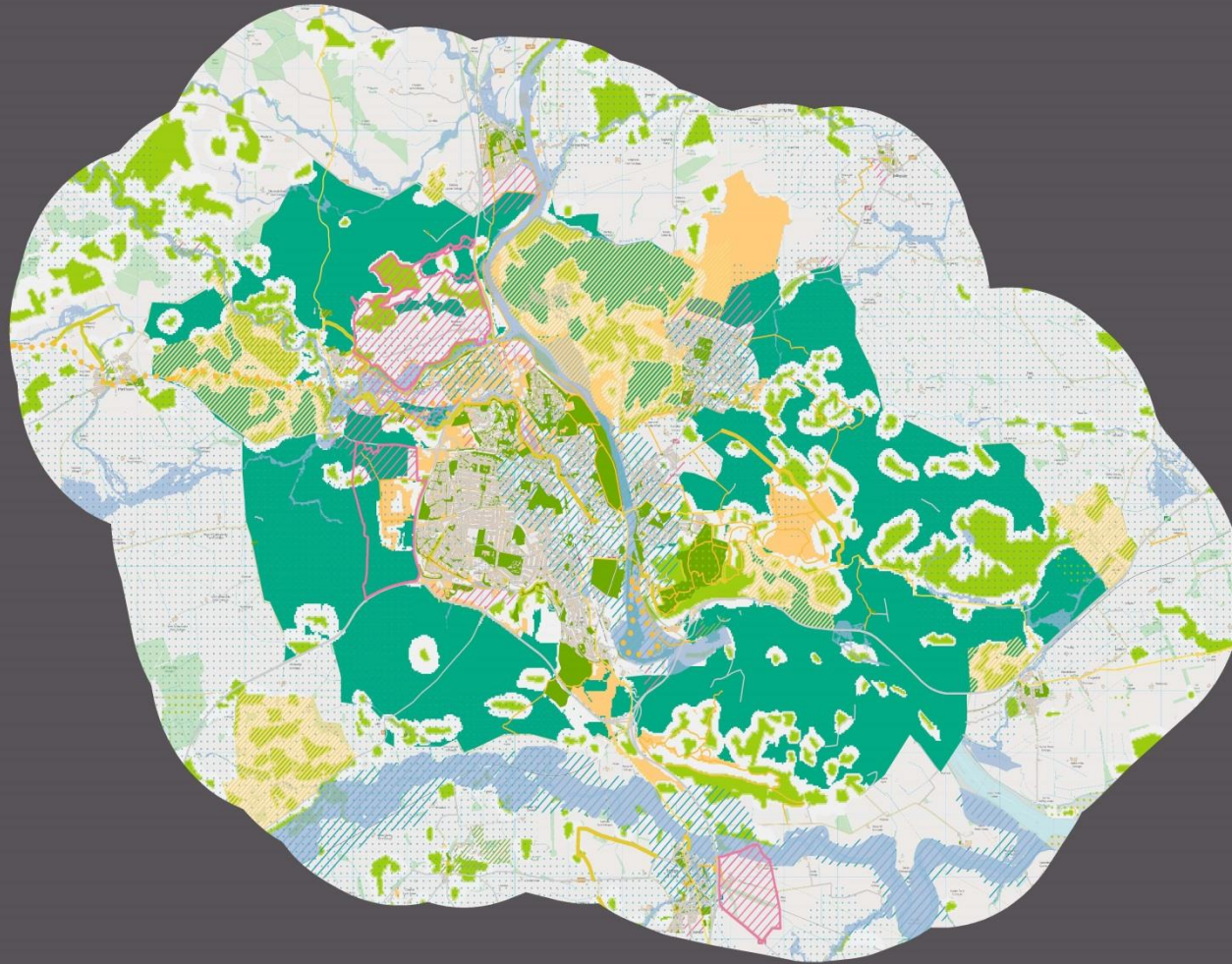
#### Multiple benefit green network

















- Number of benefits
- 1 - 2
  - 2 - 4
  - 3 - 6
  - 6 or more
- Access - Core and signposted paths, long distance routes and cycleways
- Proposed access
- Blue way
- Existing maintained greenspace
- Existing green corridor
- Proposed open space
- Development plan proposals
- Strategic Development Areas
- 1 Perth Core North West
  - 2 Perth Core North East
  - 3 Perth Core South East
  - 4 Perth Core South West





**Map 2b: Local scale green infrastructure habitat, cultural and landscape, access and water management priorities in Perth Core Area**



-  Access - Core and signposted paths, long distance routes and cycleways
-  Proposed access
-  Blue way
-  Existing maintained greenspace
-  Existing green corridor
-  Areas that may flood (medium probability) opportunity area
-  Potentially vulnerable areas and major impact historical flood events (SEPA)
-  Less than good water quality intercatchments
-  Access Network
-  Integrated Habitat Network
-  Proposed open space
-  Gardens and Designed Landscapes
-  Protected sites (NSA, SAC, SPA, SSSI, Ramsar, SSSI)
-  Greenbelt
-  Development plan proposals
-  Strategic Development Areas





Map 3a: Local scale green infrastructure map for Dunkeld / Birnam



#### Multiple benefit green network

##### Number of benefits

- 1 - 2
- 2 - 4
- 3 - 6
- 6 or more

Access - Core and signposted paths, long distance routes and cycleways

Proposed access

Blue way

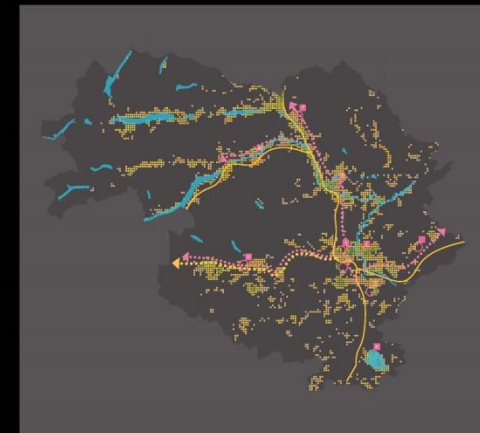
Existing maintained greenspace

Existing green corridor

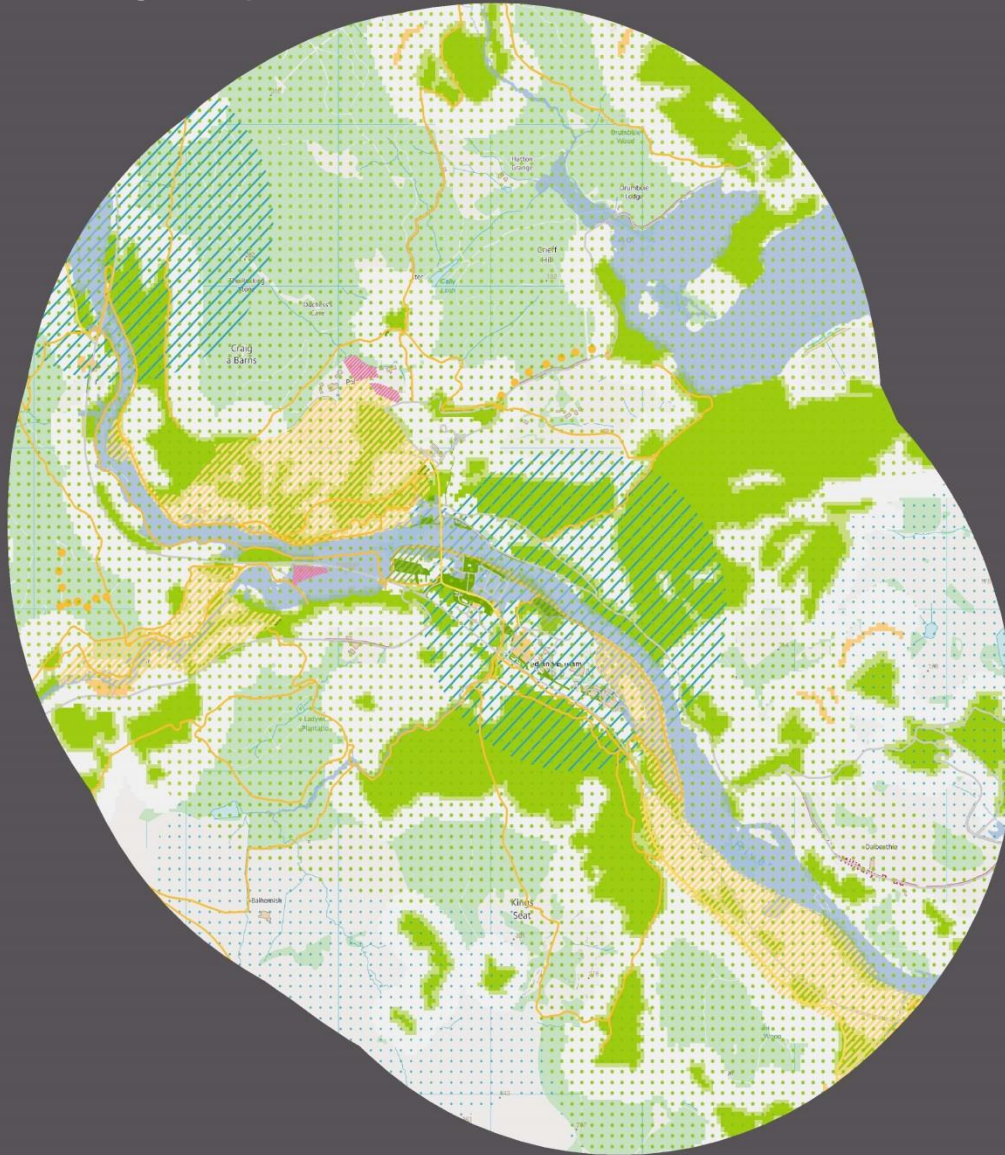
Proposed open space
















Development plan proposals

5 Dunkeld/Birnam



**Map 3b: Local scale green infrastructure habitat, cultural and landscape, access and water management priorities in Dunkeld / Birnam**



-  Access - Core and signposted paths, long distance routes and cycleways
-  Proposed access
-  Blue way
-  Existing maintained greenspace
-  Existing green corridor
-  Areas that may flood (medium probability) opportunity area
-  Potentially vulnerable areas and major impact historical flood events (SEPA)
-  Less than good water quality intercatchments
-  Access Network
-  Integrated Habitat Network
-  Proposed open space
-  Gardens and Designed Landscapes
-  Protected sites (NSA, SAC, SPA, SSSI, Ramsar, SSSI)
-  Development plan proposals
-  5 Dunkeld/Birnam





Map 4a: Local scale green infrastructure map for Aberfeldy



Multiple benefit green network

Number of benefits

- 1 - 2
- 2 - 4
- 3 - 6
- 6 or more

Access - Core and signposted paths, long distance routes and cycleways

Proposed access

Blue way

Existing maintained greenspace

Existing green corridor

Proposed open space

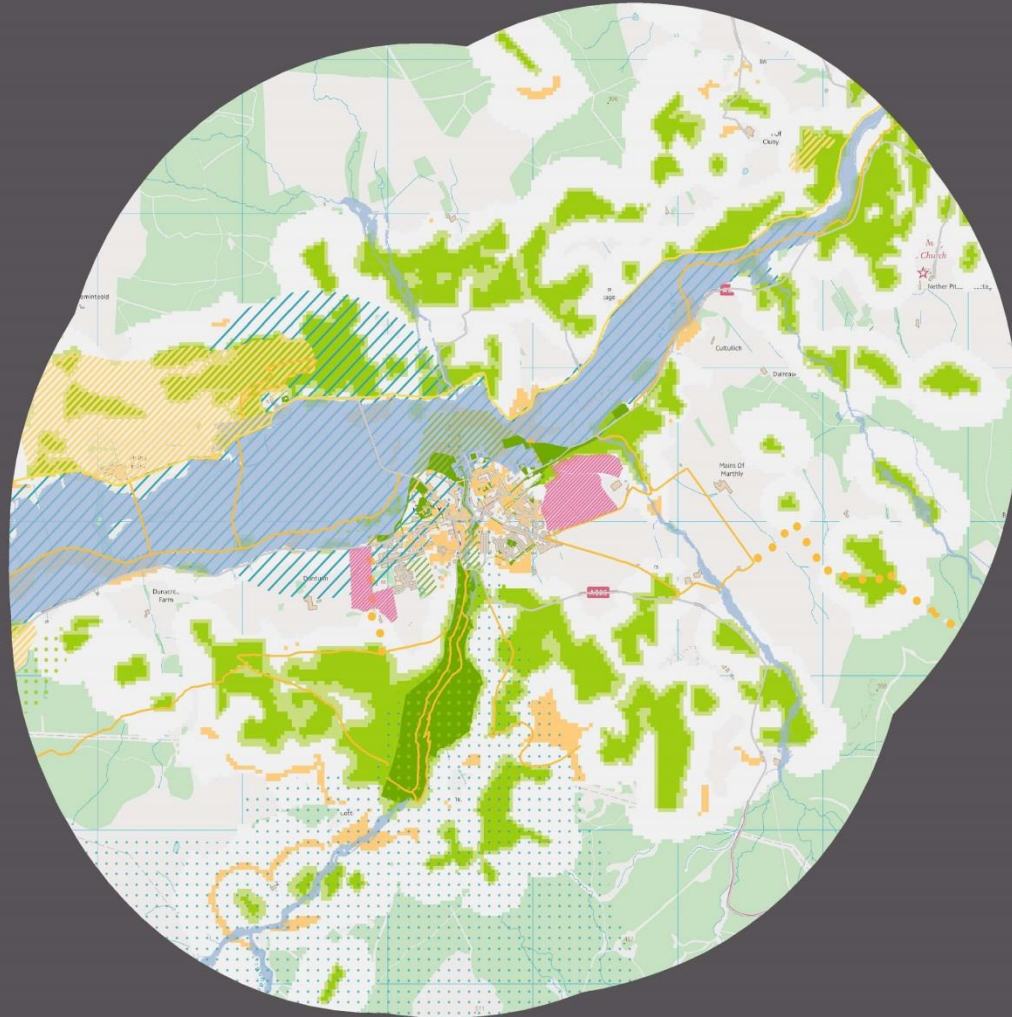
Development plan proposals

6 Aberfeldy





**Map 4b: Local scale green infrastructure habitat, cultural and landscape, access and water management priorities in Aberfeldy**



- Access - Core and signposted paths, long distance routes and cycleways
  - Proposed access
  - Blue way
  - Existing maintained greenspace
  - Existing green corridor
  - Areas that may flood (medium probability) opportunity area
  - Potentially vulnerable areas and major impact historical flood events (SEPA)
  - Less than good water quality intercatchments
  - Access Network
  - Integrated Habitat Network
  - Proposed open space
  - Gardens and Designed Landscapes
  - Protected sites (NSA, SAC, SPA, SSSI, Ramsar, SSSI)
  - Development plan proposals
- 6** Aberfeldy



Map 5a: Local scale green infrastructure map for Pitlochry



Multiple benefit green network

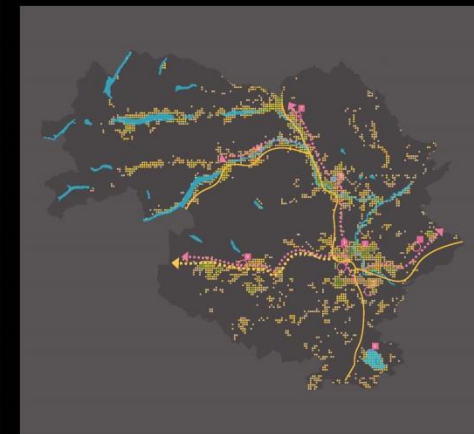
Number of benefits

- 1 - 2
- 2 - 4
- 3 - 6
- 6 or more

- Access - Core and signposted paths, long distance routes and cycleways
- Proposed access
- Blue way

- Existing maintained greenspace
- Existing green corridor
- Proposed open space
- Development plan proposals
















7 Pitlochry





**Map 5b: Local scale green infrastructure habitat, cultural and landscape, access and water management priorities in Pitlochry**



-  Access - Core and signposted paths, long distance routes and cycleways
-  Proposed access
-  Blue way
-  Existing maintained greenspace
-  Existing green corridor
-  Areas that may flood (medium probability) opportunity area
-  Potentially vulnerable areas and major impact historical flood events (SEPA)
-  Less than good water quality intercatchments
-  Access Network
-  Integrated Habitat Network
-  Proposed open space
-  Gardens and Designed Landscapes
-  Protected sites (NSA, SAC, SPA, SSSI, Ramsar, SSSI)
-  Development plan proposals
-  Pitlochry





Map 6a: Local scale green infrastructure map for Kinross / Milnathort



Multiple benefit green network

Number of benefits

- 1 - 2
- 2 - 4
- 3 - 6
- 6 or more

Access - Core and signposted paths, long distance routes and cycleways

Proposed access

Blue way

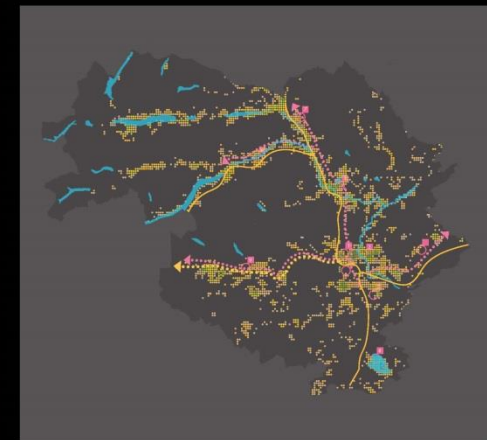
Existing maintained greenspace

Existing green corridor

Proposed open space
















Development plan proposals

8 Kinross/Milnathort



**Map 6b: Local scale green infrastructure habitat, cultural and landscape, access and water management priorities in Kinross / Milnathort**

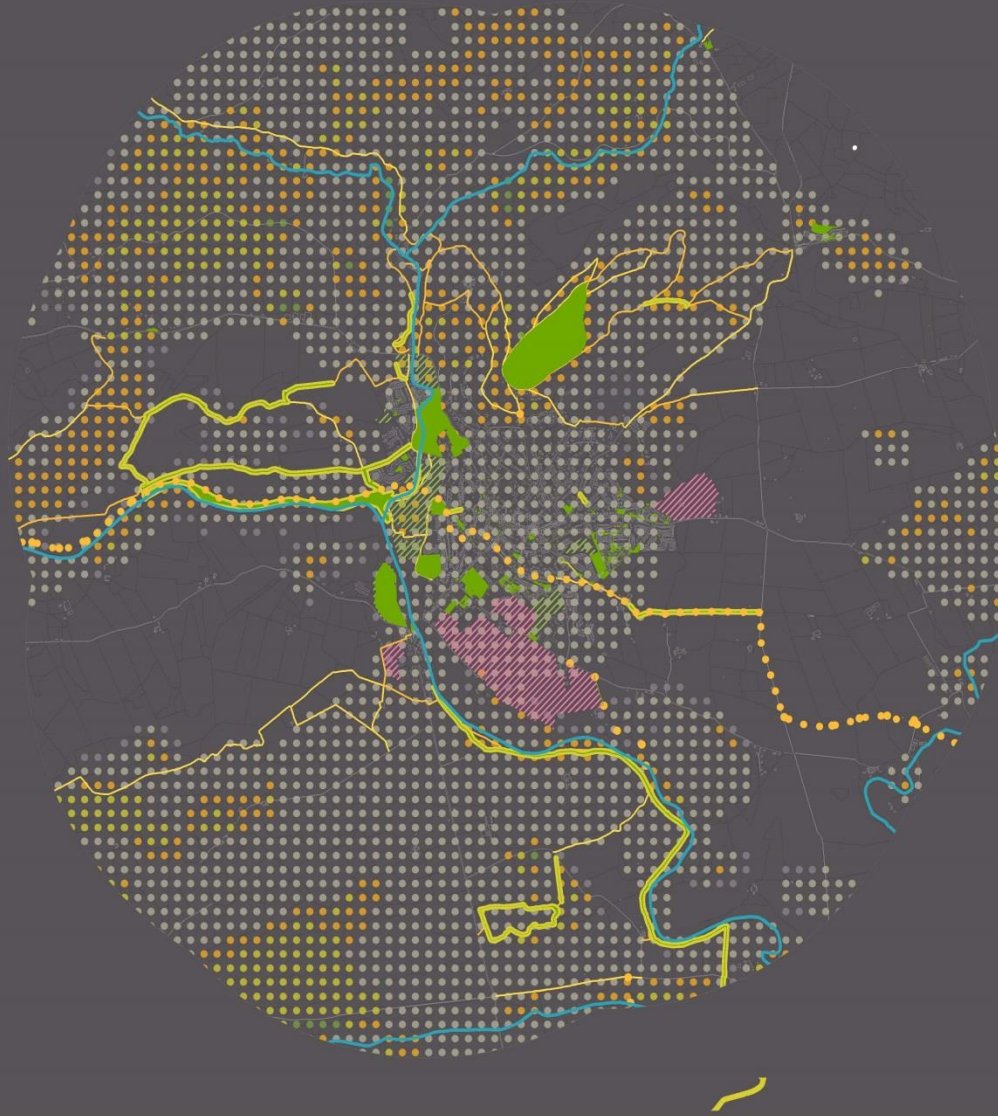


-  Access - Core and signposted paths, long distance routes and cycleways
-  Proposed access
-  Blue way
-  Existing maintained greenspace
-  Existing green corridor
-  Areas that may flood (medium probability) opportunity area
-  Potentially vulnerable areas and major impact historical flood events (SEPA)
-  Less than good water quality intercatchments
-  Access Network
-  Integrated Habitat Network
-  Proposed open space
-  Gardens and Designed Landscapes
-  Protected sites (NSA, SAC, SPA, SSSI, Ramsar, SSSI)
-  Development plan proposals
-  8 Kinross/Milnathort





Map 7a: Local scale green infrastructure map for Crieff



#### Multiple benefit green network

##### Number of benefits

- 1 - 2
- 2 - 4
- 3 - 6
- 6 or more

Access - Core and signposted paths, long distance routes and cycleways

Proposed access

Blue way

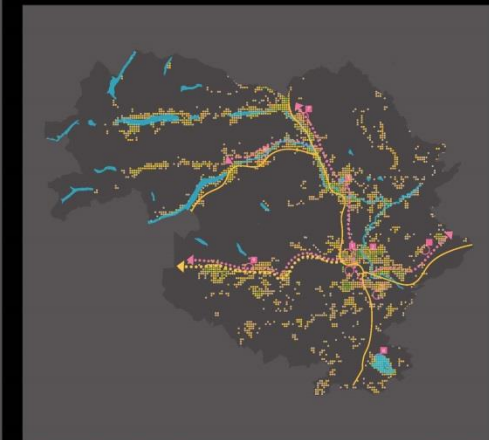
Existing maintained greenspace

Existing green corridor

Proposed open space

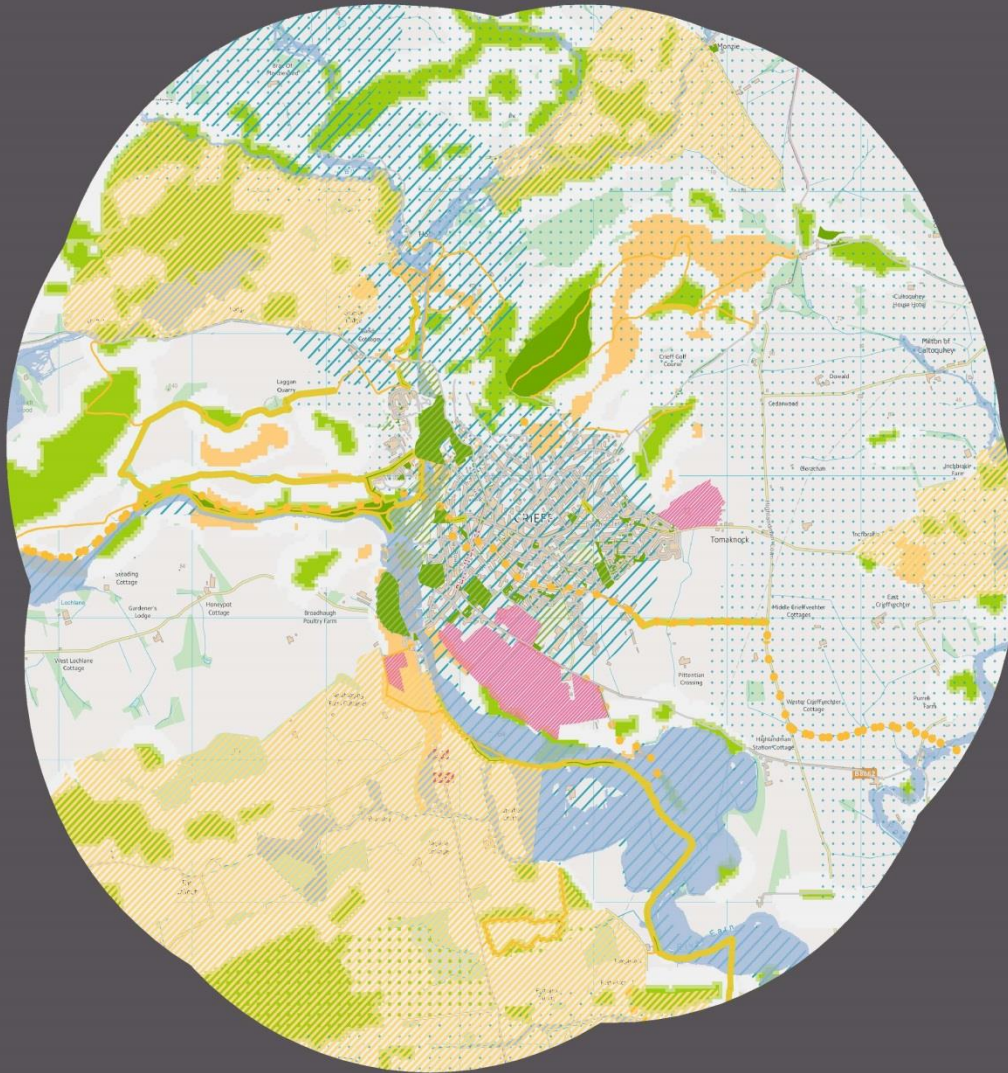
Development plan proposals















9 Crieff





**Map 7b: Local scale green infrastructure habitat, cultural and landscape, access and water management priorities in Crieff**



-  Access - Core and signposted paths, long distance routes and cycleways
-  Proposed access
-  Blue way
-  Existing maintained greenspace
-  Existing green corridor
-  Areas that may flood (medium probability) opportunity area
-  Potentially vulnerable areas and major impact historical flood events (SEPA)
-  Less than good water quality intercatchments
-  Access Network
-  Integrated Habitat Network
-  Proposed open space
-  Gardens and Designed Landscapes
-  Protected sites (NSA, SAC, SPA, SSSI, Ramsar, SSSI)
-  Development plan proposals
-  8 Crieff



Map 8a: Local scale green infrastructure map for Carse of Gowrie



Multiple benefit green network

Number of benefits

- 1 - 2
- 2 - 4
- 3 - 6
- 6 or more

Access - Core and signposted paths, long distance routes and cycleways

Proposed access

Blue way

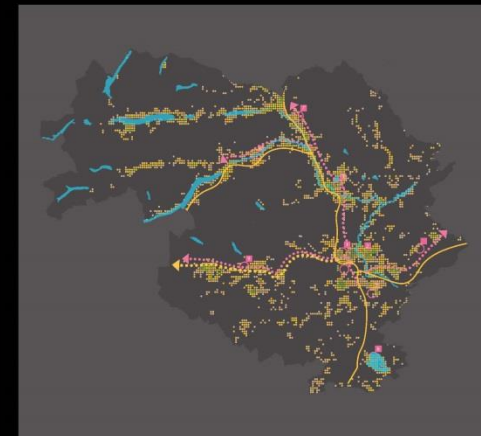
Existing maintained greenspace

Existing green corridor

Proposed open space

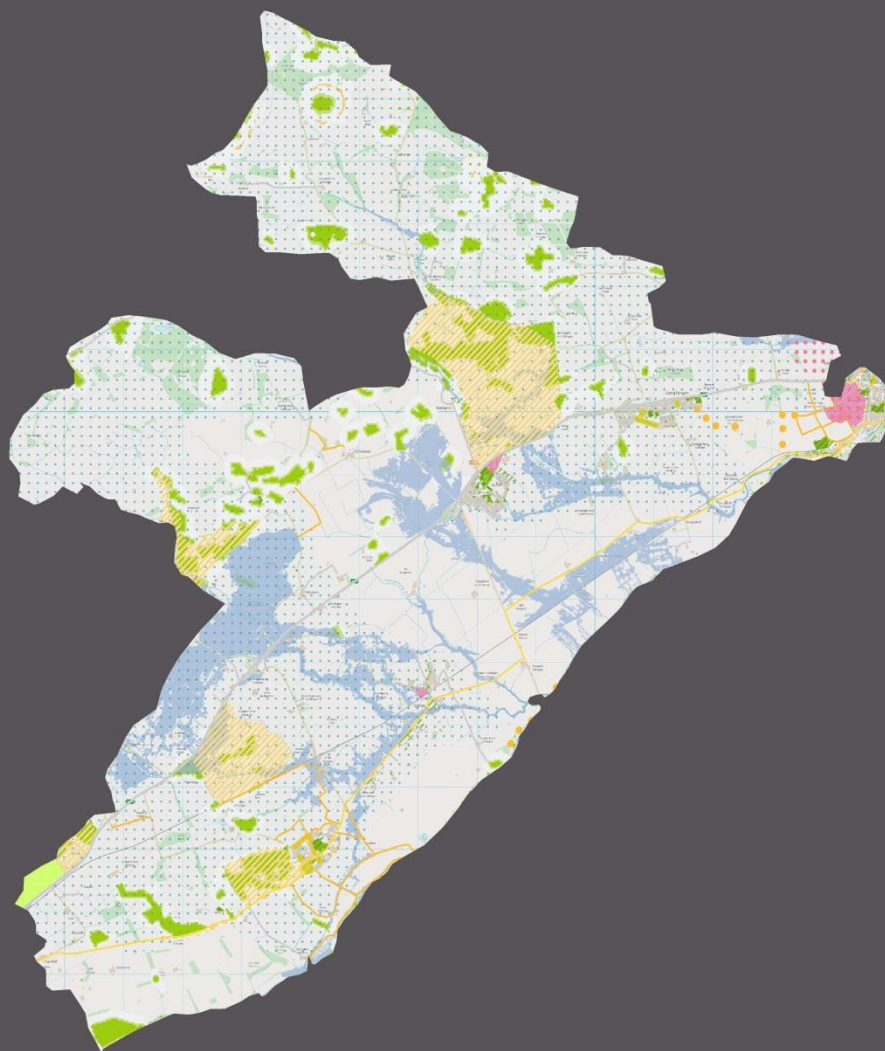
Development plan proposals
















10 Carse of Gowrie





**Map 8b: Local scale green infrastructure habitat, cultural and landscape, access and water management priorities in Carse of Gowrie**



-  Access - Core and signposted paths, long distance routes and cycleways
-  Proposed access
-  Blue way
-  Existing maintained greenspace
-  Existing green corridor
-  Areas that may flood (medium probability) opportunity area
-  Potentially vulnerable areas and major impact historical flood events (SEPA)
-  Less than good water quality intercatchments
-  Access Network
-  Integrated Habitat Network
-  Proposed open space
-  Gardens and Designed Landscapes
-  Protected sites (NSA, SAC, SPA, SSSI, Ramsar, SSSI)
-  Development plan proposals
-  10 Carse of Gowrie






























The specific **green infrastructure opportunities** which relate to each of the ten identified areas are summarised in table 1 below.

Table 1 also gives an indication of the key theme which would be addressed by the delivery of the green infrastructure opportunity in each area and any threats which have been identified.

Table 1

| Strategic Opportunity Areas                                |   | Opportunities   |   | Threats  |
|--|---|---|---|--|
| Place  |   | Green   | Movement  | Water  |
| 1 Perth Core Area North West including Cross Tay Link Road |    | Create habitat corridors to enhance Integrated Habitat Network (IHN) <sup>12</sup> particularly along the perimeter of Bertha Park (H7) and along the south boundary of site E38.   |   | Strategic Development Areas to north and west could lead to fragmentation  |
|  |    | Opportunities also exist for an open space corridor transversing Bertha Park along the Cross Tay Link Road proposed route. Network could be extended to north and west in conjunction with development – these sites contain areas of ancient woodland, wetland and are traversed by the River Almond and adjacent recreational trail. Opportunities for flood water storage and water quality improvement to the south of the area |   | Mature woodland and loch areas to the north of the existing River Almond pathway are susceptible to encroachment from development and will require appropriate site design, enhancement and mitigation |
| 2 Perth Core North East                                    |    | Could benefit from extension and enhancement around Stanley, Balbeggie and east of Scone – creation of habitat and access networks. Enhancement of existing recreation path network could be implemented in conjunction with development at these locations. Opportunity for flood water storage in west and south of the area  |    | Sites to the east (Op22 and H29) border Scone Palace Garden and Designed landscape and as such represent opportunities and limitations for proposed development  |
| 3 Perth Core South East                                    |     | Extend and enhance IHN and access network including proposed core path routes in conjunction with new development particularly at Bridge of Earn / Oudenarde (H14, H15) and Abernethy   |   |  |
|  |    | Opportunities for flood water storage and water quality improvements particularly on the northern border of the site (H15).   |   |  |
|  |     | Improving access and connections to green network along the Carse of Gowrie   |   |  |

<sup>12</sup> Integrated Habitat Network (IHN) is a habitat network which focuses on the connectivity of a mix of habitats in this case woodland, grassland and wetland habitats.

|                         |   |   |   |   |
|-------------------------|---|---|---|---|
| 4 Perth Core South West |    | Potential for further enhancement in conjunction with new development to provide greater access to green / open spaces and to create linkages with IHN and access networks . Opportunities for flood water storage and water quality improvements to the south of the area  |   |   |
| 5 Dunkeld/Birnam        |    | Existing network is strong but still potential to expand IHN and improve linkages between Dunkeld and Birnam and key landscapes for example Dunkeld House and Murthly Castle Gardens and Designed landscapes.   |    | Sites to the north border IHN and Dunkeld house Garden and Designed landscape and as such represent opportunities and limitations for proposed development.                                   |
|                         |    | Protection and expansion of green infrastructure along the River Tay corridor to target flooding issues, Dunkeld and Burnmouth road Potentially Vulnerable Areas (PVA), National Flood Risk Assessment (NFRA) medium probability flood extent and protect previously flooded areas in the settlement. Also an opportunity to improve water quality in surrounding River Tay (River Tummel to River Isla Confluences) intercatchments. |    | Employment site proposed along the southbank of the River Tay located in a medium probability flood risk area. Opportunity to mitigate risks through extension of the wetland habitat network |
|                         |    | Access enhancement through existing national cycle route and core path network along the river corridor . Expansion of core path network on proposed routes to the west and east of the settlement.   |   |   |
| 6 Aberfeldy             |  | Opportunities exist to enhance and extend IHN linkages and provide greater access to open space particularly to the east and west of the settlement in conjunction with development sites   |  | Sites to the east (H36) border existing and proposed recreational paths and as such represent opportunities and limitations for proposed development  |
|                         |  | Protection of riparian corridors to the east and west (River Tay) would enhance wider connectivity with surrounding sites (e.g. Loch Rannoch and Glen Lyon National Scenic Area (NSA) and Forest of Clunie Special Protection Area (SPA) and mitigate flood risk associated with Taymouth Castle to Boat of Clunie PVA.   |   |   |
|                         |  | Development sites are generally located alongside the existing green network<br>Sites to the east (H36) border existing recreational and proposed open space and paths and as such represent opportunities and limitations for proposed development   |   |   |

|                      |   |  |   |   |
|----------------------|---|--|---|---|
| 7 Pitlochry          |    | Opportunities for enhancement of the IHN and proposed open space to the north and east particularly in conjunction with the development of site H39 ( Robertson Crescent) where linkages are possible. Flood water storage opportunities to the south of the site.   |   |   |
|                      |    | Connectivity between ancient woodland sites forming part of the woodland network and recreational access back to the town centre could be improved through the development of site H38 (Middleton of Fonab)  |   |   |
| 8 Kinross/Milnathort |    | Opportunities to enhance habitat and access networks in and around Kinross / Milnathort through new development, particularly to the north and east and at all of the allocated sites  |  | Any development close to the reserve boundary may have adverse impacts on waterfowl populations and the setting and enjoyment of the nature trail at Loch Leven |
|                      |    | Opportunities to provide greater access to open space for leisure and recreation activities. Site to the north (H47 to H50) border existing and proposed open space and as such represent specific opportunities for proposed development.   |   |   |
|                      |    | Maintaining existing greenspace and enhancing riparian corridors along the North and South Quinch River will improve connectivity between Loch Leven and woodland areas to the west of Kinross   |   |   |
|                      |  | Development sites adjoining Loch Leven and the surrounding recreational network are well situated to offer opportunities for improved connectivity. Sites to the south (Op11) border proposed recreational paths and existing open space and as such represent opportunities for proposed development.   |   |   |
|                      |  | Opportunities for enhancement e.g. through creation of integrated habitat corridors and for increased green spaces associated with new development particularly to the east. Sites to the east (e.g. Op15) border wetland habitat networks and offer flood water storage and water quality improvement opportunities along the riparian corridors. |   |   |



|                    |   |   |   |  |
|--------------------|---|---|---|--|
| 9 Creiff           |    | Opportunities for improved access and green corridors with proposed core paths, cycle routes and open space along riparian corridors (e.g. River Earn).   |  | Sites to the south (E26) are located within Drummond Castle Garden and Designed landscape and as such represent opportunities and limitations for proposed development                           |
|                    |     | Opportunities for enhancement of the IHN and access networks to the south particularly in conjunction with the development of sites (E26 and MU7) where linkages are possible.  |   |  |
|                    |    | Sites to the south (E26 and MU7) border PVA Dallerie to Innerpeffray Castle and medium flood risk areas and as such offer flood water storage improvement opportunities along the riparian corridor.  |   |  |
| 10 Carse of Gowrie |    | The Inner Tay Masterplan 2012-22 covers this key area with the aim of providing a framework for sustainable development along the inner Tay and its environs. The core thread running through the Masterplan framework is improving access and connections along, within and to areas beyond the Carse corridor. Identifying and supporting networks which add value to the protection, enhancement and connectivity of habitats and landscapes is a key principle of the Masterplan alongside tackling climate change and establishing quality spaces. A significant number of key projects are either underway or planned and there may be the opportunity to integrate other proposals for development in this area to deliver further green infrastructure improvements along this important corridor between the two cities. |  | Sites to the east of Inchtute (H24) border Rossie Priory Garden and Designed Landscape and contain existing recreational pathways representing both opportunities and limitations to development |
|                    |     | Opportunities for flood storage and greater access to existing and proposed recreational pathways, active travel routes and open space through development of the Strategic Development Area at Invergowrie.  |   |  |

## DELIVERY OF GREEN INFRASTRUCTURE IN PERTH AND KINROSS

### Site and development appraisal

Green infrastructure should be considered right at the start of the planning of a new development site alongside other 'grey' infrastructure requirements such as roads, drainage and power supplies. Early consideration of all the infrastructure requirements together at this early stage will allow opportunities to be identified for combining grey and green infrastructure, or for replacing grey with green solutions. Similar to considering how grey infrastructure within a new site will connect into existing networks in the wider area, so too must thought be given as to how green infrastructure will connect and extend beyond the 'red line' boundary of the development site.

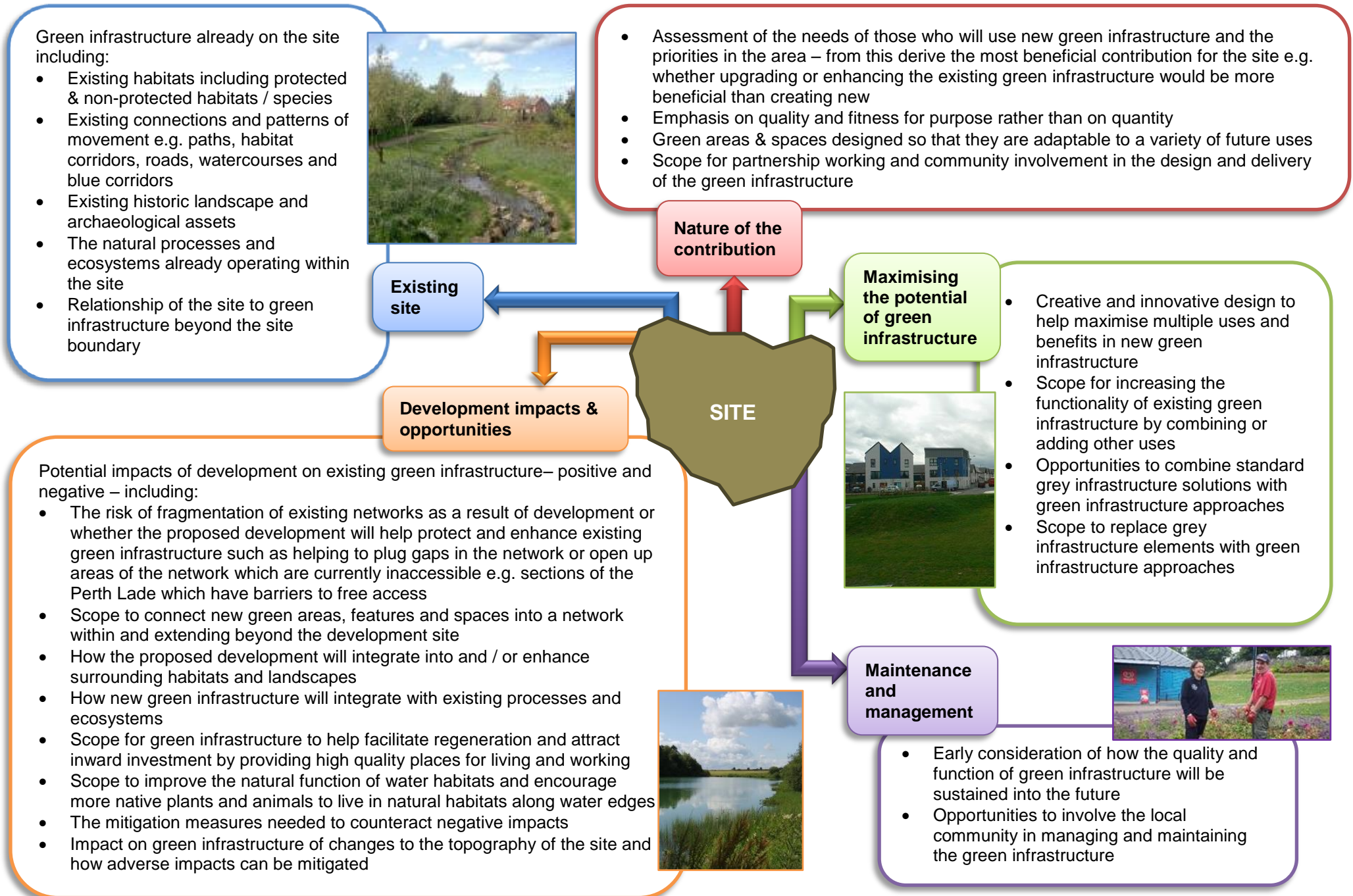
Depending on the scale and nature of the proposed development, the Planning Authority may request the provision of one or more of the following alongside the submission of a planning application:

- **A site plan which details existing green infrastructure on the site including connections beyond the site boundary**
- **A layout plan indicating proposed green areas, features and spaces and how these will connect to wider networks beyond the site boundary**
- **A landscape plan detailing the proposed planting**
- **Proposals for mitigating adverse impacts on existing green infrastructure**
- **Arrangements for the ongoing long term maintenance and management of new green areas, features and spaces**

Pre-application discussions will be important in identifying which of these will be required.

The diagram on the following page identifies the issues relating to green infrastructure which should be taken into account when starting to formulate development proposals. These are in addition to the normal consideration of the site context: location and surroundings, natural features, views, topography, hydrology and drainage, microclimate, landscape character etc.







## Green infrastructure through the masterplanning process

### Perth Core Area North West indicative example



This is an example of how site specific developer requirements set out in the Local Development Plan relating to green infrastructure could be expanded upon as part of the masterplanning process. This map shows how existing and proposed accesses through the site and extending beyond the site boundary could be integrated with existing and proposed green infrastructure areas, features and spaces within and around the site. Considering green infrastructure in this way during the earliest stages of preparing a development proposal will allow maximum benefits to be identified but also the opportunity to consider green and grey infrastructure approaches together.<sup>13</sup>

<sup>13</sup> Based on work by Springfield Properties and AREA Urban Design Architecture on the masterplan for the Bertha Park SDA  
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 AREA URBAN DESIGN & ARCHITECTURE LLP Registered In Scotland Partnership No. So300994

### Incorporating green infrastructure into development

National Planning Framework 3 aims to significantly enhance green infrastructure especially around towns and cities. The new Scottish Planning Policy 2014 requires the planning system to “*consider green infrastructure as an integral element of places from the outset of the planning process*”.<sup>14</sup> In designing green infrastructure developers should consider the qualities of successful places and treat green infrastructure “*as an integral element in how the proposal responds to local circumstances, including being well-integrated into the overall design layout and multi-functional*”.<sup>15</sup>

Green infrastructure should be integrated into the overall design process and considered at every scale of development from individual buildings through to masterplanning for strategic development areas.

**All development, regardless of scale, has the potential to make some contribution to enhancing, protecting and / or providing green infrastructure.**

It is not suggested that all grey infrastructure systems can, or should, be replaced by green infrastructure solutions as many modern man-made materials play an essential role in meeting health and safety requirements or offer levels of efficiency which make them the best overall option. Where ‘grey’ infrastructure continues to offer the best solution for particular infrastructural elements, wherever possible these should be integrated with green infrastructure solutions to maximise benefits and multifunctionality.

<sup>14</sup> Scottish Planning Policy 2014 paragraph 221





<sup>15</sup> Scottish Planning Policy 2014 paragraph 232

The Scottish Government’s ‘Green Infrastructure Design & Placemaking’ identifies some examples of simple shifts from **grey** to **green** infrastructure:

- **Street trees** instead of **road bollards**
- **Green / living roofs** instead of **traditional roofs**
- **SUDs, swales and natural flood management** instead of **engineered flooding solutions**
- **Permeable paving incorporating water storage in the sub base of the street** instead of **standard roads and sewers**
- **Multifunctional infrastructure** instead of **single function**



The following table gives some guidance as to what could be considered for different scales of development. **Please note that for larger scale proposals the guidance for smaller scale areas will also apply** i.e. for strategic scale developments the guidance for neighbourhoods, streets, and individual buildings / small groups will also apply. A significant amount of information and advice is also contained in documents which deal with specific aspects of green infrastructure and these are referenced.

| Scale  | Potential green infrastructure contribution   |   |
|--|---|---|
| Individual building or small groups of buildings |  <p>Small scale green infrastructure incorporated into the building or plot design. For example green roofs and 'living' walls<sup>16</sup>, trees and planting in gardens, hedges rather than fences, and permeable driveways. Such elements can help form networks and green corridors for the benefit of species and animal movement.<sup>17</sup></p>  |  |
| Streets  |  <p>New streets 'greened' to enable them to act as links or corridors between other larger scale green spaces such as parks or amenity green spaces.</p> <p>'Greening' could be achieved through the incorporation of features such as boundary hedges appropriate to local habitats and species, verges and SUDS, permeable paving, or new street trees and urban tree planting.<sup>18</sup></p> <p>New streets should be designed first and foremost as routes for people rather than for vehicular traffic.<sup>19</sup></p>     |  |
| Neighbourhoods                                   | <p>Incorporation of existing important green infrastructure into the design.</p> <p>Creation of networks within and extending beyond the site to take people from where they are to where they want to get to e.g. connecting open spaces, housing, services, and public transport links which can be used for recreation or active travel, or serve as safe routes to schools. These linkages should be accessible to all.</p> <p>Provision of good quality green areas, features and spaces in and around schools which can act as an educational resource as well as providing a quality learning environment.</p> |   |



<sup>16</sup> Perth & Kinross 'Sustainable Design and Zero Carbon Development Supplementary Guidance'

<sup>17</sup> Tayside Biodiversity Partnership 'Biodiversity: A Developers Guide'

<sup>18</sup> Perth & Kinross Council 'Forest and Woodland Strategy': Opportunity for Action

<sup>19</sup> Perth & Kinross Council 'Perth Transport Strategy – Shaping Perth's Future'



Consider biodiversity: incorporate existing habitats and mature trees which can have high biodiversity value. Where possible incorporate buffer strips and keep public access to one side of the habitat to reduce disturbance.



Retain or create wildlife corridors e.g. hedges, shrubs, rough grassland or buffer zones alongside field edges or ditches, and maximise opportunities for biodiversity on amenity / formal open spaces, playing field boundaries etc. through planting and provision of shelter. Link open spaces with strategically placed trees, shrubs or grass verges to create habitat networks both within

the site and outwith to wider areas of habitat beyond the site boundary.<sup>20</sup>



Enhancing streets and neighbourhood blocks with 'punctuations' of green spaces such as parks or small informal spaces which can serve as spaces for people to meet and children to play as well as enhancing biodiversity. Essential however that such spaces are multi-functional and do not end up becoming an expensive burden to maintain.



Support the principles of sustainable design and construction, e.g. in relation to the standards and specifications for path construction and signage or the use of trees, planting and landscaping to provide shade and shelter for buildings from the sun & wind.<sup>21</sup>



Sustainable Urban Drainage Systems: these can take different forms including swales and basins, infiltration trenches, ponds and wetlands, or green roofs.<sup>22</sup> SUDS can be designed so as to provide multiple benefits such as biodiversity or visual amenity in addition to their primary purpose.

Incorporating initiatives to support the historical interpretation of the landscape and integrating these with existing green infrastructure features such as open spaces and footpath linkages.

<sup>20</sup> Tayside Biodiversity Partnership 'Biodiversity: A Developers Guide'

<sup>21</sup> Perth & Kinross 'Sustainable Design and Zero Carbon Development Supplementary Guidance'

<sup>22</sup> Perth & Kinross 'Sustainable Design and Zero Carbon Development Supplementary Guidance'

## Strategic scale developments



Incorporation of new large scale green infrastructure into the design of strategic scale developments, for example:

- Civic scale spaces such as town parks with a variety of facilities for people and provision for biodiversity
- Areas of woodland and grasslands



The inclusion of large and broad areas of green spaces within strategic scale green infrastructure to create areas of large scale natural habitat.

Green infrastructure designed as part of, and making a contribution to, the landscape framework; use existing and proposed green infrastructure to help provide a landscape framework for the development and a setting within the wider landscape.

Recognise unique local landscapes and safeguard and restore sensitive woodland habitats.<sup>23</sup> Encourage the development of new active travel routes through new and existing woodland and promote the expansion of forest habitat networks.<sup>24</sup>

## All scales

Where development at any scale will result in the fragmentation or severing of an existing network it will be essential that these adverse effects are identified at an early stage and appropriate mitigation is factored into the development process. At the larger scale 'green' or 'wildlife' bridges and eco-ducts could be used to re-connect natural areas which have been artificially divided, for example, by new roads. For example the new Aberdeen Western Peripheral Route Balmedie to Tippetty includes proposals for three wildlife bridges. Such features could be combined with pedestrian access to allow movement for both people and wildlife.<sup>25</sup>

Where there are natural burns or rivers adjoining or within the development site, retain rough riparian grassland and sandy banks and create buffer zones. Such spaces should be safeguarded as natural habitat and linked to help facilitate movement of plants and animals.<sup>26</sup> The restoration of watercourses which are not in a natural state is encouraged.



<sup>23</sup> Perth & Kinross Council 'Forest and Woodland Strategy': Opportunity for Action

<sup>24</sup> Perth & Kinross Council 'Forest and Woodland Strategy': Opportunity for Action

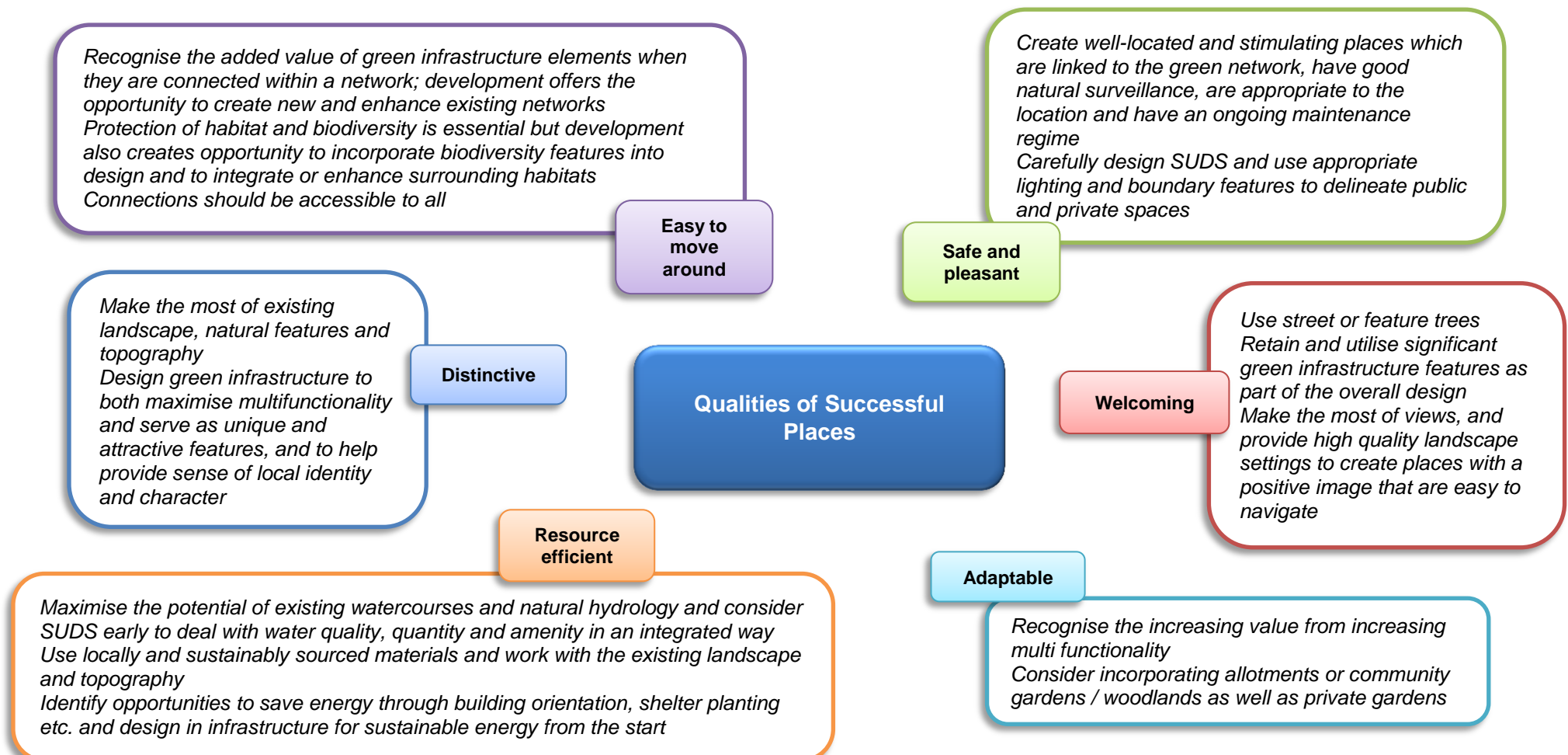
<sup>25</sup> Illustration from EU website: <http://ec.europa.eu/environment/nature/ecosystems/illustrations.htm>

<sup>26</sup> Tayside Biodiversity Partnership 'Biodiversity: A Developers Guide'

## Green infrastructure to help achieve successful places

The Scottish Government in 'Green Infrastructure: Design & Placemaking' gives a checklist of green infrastructure considerations when developing a masterplan based on the Government's aspirations for successful places. This is aimed primarily at ensuring green infrastructure is integrated into masterplans and development briefs for major developments to help ensure that these large scale developments are connected to existing networks and that new green

infrastructure is provided. However the general principles of making developments distinctive, safe and pleasant, adaptable, welcoming, resource efficient and easy to move around are relevant to all scales of development. Green infrastructure can play a significant role in helping achieve the qualities of successful places and the Scottish Government guidance is therefore summarised below.





### The cost of green infrastructure

Grey infrastructure solutions have become the 'norm' and there is a perceived risk in deviating from these standard and known solutions. A perception of higher costs, a lack of information about the maintenance and management requirements of green infrastructure solutions, together with overall uncertainty as to how well green infrastructure can do the job compared to standard grey solutions, result in a reluctance to fully explore the potential of green infrastructure and to take up the challenge of doing things in a new and different way especially in the current economic climate.

The wide ranging benefits of green infrastructure, environmentally, socially and economically have been highlighted elsewhere in this guidance. The use of green infrastructure solutions in development in place of or in addition to grey infrastructure approaches can help realise the many and varied benefits green infrastructure can bring to a development. Green infrastructure should not therefore be seen as a constraint but rather as an opportunity which can help to greatly improve the overall quality of a development.

In some cases green infrastructure solutions may cost more than the grey infrastructure equivalent. However the added value of green infrastructure solutions in terms of their multifunctionality and ability to deliver multiple benefits compared to a single function grey infrastructure solution should not be underestimated. Green infrastructure solutions may incur more upfront costs but the benefits can accrue long into the future. So when the wider benefits of green infrastructure to people, nature and wider ecosystems are taken into account, the cost-benefit analysis of green infrastructure may be significantly more favourable than it would appear based purely on the initial cost.<sup>27</sup>



### How much green infrastructure is required?

This guidance sets out what the Council is seeking to achieve in general terms across Perth & Kinross and sets out the strategic opportunities for improving and enhancing green infrastructure. Detailed quantitative requirements on a site-by-site basis need to be based on an overall audit of existing green infrastructure which would allow detailed deficiencies in provision to be identified. The Council is due to prepare supplementary guidance on Open Space Provision and Developer Contributions in the near future and this will consider in more detail quantitative requirements in terms of direct provision or financial contribution. Once this guidance is prepared it may be appropriate to revise this supplementary guidance on green infrastructure. In the meantime developers should be guided by Local Development Plan policies and the site specific developer requirements for individual sites.

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<sup>27</sup> 'Design, Implementation and cost elements of Green Infrastructure Projects' Ecologic & GHK

## MONITORING

The effects of this supplementary guidance, and the Local Development Plan policy to which it relates, need to be monitored in order to assess how well it is working and identify whether any improvements are required in order to ensure that the guidance is effective in achieving its key aims to:

- **Protect, enhance and prevent the fragmentation of existing green infrastructure**
- **Require the creation of new green infrastructure where the need arises as a result of development**
- **In conjunction with development proposals, maximise the role of green infrastructure to improve the quality of the environment to benefit people, animals and plants alike**
- **In conjunction with development proposals, maximise the role of green infrastructure in addressing climate change and adapting to its impacts**

The key indicator to assess the effectiveness of the guidance will be to monitor the percentage of major and local planning applications which include green infrastructure elements and of these:

- the percentage which have a neutral impact;
- the percentage which have a positive impact in terms of improvements to or enhancement of green infrastructure; and
- where an application has negative impacts on green infrastructure whether these have been satisfactorily mitigated

A commentary of the nature and quantity of green infrastructure provided will also be recorded where information is available.

We would welcome further suggestions as to how the effectiveness of the supplementary guidance could be monitored.

